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PA

▶ Philosophical Anthropology

Paediatric Surgery

▶ Child Surgery

Paideia

▶ Humanities

Pain (Suffering)

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Pain is a set of neurophysiological responses in complex organisms. Pain evolved because it enabled organisms to process noxious stimuli. As such it is an essential part of those organisms' interaction with their environment. Human babies born without the capacity to feel pain rarely live more than a year.

Suffering may be defined as: acute or prolonged physical or mental distress caused by trauma or disease. Suffering is particularly acute when the organism perceives no possibility of release. There are forms of suffering that are peculiar to humans – the crushing of hope associated with a diagnosis of infertility or terminal cancer, also the suffering that attends lost love, prolonged imprisonment, systematic torture, or mental illness. But observations in other animals suggest they are also capable of suffering (Southgate 2008).

This entry will concentrate on the problem that suffering poses to the Christian understanding of a creator God who is all-loving, and how conversation with science affects this debate. This is a problem in *theodicy* – consideration of the goodness of God in the face of evils. Christianity has had an ambiguous relationship with suffering: some New Testament texts suggest that suffering in the believing community engenders virtue (Rom. 5.3; 1. Peter 4.13). Suffering endured for the faith can in certain circumstances ennoble the sufferer and enrich the community. But suffering can also destroy human selves and relationships without any sign of a redemptive element in the experience.

The literature distinguishes *moral evil* – suffering engendered by freely chosen human action – from *natural evil* – suffering from other causes (such as disease, earthquakes, etc.). Suffering from natural disasters often contains an element of human neglect (moral evil) as well as natural evil. The classic responses to moral evil are the free-will defense and an "Irenaean" theodicy. The former postulates that moral evil is

a necessary consequence of God endowing humans with authentic free will. The latter supposes that a world of suffering is a training-ground for human virtues. Southgate and Robinson (Murphy et al. 2007) have categorized these as "property-consequence" and "developmental" approaches, respectively. For an evaluation of these approaches see Surin (1986). He and Phillips (2004) are very critical of any response to suffering that seeks to explain it in terms of a balance of goods and harms, rather than attending to the voice of the sufferer.

The science-religion debate influences the question of moral evil mainly insofar as its reflection on humans' evolutionary inheritance suggests that we might be programmed to behave in selfish, cruel, and violent ways. For recent explorations see de Waal (2004), and Bennett et al. (2008).

Great natural disasters such as the Indian Ocean tsunami of 2004 intensify questions of natural evil as they apply to humans. Polkinghorne offers a "free-process" defense (Polkinghorne 2005/1989) – God created the world by certain processes (including tectonic activity) – processes that give rise to new possibilities for the biosphere as well as to suffering – and God allows those processes to continue to be themselves. This can only be a partial response – God must have love and care for the individual as well as for the system. Reflection on the tsunami also shows the difficulty in speaking of God's providential activity in the world – whenever we speak of God's alleviating the suffering of an individual we intensify the problem of when God seems *not* to act. Clayton and Knapp have recently debated this issue in conversation with Wildman (Murphy et al. 2007).

Where the sciences are most influential on current theology is in relation to the suffering of nonhuman creatures. Science shows us the implausibility of the ancient Christian answer that nonhuman suffering is all caused by human sin (Southgate 2008). Further, it suggests that competition and predation are essential to the way evolution by natural selection "works" (Rolston 2003) – the suffering they cause is *intrinsic* to the process. They cannot therefore

be attributed to some cosmic "fall" of creation (Southgate 2008). Rather it may be that this was the only way that God could create creaturely selves (Southgate 2008; Attfield 2006). By itself, however, such an "only way" argument is not adequate. Again, God loves every individual creature, so an argument at the level of the overall system cannot do full justice to that love. Southgate has proposed not only that God suffers with the suffering of every creature, but that at least some creatures, whose lives know no fulfillment, will experience that fulfillment in a redeemed life (Southgate 2008; Edwards 2006).

Cross-References

▶ Divine Action
▶ Eschatology
▶ Evil, Problem of
▶ Evolution
▶ Free Will

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Pain Medicine

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Related Terms

Chronic pain; Physical suffering

Description

Pain research contains two major elements: investigating basic mechanisms of pain transmission, modulation and plasticity; and searching for novel drugs to treat chronic pain. Traditionally, the first part is performed in academic institutes, while the latter is mostly done by pharmaceutical companies. Due to recent progresses in genetic, biochemical, and brain imaging technology, integrative and translational pain medical researches have been seen in both environments, and the reduced gap between academic institutions and pharmaceutical labs may bring new insights into pain mechanisms, increasing searches for novel pain medications.

Self-identification

Pain research has always been a key component of basic neuroscience. Like other sensory studies such as vision and hearing, neuroscientists have systematically mapped relatively selective neuronal pathways that convey noxious information from the periphery to the brain (Kandel et al. 2000; Wall and Melzack 1999; Zhuo 2007). For example, the identification of selective proteins/receptors that transmit heat or cold is a major progress in neuroscience. Furthermore, pain reaches higher brain structures such as the prefrontal cortex, and imaging pain and pleasure in conscious humans may provide a new window to explore questions such as consciousness and self.

Characteristics

Differing from other neurological diseases, chronic pain can happen to any normal human. It is caused by physical injury, not by gene mutation or stressful environments. It is not a hereditary disease. Everyone experiences pain at least once in his or her lifetime. This differentiates pain research from other medical sciences.

Relevance to Science and Religion

Pain research can be divided into different sub areas: At the single protein level, where unique sensory proteins have been identified to code sensory information such as temperature and touch; at the synaptic level, where synaptic potentiation and depression are found to be involved in chronic pain; at the systemic level, where pain triggers emotional fear, anxiety, memory, depression, and the usage of addictive drugs. It also affects attention, decision making, sex desire, sleep, and many other key brain functions.

Sources of Authority

The articles published in the open-access journals such as *Molecular Pain*, *Journal of Pain* or *Pain*, which can be seen on PubMed, are the major source of authority on pain research. Conducted by those in the field, they contain the most up-to-date research information. Additionally, a few textbooks that consolidate the available information are available, such as the *Textbook of Pain*, *Molecular Pain*, etc.

Ethical Principles

As noted by International Association for the Study of Pain (IASP), investigators should make every effort to minimize pain whenever possible. Anesthetics should be used when conducing surgical procedures to eliminate sensory awareness, and analgesics should be used as long as they do not interfere with the aim of the investigation.

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Investigators should adopt an attitude where an animal is regarded not as an object for exploitation, but as a living individual. All investigators engaged in pain research should follow the explicit guidelines of their institutions, which weigh the importance of the investigation and the potential benefit of such experiments to our understanding of pain mechanisms and pain therapy, to the severity and the duration of pain involved. The duration of the experiment must be as short as possible and the number of animals involved kept to a minimum, and measures should be taken to provide a reasonable assurance that the animal is exposed to the minimal pain necessary for the purpose of the experiment.

Key Values

The key value of pain research is providing pain relief throughout the world, not only for humans, but for pets and animals. Toward that end, investigators seek to understand the underlying mechanisms of pain, and to develop new pharmaceutical agents that are able to alleviate or eliminate pain with as little side effects as possible.

Conceptualization

Pain, including physical and psychological pain, affect vital meaning of life. It influences our decision making, pleasure, consciousness and the willing to live.

Relevant Themes

Understanding of pain mechanisms provide additional potential insights for several key brain functions such as consciousness, memory, emotion, and sleep.

Cross-References

▶ Depression
▶ Gene
▶ Memory
▶ Neurophysiology
▶ Self

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Pan-Buddhist Core Themes/Terms Relevant for Buddhist Psychology

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1. The *4-Ennobling Realities* (Propositions, Experiences, Facts, Data, or Hypotheses)
2. The *8-Fold Balancing Path* (a Middle Way of balanced savvy, virtue, and meditation)
3. The *5-Skandhas* (psychological modalities of mind or self: feeling-thought-interaction)
4. The Buddha's *Dependent Origination* (causality hypothesis of feeling-thought-interaction)
5. The "provisional self" and ultimate *Not-self* (no soul, thus no reincarnation)
6. The notion of *Karma* (intentional feeling/thought and concomitant relational action)
7. The state/trait of *Nirvana* (contentment/emptiness as unwholesome affects extinguish)
8. The *3-Poisons*: greed (anxiety, sadness), hatred (anger, depression), and ignorance

9. The *4-Immeasurables* (social meditations, augmenting kindness, compassion, and joy)
10. The *3-Empirical Marks of Existence* (*duhkha*, impermanence/imperfection, and non-self)

Panentheism

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Panentheism is a concept which addresses the theological issue of God's relationship to the world by proposing that the world is "in God." The term is derived from the Greek *pan-en-theos* and means "all-in-God." The term is often understood as a third option over against the alternatives of pantheism ("all is God") and classical theism ("God is absolutely separate from the world"). Over against these two alternatives, panentheism emphasizes the closeness between God and the world (God's immanence), as well as maintains that God is more than the world (God's transcendence). The controversies over the term are often associated with the understanding of the preposition "in," for example, what it means that the world is "in" God and with discussions of God's changeability and dependence on the world.

Coinage of the term is attributed to German philosopher, influenced by German idealism, Karl Christian Friedrich Krause (1781–1832). However, the term did not gain widespread use until after it was implemented into process theology by Charles Hartshorne (1897–2000). Today, it plays a central role within the field of science and religion where it is presented by its proponents as a Christian understanding of God compatible with modern natural science because it does not propose supernatural interventions in the natural system.

There is a variety of panentheistic positions both historically and in contemporary thought. The history of the idea of panentheism, if not the term, takes its departure in Plato and Neoplatonism and continues through Christian theological thought and Western philosophy. The philosophies of Spinoza,

Hegel, and Schelling are often accentuated as key elements in the development of modern panentheistic thinking. Contemporary panentheism is not a clearly unified school of thought but can be viewed as a variety of theologians and philosophers interested in rethinking the relationship between God and the world by emphasizing God's immanence over against what is perceived as the overemphasis on transcendence by classical theism.

The concept of panentheism is linked to central Christian theological themes, such as creation, incarnation, and Trinitarian theology. In relation to the understanding of God, the main themes which are debated in relation to a panentheistic position concern the classic understanding of God as immanent and transcendent and God as omnipotent, omniscient, and omnipresent. In its contemporary form, panentheism can be seen as part of the criticism of late modernity against classical theism and the metaphors used in the understanding of God formulated within feminist and liberation theologies in the twentieth and twenty-first centuries.

The theological debate on the issue of panentheism is primarily concerned with whether panentheism can be viewed as part of a Christian understanding of God or not. Proponents of Christian panentheism point to the connection to Western theological and philosophical tradition, especially German idealism, thereby emphasizing its continuation with Western Christian thought. Proponents within a science and religion context often point to its compatibility with natural science while maintaining a potential for Christian theology (Clayton 2000; Clayton and Peacocke 2004; Brierly 2006). Opponents of panentheism on the other hand deem the notion, or at least some varieties of it, as incompatible with a Christian understanding of God due to the challenges to a more traditional understanding of God. Critics also argue that it is possible to stress God's immanence in the world without adopting a panentheistic position (Cooper 2007; Gregersen 2004). The broad spectrum of positions which may be placed under the common denominator of panentheism has been a source of debate concerning the usefulness of the terminology

(Thomas 2006; Brierly 2006). There is also a debate concerning who should be considered as panentheists (Cooper 2007; Brierly 2004).

Within Christian theology, a variety of positions have developed in the twentieth century, which can be considered in relation to panentheism. German Protestant theologian Jürgen Moltmann (1926–) presents a perichoretic panentheism, linking the internal relationship between the three persons of the Trinity to the relation between God and the world, and between creatures. Moltmann proposes a view of God's relation to the world, where God has created the world within Godself. In *The Crucified God: The Cross of Christ as the Foundation and Criticism of Christian Theology* from 2002, Moltmann stresses the theological notion of the suffering God in his understanding of the interdependence of God and creation. Also, the theology of Protestant theologian Paul Tillich (1886–1965) could be connected to panentheism in relation to his notion of God as the ground of being, a notion which stresses the close relation between God and creation, as can be seen from his work in 1952, *Courage to Be*. The theology of German Protestant theologian Wolfhart Pannenberg (1928–) is also mentioned in the theological discussions on panentheism, although Pannenberg clearly in *An Introduction to Systematic Theology* in 1991 denies holding a panentheist position (see Cooper 2007 p. 259 for a presentation of Pannenberg's position and criticism). The work of Jesuit priest and philosopher Pierre Teilhard de Chardin (1881–1955) has also had an impact on the development of panentheism within science and religion through his understanding of the relationship between God and the world. Contemporary panentheism is linked to the development of process theology or relational theology. Process theology is inspired by Alfred North Whitehead's (1861–1947) process philosophy and was developed into process theology by, among others, Charles Hartshorne (1897–2000) and John Cobb Jr. (1925–). Initially, the primary source of discussion of panentheism in science and religion has been within Western Christianity, but panentheistic ideas are also a part of Eastern Orthodox Christianity as well

as the religious traditions of, among others, Hinduism and Islam.

The position of panentheism is expressed in variety of ways with an array of reservations among its proponents. There have been various attempts to categorize these variations of panentheism. Michael Brierly offers what he describes as a "continuum of metaphors" in order to capture the various forms of understanding God's relation to the world, including classic theistic positions, pantheism, and variations of panentheism in the same spectrum (Brierly 2006). Niels Henrik Gregersen offers a tripartite typology of panentheism: soteriological panentheism, expressivist panentheism, and dipolar panentheism. In relation to Gregersen's typology, soteriological panentheism is an understanding of the relationship between God and the world in an eschatological perspective, emphasizing the future completion of the union of God and the world in the final redemption of the world. Expressivist panentheism designates those panentheistic ideas which are centered on the concept of the Spirit, which expresses itself through the development of the world. The Spirit is understood as originating and returning to God after influencing and being influenced by world history. Dipolar panentheism holds a twofold notion of God, stating at the same time God's transcendence and God's closeness to the world even to the extent where the world has influence on God and that God cannot exists without a world. Thereby, dipolar panentheism can be seen as the most extreme position in relation to the emphasis on God's immanence and God's dependence on a world. In relation to this typology, Gregersen continues his presentation utilizing a terminology of generic, strict, and qualified panentheism in order to discuss the relation between panentheistic ideas and Christian thought (Gregersen 2004). Cooper has used the terminology of implicit panentheism to be able to follow the notion from Plato to the current discussions within science and religion (Cooper 2007).

The issues raised by panentheism have been discussed by key figures within science and religion from early on, as can be seen by the work of Ian Barbour (1923–), John Polkinghorne (1930),

and Arthur Peacocke (1924–2006), with the latter as the most deeply involved in expressing a contemporary panentheistic position. Ian Barbour has utilized process thought in his presentation of an optimal model for the relation between science and religion as well as in relation to a critique of classical theism, as can be seen, for example, in his book *Religion in an Age of Science* from 1990. Arthur Peacocke presented a sacramental panentheism, utilizing a Christian concept of sacrament to emphasize God's presence in the world. Peacocke was inspired by the Lutheran sacramental notion that God is present "in, with, and under" the elements of the Eucharist to express the same kind of presence by God in the world (Peacocke 2006). Both Barbour and Peacocke, however, hold reservations concerning panentheism in regard to the complete integration of the world and God expressed in more radical panentheistic notions. John Polkinghorne also expresses concerns with a radical panentheism and leaves the notion of panentheism to the eschatological dimension of God's relation with the world and rejects it as a description of the current relation in his 2002 book *The God of Hope and the End of the World*.

In recent years, Philip Clayton has been one of the strongest voices proposing panentheism within the field of science and religion. Clayton offers a list of seven possible reasons in support of why panentheism should be adopted and has been involved in a number of publications and academic symposiums dedicated to the presentation and discussion of panentheism (Clayton and Peacocke 2004). For Clayton and others, panentheism is a source for a Christian understanding of God compatible with modern science. Panentheism in this perspective offers an understanding of divine action which holds that God is active in the world, thereby avoiding the passive God of deistic responses to science, while at the same time avoiding statements which are in contradiction with the natural laws as understood by modern science (Clayton 2000, 2004).

Clayton uses a body-person analogy to describe the relation between the world and God and links this notion to the concept of emergence. He affirms a notion of the necessity of God versus

the contingency of creation compatible with panentheism, but which also draws on thoughts affiliated with a more traditional, theological understanding. Other key representatives from within science and religion, who have been or are still involved in the discussion of panentheism from various perspectives and with a variety of points of criticism in relation to the concept, are Niels Henrik Gregersen, Celia E. Deane-Drummond, Keith Ward, and Paul Davies.

Cross-References

▶ Concept of God in Contemporary Philosophy of Religion
▶ Emergence, Theories of
▶ Feminist Philosophy of Religion
▶ Liberal Theology
▶ Process Theology
▶ Theism, Classical
▶ Theistic Naturalism
▶ Transcendence and Immanence

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Pan-Indian Movement

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This is a scholarly term used to designate the emergence of a strong movement, especially among urban American Indian communities but also among many reservation communities, that American Indian people have important shared core values as well as the shared history and ongoing experience of colonialism and its realities. Pan-Indian organizations emerged in the early twentieth century with the birth of the National Congress of American Indians and similar organizations, but the shared sense of "Indianness" gained considerable momentum starting in the 1960s.

Pan-Indianism

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The promotion of unity and shared identity across tribal affiliations. Tribal identity was all important in a precolonial context but as the United States federal government took control over all native lands, it became clear to the indigenous groups that they needed to find strength in unity. With the increasing importance of intertribal affiliations and religious practices, Pan-Indianism has become a typical feature of contemporary Native American cultures and their politics.

Papal Infallibility

▶ Catholic Church and Science

Pāramitā

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Abbreviations

Bv	Buddhavaṃsa
BvA	Buddhavaṃsa-aṭṭhakathā (Commentary to Bv)
CpA	Cariyāpiṭaka-aṭṭhakathā (Commentary to Cp)
Dhp	Dhammapada
M	Majjhima-nikāya
PTS	Pāli Text Society
S	Sayuṃtta-nikāya
SA	Saṃyutta-aṭṭhakathā (Commentary to S)
Sn	Sutta-nipāta
v	verse

Related Terms

Bodhisattvabhūmi; Highest point; Perfection

Pāramī or *pāramitā* in Buddhism plays the central role in the path of a *bodhisattva* (Pāli: *bodhisatta*) in both traditions, Theravāda and Mahāyāna. He fulfills them (ten in Theravāda and six in Mahāyāna) for the attainment of enlightenment to become a "*Buddha*" (awakened one).

Etymologies of the word "*pāramitā*" have been controversial (Hotori 2006). There seem however two popular etymologies: (1) *pāram + ita* (pp. < √i to go, reach, attain) (the state of having gone or reached the other shore) and (2) *pāramitā* derived from "*parama*" (adj. superlative of *para* – beyond, higher, further, etc.) As found, for instance, in the *Bodhisattvabhūmi*, it means "highest condition, highest point, best state, perfection." (Dayal 1999) Both etymologies can also be seen in Theravāda Buddhism of the commentarial period, though they are often seen in Sanskrit literature. In early canonical texts, the meaning is "having gone to the other shore" in the sense of "having reached liberation" as in "one who has gone to the other side" (*pāragū*) (S I, 195; Dhp, 348; etc.) and "one who has gone to the opposite shore" (*pāraṃ gato*) (M I, 135; S II, 277; Sn 803; etc.). The Commentary to the *Saṃyutta-nikāya* makes this meaning clear when it states: "'Having gone to the other shore' means 'having reached *nibbāna*'" (*pāraṃ gato ti nibbānaṃ gato*) (SA I, 89). *Pāramī* or *pāramitā* as a derivative from "*parama*," on the other hand, gained steady support by many. The PTS Pāli-English Dictionary subscribes to this view (PTS *Pali-English Dictionary*, 454.). In the Pāli tradition, the word "*pāramī*" (f) is taken as an abstract noun from "*parama*" in the same dictionary. Since the canonical texts have quite often the form of "*pāramī*" – the form of "*pāramitā*" came to be employed in postcanonical texts, and thereafter, the Theravādins may have been influenced by other Buddhist schools in adopting this term in later times.

The *pāramī* in its technical sense of "perfection" in Theravāda Buddhism is found for the first time in one of the late texts in the *Khuddaka-nikāya*, the later addition to the five collections, collectively known as the *Sutta-piṭaka* (Bv I, v 77; II, vs 117 ff (Here they are referred to as "*bodhipācana*")). Another text belonging to the same group too elucidates some of the *pāramī*-s (Of the ten "perfections," the text relates only seven; namely, *dāna*, *sīla*, *nekkhamma*, *sacca*, *adhiṭṭhāna*, *mettā* and *upekkhā*). They are otherwise referred to as "the things that make

(an aspirant) a Buddha" (Bv II, v 116) and, according to its Commentary, are said to be ten (in number) such as "the perfection of giving (*dāna-pāramī*)." (BvA, 104. Cf. CpA, 277) They are also called "ripening of knowledge" (*bodhipācana*) (Bv II, vs 121, 126, etc.). These references show that *pāramī*-s are the things every *bodhisatta* (Buddha-to-be) must fulfill (See Bv I, v 79). However, the Commentary to the *Buddhavaṃsa* interprets "*bodhipācana*" to mean either "ripening of the path" (*maggaparipācana*) or "ripening of omniscient knowledge" (*sabbaññutañāṇaparipācana*) (BvA, 105). Here its meaning includes the general sense of "ripening of knowledge" that is applicable to both arahants and Buddhas. This sense of *bodhi* became a stepping-stone for further development of the doctrine of *pāramī* in the Pāli commentaries (See Endo, T. op.cit., 227 ff).

The Theravāda tradition lists ten *pāramī*-s: (1) *dāna* (generosity, giving, liberality), (2) *sīla* (virtue, morality, righteousness), (3) *nekkhamma* (renunciation), (4) *paññā* (wisdom), (5) *viriya* (energy), (6) *khanti* (patience/forbearance), (7) *sacca* (truthfulness), (8) *adhiṭṭhāna* (determination), (9) *mettā* (friendliness/loving-kindness), and (10) *upekkhā* (equanimity). The general list of *pāramitā*-s in Sanskrit literature on the other hand includes (1) *dāna* (generosity, giving), (2) *sīla* (virtue, morality), (3) *kṣānti* (patience, forbearance), (4) *vīrya* (energy), (5) *dhyāna* (meditation), and (6) *prajñā* (wisdom). Four additional perfections are added to this list: (7) *upāya* (skilful means), (8) *praṇidhāna* (aspiration), (9) *bala* (power), and (10) *jñāna* (knowledge). These ten are integrated into the ten stages of the *bodhisattva* path called the "*bhūmi*" (stage) as in the *Daśabhūmika-sūtra*. A slight difference is observed between the two lists, Pāli and Sanskrit – the Pāli list gives "*nekkhamma*" instead of "*dhyāna*" of the Sanskrit list. The number of *pāramitā*-s underwent several stages of development until the final formation of the list of six in Mahāyāna was reached (Dayal, H. op.cit., 168).

The six *pāramī* / *pāramitā* are the outgrowth of several basic concepts of early Buddhism. But in Mahāyāna Buddhism, great importance is attached to them because of their relation to the

Bodhisattva Ideal. The *pāramitā*-s are a progressive scheme to follow in the spiritual path to attain Buddhahood. It is sometimes considered to be necessary to remain in the cycle of births (*saṃsāra*) for the *bodhisattva* to practice compassion (*karuṇā*) for weal and happiness of the many and finally guide them to the yonder shore of suffering. Mahāyāna advocated this compassion to the highest. They lead to welfare, happy rebirths, serenity, unremitting spiritual cultivation, successful concentration, and the highest knowledge (Dayal H. op.cit., p. 171).

Like Theravāda Buddhism of the commentarial period which advocates thirty *pāramī*-s (perfections) with each *pāramī* having three levels of intensity, namely, ordinary perfections, higher perfections, and the highest or ultimate perfections; the *Laṅkāvatāra-sūtra*, a Mahāyāna text, too classifies them according to the three levels of practice, i.e., ordinary, extraordinary, or superlative (The *Laṅkāvatāra-sūtra*, edited by Nanjio, 1923, 237 ff.). This text demonstrates that "perfection" is ordinary if practiced by the ordinary worldly people for happiness in this life or the next, it is extraordinary if practiced by the Hīnayānists for the attainment of personal enlightenment, and it is superlative if practiced by the Mahāyānist *bodhisattva*-s for the welfare and liberation of all beings. Thus, in Mahāyāna, emphasis is laid more on others' welfare, happiness, and liberation while Theravāda, though some ideas are common to both, aims at the attainment of three different kinds of liberation as Buddha-s, pacceka-buddha-s, or *sāvaka* (arahants) (Endo 1997, 2002, 225 ff.).

"*Prajñā-pāramitā*" (perfection of wisdom) is considered to be most important, and it is believed that the remaining five *pāramitā*-s show a progressive training culminating in the attainment of "*prajñā*" at the end. In this is seen a clear systematization of the concept in Mahāyāna. The *Prajñāpāramitā* literature in particular places the utmost emphasis on this. Like in early Buddhism, Mahāyāna gives "*prajñā*" as the opposite of *avidyā* (ignorance) or *moha* (delusion). The *Bodhisattvabhūmi* classifies three kinds of "*prajñā*": that which depends on hearing the teaching from another person and on

the study of Scripture, that which arises from reflection, and that which is developed by cultivation and realization (Dayal, H. *op.cit.*, 236). Further, the Yogācāra school of Buddhist thought explains that "*prajñā*" is "the Knowledge of the supreme Good or the supreme Truth" (*paramārthajñāna*) or simply "Knowledge." It is thus "perfect knowledge" in all aspects. The Mādhyamika school, on the other hand, understands "*prajñā*" as the knowledge arising from the comprehension of "emptiness or void" (*śūnyatā*) of the phenomenal existence. It is thus called that "it is greater than all the other *pāramitā*-s; all the other *pāramita*-s should be sublimated into the *prajñā-pāramitā*. It is the essence of the Mahāyāna" (Dayal, H. *op.cit.*, 237).

The order of "*pāramitā*-s" became a focal point of discussion in Sanskrit literature. The Buddhist practices are often classified into three stages of spiritual path to enlightenment, namely, *śīla* (virtuous conduct), *samādhi* (concentration), and *prajnā* (wisdom). It is believed that the first six (as in the list of the Mahāyāna tradition) appears to be original, as it ends with the attainment of full knowledge or wisdom *prajnā*, (Thomas 2006, 211) or that the first six are the chief factors in a *bodhisattva*'s discipline, and the four additional *pāramitā*-s are merely supplementary in character (Dayal, H. op.cit., 167). The Mahāyāna list is generally represented with "*prajñā*" as the final culmination of spiritual path while the Theravāda list does not show such a progressive path, and instead it is placed in the middle (See for instance Dayal, H. op.cit., 168–9; Thomas, E.J. op.cit., 211; etc.). The Pāli list must therefore be examined in a different light from that of Buddhist Sanskrit literature. However, both lists begin with *dāna* and *sīla* which are the first steps into a higher realm of religious training commonly accepted in Buddhism.

The practice of *pāramī/pāramitā* for the attainment of the supreme enlightenment culminated its importance particularly after the rise of Mahāyāna, though, historically speaking, earlier stages of development of its concept in relation to the apotheosis of the Buddha cannot be ignored. On the way to the final acceptance and establishment of this concept, both traditions, Theravāda

and Mahāyāna, may have influenced each other, and the former in particular came under the tangible influence of the latter, which fact can be detected in Dhammapāla's commentaries (See Bodhi, Bhikkhu 1978; Katsumoto 2006, 173-192).

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Particle Physics

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Related Terms

Elementary particle physics

Description

Particle Physics is the name of the branch of Physics that, as the name suggests, studies composite and non-composite ("elementary") particles, that are the most fundamental components of our Universe. Studies in this field are carried out both theoretically and experimentally, in order to explain the properties and the behavior of such particles and to gain a better understanding of Nature. Particle Physics typically addresses microscopic lengths, of order of 10^{-15} m (approximately the size of a proton) or smaller, and high energies: the Large Hadron Collider (LHC) experiment at CERN laboratories is now testing the TeV scale – 1 TeV $= 10^{12}$ eV where approximately 1 eV $= 1.602 \times 10^{-19}$ J – by comparison, the energy of nuclear radiation is usually between 10^3 and 10^6 eV and chemical bonds are of the order of a few eV; for this reason, Particle Physics is also called High Energy Physics (HEP). Despite the small length scales, Particle Physics enters the study of the cosmos too: in fact models such as the Big Bang theory use the laws of Particle Physics to describe the early state of our Universe and its evolution; moreover, the very existence and the evolution of stars and even larger structures like galaxies and cluster of galaxies are tightly connected with the properties of particles.

It is important to notice that one should not think of a "particle" as a little sphere neither as a point-like material object: the theory of Quantum Mechanics (QM) in fact did shed light on the concept of particle as an object which presents both behaviors of classical material particles and of waves, and unify these behaviors in the notion of probability (density) wave, called "wavefunction." This duality was clarified with the help of the de Broglie relation λp = h, where h is the Planck constant, λ is the wavelength of the particle, that can be related to its size, and p is the particle momentum, related to its energy. An interpretation of this formula is that, when higher and higher energies are employed, smaller length scales are probed. For this reason, in order to uncover the fundamental laws ruling our Universe, very high energies are needed. The current description of particles, the Quantum Field Theory (QFT), formulated in the framework of A. Einstein's Special Theory of Relativity, encompasses QM and allows to address both

microscopic lengths and high energies; it predicts the existence of an antiparticle for every existing particle (the two can in case coincide), both with the same mass, as P.A.M. Dirac first theorized in his famous work on the electron in 1931. In QFT particles are mathematically described as "fields" and are classified according to the way they change under some symmetry transformations, for example, spatial or temporal translations and rotations. Quantities that are linked to these symmetries but that do not change under any of such transformations are then particularly useful, and are used in the description of a particle: for example, its rest mass or its spin. Other symmetry transformations, called "internal" because they do not involve transformations in space-time, are considered as well since it is found that the known particles all fit in certain symmetry patterns according to their properties; some of these symmetries, that are "local" since the transformation depends on the space-time point, are particularly important, because the requirement that the physics should instead not change from one point to another forces to assume the existence of new particles. These particles are called "gauge bosons" and are the carriers or mediators of a new interaction, intimately connected to the local symmetry, alternatively also called "gauge symmetry." An example of gauge symmetry at low energies is found in classical Electromagnetism in J.C. Maxwell formulation (1864), where the electric and magnetic fields and the forces they induce are described by mean of another more essential quantity A (thus this theory unifies the two forces). The theory is invariant under a local redefinition of A, hence under the gauge symmetry generating this transformation. While in Maxwell's view this new quantity described the propagation of light as oscillation of electric and magnetic fields and their effect on the electrons in terms of forces, the quantization of his theory (named Quantum ElectroDynamics (QED)) describes in more modern terms the propagation of the photon (described by the field A) and its interaction with the electron field. Therefore the macroscopic forces felt by a particle are described in QFT by its interaction with the mediator field, in this case the photon; so for example

an electron can absorb or emit a photon, or it can exchange a photon with another electron, producing in this way something that at the macroscopic ("classical") level we call a force acting on the two electrons. (By "quantization" of a classical theory we mean a procedure, described by QM and QFT, which modifies the theory in order to make it hold in the quantum regime, i.e., at small distances.)

Maxwell's formulation of Electromagnetism is the first and simplest case of gauge theory, from which the study of such theories arose. Moreover these theories introduce a remarkably simple conceptual setting to introduce interactions between particles in quantum theories, which is until now the only consistent setting known. Symmetries then turn out to be very useful not only in our description of Nature as powerful tools for calculations and settings, they are also intimately connected to our description of interactions between particles, and in this framework give powerful predictions, for example the number of existing gauge bosons, given the gauge symmetry group, and that all such gauge bosons must have spin 1 and mass 0 unless the related symmetry is broken.

The present quantum field theoretical model describing our knowledge of Particle Physics is a gauge theory called the "Standard Model" (SM), whose particle content is listed in Tables 1, 2, and 3: the so-called matter particles are six leptons and six quarks (together with their antiparticles), sorted in three generations or families, moreover there are the gauge bosons mediating the interactions, namely, the photon, the massive Z, W^+ and W^-, and eight massless gluons. The status of the Higgs boson, the last particle predicted by the model, is not yet established. A particle with similar properties has been observed at the LHC in 2012 but further investigation is still needed to confirm the identification. The SM is divided into two gauge sectors, the Electroweak sector and Quantum ChromoDynamics (QCD). The former, including also the Higgs sector (i.e., the Higgs boson and its interactions), encompasses the QED and hence describes, among the rest, the electromagnetic interaction bounding electrons to the nucleus thus forming

Particle Physics, Table 1 The six leptons divided into three families (As per the data in Beringer et al. (2012))

Name: electron	Name: muon	Name: tau
Symbol: e	Symbol: μ	Symbol: τ
Mass: 0.5 MeV	Mass: 106 MeV	Mass: 1,777 MeV
Name: electron neutrino	Name: muon neutrino	Name: tau neutrino
Symbol: ν_e	Symbol: ν_μ	Symbol: ν_τ
Mass: <2 eV	Mass: <0.2 MeV	Mass: <18.2 MeV

Particle Physics, Table 2 The six quarks divided into three families (As per the data in Beringer et al. (2012))

Name: up	Name: charm	Name: top
Symbol: u	Symbol: c	Symbol: t
Mass: 2.3 MeV	Mass: 1.27 GeV	Mass: 173 GeV
Name: down	Name: strange	Name: bottom
Symbol: d	Symbol: s	Symbol: b
Mass: 4.8 MeV	Mass: 95 MeV	Mass: 4 GeV

Particle Physics, Table 3 The gauge bosons (As per the data in Beringer et al. (2012)) and the tentative mass for the Higgs boson as measured in 2012

Name: photon
Symbol: γ
Mass: 0
Name: W bosons
Symbols: W^+, W^-
Mass: 80 GeV
Name: Z boson
Symbol: Z
Mass: 91 GeV
Name: gluons
Symbol: g
Mass: 0
Name: Higgs boson
Symbol: h
Mass: 125 GeV

atoms; the Higgs boson is responsible for the generation of the masses of all the other particles in the model – for this reason it is sometimes naïvely addressed as "God's particle"; anyway this is just a nickname, mainly used by nonspecialists fans of the subject and by popular literature, without any religious meaning or any assumption about the existence of God. Moreover, despite it is the more elusive particle of the model and it has special features, it does not mean that it is more fundamental than the others.

The QCD describes instead the strong interactions between quarks, mediated by the gluons: contrary to what happens with the electroweak interactions, the force generated becomes in fact stronger with the distance causing a behavior known as "confinement," that means that quarks and gluons tie together forming composite particles: actually no free quark or gluon has ever been directly detected, what we observe are only the composite states. At low energies then QCD tries to explain some of the observed particles, called "hadrons," as composed by quarks; the hadrons, some of which are listed in Table 4, fall mostly in two categories: the "mesons," composed by one quark and one antiquark like the pion, and the "baryons," composed by three quarks or three antiquarks, like the proton and the neutron. It is worth noting that the hadrons are much heavier than the quarks composing them, as one can see comparing proton, neutron, and pions in Table 4 with the up and down quarks, of which they are composed, in Table 2. Actually, it is not exact to say that hadrons are composed by two or three quarks, rather those are the so called "valence" quarks that determine the properties of the particle. The internal structure of an hadronic state is better described as a quark-gluon "soup", where a large number of gluons and short lived "virtual" quarks interact: they all contribute to the particle mass, which is said to be generated dynamically by the strong interaction. Restricting ourselves to the matter described by the SM, if one considers that the Universe is almost totally composed by hydrogen and helium and that the proton and the neutron are heavier than the sum of their valence quarks masses by roughly a factor 100 (the electron mass in comparison is negligible), one sees that circa 99% of the total mass is due to strong interactions, while the remaining part is given by the masses of the electron and of the lightest quarks, whose generation is attributed to the Higgs field as mentioned above.

Particle Physics, Table 4 The lightest hadrons divided in mesons and baryons (As per the data in Beringer et al. (2012))

Mesons	Baryons
Name: neutral pion	Name: proton
Symbol: π^0	Symbol: p
Mass: 135 MeV	Mass: 938 MeV
Name: charged pions	Name: neutron
Symbol: π^+, π^-	Symbol: n
Mass: 140 MeV	Mass: 940 MeV
Name: eta	Name: lambda
Symbol: η	Symbol: Λ
Mass: 548 MeV	Mass: 1,116 MeV

The SM is a completely self-consistent theory, and provides an accurate description of almost all microscopic phenomena observed in collider experiments. Despite this, it suffers from both conceptual problems, notably in the Higgs sector, and the lack of explanations for some experimental evidences, like for instance the presence of Dark Matter. Moreover, the problem of unifying the gravitational force to all other interactions is still unsolved.

In order to address these problems a number of theories and models have been proposed, but none of them is still definitely convincing. Among the main ones not explicitly addressing the unification of Gravity we find: Supersymmetry (SUSY), based on the intriguing idea of an enlargement of the space-time symmetry (the only possible, as far as we know); Technicolor, which substitutes the Higgs sector or part of it with a new strongly interacting gauge sector; invisible extra space-time dimensions, other than the three known space dimensions and the only time dimension; Grand Unified Theories (GUTs), which generalize the gauge symmetries of the SM embedding them in a larger unified symmetry group.

Hints for physics Beyond the Standard Model (BSM) are being searched by means of particle experiments that exist at present in a variety of setups. Most of the experiments detecting particles from natural sources look for signals from astronomic sources: satellites experiments like, for example, Planck and AMS are compact particle detectors studying, respectively, the Cosmic Microwave Background (CMB) and the cosmic rays, particles arriving on the Earth or nearby from the cosmos; ground-based telescopes like MAGIC or Auger look for the light coming from interactions of high energy cosmic rays with the atoms of Earth's atmosphere; underground radiopure detectors like DAMA/LIBRA and XENON look instead for signals of Dark Matter particles in the cosmos. Other experimental setups like LHC make focused beams of accelerated particles collide to produce and detect interesting events, for example the creation of new particles; contrary to the previous case, here the initial state is human-controlled, i.e., the properties of the particle beams are chosen and tuned in order to get the most convenient possibilities for the events one wants to study. Finally, modern neutrino experiments are a kind of their own: those looking at neutrinos coming from the Sun, from supernovae, from an accelerator beam, or from nuclear power plants consist usually of large sensitive detectors accommodated in deep caves (like, e.g., Super-Kamiokande) or under large mountains (OPERA) to screen out cosmic rays. Neutrino telescopes that look instead for neutrinos coming from astronomical sources, need to be much larger and are mounted, for example, deep under water (ANTARES, NEMO) or inside the Antarctic ice (IceCube).

Particle Physics, as a branch of Physics, is a full science, which theoretically relies on the language of mathematics to describe our Universe and whose statements are to be checked experimentally. Unlike every other branch of Physics, and potentially of every other science, assumptions in Particle Physics cannot be explained by other disciplines, because it addresses the behavior of the most fundamental "bricks" constituting our Universe and its most fundamental laws. In the reductionist belief that macroscopic behaviors could in principle always be explained (even if potentially with big difficulties) on the basis of microscopic laws, but not the contrary, Particle Physics arises as the most

fundamental between all sciences, since it addresses the smallest length scales existing in Nature. This means that particle physicists always look for a more general and broader description ("laws") of Nature that would lead to a deeper understanding, trying to modify the assumptions of the old paradigm itself. Obviously, every model and theory relies on a number of theoretical assumptions that are not explained by the model or theory itself, but physicists always keep trying to understand by looking for more general models, based on additional fundamental assumptions, that can explain the previous ones. In this way, one will never get rid of a certain number of assumptions, but will be able to understand more and more and at a more fundamental level the behavior of Nature. One particular assumption that Particle Physics makes, as well as the whole Physics, from the birth of the modern scientific method with the work of Galileo Galilei in the seventeenth century, is that we are able to translate in the language of mathematics all the behaviors we discover in Nature, and that such a language is powerful enough to be used to describe all kinds of such behavior.

As for all natural sciences, the progress of Particle Physics relies on the curiosity of scientists including their theoretical as well as experimental efforts to provide an always better knowledge of Nature. In the last century, great financial efforts have been undertaken by the international community to enable the construction of new experiments, sometimes very expensive, like particle colliders or experiments mounted on satellites. Even if not immediately, with the progressing of time a number of discoveries and techniques from Particle Physics find socially useful applications beyond the purely theoretical interests. For instance particle accelerators of various sizes and energies are routinely used for the medical treatment of certain type of cancers trough radiotherapy and hadron therapy; remarkable is also the development of technologies not directly related to scientific research: for example, the World Wide Web was invented at CERN.

Particle Physics does not make any statement related to human beings, except for regarding them as self-conscious beings that are able to observe Nature. Since quantum theories typically address the most fundamental bricks of our Universe, it is not possible to study such a small system with smaller probes, in order not to influence it with the measurement operation. Thus, while in classical physics it is possible to define a system that does not include the observer, in quantum theories the observer is always part of the system that he wants to study. To this end quantum physics needs to "define" an observer (inside the system), as one who perturbs the system in order to make measurements.

Explaining life and its origins on Earth, as well as death, is not an aim of Particle Physics, although physicists are interested in understanding why our Universe possesses the right characteristics to allow the form of life as we know it (i.e., carbon-based) to have developed. For example, a slight modification of light particles masses would make impossible the existing complex chemistry, thus changing in a crucial way the evolution of the Universe, making it unsuitable for the emergence of life. Some physicists find in these and similar arguments, called "anthropic," the reasons to believe that the Universe in which we live was somehow fine-tuned to allow life. Others believe instead that this is a question of pure chance.

Knowledge and truth are values of the scientific community, but Particle Physics does not define them, since they are not objects of its study. Moreover, as pointed out by scientist and philosopher of science B. Russell, no theory can be proved to be true but at most it can be found to be incomplete, if in a certain moment it cannot explain some experimental observations, or false, if it is at odds with them. The claim to find an ultimate theory that can potentially explain everything is then pointless, even because, in the impossibility of proving that it really is the true ultimate theory, people will be continuing testing it, hoping to eventually find some hints of a new physics. Thus the *ultimate* truth, if there exists any, may just be impossible to be found

out; what one can always look for instead is an enlargement and generalization or enhancement of the old theory, to be regarded as a new approximate ("effective") but more precise and encompassing theory, that would lead us to a deeper but not definitive understanding of the nature of reality.

Perception is what allows the human observer to make experience of natural phenomena; rationality and reason are observer's tools in trying to understand such phenomena, sorting them out into categories, in the deterministic belief that from the same initial condition a closed system (closed with respect to the external environment) will always end up in the same final state, or that if the final state is different than an unseen modification of the system occurred at a certain point of the evolution. Once again, this is true in macroscopic regimes but not at the quantum level: as already stated above, QM and QFT are intrinsically probabilistic theories, which means that they waive from the outset the claim to predict the exact final state of a microscopic system, while only being able to determine the probabilities of the possible final states to occur. Indeed, it was a hard challenge for the physicists of the beginning of twentieth century to understand and explain this random microscopic behavior, because they first had to give up the habit to experience and try to understand Nature through the perceptions of their senses. They, however, succeeded and that's why we continue believing and relying on our reason to unravel, understand, and elucidate, using logic and the language of mathematics, the mysteries of Nature. Mystery here is obviously a term used merely to address what we still do not know, especially if we have some hints of what could lie beyond our knowledge but without understanding how this is linked to what we already know.

Particle Physics, in its quantum field theoretical formulation, uses time as defined in the framework of Special Theory of Relativity, the theory that unifies space and time into the broader concept of (flat) space-time. Space and time are then treated on the same footing, without respect to the problem of why it is possible to travel back and forth in space but not in time (or, if it is, why it is not as easy as it is for space). Thus time (as well as space) is an external object for Particle Physics used for the description of events but that is not described; in particular its unstoppable flow is accepted without any further investigation.

In the Sciences and Religions engagement a relevant issue addressed at present by Particle Physics is the understanding of what matter exactly is and the origins of mass. As Science goes deeper and deeper through this subject, Particle Physics is expected to provide the answers to important questions about our origins and the birth of the Universe itself.

Cross-References

▶ Anthropic Principles
▶ Applied Mathematics (Mathematical Physics, Discrete Mathematics, Operations Research)
▶ Astrophysics
▶ Causality in Physics
▶ Cosmology
▶ Determinism and Indeterminism
▶ Energy in Physics
▶ Physics
▶ Quantum Theory
▶ Reductionism
▶ Space and Time

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Passion

▶ Emotion
▶ Love (Affective, Sexual)

Passion and Emotion, Theories of

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Related Terms

Affective attitudes; Desires; Feelings

Description

Passions and emotions have been the object of sustained philosophical treatment from Ancient Greco-Roman times to the present. For the ancients, passion and emotion (principally the emotion of desire) can be dangerously in conflict with reason. This was a salient theme in Greek tragedy and it was a hallmark feature of the romantic approach to the emotions in the eighteenth century. Today, the emotions tend to be seen in three different ways. According to cognitive accounts, the emotions consist of judgments and are thereby seen as a species of reason. Affective accounts do not necessarily take emotions to be noncognitive, but they stress the sensory dimension of the emotions. Functional accounts, on the other hand, tend to diminish the first-person, conscious role of the emotions, and tend to see emotions as functioning in biological and cultural ways. A fourth account should be mentioned, though it is very little represented today, and that is a behaviorist account which treats emotions entirely as actual and dispositional ways of behaving. In this entry, passion will be treated as a kind of emotion.

Emotions, Reason, and Sensations

The starting point for some modern theorizing about the emotions is the extent to which the emotions may be treated as cognitive, evaluative states and the extent to which emotions are related to sensations or general affective states. One reason for thinking that the emotions involve judgments is because it seems that if the emotions were identified with sensations, then you could not have the sensations without the emotion. Consider a case of a person who is angry with someone because he believes that the person is responsible for damaging his property. Right away in this description, we are assuming that there is some reason behind a given emotion, but imagine that the person is feeling the full set of feelings or sensations that we associate (or perhaps even identify) with anger. The person's blood pressure is raised, heart bounding, there is some sweat and anxiety. Now imagine that the person comes to realize that the person did not do such damage and that his property is fine. It still might be the case that all the sensations continue, but so long as the person has ceased to judge that he was wronged, there is no more anger. We might say that the after-effects of anger have persisted, but not the anger itself.

While the above case illustrates the appeal of the cognitive account, the affective account receives some support from the ostensible counterintuitive nature of the cognitive account. Imagine someone claims to be angry and has the requisite judgment, but is completely lacking in any of the expectant sensations whatever. Such a Stoical person may be thought of as more like the fictional character Mr. Spock from the world of Star Trek rather than fully human. The affective account may also receive some support from apparent cases of emotion when there seems to be no object of emotion. Some philosophers think emotions must always have an object, whether or not the object exists in reality. These philosophers treat emotions as intentional attitudes like belief and desire. You may hope that some state of affairs occurs, and yet the state of affairs does not occur. A challenge to this account is the apparent fact that persons may have a kind of nameless or seemingly objectless dread, anxiety, or joy. One may claim that the person's emotion does have an object such as life in general, but this claim may be strained.

One other reason for thinking that the emotions are distinct from or that they at least involve more than sensations is that sensations seem to have locations in our bodies. For example, one feels a pain in one's leg, but it would be a stretch to think one feels happiness in one's leg or

anywhere. Also, sensations appear to have organs. One sees with one's eyes. One's skin becomes itself an organ through which or by which one feels. But one does not feel happy with a specific organ, other than referring to the brain or the body as a whole as an organ (Solomon 1993).

The functional account tends to eschew first-person introspection and reports of what it is like to have emotions and passions. In this way, while functionalism is not behavioristic (for it allows that there is a feeling or a sense of what it is to have an emotion) but it analyzes emotions in terms of their causes and effects. To be angry, on this account, would be to be in a state that is customarily brought about by a perceived injury, which gives rise to blaming or resentful behavior toward the apparent wrongdoer.

Most thorough accounts of emotion and reason need to come to terms with the question of when emotion (or passion) can provide evidence of or be a source of values. When we respond with an emotion like revulsion to states of affairs that we describe as cruel or unjust, is that revulsion evidence that the state of affairs actually is cruel and unjust? Some moral realists are in the phenomenological tradition (such as Scheler), whereas those who are not realists such as the non-cognitivists (those who deny objective content to moral judgments) simply reduce moral judgments to *merely* affective responses. Realists, however, have developed a rich literature on how the moral life consists of a proper order of emotions, what has classically been referred to as the order of love or *ordo amoris* (Chisholm 1986). This literature is some evidence that more content is involved in our moral judgments like John Mackie (Lyons 1980; Nussbaum 2004).

The Emergence of Emotions

Some philosophers believe that emotions did not come into human history until the development of language; these are the same philosophers today who deny that nonhuman animals have emotions. The most common argument is that to have emotions requires having beliefs. To have beliefs, it is necessary to have language. Nonhuman animals do not have language, hence no beliefs, and thus no emotion (R.G. Frey 1987).

This argument does not have wide support, however. It implies that prelinguistic babies lack emotions, which seems at least counterintuitive. Moreover, it seems that consciousness and some capacity to form beliefs would have to be prelinguistic, otherwise it is more difficult to describe and explain how a human or nonhuman could acquire language (which would seem to involve the capacity to understand and have beliefs about sounds and events). But granting that at least some nonhuman animals have emotions (as Darwin did), it is not clear which animals have which emotions. The best case for animal emotions concern animals whose anatomy (especially brain and nervous system) seems analogous to our own and that the animals behave in ways that seem to be analogous to us when we are in emotional states (e.g., animals appear to act as we do when we grieve or are angry, joyous, and so on). On these grounds, it appears reasonable to think that the great apes have emotions, as do dolphins and the like. It is not as uncontroversial, however, when it comes to chickens, fish, worms, and so on. One reason for being unsure about the emergence of emotions involves the general question about subjectivity itself. In a famous 1974 essay, "What is it like to be a bat?" Thomas Nagel argued that even an exhaustive third-person knowledge of an animal's body and behavior could not yield knowledge of its subjective states.

So, it is evident that humans have evolved to have emotions and passions; it is evident that they play a key role in our lives (it would be hard to understand human history without understanding love and hate), but it is not obvious in human and nonhuman evolution at what point emotions emerged.

Emotions and Personal Identity

As noted earlier, moral realists contend that a person's moral character has been described in terms of the order of one's emotions. Arguably, if you are the sort of person who sorrows when the innocent suffer and have a passion to assist them, you are a compassionate person. And if you are someone who delights over the suffering of the innocent, you are a cruel person. Some interpreters of Kant hold (with good reason) that he

thought the moral worth of a person did not preside in the emotions, but in their act of the will.

In the history of ideas, there have been some figures and movements who regard emotions and passion with suspicion. This is true in the Buddhist tradition, but it may also be found in non-Christian and Christian forms of stoicism. For an excellent overview of the latter, see Sorabji 2003. There is more of a literature from Ancient Greco-Roman philosophy to today on how to control, or even whether we can control, emotions and passions. Some who adopt the cognitive account of emotions and who hold that beliefs are not under our voluntary control tend to believe that the emotions are not under our immediate voluntary control. A great deal of current work on the topic of forgiveness presupposes that persons can moderate emotions like resentment (Griswold 2007).

Emotions in Science and Religion

While the scientific method, as conceived by Francis Bacon in the seventeenth century, would seem quite free of emotions such as anger, greed, the desire for fame, and so on, there remained an acknowledgement of the vital role of the emotion of love when it comes to love of the truth, trustworthiness, and the like. Today, many scientists and philosophers of science acknowledge that aesthetic considerations can enter into science (the desire for the simplest or most elegant explanations, for example), and this has also been increasingly appreciated in the case of philosophical reflection on religious belief. To be sure, early modern philosophers such as the Cambridge Platonists, John Locke, Immanuel Kant, David Hume, and others were wary of what was called "enthusiasm," a state of excessive emotion and passion that tended to distort rational judgment. But there is a growing literature on how emotions, such as awe, love, a sense of the sacred, and so on, can have a responsible and important role to play in the formation and sustaining of religious belief and practice (Taliaferro and Evans 2011).

Cross-References

▶ Cognitive Psychology
▶ Epistemology

▶ Ethics
▶ Experience
▶ Phenomenology

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Pastoral Theology, Roman-Catholic, Europe

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Related Terms

Roman-Catholic pastoral theology in Europe

Description

In Catholic theology, the term "practical theology" has a twofold meaning: On the one hand, the

term "functions" as a collective name for one of the four main branches of theology (the others being biblical, historical, and systematic theology) and contains the subdisciplines of pastoral theology, religious pedagogy, catechetics, homiletics, (theory of preaching) poimenics and liturgical theology, canon law, and still others. On the other hand, the term "practical theology" has been used for sometime now as synonymous with "pastoral theology." This is the meaning primarily used in this entry.

As the term "practical theology" indicates, it is the discipline within Catholic theology that deals with the mediation between theory and practice in reference to the Christian faith. In a certain sense, the whole theology is a "scientia practica," yet the practical theology under discussion differs from theology, in general, inasmuch as its material object is the actual practice of Christians and their Church. How the mediation between theory and practice is done depends on the kind of practice that is considered (the practice of pastors, of churches, of groups or individual Christians) and on the kind of theory that is employed (action theory, aesthetics, hermeneutics of culture or system theory). Until today there is no consensus among practical theologians in regard to these issues. The present development in practical theology is related to the changing presuppositions of Christian faith and ecclesial practice, and this not only in regard to the strictly religious sphere (torn between secularization and renewal), but also in regard to the historical factors that presently change the conditions of human existence.

Self-identification

Science

Thanks to a decree of the Empress Maria Theresia (1717–1780) that reformed the study of theology in the Austrian Empire, pastoral theology became an academic discipline at universities in German-speaking lands. This started an ongoing effort on the part of pastoral theology to present itself as a recognized, full-fledged discipline, at the same level as the other theological disciplines, with its own material and formal

object. In other parts of Europe, the integration of practical theology into academic theological studies occurred only in the second part of the twentieth century.

Whether practical theology (pastoral theology) should be considered an autonomous discipline besides the other theological disciplines is a question posed in practical theology itself and often answered negatively by the other disciplines. For a long time – in some regions until today – the place of practical theology is not the university, but the seminary. Its task over there is to instruct seminarians at the end of their theological studies about how to apply their theoretical knowledge to their pastoral activities. Here, pastoral theology is a form of apprenticeship, not an academic discipline.

At the center of attention of practical theology is the question how pastoral practices and ecclesiastical directives are to be determined, taking into account the various social contexts in which people live. This concern demands that the process of modernization, involving social, cultural, economic, and other factors, be analyzed and interpreted in the light of the gospel. It follows that the task of practical theology has three components: an analytical, a hermeneutical, and a praxeological one. Because the subject of practical theology is related to other theological disciplines as well as to humanistic disciplines, practical theology must engage in intradisciplinary cooperation within theology and in multidisciplinary cooperation with the adjacent arts and sciences.

For a long time pastoral theology (like the whole of theology) made use of the deductive method: here the principles and directives guiding pastoral practice were derived from one or several axioms of the Christian faith. More recently, especially since Vatican Council II (1962–1965), the preferred method has been deductive, inspired by the motto "see, judge, and act." This calls for a systematic search for "the signs of the time," that is, the most characteristic trends of the given historical and cultural situation, a process that takes into account the empirical findings of other disciplines (sociology, psychology, etc.) and adds to them empirical

research done by practical theology itself. Since the meaning of empirical research is not obvious, practical theology must situate these findings in a wider frame of reference, a task that makes use of hermeneutical methods. Moreover, since practical theology guides courses of action inspired by Christian faith and appropriate to people's social and personal context, this discipline must also take into account the social and pedagogical sciences These three types of empirical research are closely interrelated and constitute a spiral-like process that must again and again start from the beginning.

In the course of the intense preoccupation with sociology and psychology, practical theology has generated the subdisciplines of pastoral psychology and pastoral sociology. In their inquiries, these subdisciplines follow the methodological and theoretical standards of the sciences on which they rely. The plurality of these standards has consequences for the whole of practical theology. In recent years, the spectrum of epistemological and science-theoretical foundations of practical theology has produced a number of distinct approaches, from the theory of communicative action through aesthetics to the idea of practical theology as "empirical theology."

Characteristics

Practical theology is part of academic theology. It relies on the research of other disciplines of theology, to the extent that it touches its own particular perspective. This perspective and the methods that flow from it differentiate practical theology from the other theological disciplines. Its central concern is research aimed at finding concrete possibilities for practical communication of the gospel that is plausible and relevant, given the present conditions of social and personal life.

Relevance to Science and Religion

Practical theology sees itself as belonging to the human sciences. Yet, since contemporary culture is strongly affected by the natural sciences and the science of engineering, the central concern of practical theology obliges it to deal also with these sciences. Some practical theologians have actually studied the natural sciences, allowing them to use with competence the discourses of the natural and the human sciences. Subjects in the field of "science and religion" are of interest to practical theology if they deal with insights that have an effect on the self-understanding of human beings and on the form of their social existence, including their relation to nature. This begins on the thematic level with the question of the beginning and the end of human life, the theories of the origin and function of religion in phylo- and ontogenesis, and the possible contribution of religion to stem the tide of the present ecological disorder; and moves to the meta-theoretical level, such as the epistemological and science-theoretical aspects in the interrelation of the sciences and practical theology.

Sources of Authority

The judgments made by practical theology rely on two sources: the study of the Scriptures together with their interpretations and the history of their reception and, second, the theological interpretation of the "signs of the time." The particular competence of practical theology is to connect these two inquiries in a critical-constructive manner. In doing this research, practical theology follows the same criteria of validity and reliability that are respected in non-theological research. An additional criterion in the exercise of practical theology is whether its proposals actually prove themselves in real life. The reflection within practical theology has recently been enriched by extending it to the international level.

Ethical Principles

On the basis of the insights gained into the conditions of people's personal and social life,

practical theology wants to help making it possible for men and women to promote the well-being of church and society – a promotion to which this discipline has contributed – and thus increasingly enjoy "the fullness of life" (John 10: 10) promised in the New Testament. Implied in this fullness is a special relationship to oneself, to other humans, to nature, and to God, the special relationship to other humans is marked by esteem, respect, and, above all, an appreciation of others in their otherness – the opposite of a calculated relationship guided by self-interest and the drive for power. A preferential option calls for extending compassion and solidarity to all who are in need or suffer distress.

Key Values

Key values of practical theology are those that help human beings to enjoy a greater fullness of life, such as human dignity, human rights, solidarity, justice, peace, the integrity of creation, tolerance, compassion with those who suffer, or – in theological terms – the reign of God and shalom (salvation in the integral sense).

Conceptualization

Nature/World

Nature may be conceptualized first of all as the totality of the conditions of life at the disposal of human beings which they must use with care in view of preserving them for future generations. Nature is part of the world as God's creation. Creation does not mean the beginning of the world as studied by the natural sciences, for example, biology or physics. Creation refers to the faith that God is the ultimate sustaining ground of the whole of reality. This faith also hopes that God will complete the world, overcoming and transcending the evil in it. This high calling should persuade believers not to desert the world altogether, despite its shortcomings, but rather to act in it, together with others, in an effort to reconstruct it in accordance with its divine destiny.

Human Being

Essential characteristics of human beings in (practical-)theological perspective are (a) that they are creatures of God and are called by Him to be his image, (b) that they are dispensed from being like God, though they are tempted to want to be like God – with devastating consequences, (c) that they are social beings, (d) that they are finite and thus unable to achieve their completion by themselves, (e) that they are not determined but free, free even to sin against their original vocation or turn away from it altogether, yet even as sinners they are accepted by God and offered the unmerited grace of having their sins forgiven and their broken lives healed. Human beings are called to accept the gift of salvation, to embrace it, and hand it on to others, thus making a contribution to the completion of the world. Practical theology has the task of exploring the preconditions of the possibilities for the practical realization of such a faith-inspired vision; its task includes the elaboration of scientifically established guidelines for pastoral action to educate believers and accompany them on their journey.

Life and Death

In light of faith, practical theology understands life as a gift created by God and received by humans with the imperative of developing and shaping this life. It follows from this that faith, in and by itself, is related to the enhancement of humans' life on earth, especially where it is threatened or being destroyed. Faith in God with his unconditional option for life inspires the hope that death is not the absolute end of life, but that life will be transformed in a new creation. The task of practical theology is to reflect on how this view of life and death can find adequate expression in pastoral practice – from birth to burial.

Reality

Faith has an impact on reality. To study this impact with empirical methods is the task of practical theology (cf. Nature/World).

Knowledge

Knowledge is an indispensable capacity of practical theology that enables it to deal with the

issues and questions raised by pastoral practice. This knowledge is derived from insights that pastoral theology has produced by scientific research, yet it is also open to the insights of ordinary people (popular wisdom and popular piety) as possible sources of the truths of faith.

Truth

As every science, practical theology is dedicated to truth, the all-embracing knowledge of what is, even if this can only be reached in approximate and fragmentary fashion. Still, the dedication to truth is the protection against a relativism that does not recognize differences between diverse values and diverse perceptions (and their consequences in practice), but declares them all as equally valid.

Perception

The kind of perception and the methods and instruments used to gain it (empirical and/or hermeneutical) depend on the particular object pastoral theology deals with and the particular aim it pursues in its research. Despite the effort to do research with objectivity, the subjective factor inevitably plays a certain role—a factor that should be made transparent and lead to self-critical reflection.

Time

Time has a quantitative and a qualitative dimension. Time is not only an objectively measurable quantity that extends in continuous sequence from the past, through the present to the future. Time is also a quality experienced by persons in a variety of ways, including high point and low points. Christian faith itself is related to experiences and interpretations of events in time, in particular those constitutive of its being, such as the Exodus (the liberation of Israel from the slavery of Egypt) or the life, passion and resurrection of Jesus of Nazareth. Practical theology must turn its attention to qualitatively outstanding courses of events – in personal life or the life of society – which allow people to experience hints of salvation (escape from distress, hopeful new starts) and echoes of evil (illness, suffering, violence, war, etc.), experiences that will guide and sustain

their course of action. Vatican Council II has referred to such events as "signs of the time" to be interpreted in the light of the gospel. They offer Christians and their Churches norms and guidelines for the exercise of their co-responsibility for the well-being of the world. Important for practical theology is here the phenomenon of "the simultaneity of the non-simultaneous" in church and society which produces mutual incomprehension between different attitudes and thus causes conflicts. This phenomenon often occurs in the field of religion (e.g., reformers vs fundamentalists).

Consciousness

Of particular interest to practical theology is to inquire, in the light of contemporary theories of consciousness, whether there is a proper religious consciousness. If this is the case, then the following questions arise: What are the characteristics of this consciousness? What relation it has to other forms of consciousness and in what way does it develop phylogenetically and ontogenetically? From this inquiry emerges the practical question as to which level of religious consciousness should be aimed at if the purpose is to enable persons to deal creatively and not defensively with the challenges of the present. How should the learning curriculum be set up so that this level can be reached.

Rationality/Reason

As the whole of Christian theology, practical theology also tries to illuminate and justify Christian faith, in this case specifically Christian practice, in the light of reason. Conversely, faith invites reason to think new thoughts.

Mystery

Understood in theological terms, human beings are by their very nature creatures encompassed by the mystery of ultimate reality, named God, a mystery of the "whence" and "whereto" of all beings, which in its totality can never be grasped by human reason. The "knowledge" of this mystery is preserved and transmitted by the religious tradition. The task of practical theology is to explore ways of how people can be initiated and

made familiar with this mystery, and how they can live their lives in view of this incomprehensible horizon (mystagogy).

Relevant Themes

For sometime now the greatest challenge to religion or faith and thus, also to theology has been the so-called naturalism that claims to be able to explain and enlighten all phenomena in the world on the basis of theories demonstrated by the natural sciences, including the as yet scientifically unexplored phenomena, such as the brain, the regulating center of all human thinking, and action. The theory of naturalism is not confined to the realm of the sciences; it has been popularized and influences the mentality of the people today. Practical theology – and not only the systematic theology – feels the effect of this cultural development. What is urgently needed is a conversation between science and religion, exploring the range and limits of techno-scientific reason and implicit in it the different images of humans and the world (translated by Gregory Baum).

Cross-References

▶ Ecclesiology
▶ Practical Theology
▶ Religious Education Theory, Roman-Catholic, Southern Europe

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Pathological Science

▶ Religion and Pseudoscience

Pathology of the Nervous System

▶ Neuropathology

Paticca samuppāda (Pāli)

▶ Dependent Arising

Pavlovian Conditioning

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A conditioning procedure, originally developed by Ivan Pavlov, in which a stimulus which initially does not elicit a strong reaction (called the conditioned stimulus) is presented in conjunction with another stimulus (called the unconditioned stimulus) which has much greater biological impact from the outset of training. With repeated pairings of the two stimuli, the conditioned stimulus comes to elicit responses related to the unconditioned stimulus. For example, if a friend routinely wears the same cologne, the smell of the cologne comes to elicit positive emotions as a result of being associated with the friend.

PBUH (an Abbreviation)

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When writing the name of the Prophet Muhammad, Muslims often follow it with the

abbreviation "SAWS." These letters stand for the Arabic words "sallallahu alayhi wa salaam" (may God's blessings and peace be with him). Muslims use these words to show respect to one of God's Prophets when mentioning his name. It is also abbreviated as "PBUH," which stand for the English words of similar meaning ("peace be upon him").

PC Games

▶ Games, Computer

Pediatric Gastroenterology

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Description

Pediatric gastroenterology is a specialty of pediatrics which is the clinical discipline concerned with the diseases of childhood (Walker-Smith 2003). It is now well developed in Europe but this is a recent development. It has a short history which is closely related with the development of the European Society of Pediatric Gastroenterology. Pediatric Gastroenterology began chiefly in University departments and this was reflected in the first council of the society. Western Europe led the way with representatives from the Netherlands, Sweden, Britain, Italy, and France as members of the first council (Walker-Smith and AllanWalker 2003). Yet Europe has the distinction of hosting the foundation of the first society of this discipline. This occurred in Paris in 1968 at the first meeting of the European Society for Paediatric Gastroenterology. Subsequently this society has flourished and has grown to encompass hepatology and nutrition.

The official organs are now the European Society of Paediatric Gastroenterology, Hepatology, and Nutrition. It is generally known by the acronym ESPGHAN. This society has fostered the development of this specialty both within Europe and the wider world. It holds annual scientific meetings which have been an important catalyst for scientific research into this field. This has been of significant importance for sick children. The Society now provides indications and guidelines to clinicians and health authorities that drive the care of children.

Self-Identification

Science
Pediatric gastroenterology is an applied form of clinical science. From its foundation, it has been rooted in science. Scientific research in this field became of major importance once it became possible to study small pieces of the tissue from gastrointestinal organs of living children in the laboratory. Small intestinal biopsy and liver were the first important techniques to be developed. Of course, the research was always a by-product of these procedures, which were developed solely for the benefit of children in order to make a diagnosis of specific disease entities in children. Once these procedures were established to be safe and causing minimal distress to children, there was a major expansion of knowledge concerning clinicopathological syndromes which affected children.

Characteristics

Pediatric gastroenterology arose from its sister discipline gastroenterology which is concerned with adult patients. Gastroenterology began in Europe at the end of the nineteenth century. Pediatric Gastroenterology may be seen either as a specialty in pediatrics or a pediatric branch of gastroenterology. However, the development of pediatric gastroenterology is closer to general pediatrics than to adult gastroenterology.

Relevance to Science and Religion

This discipline is not relevant to "Science and Religion." It is a branch of clinical medicine.

Sources of Authority

The sources of authority in the discipline are the same as for any branch of medicine.

Historically, they will vary from country to country. There are international sources of authority in relation to knowledge throughout the world. Textbooks, international scientific, and medical journals, and international meetings, all play their part. ESPGHAN in association with its sister society in North America NASPGHAN publishes the *Journal of Pediatric Gastroenterology and Nutrition* (Guarino 2010). This is influential in terms of knowledge of the discipline. Several initiatives have been developed in the field of pediatric gastroenterology including traveling school for young physicians and scientists in developing countries that have gained reputation to the discipline. Health services in individual nations develop their own recommendations. However, guidelines and recommendations by ESPGHAN are carefully considered by physicians as well as European Health Authorities such as the European Centers for Disease Control, the European Commission, and the Codex Alimentarius.

Ethical Principles

As for the practice of medicine as a whole, pediatric gastroenterology follows the same ethical guidelines. Clinical practice and research may be regulated by individual ethical committees.

Key Values

Pediatric gastroenterology is fundamentally concerned with those disorders of children which may damage the gastrointestinal tract and the liver (Walker-Smith 2004). It is also very much concerned with the secondary effects of such damage. These include major effects on the child's nutrition, leading to severe malnutrition, i.e., undernutrition. This fact led to nutrition being a vital element of this discipline from the early days. This interest has extended to a concern with other aspects of nutrition, without gastrointestinal involvement. An important example of this is obesity.

A major concern of pediatric gastroenterologists has been to extend their interest to children of the developing world where on the one hand diarrhea and malnutrition related to poverty and increasing obesity related to rapid urbanization are both important issues. Collaboration with a wide range of other professionals interested in the welfare of children is vital. The discipline is also interested in the feeding of children well. Promotion of breast feeding has been a major matter. In addition, fostering the creation of special milk formulae for children with a range of disorders from cow's milk allergy and celiac disease to older children with chronic inflammatory bowel disease has been very important.

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Pediatric Surgery

▶ Child Surgery

Pentecostalism

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Related Terms

Apostolic churches; Baptism in the spirit; Neo-
charismatic movements; Neo-Pentecostalism;
Oneness churches; Pentecostalism, Charismatic
movements; Pfingstbewegung

Description

"Pentecostalism" is a comprehensive term used
for a series of renewal movements within Chris-
tianity, initiated in the twentieth century, that
emphasize the use of charismata and divine
healing. Today these movements are estimated
to encompass some 500,000,000 believers, thus
representing one of the largest branches of
Christianity. From an anthropological point of
view, Pentecostalism is seen as the most exten-
sive cultural transformation in the present-day
world, together with the growth of Islam. (The
movement is called *pentecostalismo* in Spanish,
Le mouvement pentecôtiste in French and
Pfingstbewegung in German.)

In the wake of revival movements within
Christianity during the nineteenth century, like
Pietism, the Moravian movement, Methodism,
Holiness movements and the international
Evangelical missionary crusade, there was
a worldwide growing expectation of a spiritual
renewal within the Evangelical churches. In this
anticipation several different "outpourings of
the Holy Spirit" occurred around the world. The
most influential was the Azusa Street revival in
Los Angeles from 1906 to 1909, where African-
Americans synthesized several different

theological trends and forms of spirituality into
what today is known as Pentecostalism (Robeck
2006).

The group at Azusa Street was neither first, nor
the only one. In several parts of the southern
United States there were similar movements
among poor white workers. In Wales, there was
a revival among miners in 1904–1905. In Mukti,
in India, a similar revival took place in
1905–1906. Thus the rise of Pentecostalism
should be seen as a successive and global phe-
nomenon that is more related to the spirit of the
time and the general developments within Evan-
gelical Christianity rather than diffusion of
a particular set of ideas from a single center.

The same goes for the Healing revivals in the
1950s and the Charismatic movement in the
1960s respectively. The latter movement, e.g.,
appeared in Colombia and the USA simulta-
neously in 1967. From this period and onward,
Pentecostalism has become an increasingly glob-
alized movement with intricate networks that has
spread around the world.

There have been several attempts to define
Pentecostalism theologically. In 1987 Donald
Dayton based his search for Pentecostal roots
on, among other things, the "Fourfold gospel,"
inspired by i.a. A. B. Simpson of the Christian
and Missionary Alliance in the United States.
The four main points are: Jesus as savior, Jesus
as baptizer in the Holy Spirit, Jesus as healer,
and Jesus as the coming king. This fourfold
Christocentrism is definitely a basic characteris-
tic of many of the branches of Pentecostalism,
but nowhere near a uniformly expressed creed
(Dayton 1987).

In his 1994 book "Fire from Heaven" Harvey
Cox approaches Pentecostalism from an entirely
different angle. Instead of searching for theolog-
ical roots, he argues that the particular form of
spirituality found within these movements
unconsciously resonate with so-called "primal"
religion, i.e., basic religious traits that largely
have been lost and now are threatened by global-
ization and modernization. This approach, he
argues, would also explain why Pentecostalism

has become "a religion made to travel." This would explain, e.g., the growth of Pentecostalism in South Korea because the Pentecostal emphasis on receiving spiritual gifts would correspond to the traditional shamanic experiences of spirits. In performing this "revival" of primal religiosity Pentecostalism would answer to the needs of people confronting a modernist or a rationalist view that threatens to alienate them from their traditional background. Instead Pentecostalism would bridge that gap and take the believer back to her or his spiritual roots (Cox 1994).

In his widely cited book on "The Pentecostals," Walter Hollenweger offers yet another hypothesis that downplays the importance of theology. Instead, Hollenweger tend to emphasize the spirituality of Pentecostalism, especially its "oral structures." He claims that the African American roots of the Azusa Street movement have promoted different characteristics that resonate well with many non-Western cultures. He mentions, e.g., narrative theology, the emphasis on personal testimonies, oral liturgy, the inspiration from visions and dreams in worship, and understanding the relationship between body and mind as it is revealed in healing through prayer.

Hollenweger also attributes the emphasis on antiracism, pacifism, and gender equality to the slave background of the predominantly African American leaders of Azusa Street, Lucy F. Farrow, William Seymour and others. In his view, Seymour represents the "reconciling Pentecostal experience" and "a congregation where everybody is a potential contributor to the liturgy (Hollenweger 1988)." The latter ingredient implicated a social revolution, considering that the year of 1906, when this was applied, saw the most ugly face of racism in the United States up until today. (That year the number of lynchings reached its peak in the US.) According to eyewitness Frank Bartleman "The color line was washed away in the blood" at Azusa Street (Bartleman 1980 (1925)).

When Pentecostalism spread over the globe, it retained some of this early radicalism. In the first country in Europe to be reached by missionaries from Azusa Street, Sweden, Pentecostalism joined forces with the popular movement and became a refuge for the working class. In many other contexts, however, Pentecostalism was domesticated and evangelicalized perhaps due to different factors, like the denominational identity of the local gatekeepers (Kay and Dyer 2011).

Many scholars have aligned with Hollenweger in his analysis, especially when it comes to the ability of Pentecostalism to adapt to local conditions through the emphasis on practice of spirituality rather than on a particular theology. Juan Sepúlveda, for example, states that the reason for the dynamic growth of Pentecostalism in Chile is to be found in its ability "to translate the Protestant message into the forms of expression of the local popular culture." Allan H. Anderson claims that the movement's success in Africa is due to its ability to communicate with African spirituality: "a message that promised solutions for present felt needs like sickness and the fear of evil spirits." He also claims that African Initiated Churches (AICs) are in the main churches of a Pentecostal type that have "contextualized and indigenized Christianity in Africa (Anderson 2004)."

Even though Christocentrism is a general feature among Pentecostals, most denominations are trinitarian. Already in 1913, however, at a camp meeting in California a dispute erupted as to the wording of the liturgy of baptism. The Baptist tradition implied a blessing "in the name of the Father, the Son and the Holy Ghost." The revelation in 1913 was to baptize believers according to what happened at "the first day of Pentecost," as described in Acts 2:38: "Repent, and be baptized... in the name of Jesus Christ," i.e., only in the name of Jesus. This debate resulted in an early split of Pentecostalism and the extreme Christocentrics were called "Oneness Pentecostals." This branch has established itself especially in North and South America. It has been estimated that some 10% of all Pentecostals belong to the Oneness branch (Anderson 2004).

Believer's baptism, as in the Anabaptist tradition, was often present in early Pentecostalism, but was never emphasized as strongly as in that tradition. Depending on the theology of the

"receiving" church or the pioneers in each country, the mode of baptism varied. In Scandinavia, Pentecostalism was first spread among Baptists in Sweden by nondenominational Andrew G. Johnson in 1906. Thus believer's baptism became the accepted mode. Around Christmas time that very year the same message reached also the neighboring country of Norway through Methodist pastor Thomas Ball Barratt. There, however, infant baptism was the natural outcome for many years. In Chile, the Methodist Pentecostals still practice infant baptism up until present. Nevertheless, the overwhelming majority of Pentecostal and Charismatic churches today practice believer's baptism (Kay and Dyer 2011).

The Methodist idea of a two-stage pattern in Christian conversion, first "justification" and thereafter "sanctification" was readily transferred to Pentecostalism in the early twentieth century. Another feature, mentioned in the first tradition, but never really emphasized, was the "baptism in the Holy Ghost." For the emerging Pentecostalism, however, this became a basic feature, in fact the most characteristic of all. Through this experience, differently configured among Pentecostals, new dimensions of spirituality opened up. According to the new believers, baptism in the Holy Spirit was the entrance into the world of charismata.

When William J Seymour of Azusa Street put this Methodist heritage into new, Pentecostal terms, he added the baptism in the Holy Spirit and created a three-stage pattern, still adhered to by, e.g., Church of God in The United States: (a) salvation by faith; (b) sanctification as a cleansing process of the spiritual being; and, (c) baptism in the Holy Spirit with the following sign of speaking in other tongues. The last stage was for long interpreted as xenolalia, i.e., speaking in another (foreign) language, in the main for missionary purposes. Later, around 1908–1909, "speaking in tongues" was reduced to glossolalia, i.e., speaking in a heavenly language unknown on earth, with occasional incidents of xenolalia.

Around 1910, William H. Durham, a Pentecostal pastor of Chicago, revised this pattern and comprised stage one and two into one. This meant that no other sanctification but the conversion

experience was necessary before receiving the baptism in the Holy Ghost, referring to, e.g., Acts 10:44. For Pentecostalism in Scandinavia, where Seymour's three-stage model was introduced by Andrew G. Johnson, Durham's influence meant a possibility to adapt to local conditions. In the Nordic countries Pietism had advocated a processive sanctification, stretching over the believer's life span, and this view now supplanted the American Methodist-Holiness punctual experience of sanctification. Instead, especially in the Baptist-dominated circles in Sweden and Finland, baptism took the place of sanctification as the second phase of spiritual development. Here, the three-stage pattern became: salvation, believer's baptism, and Baptism in the Holy Spirit (Anderson 2004; Dayton 2000).

When, what we may call the Healing revival struck, first the United States, and later Europe, in the late 1940s and early 1950s, healing became most central. Oneness Pentecostal William Branham had had a revelation in which an angel bestowed him with the gift of healing. Thereafter Branham was rapidly engaged in healing meetings and soon this emphasis became a trend in Pentecostal preaching and the "Healing revival" as well as the "Latter Rain revival" were results of this trend. Branham visited the Nordic countries in 1950 and had a deep impact there. The characteristic features of this wave, however, were not theological but more liturgical: dancing in the Spirit, clapping of hands, raised arms, laying on of hands, and prophetic messages in the meetings.

If the use of printed material – *The Apostolic Faith* of Azusa Street had a circulation of over 50,000 copies in 1906 – and extensive "flying ministry" (carried out by train, as it were) were characteristic of the first wave of Pentecostalism, this renewal was characterized by large revival campaigns, often in circus tents or sports stadiums, and the use of radio and television. Preachers like Oral Roberts and T. L. Osborn became well-known characters in North American mass media. This was the birth of what was later called "televangelism (Anderson 2004)."

But the revival did not limit itself to the northern hemisphere. In 1954 healing evangelist Tommy J. Hicks managed to meet the President of Argentina, Juan Perón, and obtained a permit to use the largest soccer stadium of Buenos Aires. In a few days the healing campaigns gathered some 200,000 people in the *Estadio Huracán*, indicating a breakthrough for Pentecostalism in the country. Crusades in West Africa led to similar results.

Up until this point Pentecostalism had had little impact upon "traditional" mainline churches like the Lutheran, Episcopalian, Anglican or Catholic churches. The rapid growth in the 1950s changed that and from that period we can see a successive "Pentecostalization" of sections of these mainline churches. In the United States, we can see direct links between certain Pentecostal centers, and especially magazines like *Herald of Faith* or *Harvest Times* and the upcoming Charismatic movement.

In 1967 this development was concretized in an "outpouring of the Spirit" among Catholics in Pittsburgh, Pennsylvania and Bogota, Colombia. Thus the Charismatic movement among Catholics became official. One of the often cited leaders was Dennis Bennett and many of the people affected initially were students (Cox 1996).

However, the Pentecostalization of the Catholic church should be seen more as a process than a punctual event. The development aligned with that of Pentecostalism in some respects and took another turn in others. The emphasis on the punctual experience of the Baptism of the Holy Spirit, for example, was played down in favor of the view that all believers are filled with the Holy Spirit at the "new birth" of the believer, and that subsequent experiences are mere refillings or replenishments of the Holy Spirit. The outspoken focus on "speaking in tongues" as the "initial evidence" of a baptism in the Holy Spirit, as advocated by, e.g., the North American Pentecostal denomination Assemblies of God, is often discarded for more pluriform manifestations like prophecy, miracles, healing, or physical manifestations of being filled with Spirit. In contrast to classical Pentecostals who put emphasis on evangelization and missionary activities, Charismatics often regard their baptism in the Holy Spirit as a form of revitalization and renewal within their own church traditions.

The next step in the globalization of Pentecostalism has, strangely enough, been called "The Third Wave" by Peter Wagner. It has been localized to California in the early 1980s, but again this was a global phenomenon. This development, also called the "Neo-Pentecostal phase" took different forms, one of the most well known called the "Toronto blessing" started in 1993. This charismatic wave was characterized by new spiritual manifestations, like "laughing in the Spirit," but also by structural changes. The early ideal of "suffering for Christ" was supplanted by a message that emphasized "health and wealth" or "prosperity." The Universal Church of the Kingdom of God, with its center in Brazil, has as one of its mottos, often put up as a signboard outside the church building, the exact opposite of the first ideals: "*Basta de sofrer*" ("Enough of suffering").

While early Pentecostalism favored a democratic, local congregation with strong popular participation, this was now replaced, or at least complemented, by an emphasis on "apostolic leadership" and "one shepherd." This was supplemented by cell groups and, with its origin in Latin America, the "G12-method," that emphasizes cell group responsibility, evangelization and hierarchical leadership.

In turn, this gave way to the "megachurch" trend, with neo-Pentecostal churches gathering several thousand people for a single service – or a series of services on a single day. The most well-known example is the Yoido Full Gospel Church of Seoul, South Korea, founded by Rev. David Yonggi Cho, that claims to have 10% of the capital's inhabitants as active members. In many places, these trends have been combined with a new form of worship. While traditional Pentecostalism was characterized by prolonged personal prayer, often on one's knees, the most recent trend emphasizes the opposite. People remain standing up with raised hands for a long time, and simple choruses are sung again and again. Sometimes this is combined with lights and sound systems that echo that of a rock

concert. Interestingly enough, this type of praise has an unexpected center in Australia, in the Hillsong church, directed toward young professionals (Coleman 2000).

Nevertheless, the megachurch is far from being the only form of Pentecostal church in today's world. We now see specialized forms of Pentecostalism. Apart from churches for business professionals, we now have churches for athletes, film stars, gay people and the like. In 2007, soccer player Ricardo Izecson de Santos Leite, or Kaká as he is better known, shocked the spectators of the Champions League final by stripping down to a T-shirt with the message "I belong to Jesus" emblazoned across his chest. Kaká belongs to the *Igreja Renascer em Cristo* ("The Rebirth in Christ" Church), which was founded in São Paulo in 1986 by Estevam and Sonia Hernandes. Far from being the largest denomination in Brazil, it nevertheless claims some 2,000,000 members and more than 1,500 local congregations.

Most Pentecostal churches, however, are small, local, ethnified, and culturally adapted churches. Styles of architecture, organizations and liturgy are almost as many as the number of churches. Pentecostal denominations are unstable entities and it is sometimes claimed that they are like cells; they multiply through fission or division. This adaptability, combined with a never ending optimism about the transformative power of Jesus, is the key factor for understanding the continuous growth of Pentecostalism around the world (Anderson 2004; Martin 2003).

Within the cross-disciplinary area of "Pentecostal studies," one may divide the many different theories about the attractiveness and growth of the different branches of Pentecostalism into three main paradigms. The first one could be labeled "North American Neo-colonialism." This paradigm can be claimed to include all the theories about Pentecostalism as a conservative form of Christianity that has been exported from the USA to pacify the rest of the world, often with a hint about infiltration from the CIA. This paradigm has been especially favored by Latin American, anti-North American scholars. Unfortunately, these theories have proved very little and, if focusing on South America, one may note that much of the outside influence in Pentecostalism comes from Europe, not only from the United States, and that most of the more successful movements are indigenous of South America or at least perceived of as being endemic. Most North American, as well as most European, missionary agents have had little success on the continent.

The second cluster of theories may be called "The Deprivation Paradigm." These theories try to explain Pentecostalism as based on needs caused by fallible or meager social conditions. Worldwide urbanization, industrialization, and acculturation have deprived people of their traditional social security and left them with few alternatives, Pentecostalism being one of them; often seen as "the opium of the people" or the "haven of the masses." Here we also find theories on the issue of popular religion and Pentecostalism as "sect." It is obvious that Pentecostal movements have been attractive to the poor. The emphasis on oral tradition, mentioned above, is one such factor in the communication of the Pentecostal version of the gospel. Other such factors are emotional styles of worship, the heavy reliance on symbols, the absence of written creeds, modern music and the like. Considering the fact that Pentecostalism tends to grow in number and importance even when the economic situation improves considerably, as in countries as Brazil or Argentina, disclaims some of the explanatory power of this paradigm.

The third cluster of theories may be labeled as the "Empowerment Paradigm." This paradigm may be said to claim that Pentecostalism somehow empowers people to take things in their own hands, and to act. Pentecostalism may be conservative in certain respects, but it radicalizes people, frees them from social and verbal constraints; it prompts innovations and, as Elizabeth E. Brusco has put it: Pentecostalism "restores the breadwinner to the home" and it represents a "Reformation of machismo" in, e.g., Latin America, nowadays the continent of Pentecostalism. Here, we may also include the theories of the coincidence between the character of Pentecostalism and that of the postmodern

society. So far, this paradigm seems to be the one that holds more explanatory power than the others (Brusco 1995).

Cross-References

- ▶ Ecclesiology
- ▶ Global Christianity
- ▶ Globalization, Sociology of
- ▶ Religion, History of
- ▶ Religion, Sociology of
- ▶ Religion, Theory of
- ▶ Religious Studies
- ▶ Systematic Theology

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Pentecostalism, Charismatic Movements

- ▶ Pentecostalism

Perception

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Related Terms

Sensation; Sensory experience

Description

The discipline of perception is concerned with explaining the operation of the senses and the experiences and behaviors resulting from stimulation of the senses. The senses are vision, hearing, the cutaneous senses (touch, pain, tickle, itch), chemical senses (taste, smell, flavor), proprioceptive senses (awareness of body positions and motion), and the vestibular sense (body orientation, balance) (Goldstein 2010a, b).

Psychophysical and Physiological Approaches

The discipline involves two parallel and interacting approaches, the *psychophysical approach* and the *physiological approach*. The psychophysical approach involves determining

the relationship between stimuli in the environment and perception. This approach has measured basic operating characteristics of perception by determining thresholds for qualities associated with each sense (e.g., detecting light, motion, sounds, taste, and smell stimuli) and how stimulus characteristics influence perception (e.g., how wavelengths of light are associated with color perception, frequency of sound with pitch, depth information in the environment with depth perception). The psychophysical approach is essential because it defines perceptual phenomena to be explained and also helps elucidate underlying mechanisms.

The physiological approach is concerned with determining the biological mechanisms responsible for perception. The main goal of the physiological approach is to determine the sensory code – how stimuli in the environment are represented by the firing of neurons. Recent research involving the physiological approach has determined (1) that there are areas in the brain that are specialized to process information about specific types of stimuli (e.g., an area for processing information about faces, an area for complex auditory stimuli), (2) that even stimuli that have specialized areas also activate many other areas of the brain – that is, their activity is "distributed," (3) that the brain is "plastic," – that is, its properties can be shaped by experience in perceiving specific stimuli. This shaping can result in neurons that respond best to these stimuli so that neurons eventually become tuned to stimulus characteristics that are most likely to occur in the environment, and (4) that there are neurons that respond to higher-order aspects of behavior. For example, neurons called *mirror neurons* fire when a monkey observes an action being carried out by the experimenter (e.g., picking up a peanut) and also fires when the monkey carries out the same action. There is also evidence that similar neurons exist in humans, with some researchers suggesting that mirror neurons are important for imitative behaviors, determining other people's intentions, and guiding social functioning, and others taking a more cautious "wait and see" attitude regarding the functional significance of these neurons.

Theoretical Approaches

The Gestalt approach to perception, which is still influential today, was proposed by Max Wertheimer who, beginning in the 1920s, formulated "laws of perceptual organization" governing how elements of the environment are perceptually organized into larger units. The Gestalt principle that "The whole is different than the sum of its parts" emphasized the importance of context in determining perception (Koffka 1935).

The ecological approach to perception, introduced by J. J. Gibson beginning in the 1950s, emphasizes the importance of determining environmental stimuli that govern perception in the environment and considering perception as experienced by observers as they move through the environment (Gibson 1979). The focus on studying perception of the moving observer contrasts with traditional perception experiments of the time, which typically involved testing stationary observers in laboratory settings. The ecological approach is important because it emphasizes natural stimuli and conditions of observation.

The constructivist approach to perception takes as its starting point the fact that the information provided by the image on the retina is ambiguous because a particular image can be caused by an infinite number of objects (Fig. 1). Because of this ambiguity, additional processes are needed, and perception is conceived as an inferential process in which observers make use of their knowledge of *regularities of the environment* – aspects of the environment that occur with high probability. For example, it is likely that a blue area in the upper part of an outdoor scene is the sky and that a desk lamp extends behind a computer that covers part of it. This approach traces its roots to the nineteenth-century physicist Hermann von Helmholtz who proposed that perception is determined by a process called unconscious inference that occurs automatically and without conscious awareness of the perceiver. Irvin Rock later characterized this inferential approach as "perceptual problem solving" (Rock 1985). In the spirit of constructivism, an approach called the *computational approach* considers perceptual processes

Perception,
Fig. 1 Ambiguity of image on the retina. Any image can be created by an infinite number of objects. Three are shown here (from Goldstein, E. B. (2010). *Sensation and Perception*, 8th edition. Cengage Publishers)

Image on retina

Objects that create the same image on the retina
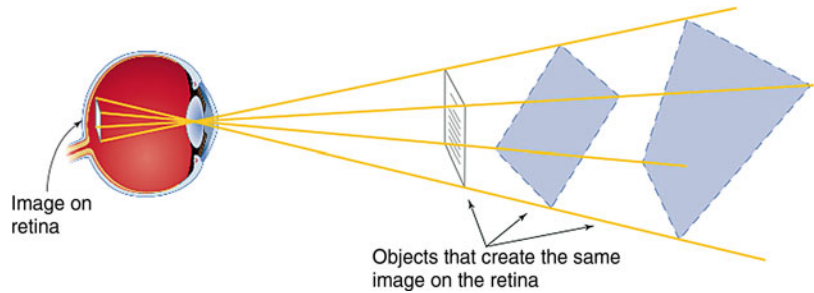
as solutions to computational problems which involve inferences about the nature of the environment. This approach often states these inferences in formal statistical terms.

In addition to treating perception as an inferential process, modern perception research has begun to focus on links between perception and the physical capacities and behaviors of the perceiver. This approach, which has been called embodied perception, proposes that actions are the important outcome of perception. One reason for this assertion is the adaptive significance of taking action. Consider, for example, an observer who sees a dangerous animal nearby. While perceiving the animals is important, it is also crucial that the observer take the necessary actions to avoid being attacked by the animal (Milner and Goodale 2006).

Thinking about action as an important outcome of perception has led to a great deal of research on links between perception and action and the discovery of one processing stream in the brain responsible for perceiving and recognizing objects and another stream responsible for determining the object's location and then taking action toward it. This means that even a simple behavior such as picking up a coffee cup involves numerous brain processes – first, the object recognition system results in perception of the cup, then another system determines where the cup is, and finally, another system is involved in reaching for the cup, grasping it, and picking it up.

In summary, the study of perception has been extended beyond early research that focused on perceiving simple stimuli under reduced laboratory conditions to determining how people perceive in environmentally relevant situations and

how unconscious inferential processes are involved in perception, connections between perception and action, and the nature of the brain mechanisms that underlie both perceptions and the behaviors that derive from perception. As will be described later in this entry (see "Reality" and "Knowledge"), another important aspect of perception is how it can be influenced by the observer's knowledge, past experiences, and expectations.

Self-Identification

Science
The field of perception is a natural science. Perceptual research is governed by the methods of science and the facts and principles of the discipline derive from controlled empirical research based on the scientific method. The goal of perception research is to determine correlational and causal relationships between sensory stimuli and perceptual effects and to determine underlying physiological mechanisms.

Religion
The field of perception is not identified as a religion. Religious belief or doctrine plays no role in the elucidation of the principles of perception.

Characteristics

Perception is distinctive among other disciplines because it is concerned with a specific type of experience – experience derived from the senses – and the discovery of mechanisms responsible for

these experiences. It is this focus on sensory experience that differentiates perception from disciplines that may be concerned with other types of human and animal experience. There is, however, extensive cross talk between the discipline of perception and other related disciplines. For example, there are connections between perception and the subdiscipline of memory in that experiences rich in perceptual detail are often remembered more vividly and accurately than experiences that lack this detail. Emotion is another example of cross talk because perceptions can elicit both positive and negative emotions, and a person's emotional state can influence what they observe and how they observe it.

Relevance to Science and Religion

The discipline does not specifically concern itself with the scholarly area of science and religion, although there are some phenomena that may be of concern to religion, which could be studied within the field of perception. Examples of these phenomena are the nature of consciousness, connections between physical stimuli and experience, subjective feelings associated with religion, and perceptual aspects of religious practice.

Sources of Authority

The source of authority for the field of perception is empirical research reported in scientific journals and books and theoretical formulations. Research reported in journals is considered authoritative because of the use of the scientific method and because most research is peer reviewed. Authority is also achieved through the reputation of the authors who have published extensively in the field (see References for some representative works).

Ethical Principles

A major ethical principle, which is associated with the scientific method, is the principle of objectivity of scientific investigation and the description of procedures in a way that enables results to be replicated by other investigators. Additionally, ethical principles established by university review boards and professional societies such as the American Psychological Association and the Society for Neuroscience govern how humans and animals are treated when they are subjects in experimental research.

Key Values

In addition to the ethical values described above, a value shared by many researchers is the importance of basic research for advancing knowledge. In some cases, the results of this basic research may lead to applications that result in improvement of the human condition. One example of basic research which led to an application is the auditory research that established connections between inner ear physiology and pitch perception. The result of this research later became the basis for the development of the cochlear implant prosthetic device which has made hearing available to hundreds of thousands of people. Prosthetic devices for vision, hearing, and touch are also being developed. Additionally, research on pain perception has applications for alleviation of chronic pain.

Conceptualization

Nature/World
Nature and the world are primarily conceptualized as the source of stimuli for perception. Of primary concern are any physical stimuli that can be sensed by people or animals.

Human Being
Human beings are conceptualized as biological organisms, which can be understood by reducing processes to basic mechanisms. The "human element" to these mechanisms is provided by considering how people's expectations and knowledge, which is usually connected with past experience, can influence perceptual

processes. A large amount of physiological research on perceptual mechanisms has been carried out on animals, with the results often being generalized to humans.

Life and Death

The origins of life are not treated, although the connection between developmental processes and perception (tracing perceptual capacities as they develop, beginning with birth and then continuing into old age) is an important area of research. Also, the various sense organs and sensory nervous system are considered to have evolved according to the principles of natural selection.

Reality

It would not be inaccurate to say that the study of perception is the study of people's conception of reality. From the point of view of the perceiver, perceptual reality is what is experienced. The person's subjective feeling accompanying this perception may be that what is perceived is an accurate reflection of what is actually present, but this may not totally be the case. One reason this is so is that only a fraction of what is "out there" is perceived. This occurs (1) because some things are too small to be perceived, (2) because some types of environmental energy cannot be sensed by our perceptual system. For example, humans cannot detect ultraviolet (very short wavelength) light energy (although other animals can), (3) we can pay attention to only a small fraction of the available stimuli, and (4) because of the limits of attention, we can miss changes that occur directly within our field of awareness. This effect, which is called change blindness, occurs, for example, when viewers miss continuity errors in movies – changes from one shot to the next in some aspect of a scene that is supposed to remain constant (such as what a person is wearing or the locations of objects on a table).

Illusions provide another example of a noncorrespondence between perception and physical reality. Although it may appear, in Fig. 2, that the animal further down the railroad tracks is larger on the page than the one that is closer, both animals are, in fact, the same size on

the page (measure them!). Another way to check the degree of correspondence between perception and physical reality is to ask how an observer would perceive the sizes of the two animals if they were perceived within the actual three-dimensional scene. The answer to this question is that estimates of size do not always exactly correspond to physical reality. It is common for errors to occur in estimating qualities such as size, depth, movement, and the location of sounds, and these errors typically increase under degraded conditions such as low visibility or noise in the environment.

It is also important to note that everyone's perceptual reality may not be the same, and that because perception is a private experience, it is not possible to know whether experiences that two people label similarly (e.g., "the tomato is red") correspond to the same inner experience (see Goldstein, E. B. "Private nature of experience" in Goldstein 2010b).

Because perceptual reality is created by the brain, what we perceive reflects both what is "out there" and the operation of the brain. There are many examples of how physiological properties of the brain can affect perception, in some cases creating experiences that do not correspond to the physical stimulus (Goldstein 2010a). The most dramatic examples of how the brain can create "realities" that are not actually present physically occur when there is damage to the body or the brain. For example, it is common for people who have had a limb amputated to experience a *phantom limb* – the experience that the limb still exists. This illusory perception is caused by as yet not completely understood brain mechanisms (Ramachandran and Blakeslee 1998). Another distortion of reality caused by the brain manifests itself in some patients with damage to their right hemispheres, whose limbs on the left side of their body are paralyzed. Despite their inability to move their limbs, these patients deny they are paralyzed. This condition is called *anosognosia*, which means "unaware of illness" (Ramachandran and Blakeslee 1998).

But perhaps the most profound aspect of how the brain influences perceptual reality is that functioning of the brain not only influences how

Perception, Fig. 2 Ponzo or railroad track illusion. The two creatures are the same size on the page (composition courtesy of Mary Bravo; Railroad track photograph: William Vann/ www.edupic.net) Contact information: Mary Bravo - mbravo@camden.rutgers. edu

we perceive the qualities of the physical world but that the brain creates the experience of some sensory qualities from energy that itself has no sensory quality. For example, the experience of color is created by how different wavelengths activate receptors in the visual system. Thus, when a fire engine reflects long-wavelength light into the eye, the nervous system creates an experience of "red" from electromagnetic energy that is colorless. Considering an analogous example from another sense, we can ask why sugar tastes sweet. Sugar is no more than an arrangement of molecules. Where is the "sweetness" in the sugar molecule (or the rancidity in molecules released from rotting meat)? These qualities are not in the molecules but are created by the action of these molecules on the nervous system. Perceptual reality is therefore determined by the energy to which the nervous system responds and by the experience it creates from this energy.

Knowledge

Knowledge plays an important role in perception because knowledge of the characteristics of the environment can affect perceptual experience. The effect of knowledge is often conceptualized in terms of top-down processing, which refers to the perceptual processes that take as their starting point the knowledge a perceiver brings to the perceptual situation. This contrasts with bottom-up processing, which refers to the perceptual processing that begins with information presented to the receptors. Most perception involves a combination of both types of processing. For example, consider a situation in which you are listening to someone talk in a noisy environment. You hear their words because pressure changes in the air that enters your ears and activates receptors inside the ear. This triggers a series of neural events that eventually reaches the brain. This is bottom-up processing.

Meanwhile, your knowledge of the language as well as the topic of the conversation enables you to perceive some works that may be partially obscured by noises in the environment. This is top-down processing. The idea of regularities in the environment is also relevant to top-down processing because knowledge about how the environment is constructed influences the ability to perceive objects and scenes.

Knowledge is also involved in perception because of the way experience in the environment can shape the characteristics of neural systems responsible for perception. As mentioned previously, the properties of the brain can be shaped by experience in perceiving stimuli so that neurons become "tuned" to respond best to common features of the environment. Looked at in this way, knowledge is programmed into the nervous system. One reason it has been difficult to program computers to perceive objects is that the computer programs lack the knowledge that is programmed into the human perceptual system.

Truth

Truth is involved when evaluating the accuracy of empirically collected data and how well perceptual theories explain the facts of perception. "Truth" is also involved when we ask whether a particular perception is "true." The question can be evaluated only for qualities that can be objectively measured. For example, it is possible to compare the perceptual report "the 4-sided shape is square" to actual measurements of the four sides and angles of the shape. However, other perceptual experiences, such as perceiving colors, pitches, tastes, and smells, cannot be evaluated in this way because these perceptual qualities are created by the nervous system and are not, therefore, intrinsic to the physical stimulus (see "Reality").

Perception

See previous description of the discipline.

Time

Time is treated as a variable in perceptual research by asking how other variables affect the perception of the passage of time. It has been shown, for example, that a particular time interval appears to last longer as the frequency of events that occur within that interval increases. Time is also important when considering the time course of the perceptual process. Research has shown that the time course of perception is limited to some extent by the time course of neural responding, but that, in general, perception occurs extremely rapidly (within fractions of a second) and that a great deal of information about the environment can be taken in based on a very brief exposure.

Consciousness

Consciousness is central to perception because perceptual experience is a manifestation of consciousness. ▶ Qualia is the term used to refer to the essence of what it is like to have a particular experience. For example, a person's experience of "red" would be his or her "red qualia." A characteristic of qualia is that they are private experiences. Thus, if two people looking at a fire engine both say they experience "red," there is no way to know whether their experience is the same.

An active area of perceptual research is the study of disorders of consciousness. This can include deficits in the ability to perceive specific perceptual qualities (e.g., color blindness) and also can refer to conditions in which people can demonstrate perceptual abilities even in the absence of perceptual experience. An example is *blindsight*, in which a person who is blind within an area of the visual field can report characteristics like orientation or the direction of movement of stimuli that are presented to the blind area, even though the person reports that they are unable to see the stimuli. This phenomenon is an example of what has been called "zombies in the brain" – the idea that much of our perceptual behavior is controlled by unconscious processes in the brain. This unconscious nature of processing is a characteristic of much of embodied perception described above (Ramachandran and Blakeslee 1998).

Rationality/Reason

The study of perception is considered rational because it is based on the scientific method. However, many perceptual phenomena appear to be irrational, such as anosognosia, in which people are unaware of apparently obvious physical deficits such as being paralyzed.

Mystery

Mystery, as such, is not a subject of study in perceptual research. However, the question of how physiological events such as neural impulses can become transformed into perceptual experience, which is called the ▶ mind-body problem, is one of the most mysterious (and still unsolved) problems of nature.

Relevant Themes

Perception in Religion's Ritual and Practice

There are many connections between perception and religion both because of intersections between their concerns (both are concerned with issues such as reality, consciousness, and truth) and because perceptual phenomena are important components of religious ritual and individual religious practices.

Perceptual stimuli are hallmarks of many religious services. Services can involve colorful vestments, music, smells (such as those created by incense), tastes (as occurs in tasting wine and communion wafers), and visual environments of lights, colors, and religious icons. Such "multidimensional" sensory environments can facilitate spiritual feelings by creating a mood, transporting people out of their everyday routine, and thereby opening them to spiritual experience.

Considered from a mechanistic viewpoint, the pairing of sensory experience and religious services can create a conditioned response that exposure to perceptual stimuli elicits religious experience. For example, the smell of incense having been paired with the experience of the religious service may elicit religious feelings even outside of the religious setting.

Another example of pairing perceptual experience and religions practice is provided by the Islam practice of salat – performing a series of prayers five times during the day. Pairing occurs when the person adopts a particular body posture as each prayer is recited. For example, the opening prayer "Allah is great" is recited while standing, whereas other prayers are recited while in various positions (sitting, bowing, prostrate). This pairing of body postures and prayers can create a conditioned response that causes each body posture to elicit and therefore reinforce the spiritual feelings associated with the prayers. This conditioning may possibly be strengthened in situations in which the person prays in a group and so experiences his or her own body postures and also observes the postures of others. Recent research on mirror neurons (described above) indicates that watching someone else perform an action can cause the same neural responses that occur when the person is carrying out these actions.

Religious experience not only occurs within a perceptual environment, but can also create new perceptions. For example, meditators report experiencing visual images, sounds, words, feelings within the body, and tactile feelings. What causes perceptual experiences such as these, even in the absence of physical stimulation? This question can be answered in different ways. Consider, for example, a meditator who believes that sensory feelings experienced during meditation are caused by the presence of an angel (a belief that may be held by some, but not all, meditators). Some perception researchers, taking their cue from research which shows that perceptual effects and physiological responses can result from expectation and suggestion, might explain the meditator's experiences as being caused by their belief, which results in brain states that cause various sensory experiences (Austin 1998). The meditator, taking their cue from religious teachings, might explain their experiences as being caused by the actual presence of an angel. The difference between the explanations reflects differences in levels of explanation. The scientific explanation attributes causation to physical

events in the mind or brain, whereas the religious or spiritual explanation attributes causation to spiritual, not easily measurable, factors.

Another illustration of different levels of explanation is provided by the hook-swinging ceremony, a nearly extinct custom practiced in remote Indian villages, in which a "celebrant" hangs from steel hooks shoved under his skin and muscles and which are attached by ropes to the top of a small cart. As the celebrant is moved from village to village to bless the children and crops, there is no evidence that he is experiencing pain but instead appears to be in a "state of exultation." Explaining this apparent lack of pain at a spiritual level might involve reference to the spiritual nature of the celebrant or to the operation of divine forces. Explanation at the physical level would focus on findings that pain can be decreased by modulation of the firing of neural impulses caused by a person's mental state (Melzack and Wall 1988).

In addition to perceptual effects that are observed during spiritual practices such as meditation and ceremonies such as the hook-swinging ceremony, long-term effects of religion on perception could potentially occur. Just as growing up in a particular culture can affect perceptions (a well-documented example being the way differences in color naming in different cultures can result in differences in the way people perceive boundaries between different colors), it has been hypothesized that religious training might affect the interpretation and processing of perceptual stimuli. A study by Lorenza Colzato and coworkers (Calzato et al. 2008) has found that Dutch Calvinists tended to focus more on details of visual patterns than did a control group of atheists. They attributed this result to the Calvinists being taught from an early age to focus on local aspects of events. This result and its interpretation are intriguing, but empirical support for long-term effects of religion on perception is scant at this time.

Another example of long-term effects of training or practice is the following Zen Buddhist saying:

> Before you study Zen, mountains are mountains and rivers are rivers. While you are studying Zen, mountains are no longer mountains and rivers are no longer rivers. But once you have achieved enlightenment, mountains are once again mountains and rivers again rivers.

This saying is usually explained to mean that once enlightenment is achieved through Zen practice, mountains and rivers are perceived not only as physical forms, as before, but with an added appreciation of the spiritual significance of the mountains and rivers and the connection or "oneness" of the mountains, the rivers, and the perceiver. Zen training, therefore, leads to new appreciations and ways of perceiving (Austin 1998).

The idea that there are modes of perception beyond the purely physical process of seeing or hearing is provided by St. Bonaventure's description of *three ways of knowing*: (1) *the eye of the senses*, which involves pure sensation – sensing a light, darkness, color, or form without attaching meaning to it. (2) *The eye of reason*, which involves interpretation and organization that transforms pure sensation into meaningful perception. These first two ways of knowing correspond to "sensation" and "perception" as studied by contemporary perception researchers. And (3) *the eye of spirit or contemplation*, which involves perception at the level of the divine and realization that all things are one. This third way of knowing is analogous to the enhanced perception of mountains and rivers that results from Zen training.

The examples of the effect of Zen training and Saint Bonaventure's *eye of the spirit* extend beyond what most perception researchers study. There is, however, an emerging field of "consciousness studies" that is concerned with investigating the role of the mind and brain in creating conscious experiences ranging from perceiving simple perceptual stimuli to feelings of transcendence (Austin 1998; Ramachandran and Blakeslee 1998).

In light of the above, it could be said that perception and religion have a symbiotic relationship. Perceptual experiences can enhance the experience of religion, and religious practice

can elicit new perceptions, add new dimensions to existing perceptions, and extend perception beyond the physical and into the spiritual.

Cross-References

► Attention
► Biological Psychology
► Blindsight
► Cognitive Psychology
► Consciousness, the Problem of
► Ecological Psychology

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Perceptual Systems, Gibsonian

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The means by which animals detect information specific to the environmental layout and its features. Perceptual systems extend beyond the sensory receptors, neural projections, and brain processes to include the actions of the body that are essential for the detection of information (structure). For example, the visual perception system includes not only the retina, optical radiations, and the brain, but importantly, the possible movements of the head, neck, and entire body that participate in the detection of information. Such movements typically reveal invariant structure that is specific to particular objects and events. From the perceptual systems perspective, which was formulated by James Gibson, perception is best conceptualized as a perception-action process.

Perfect Being Theology

► Theism, Classical

Perfection

► Pāramitā

Performance

► Theater

Performance Art

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Artwork in which the primary medium is the artist himself or herself, or the artist's own body; distinct from the performing arts, such as theater, performance art grew out of Dada and Futurist events in the early twentieth century and

the Happenings of the 1960s. Performance artists often reject theatrical conventions and artifice, relying instead on the metaphoric and symbolic resonances of real materials and the artist's actions with them. Performance art is often intentionally provocative and/or political, inviting the audience to react intensely as the artist violates expectations usually associated with the performing arts.

Performance Event

► Theater

Performativity

► Theater

Perinatal

Neil Spurway
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Occurring around the time of birth.

Person

► Personhood and Scientific Methodology
► Self

Person Perception

► Attribution/Attribution Theory

Personal God

► Monotheism

Personalism

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Related Terms

Personality; Uniquely individual

Personalism is a current of modern philosophy with different versions related by historical influence or by partly similar yet independently developed positions. It is distinguished from other forms of modern thought that make more limited and peripheral use of the concept of the person, and from earlier thought specifically about this concept, by making it central to its worldview in a more systematic fashion and by its insistence on further philosophical implications of personal experience.

While the term "personalism" had been used occasionally since the late eighteenth century, it became generally known as a designation of such philosophy only in the first half of the twentieth century. A main distinction could then be made between the American personalism of Borden Parker Bowne (1847–1910) and his successors mainly at Boston University, and the Continental European personalism of which Emmanuel Mounier (1905–1950) was long the best known representative.

The former is a quite distinct school with an unambiguous lineage in terms of the history of philosophy and with Bowne as the undisputed founder, while the latter is a more complex phenomenon in terms of its philosophical components and its historical development, and other thinkers, above all perhaps the early Max Scheler (1874–1928), could be considered quite as important and representative as Mounier. The earlier, American form of personalism is a version of nineteenth-century idealism, whereas all versions of the latter, European, are decisively shaped by twentieth-century phenomenology and existentialism. European personalism also developed

quite independently, without historical influence from American personalism.

European personalists sometimes regard their form of personalism as a completely distinct phenomenon that should always be considered apart from and never confused with American personalism. Yet, in substance, there is at least enough resemblance for others to have attempted to present a shared, more general worldview profile of personalism, and Mounier himself to some extent collaborated with the Americans.

For all personalism, the person is a uniquely individual, positively determined, conscious, rational, willing, partly free and morally responsible being, whose continuous realization or development of itself as such is achieved though its dynamic existence in social, reciprocal relation and community with other persons, through moral character-formation and action, and through the process of gradual appropriation and concrete manifestation of higher values. Properly understood, the reality and life of such persons reveal the nature and meaning of all existence, as conceived both in the theoretical terms of knowledge and metaphysics and in the practical terms – regarded as closely related to and in some respects preconditions of the theoretical – of ethics and aesthetics.

The person is thus asserted as an epistemologically, ontologically, morally, and axiologically primary category, i.e., in all traditional fields of philosophy, while its proper understanding is also held to add new dimensions of insight into the existential significance and potentialities of life. Because of the depth and complexity, the partial elusiveness and opacity of the reality designated as personal, its primacy does not offer any simple key to final, definitely formalizable solutions to all philosophical problems. But the truths regarding the nature of the person in most cases point in a particular direction, beyond other systems of thought. Especially American personalism, at least in its earliest formulation by Bowne, does conclude that all existence, and ultimate reality, must be conceived in personal terms. While it takes distinct positions on and sometimes reconceives traditional theoretical issues of philosophy, personalism is ultimately about the quality of the life concretely lived by persons and in particular by persons-in-relation.

The person as specifically defined by personalism cannot be explained by, reduced to, or absorbed in impersonal or non-personal structures, realities, or unrealities, whether conceived in terms of matter, social and cultural conditioning, general scientific and mathematical laws and models, other conceptual abstractions and universal principles, general ideal forms, dialectical processes, social collectives, a pantheistically conceived totality, monistic spiritual unity, or nothingness. Personalism thus defends the spiritual and moral nature of humans against scientific reductionism, while also insisting on the personal nature of this spiritual and moral reality against impersonal conceptions of them.

The rejection of the primacy of impersonal universality and objectivity is not tantamount to relativism. Universality and objectivity are not suspended by but reconceived in accordance with the ultimacy of personality, apprehended either in the shared reality of a social plurality of human persons and/or as the supreme reality of the personal God. The nonrelativistic yet one-sidedly epistemological and formally moral subject of modern rationalism, including Kantianism, is modified, supplemented, or replaced by the concrete person, but the very nature of that person and his place in the personal whole rules out and invalidates relativistic subjectivism.

For this reason, personalism also rejects individualism. In terms of political philosophy, most forms of personalism have been characterized quite as much by the rejection of modern individualistic liberalism as by the rejection of collectivism and totalitarianism. Individualism too is a reduction of the person, either to the uniform rational abstraction of the Enlightenment, in which, in line with the term's etymology, individual does not signify any distinctive singularity, or to morally undisciplined singularity and the egoism that reduces other persons to means.

The person differs from the mere individual by its higher, moral and value-realizing nature that coordinates and synthesizes its singularity with the moral and spiritual order of which it is a part, and by its constitutively necessary

interrelatedness and community with other persons who are organic parts of that larger, personal yet at the same time objective order.

Such general positions could be said to characterize personalism in general, including most of its subdivisions. In the course of the second half of the twentieth century, some contact and exchange between the American and European schools have also been established, resulting in new syntheses and *rapprochements.*

At the same time, the differences not only with regard to philosophical and methodological points of departure but also of emphasis and specific, subordinate themes persist. Even when published in the same journals and appearing at the same conferences, personalists are still normally seen to represent a broad spectrum of different positions.

Historically, all personalism must, however, be understood against the background of and in close relation to the general cultural and intellectual development of Western modernity. Not least, it is in such deeper historical perspective that the shared themes as well as the meaning of the current issues and developments in personalism can be grasped.

Primarily in its idealist form but also to a considerable extent, albeit in some respects more indirectly, the phenomenological and existentialist, personalism was shaped by the nineteenth-century current of humanistic ideals of *Bildung* in their many national variations, and the unbroken confidence in the significance, power, and value of the modern subject as understood in nineteenth-century idealism – both harmonized with a more or less liberal version of Christian theism. In European personalism from the beginning, and in later generations of the American school, these values were merely modified and adapted to a new cultural, social, and political situation.

The philosophical concept of the person had developed through a long and complex historical process, beginning with the pre-Christian term *persona* being taken up in the protracted theological debates over the Trinity and the Incarnation. In the course of the Middle Ages, with a point of departure in Boethius' definition, *persona est rationalis naturae individua substantia* (person is an individual substance of rational nature), it descended from the level of the divine to be applied on the human level, where its definition was continuously developed and refined. The process then continued as the concept was influenced by most of the main currents of modern thought, with an increased emphasis on subjectivity and self-consciousness.

The growing valorization of and confidence in secular humanity developed in the course of modernity account for much of the modern attention to and conceptual development of the category of personality. Even as personalism retained the theistic concept of God as the highest as well as deepest level of personality, and as the ultimate support of the value and dignity of human personhood, it was to some extent the conceptual development on the human level that was projected back onto the divine from where the concept had once descended. Thus, the theology or theistic metaphysics of personalism, in both its main early forms, was distinctively shaped by modern developments in theology, and, most obviously in the case of American personalism, in one strand of nineteenth-century idealism.

Making the concept of the person central in new systems of thought amounted to a kind of summary, encapsulation and reinforcement of the values and achievements of a broadly Christian humanism and idealism, reasserted against the perceived threats posed by impersonalism primarily in the forms of rationalism, naturalism, and collectivism. But by the time this project was becoming known under the new designation of personalism, it had already been carried on, in substance, for over a century. A historically decisive event for the development of what was subsequently to be called personalism seems to have been the so-called *Pantheismusstreit* in Germany in the 1780s, in which Friedrich Heinrich Jacobi (1743–1819) made the category of the person central to his criticism of the increasingly dominant pantheistic forms of thought that originated primarily in Spinoza.

Defending the core positions of the limited yet decisive freedom, the moral responsibility, and the value of the human person that is

constitutively defined by his relation to the personal God, Jacobi carried on and continuously updated his polemic as Spinozist pantheism was transformed from its Enlightenment rationalist incarnations of Mendelssohn and Lessing to the romanticized versions of the early Schelling and others. While in his understanding of the person, Jacobi was himself influenced by the Enlightenment and early Romanticism, i.e., by the whole modern humanistic development that accounts for the new importance and prominence of the human person, and while this influence combined with and modified his Christian convictions, he also clearly perceived the significance and problematic potential of the impersonalistic momentum of other aspects of the development of specifically modern thought. The new term *nihilism* was used by Jacobi to illustrate the effects of the impersonalistic dynamic within modernity that he predicted and warned against.

Jacobi's adversary, the leading German idealist Friedrich Wilhelm Joseph von Schelling (1775–1854), turned out to be receptive to Jacobi's analysis and arguments. In *Philosophische Untersuchungen über das Wesen der menschlichen Freiheit* (1809), his early idealism was strongly modified by a new, central use of the category of the person on both the human and divine levels. This contributed to the development of a whole alternative branch of German idealism, critical of the idealist mainstream from Fichte over the early Schelling to Hegel. It was called *der spekulative Theismus*, and represented by thinkers like Immanuel Hermann Fichte (son of Johann Gottlieb) (1797–1879), Christian Hermann Weisse (1801–1866), and Rudolph Hermann Lotze (1817–1881).

While the later Schelling was still strongly influenced by pantheist and to some extent esoteric conceptions in his idea of ultimate reality, distinguishing between God and a "Ground" in God in relation to which human history and God himself developed in a continuous moral and metaphysical drama, the speculative theists sought to overcome what they here perceived to be a residual element of impersonalism, and to elevate the new person-centered idealism above pantheism.

Jacobi himself had not been an idealist in the new, German sense, and was influenced rather by elements of common-sense realism in his criticism of rationalism in its Enlightenment and idealist forms as well as of the romantic monistic intuition that was a feature of some German idealism. This aspect of Jacobi's criticism was taken up by the speculative theists in the form of the prioritizing of the irreducible concrete experience of the person as a necessary point of departure for philosophy, which came to define their strongly modified form of idealism.

There is an unbroken and sometimes strictly disciplic succession of thinkers here, not only from Jacobi over Schelling to the younger Fichte Weisse, and the latter's student Lotze, but further on to Lotze's students, among whom is found Bowne, and also Andrew Seth Pringle-Pattison (1856–1931), who developed in Britain an idealistic personalism similar to Bowne's. This alternative branch of idealism, which in Britain and America often came to be called *personal idealism* in contradistinction to *absolute idealism*, also had counterparts in many other European countries throughout the nineteenth century and often well into the twentieth century.

Before Max Scheler came under the influence of Husserl's phenomenology, he was a student of the German idealist philosopher Rudolph Eucken, who, while not strictly a speculative theist, was certainly familiar with this current of thought. Although it is unclear how much of it he picked up from Eucken, Scheler's most important work, *Der Formalismus in der Ethik und die materiale Wertethik* (1913–1916), is in many respects a transposition of basic themes in the broad current of nineteenth-century *avant-la-lettre* personalism to the terms of phenomenology. The criticism of Kant's ethical formalism and the emphasis of the positive, concrete development of personality under the normative guidance of intuited higher ideals like the good, the true and the beautiful (although the latter were not normally described in terms of values), ideals that were yet reconceived as realizable only in concrete personal form, had been developed in great detail by personalistic idealism throughout the nineteenth century.

The phenomenological method of the early Husserl, however, in some respects certainly

distinguished Scheler's personalism from the modified idealistic line carried on by Bowne, although in substance the latter was not always far from it. While idealism was largely retained by both the second generation of Boston personalists, Bowne's followers Edward Sheffield Brightman (1884–1953), Albert C. Knudson (1873–1953), and Ralph Tyler Flewelling (1871–1960), and the third generation represented by Peter A. Bertocci (1910–1989), the continuity with the idealist tradition in the strict philosophical sense was broken in continental European personalism in a way that made it seem it was never there at all.

Personalism had been used in France as a designation of his philosophical system already by Charles Renouvier (1815–1903) in the title of a work published in 1903. Renouvier was a representative of French Kantian neo-criticism, focusing on Kant's Critique of practical reason, and did exercise some influence on the development of personalism in France in the new century. Yet the general tenor of the personalism of Emmanuel Mounier is quite distinct from this version, and also in important respects from Scheler's in Germany. It is a product of the intellectual *milieu* of what has been called *les non-conformistes des années 30* in France, among whom Mounier was only one of several important personalists.

A cultural and social activist thinker rather than an academic philosopher, an editor of the journal *Esprit* and not a university professor, Mounier first conceived of personalism in the 1930s as part of a larger program of spiritual and moral renewal in a broad sense, perceived to have been made necessary by the decadence and materialism of bourgeois liberalism and democracy. While central concerns of the political philosophy of idealist personalism were in fact still recognizable, and the general Christian inspiration was central and basic, the mood of their expression in the new historical situation added quite as much as the new philosophical themes to the distinctiveness of this form of personalism. It was now primarily a practical philosophy oriented toward certain forms of social change.

The most important feature of the French personalism of this period was that themes from the emerging existentialist movement, in some respects a variation of phenomenology, were taken up. Considerable influence in this direction was exercised by the exiled Russian philosopher Nikolai Berdyaev (1874–1948). Some of the most characteristic of those themes were, however, anticipated already in the nineteenth century not just by Kierkegaard, but by Schelling and even to some extent Jacobi. They had developed in the line of these decisive early sources of personalism, and were now rediscovered and developed in new directions. Not least important in this context was the work of Gabriel Marcel (1889–1973), alone among the French existential personalists to be thoroughly familiar with the work of Schelling.

Within this framework, much that was to become central and distinctive of twentieth-century European personalism was developed by Mounier and other "nonconformists." In their work, the basic worldview profile of personalism is clearly restated and recognizable in most respects. Yet in the case of Mounier himself, the aversion to contemporary liberal society, in the Western European form and even more in the American, was so strong that he not only displayed, before the war, a partial sympathy for fascism, which many at the time construed as asserting community against mere liberal *Gesellschaft* in a way that was more compatible with personalism, but also a similar partial leaning, especially after the war, toward Soviet communism, whose anti-personalist nature was by then well known. This paradox in the thinker long considered the leading European personalist has been more adequately addressed by other scholars than by European personalists themselves.

Among the important personalists produced by the circles of the 1930s nonconformists were also Alexandre Marc (1904–2000) and Denis de Rougemont (1906–1985), who came to shape the growing European federalist movement in a distinctive manner that remains influential today, and whose specific political focus represents a variation of the activist features of French personalism. While these features could,

in the eyes of some critics, seem to become problematically absorbed and distorted by ideology even as one personalist, Jean Lacroix (1900–1986), would insist that personalism was nonideological, it also exercised a decisive influence on thinkers who came to some extent to represent a traditionalist, Christian counterweight to this development, namely the neo-Thomist philosophers.

Thomist personalists absorbed not just the existentialist influence from Mounier, but also the phenomenological influence from Scheler. Thus, a new synthesis was produced, in which the theistic and traditional moral dimensions of personalism were reinforced, and in which it was possible with the help of the new philosophical resources to add further meanings and values to or draw out latent ones from the rich and complex theological legacy of the development of the concept of the person ever since antiquity.

Thomistic personalism does not, like idealistic and early phenomenological personalism, take as its necessary point of departure the experience of the person and analyze the whole of reality in terms of it. Insights derived from this method are merely added as a new part to the already existing, traditional yet renewed system of Thomism. For this reason, it is not considered personalist in a strict sense, but only in a broader sense. Its claim to being a personalism is based on the singular value and role the system now ascribes to the person, but it is not the understanding of the person itself that determines the system as a whole. Yet the addition of elements of phenomenological personalism to Thomism accounts not only for new insights regarding the person, but also for the new emphasis on it.

This can be clearly seen in the work of Jacques Maritain (1882–1973) as well as that of Karol Wojtyła (1920–2005), who was a philosophy professor before becoming bishop of Krakow, and whose philosophical work later shaped the teaching of his encyclicals when he became Pope John Paul II. Wojtyła was the founder of the important Polish school of personalism, which is exclusively Catholic and whose leading representatives are members of the Catholic clergy.

Thomistic personalism too was, however, increasingly implicated in the ideological development of the twentieth century, as evidenced by Maritain's work after the Second World War with the United Nations' Universal Declaration of Human Rights, and with the Second Vatical Council, this tendency was further reinforced. While the theoretical opposition to naturalist and scientist reductionism was retained, the understanding of the import of personalism as an alternative to the more basic impersonalist dynamic in much of the intellectual and social developments of modernity was somewhat overshadowed by new concerns, such as the equal dignity and worth of all human persons. Personalism was increasingly used for the reinterpretation of the traditional Catholic teachings of the natural law as identical with modern human rights ideology.

This shift was not confined to European personalists, but also observable in new orientations of American personalism. Through the later Maritain, Thomistic personalism, increasingly conceived in terms of the new Catholic social ethic, had immediately exercised its influence in America, but the strict personalism of the Boston school too was now often being perceived primarily in terms of a similar ethics. American personalism is thus today shaped to a considerable extent by various social causes, the support of which is perceived to be the practical, ethical meaning and application of personalism. Much of this development Boston personalism has in common with the broader American current of liberal Christianity to which it belongs, although there are some significant differences between Bowne's ethics and that of the school's later generations.

A strong further impetus in this direction was given by the fact that Martin Luther King (1929–1968) wrote his doctoral dissertation under the direction of Boston personalists and explicitly identified himself as a personalist. Since then, American personalism has been even more preoccupied than European personalism with equal dignity and self-worth applications of its teachings to ever new *groups* of persons, in tandem with general ideological and

political change. Thus, the dignity of women, and of ethnic and sexual minorities has been a prioritized theme. One manifestation of this is the space devoted in a recent article on personalism by Bertocci's student Thomas O. Buford (1932–), the *doyen* of the Boston school, to "Afrikan" (African-American) and American Indian personalism. Representatives of such personalisms are considered on the one hand to have identified in Boston and other personalism elements congenial with the cultures of their respective groups, and on the other to have added to it distinctive qualities of those cultures.

Another characteristic application of this thematic is the emphasis on the equal dignity of the body as an integral part of the person conceived as the unitary whole of the human being, as against earlier idealist conceptions of the essence of personality in terms of spirit, self-consciousness, and will. American Methodist, Thomist, phenomenological and existentialist personalists have all increasingly insisted on such corporealist personalism, sometimes as being in line with Biblical teaching.

The idealist roots of American personalism are not wholly severed, however, and there is much discussion of the relation between the early Boston school and the other thinkers of its period, mostly at Harvard, some of whom were idealists, like Royce and Hocking. Others among these thinkers, however, created or belonged to more exclusively American currents of thought, like Peirce, James, Whitehead, and Hartshorne. Many of them called themselves personalists, but in the case of the pragmatists and process philosophers, there are significant differences between their personalisms and Bowne's idealistic and theistic version.

The importance of these differences was, however, reduced in the eyes of Boston personalists by the fact that, while Bowne's position was maintained by Knudson and others, the leading, second- and third-generation representatives of the school, Brightman and Bertocci, themselves abandoned Bowne's version of theism and approached that of process philosophy. Brightman reverted to a position similar to the later Schelling's which, although it represented

a decisive step in the development of personalism, had been regarded by the speculative theists as incompletely personalistic and which they had thus striven, as a further step in the same development, to supersede. If God is to be understood as personal, Brightman held, he must not only be conceived in finite and temporal terms, but there must also be a "nonrational Given" within God's own nature, which accounts for the evil which the world process, in which God is implicated, seeks to overcome. Significantly, in the European phenomenological context, the later Scheler too moved toward a similar new counterpart of the later Schelling's position.

One outcome of these developments as well as of the reduction of the divide between American and European personalism has been that personalism is seldom represented in its strict theistic idealist form either in Europe or America. With this exception, however, a rather broad spectrum of philosophers today regard themselves as personalists. The original similarities as well as the later convergence account for the fact that European and American personalists still largely share the very general, core positions outlined above, even as they are transposed to a new social and ideological context. Most of the European schools and branches have been further synthesized in the work of Armando Rigobello (1924–) – who builds partly on the thought of his teacher Luigi Stefanini (1891–1956) – and Juan Manuel Burgos (1961–), while American personalists continue both to reformulate Boston personalism and to integrate themes from European personalism.

Yet the complexity and vagueness of the concept of the person, with its many layers and facets of historically accumulated meanings, to some degree explain the further differentiation that has also taken place within the shared framework. The central category of personalism is one that many other philosophers too have to deal with. Thinkers who are not directly related, intellectually and historically, to personalism in its explicit forms and who do not call themselves personalists, have addressed personalist themes tangentially or within other frameworks. The prominence of themes recognizable as identical or at least congruent with those of personalism

proper accounts for the decisive influence of such thinkers in today's personalism.

Most importantly, the philosophy of dialogue developed by Martin Buber (1878–1965), and Emmanuel Levinas's (1906–1995) ethics of the Other, have been taken up and coordinated with the earlier themes of personalism. Levinas's ethics dovetails especially with and underpins the development of personalisms of minority groups and cultures in the West. But it is also the case that Buber's I-Thou-thematic does have a counterpart as early as Jacobi. Both of these developments in phenomenology, broadly conceived, have made it possible to bring out more clearly some implications of earlier personalist positions.

Another example of this is John Macmurray's (1891–1976) philosophy of persons-in-relation, which develops similar themes and has thus been regarded as personalist. Paul Ricoeur (1913–2005) was associated with both Mounier and Marcel in his early career, and retained some personalist themes in his later work. Michael Polanyi's (1891–1976) criticism of positivism and scientism, based on his understanding of personal and tacit knowledge, has also attracted attention among personalists.

The Christian input is continuously renewed, not just in the Thomist tradition, but also by Eastern Orthodox theologians, so-called social trinitarians, who seek to demonstrate the presence of "modern" personalist and dialogicist themes in some Church Fathers' views of the Trinity.

Personalism also responds to other concerns of contemporary philosophy. Erazim Kohák (1933–) has, for instance, addressed the relation between person and nature in general and with regard to the nature of animals, thus moving away from the too radical, Biblically inspired "human exceptionalism" primarily among Thomistic personalists.

Another important current trend is the interest shown by personalists in comparative work that finds parallels to personalism in Eastern thought. Some early personal idealists were aware of the relevance of such study, and Bertocci devoted an article to it. Today this work has at its disposal vastly expanded scholarship and can build on well-established scholarly dialogue and mutual familiarity, although it still faces difficult questions of translation and interpretation.

Although the philosophical concept of the person and its being made central in philosophical systems are in themselves products of specifically Western historical and cultural developments, there are sometimes striking, more general worldview similarities, not least with some branches of Vedanta. Given the nature of the relevant Eastern schools of thought, it is possible that comparative personalism could facilitate a rediscovery of personalism's early idealist forms and prehistory. In this way, and through the assimilation of a wider range of insights from congenial traditions in other cultures, personalism could confirm and reinforce its position as perhaps the main philosophical alternative to physicalist and scientist reductionism.

Cross-References

► Existentialism
► Idealism
► Phenomenology
► Self
► Theism, Classical

P

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Personality

▶ Personalism
▶ Personality Psychology

Personality Psychology

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Related Terms

Character; Identity; Personality; Self; Temperament

Description

Personality psychology is the scientific study of psychological individuality. Personality psychologists aim to understand the individual person as an integrated biological/psychological/cultural organism who, by virtue of human nature, shares many features with other persons and yet who is, at the same time, unique. Theory and research in personality psychology focus on individual differences in behavior, thought, feeling, and motivation across persons. Researchers measure the person's dispositional traits, temperaments, motives, goals, values, interests, identities, self-narratives, and other psychological features that tend to differentiate him or her from other persons. Assessments of personality are valuable to the extent they are able (1) to account for consistent trends in a person's behavior across situations and over time; (2) to predict important life outcomes like mental health and well-being, job success, the quality of interpersonal relationships, civic engagement, physical health, and mortality; and (3) to provide a full picture of a person's unique adaptation to the world.

The historical roots of personality psychology lie in nineteenth-century experiments and tests on individual differences in mental functioning, studies of character and biography, and the pioneering efforts of Sigmund Freud and other psychoanalytic theorists and clinicians who sought to understand the unconscious mind. The field of personality psychology emerged as a bona fide academic discipline in the 1930s, largely due to the influence of Gordon Allport's (1937) authoritative textbook, *Personality: A Psychological Interpretation*. Allport identified many of the perennial tensions and questions in the discipline of personality psychology, including the role of traits and situations in the prediction of behavior, the extent to which behavior is consistent or variable across different situations, the issue of personality continuity versus change over time, the links between normal personality functioning and psychopathology, and the relative merits of nomothetic research aimed at establishing general laws in personality versus idiographic case studies aimed at understanding

the individual person (Allport 1937). The discipline went through a very difficult period in the 1970s, when many researchers came to doubt the efficacy of personality traits as valid predictors of behavior. At the same time, the all-encompassing grand theories of personality that have traditionally been loosely grouped under the rubrics of psychoanalysis, humanistic psychology, and behaviorism began to lose favor among both researchers and clinicians. However, the next few decades witnessed a strong resurgence of activity in personality theory and research. Among the most important trends in the field today are (1) the revitalization of personality traits as predictors of important behavioral trends and life outcomes, (2) behavioral genetic studies speaking to the heritability of traits and gene by environment interactions, (3) neuroscientific studies of the psychophysiology of traits, (4) the influence of evolutionary psychology on understandings of psychological individuality, (5) cross-cultural studies of personality, (6) studies of motives and goals across the life course, and (7) the emergence of narrative approaches to personality that view human identity as an internalized and evolving life story.

Self-identification

The vast majority of personality psychologists identify themselves as behavioral scientists. The discipline of personality psychology is self-consciously scientific, publishing articles in rigorously peer-reviewed scientific journals, holding scientific conferences, securing scientific grants, and so on. However, the discipline has historically experienced tensions regarding its scientific status. Going back to Allport, personality psychology sets out to explore general laws or trends in psychological individuality and to understand the single case. It has always been difficult, however, to demonstrate how a nonrepresentative, idiosyncratic single case study can hold scientific value. Most personality psychologists, therefore, conduct conventional nomothetic research with large samples of subjects, which is evaluated according to

scientific standards, and yet they typically expect that their findings could, in principle, be applied to the individual case. At the same time, a small but vocal minority in personality psychology has perennially accused the mainstream of being overly concerned with scientific generality and of failing to focus enough attention on the uniqueness of individual human lives. This critical point of view usually comes from either clinical psychologists or from those personality psychologists who have a proclivity for cultural anthropology, qualitative sociology, literary studies, or the humanities.

Characteristics

Within psychological science, personality psychology stands out for its focus on psychological individuality. More than any other subfield in psychology, personality psychology aims to understand individual differences between people. It is also distinctive for its proclivity in developing integrative and broad-based conceptual perspectives that aim to understand the whole person. The field does, nonetheless, share many interests and perspectives with social psychology, developmental psychology, clinical psychology, and industrial-organizational psychology, among other fields. In many cases, boundaries between disciplines are blurred. Both social psychology and personality psychology focus attention on the social behavior of human beings, but personality psychology tends to emphasize individual differences in social behavior. Therefore, whereas social psychologists tend to study how different situations bring out correspondingly different behaviors in the same people, personality psychologists tend to study how different people show different behaviors in response to the same situation, those differences being due to different internal traits, motives, and so on. Both developmental and personality psychologists study continuity and change in behavior over time, but developmental psychologists study a wider range of phenomena – from perception to attention to cognition to emotion – and personality psychologists

focus mainly on social and emotional functioning as it appears, typically though not exclusively, in adults. Nonetheless, interest in child personality has increased in recent years. Most personality psychologists study psychological functioning within a more or less normal range, whereas clinical psychologists are more concerned with psychopathology. Having said that, clinicians have identified certain personality disorders – such as narcissistic personality disorder and antisocial personality disorder – and personality psychologists have shown increasing interest in these syndromes in recent years. Finally, personality psychologists focus on a wide range of individual differences, some (but not all) of which have proven useful in industrial-organizational psychology for predicting job performance, informing personnel selections, and the like.

Relevance to Science and Religion

Both Freud and Allport wrote important treatises on religion. In *The Future of an Illusion*, Freud suggested that religion was an irrational outgrowth of infantile and Oedipal dynamics (Freud 1927/1961). In *The Individual and his Religion*, Allport offered a more sanguine view, suggesting that intrinsic religious beliefs and practices can promote psychological maturity and motivate prosocial behavior (Allport 1950). Most personality researchers, however, have traditionally ignored the subject of religion. This is perhaps surprising given how important religious beliefs and practices are for millions of people the world over. The situation has begun to change somewhat in the past decade, as empirical psychologists of many different persuasions have come to recognize that religion is associated with many indices of mental and physical health (Emmons and Paloutzian 2003). Moreover, recent personality studies of virtues such as forgiveness and gratitude, for example, touch on religious themes (Emmons and McCullough 2004).

The historical reluctance of personality psychologists to explore religion in people's lives may reflect, in part, the discipline's self-conscious and somewhat defensive status as a rigorous science. Just as psychology writ large broke away from philosophy and religious perspectives in the late nineteenth century to establish itself as a science, so did personality psychology struggle in the first half of the twentieth century to attain the imprimatur of science. The struggle was made even more difficult by the fact that some of the intellectual strands that went into the making of personality psychology as a science seemed to have certain kinds of religious flavorings. For example, some observers have characterized psychoanalysis as akin to a twentieth-century secular religion, complete with origin myths (Freud's years of "splendid isolation"), heroic figures (Freud, Jung, Adler, Erikson, Kohut), sacred beliefs (the unconscious, the Oedipus complex), and canonical practices (free association, dream interpretation, transference). In any case, a religious worldview has never resonated well with personality psychology's commitment to the scientific method and its effort to explain psychological individuality in terms of measurable constructs in the brain, the body, and society. That said, personality theories have traditionally addressed some of the same big questions in life that religions have addressed: Who are we? What is the meaning of life? What makes for a good life? Even as most personality researchers have traditionally shied away from these questions in their experiments and correlational studies, the questions still lurk in the background and probably inform research in subtle ways. Furthermore, these broad, existential questions often arise in college undergraduate classes on personality psychology.

Sources of Authority

The prime sources of authority in personality psychology are its scientific journals and monographs. Among the most authoritative journals are the *Journal of Personality and Social*

Psychology, the *Journal of Personality*, and the *Journal of Research in Personality*. Particularly influential are research reviews on personality appearing in such journals as *Psychological Bulletin*, *Psychological Review*, *Psychological Inquiry*, and *Review of Personality and Social Psychology*, as well as in chapters on personality in the *Annual Review of Psychology*. Because journal articles are subjected to scientific peer review, journals are considered more authoritative than books. Nonetheless, books often offer authoritative sources for personality theories and for broad applications and illustrations of research findings. In addition, the discipline holds in high regard a small number of classic books that have historically had a large impact on theory and research. In addition to Allport's seminal textbook, these would include some of Freud's writings (e.g., *The Interpretation of Dreams* (1900), *Introductory Lectures on Psychoanalysis* (1916)), Murray's (1938) *Explorations in Personality*, Erikson's (1950) *Childhood and Society*, Kelly's (1955) *The Psychology of Personal Constructs*, McClelland's (1961) *The Achieving Society*, Eysenck's (1967) *The Biological Bases of Personality*, Mischel's (1968) *Personality and Assessment* (a searing critique of the field), Bandura's (1971) *Social Learning Theory*, and Wiggins's (1973) *Personality and Prediction*. In recent years, a number of authoritative handbooks have been published. The most important are these: *Handbook of Personality: Theory and Research* (3rd Ed., edited by John et al. 2008), *Handbook of Research Methods in Personality* (edited by Robins et al. 2007), and *Handbook of Personality Development* (edited by Mroczek and Little 2007). College textbooks in personality come in two varieties. Modeled after Hall and Lindzey's classic (1957) text, books covering the grand theories of personality provide conceptual and philosophical overviews of the writings of Freud, Adler, Jung, Murray, and other theorists. These books tend to ignore scientific research, however, so their status as authoritative sources is seriously compromised. Still, they remain popular. The second type of college textbook focuses on scientific research in the field while making efforts to connect to classic and contemporary theories of personality. A good example of the second type is McAdams's (2009) *The Person: An Introduction to the Science of Personality Psychology* (5th Ed.).

Ethical Principles

The ethical principles that guide work in personality psychology are those of science as it is intended to flourish in a free and democratic society. As such, personality psychologists aim to conduct well-designed research studies that aim to advance our understanding of psychological individuality. Studies should adhere to the best standards of practice for research on human subjects, as articulated by the American Psychological Association and the Association for Psychological Science, and by various institutional review boards at universities.

Key Values

The key values are generally those derived from science and medicine. From science, personality psychology derives the values of curiosity, open inquiry, and objectivity. Ideally, personality science is a progressive and self-correcting discipline wherein observations influence theory, which influences further observations, and so on. Over time, personality science should develop better, more coherent, more comprehensive, more rigorous and precise, and more generative understandings of psychological individuality. From medicine (and the clinical tradition in psychology), personality psychology derives values of alleviating suffering and improving human lives. Many personality psychologists hope that their research findings and their theories will ultimately have a positive impact on individual people and on society, through the dissemination of their ideas in the public and their application to clinical work and social policy.

Conceptualization

Nature/World

For personality psychology, nature/world would encompass all that is outside the person, often captured in the discipline's common expression of the *situation*. In simple terms, personality variables combine with the situation to produce behavior. In personality research, the situation usually refers to the proximal social and natural factors that impinge on the person at a given moment in time. The most contentious intellectual battles in the history of personality psychology have been fought regarding the relative efficacy of personality variable versus situations in the prediction of behavior. In the 1970s, the situationist view gathered many adherents, but today most personality psychologists espouse an interactionist perspective – behavior is a function of the interaction between the person and the situation.

Personality psychologists tend to see nature and the world as objectively "out there" – separate, in principle, from the person. However, personality psychologists are generally cognizant of the fact that reality is, to some extent, socially constructed. What often matters in the prediction of behavior is a person's perception of or interpretation of social reality. At the same time, the outside world provides a nested set of contexts that profoundly shape how people think, feel, and behave. These contexts range from the immediate situation to family settings, neighborhoods, schools, social class, and culture. A person's life is embedded in a complex social ecology. Whereas most personality psychologists do not study that ecology in detail, they are aware it exists, and they typically try to interpret their research findings with that kind of complex frame in mind.

Human Being

The person is a human being, endowed with consciousness and intention and expressing behavior, thought, and feeling as he or she moves across different situations and over time. In studying human beings in general, personality psychologists aim to shed light on human nature and to determine what the most socially consequential individual differences between human beings are. In addition, they aim ideally to understand the individual human being – the case study of the particular person – who is like all other human beings and yet unique. Human beings begin life as social *actors*, but they eventually become motivated *agents* and self-*authors* as well. Even in infancy, basic temperament traits structure human action. By childhood, persons have developed goals and motives that they strive to achieve, expressing themselves as motivated, agentic forces in the world. In late adolescence and young adulthood, a third layer of personality begins to emerge, as individual human beings come to see their lives as to-be-authored narratives. The full expression of psychological individuality for the adult human being is an evolving patterning of social action traits, agentic motives, and self-authored narratives, complexly situated in time and culture.

Life and Death

As scientists, personality psychologists typically reject the concept of an immortal soul. Life and death are biological realities. People become who they are through a complex process of gene-by-environment transactions. Individual human beings are challenged to make sense of their lives while living. People may be more or less successful in making meaning out of their lives. A large factor in that meaning-making process relates to how people understand and anticipate their own deaths.

Reality

Personality psychologists have tended not to offer deep, philosophical musings on reality. Unproblematically, reality is simply "what is." Yet, most contemporary personality researchers and theorists are aware of the fact that reality is psychosocially constructed in various ways – through perceptual biases (innate and learned), cognitive schemata, values and interests, motives and goals, expectancies, personal projects, life-narrative frames, and a wide range of internal psychological phenomena, as well as external

social categories, that influence what people see as reality and how they understand it.

Knowledge

Personality psychologists have generally not articulated complex epistemologies. Unproblematically, knowledge is "what people know." Of course, knowledge comes in many forms, from semantic to episodic to procedural, from impersonal to social, from explicit to implicit. But these cognitive/epistemological distinctions are generally viewed to be the province of cognitive psychology rather than personality studies per se. Different personality theories hold somewhat different images of the kinds of knowers that people, in general, are. For example, Kelly's (1955) theory of personality viewed the person as akin to a lay *scientist* who gathers knowledge in order to predict and control the world (Kelly 1955). McAdams's (2006) life-narrative perspective on personality, by contrast, views the person as akin to a fledgling *novelist* who synthesizes autobiographical knowledge – both episodic and semantic – into a self-defining story (McAdams 2006). With respect to the field's overall epistemology for itself, personality psychology values scientific knowledge above any other kind of knowledge.

Truth

Personality psychologists tend to believe that science reveals truths. Truth is adjudicated through the scientific process. Scientific truth trumps other kinds of "truth." At the same time, personality psychologists realize that the people they study operate according to many different kinds of truths, many of which are not particularly scientific.

Perception

Personality psychologists do not have any profound insights to offer on the topic of perception, except to suggest, as do many other behavioral scientists, that people perceive the world through a wide range of idiosyncratic filters, including various sorts of biases, expectations, stereotypes, and the like. There is probably no such thing as unbiased and completely objective perception.

Nonetheless, personality psychologists aim to decrease bias in their own observations and to develop consensually valid and reliable methods for observing/perceiving the behavior of persons.

Time

Time is a very important issue in personality psychology. For starters, personality itself – that is, the pattern of psychological individuality that distinguishes one person from the next – is assumed to have some nontrivial duration in time. If personality does not continue to exist in the same form from one moment to the next, then "it" is not "personality." Thus, personality psychologists distinguish between momentary *states* in human life and more enduring *traits* of personality. The question of just how enduring traits – and other features of psychological individuality – are is a question that lies at the heart of personality science. A wealth of empirical data collected over the past three decades shows conclusively that dispositional traits (such as extraversion, neuroticism, agreeableness, and conscientiousness) can be remarkably stable over the life course – especially from young adulthood onwards – and yet also change in developmentally meaningful ways. The issue of time is important for personality constructs in other ways, too. For example, motives and goals in personality are time-dependent constructs in that they capture what a person is striving to accomplish in the future. People's self-narratives reflect how individuals make sense of their own lives in time. Self-narratives integrate the reconstructed past and imagined future to tell a more or less coherent and causally convincing story about who I was, who I am now, and who I will be in the future.

Consciousness

Most approaches to personality psychology view human beings as inherently endowed with consciousness and intention. Yet the role of consciousness is more prominent in some approaches as opposed to others. Whereas Freud and the psychoanalysts tended to value unconscious forces over conscious experience, the humanistic personality theorists like Rogers and Maslow

argued that a person's conscious phenomenology lies at the center of psychological individuality. On the current scene, approaches that focus on cognition and motivation tend to value consciousness more than do trait-based and purely behavioral approaches to personality. But even the latter depend on people's powers of conscious reflection. For example, studies of personality traits typically rely on self-report questionnaires. People respond to a series of questions about themselves that ask them to reflect upon their lives and/or to rate their characteristic thoughts, feelings, and behaviors. The researchers assume that their participants are endowed with the powers of consciousness necessary for providing scientifically useful self-reports. The huge empirical literature attesting to the construct validity of self-report trait scales suggests that the researchers are correct in that assumption. At the same time, most personality researchers recognize that some determinants of human behavior are implicit, lying outside of conscious awareness. Obtaining reliable and valid assessments of outside-of-consciousness factors has always presented a tough challenge for the field.

Rationality/Reason

Personality psychologists differ with respect to the extent they view human beings as rational organisms. Freud focused almost exclusively on human irrationality, whereas Allport viewed persons as potentially planful, well-organized, and reasonable. On the contemporary scene, there is no consensus on this issue. For the most part, personality psychologists seem to work under a "both/and" assumption: People are capable of rational analysis but do not always engage in such; indeed, rational thought is probably not the most adaptive response to some, if not many, social situations, both today and, most likely, over the course of human evolution.

Mystery

Personality itself – that pattern of psychological individuality that distinguishes one person from others – is a great mystery, and that mystery probably motivates personality psychologists to study what they study. The scientific aim, of course, is to cut through the mystery, so that we can eventually replace all the unknowns with knowns. But we are a long way from accomplishing this feat, so it is safe to say that personality will remain an intriguing mystery – in the minds of both scientists and laypersons – for the foreseeable future.

Relevant Themes

More than many other subdisciplines of psychology, personality psychology has perennially struggled to reconcile the grand theories that defined the discipline in the middle years of the twentieth century with the hard realities and constraints of empirical research. The conflict is reflected in the different ways that the course is taught in universities and colleges. One approach is to focus exclusively on the grand theories of yesteryear – from Freud onwards. This kind of course has the advantage of lending itself to the big questions about human life that many undergraduate students are so interested in asking. The disadvantage is that the old grand theories have a very tenuous relationship to the current science. The other approach is to focus on the current science, surveying important studies on personality structure, function, and dynamics, with some minimal coverage of the grand theories. The latter approach has the advantage of reflecting the contemporary scientific scene, but it sometimes leaves students (and instructors) longing for more of the big picture.

Cross-References

▶ Altruism
▶ Developmental Psychology
▶ Evolutionary Psychology
▶ Narrative Psychology
▶ Positive Psychology
▶ Psychoanalysis/Depth Psychology
▶ Self
▶ Social Psychology

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Personhood

Personhood and Scientific Methodology

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Related Terms

Method; Person; Personhood; Science

Description

Personhood concerns the problems about what makes a human being a person. The notion involves a cluster of interconnected philosophical questions and everyday concerns, descriptive as well as normative, that are pertinent to research on the relation between science and religion. How do we ascertain that an organism is in fact a person and not simply a lump of living tissue? What are the criteria that convince us that something is a person? Once it is ascertained that an organism is a person, should that affect how we treat that organism? Why is being a person different from being a snail or even a stone? Is the fetus a person from the time of the conception, and if not, when does it become a person? What makes one person different from another? Can we actually say that a human being remains the same person through time? And does a person continue to exist after the physical organism is dead? This entry will not investigate any of these questions in detail but will focus on some of the more general philosophical questions about the descriptive and normative dimensions of personhood in relation to scientific methodology. The discussion of personhood has a long and complex history in both Western philosophy and Christian theology. In fact, the philosophical conception of a person is closely connected to early Christian debate about the Trinitarian God (three separate persons that are all the same God)

and the survival of intact personhood after physical death. Furthermore, Eastern philosophies have discussed the concept of a person to the same extent and possess a perhaps an equally rich literature on the subject. This entry, however, will limit itself to discussions developed in twentieth-century Western philosophy (Kant is used, nevertheless, because his concept of a person still plays an important role). Furthermore, the focus will be on issues that are relevant to the contemporary discussion about the legitimate scope and possible limits of scientific methodology when it comes to questions about human nature. By way of conclusion, it will be argued that the relation between personhood and scientific methodology is relevant to contemporary research on science and religion. But turning to the question of personhood, we need a definition, or at least a general idea, of what is meant by scientific methodology. This is not an obvious or simple matter.

Scientific Methodology

The nature of scientific methodology has been a long-standing philosophical problem since the beginning of the twentieth century. The rapid, and sometimes dramatic, development of empirical sciences such as psychology, anthropology, ethnology, and paleontology together with the birth of new disciplines such as molecular biology, quantum mechanics, evolutionary biology, cognitive neuroscience, and cognitive science in the first 60 years of the century elicited many questions about the formal unity of the different scientific methods, forms of research, and explanatory arguments. These questions are still intensely debated today. One reason why the nature of scientific methodology is particularly critical for philosophy and theology today is that, since the mid-1990s, disciplines such as evolutionary psychology and cognitive neuroscience have argued for a new and, allegedly, more scientifically sound explanation of human nature (Pinker 2002). Whereas less scientific times used logical analyses and reflective introspection to understand human mind and action, this new approach makes use of empirically verified observation and brain imaging to explore the enigmatic human nature. According to advocates of such an approach, a combination of graduate evolutionary development and complex neural networks can explain human consciousness and behavior. This view is variously characterized as ▶ *physicalism*, ▶ *reductionism*, or *eliminative materialism* and involves several problematic philosophical questions. The two most critical, or at least most debated, questions today are whether or not it is legitimate to speak about one ultimately valid scientific methodology and whether or not such a scientific methodology is sufficient for explaining human nature. This section deals with some of the problems involved in the first question. The section aims at offering, if not a picture of a unified scientific methodology, at least a general idea of what is commonly considered to qualify as scientific methods as opposed to nonscientific methods. This done, the rest of the entry will present some problems concerning the explanation of human personhood that arise when approached by means of such a scientific methodology.

The critics of scientific methodology typically address the imperialistic tendency in the use of scientific methods more than the validity of the methods themselves. Few philosophers, or theologians for that matter, would question the value of scientific methods in every academic discipline, from organic chemistry to biblical exegesis, or the benefits of such methods for the production of legitimate research results. The question under debate is rather the nature, scope, and limits of scientific methodology. One way to approach the question is to examine two forms of scientific methodology: (1) a minimalist version and (2) a restricted version.

A Minimalist Version: Objectivity and Rationality

A minimalist version of scientific methodology can be characterized as a set of specific methods that separates academic research from other kinds of explanations of what constitutes the world we live in: how we understand the world (and possibly other worlds), the creatures that populate the world, and how and why we humans think, feel,

and behave as we do. Contrary to everyday reasoning about the world and the human mind (often characterized as ▶ *folk physics* and ▶ *folk psychology*), academic research sets some standards and rules that must be accepted and followed in order for arguments and explanations to qualify as scientific. In this sense, a very broad definition of scientific methods is that they are objective and generate objective knowledge by means of rational (internally consistent) arguments. In other words, scientific arguments and explanations are characterized by absence of subjective biases and values. A scientific study, no matter if the subject is the sermons of Jesus or the auditory cortex, must approach the material at hand, develop the arguments, and produce its results, independent of the researcher's individuality. Personal convictions, religious beliefs, and metaphysical assumptions are considered irrelevant and even impairing to a scientific study. Thus, first-person accounts and explanations can be an integral part of a scientific methodology if, and only if, they can be checked and verified from a rational, third-person point of view. Obviously, science is performed by individual human beings, but their different character traits can have no bearing on the research. The various methods employed by different academic disciplines must all subscribe to the minimal criteria of objectivity and rationality, notwithstanding their heterogeneous material and individual research procedures. From around the middle of the twentieth century, the notions of objectivity and rationality have at times been criticized as unattainable ideals with no basis in the actual process of science. One of the most important contributions to this kind of criticism was made by the American physicist Thomas Kuhn (1922–1996) in 1962 (Kuhn 1962). Kuhn argued that the historical process and growth of scientific knowledge is not a continuous and objective uncovering of truth by means of rational arguments. The most decisive scientific insights are attained, not by the development of a continuous scientific evolution, but by means of scientific revolutions produced by individual scientists. Scientists are never completely isolated from their subjective biases and social environment,

and Kuhn argued that it is actually these subjective features and social factors that contribute most to the growth of scientific knowledge. But although Kuhn pointed out the idealistic nature of objectivity and rationality, he still maintained the benefit of these ideals for the progress of science. Besides the criteria of objectivity and rationality, ▶ falsifiability has also been regarded as a minimal criterion for scientific methodology in order to demarcate science from nonscience. This criterion was first proposed by the Austrian-born philosopher Karl Popper (1902–1994) in 1934 and gained enormous influence with the English publication in 1959 (Popper 1959). Put in simple terms, Popper argues that a scientific hypothesis, proposition, or theory is only scientific if it is falsifiable. Many theories can be made compatible with empirical observations without being scientific theories, but only those hypotheses and theories for which empirical counterexamples are possible are to be considered scientific. If the methods employed by a theory do not allow for the results to sustain the test of falsification, they cannot be considered scientific methods. However, whereas the criteria of objectivity and rationality are part of the methodology employed by every academic discipline, the criterion of falsifiability is not so readily accepted. There are several conceptual difficulties with the application of the criterion, but perhaps the most persistent one is the difficulty of falsifying hypotheses: there are so many factors involved in scientific experiments that it becomes close to impossible to falsify a theory on the basis of one inconsistent empirical observation. A scientist can defend his theory against observed empirical facts by appealing to another fact, namely, that one or more of the factors involved in the experiment may have changed during the experiment (Dupré 2001). Thus, a minimalist version of scientific methodology must limit itself to the criteria of objectivity and rationality since only these are accepted as general standards in all academic disciplines. This broad view, however, is only valid for those who consider all academic disciplines to be doing scientific research. There are a growing number of

philosophers and empirical scientists who argue for a more restricted version of scientific methodology.

A Restricted Version: Facts and the Risk of Scientism

Not everybody is happy with the minimalist version of scientific methodology. Through the 1990s, long and vehement intellectual battles, the so-called *science wars*, were fought in academic circles as well as in the larger public (Ashman and Baringer 2001). On one side were those who believed firmly in the objectivity of science, and on the other, those (often coming from the humanities and the social sciences) who rejected this objectivity and considered it a dangerous ideology. The science wars, however, subsided at the close of the century, and since the early years of the twenty-first century, empirical scientific disciplines such as neuroscience and evolutionary psychology have dominated both the academic and public debates. The unified critique of the objectivity of science has dissipated into sporadic skepticism, and appreciation of a general naturalistic framework for understanding human nature is growing steadily, even inside the humanities and the social sciences. Anthropology, literary theory, psychology, economics, and other disciplines look to the biological roots and evolutionary explanations of the world and human nature for scientific validation of their theories. In this rapid development, an old philosophical issue has resurfaced, namely, naturalism versus supernaturalism. Supernatural or immaterial elements cannot be allowed to figure in scientific explanations. Thus, immaterial phenomena or entities (soul, God, values, concepts, ideas, thoughts, feelings, etc.) must be either reduced to natural (materialistic/physical) constituents or eliminated altogether. In order to find a valid explanation of human mind and behavior, we need to establish a naturalistic framework by means of solid scientific methods. But objectivity and rationality are not sufficient criteria for such an enterprise, since many disciplines that deal theoretically with immaterial phenomena and entities, such as theology, philosophy, cultural anthropology, and

psychoanalysis, claim scientific status on exactly such terms. Hence, scientific methodology needs a more positive demarcation against supernatural explanations if the naturalistic framework is to be secured. There are various ways to do so, but a general trait among the different theories is to model scientific methodology on the methodology of the empirical sciences, in particular physics and biology. On this account, a methodology can only be scientific if its arguments, explanations, and results find support in observational data. Contrary to other forms of explanations, a scientific explanation discloses the natural facts of the world, and only empirically verified phenomena and entities are considered factual (Gillett and Loewer 2001). Disciplines that do not meet the demand for empirical verification cannot qualify as scientific, or at least they must be considered less scientific than the sciences that fulfill the empirical criterion.

Obviously, this restrictive view has been met with suspicion and criticism, in particular among philosophers. Some critics have, somewhat disdainfully, named this firm trust in the empirical sciences *scientism*: an attempt to distinguish normatively between a restrictive class of first-order real sciences (physics, chemistry, and biology) from a murky and broad class of second-order "sciences" (disciplines that do not conform to the methods of the first-order sciences). Scientism creates a hierarchical model of academic disciplines with normative implications. The empirical sciences are considered the superior scientific disciplines with ultimate authority over the interpretation of nature and human life. If other less empirical disciplines are to have any credibility, they need to accommodate their methods to those of the empirical sciences and construct their theories, arguments, and explanations on the data provided by the empirical sciences. Scientism does, indeed, face various explanatory problems including the eliminative, or at least reductive, attitude regarding mental states and subjective experience. How can we explain anything as impalpable and hazy as thoughts and subjective experience within the limits of a naturalistic framework? Are such phenomena to be considered supernatural and thus remnants of less

enlightened times? The problems concerning naturalism and supernaturalism become sharpened when faced with such difficulties. The blunt rejection of anything supernatural entails explanatory problems concerning the phenomenal content of human consciousness and the blurry nature of human values. A completely naturalized explanatory framework must either reject the existence of such phenomena or reduce them to something that can be accounted for by means of a restricted scientific methodology. One way to illuminate the problematic status of both subjective experience and human values within a naturalistic framework is to look at the complex nature of human personhood.

Personhood

Few advocates for a restrictive scientific methodology are willing to dismiss the notion of personhood. Nonetheless, the notion involves phenomena that are considered suspicious and recalcitrant on the basis of a purely empirical explanation of human nature. Human beings are creatures of nature and constituted by the same physical and chemical constituents as all other living organisms. And yet, human beings are quite peculiar beasts (Preuss 2004). They behave very differently from even their most intimate relatives on the phylogenetic scale. Their behavior is characterized by highly developed language capacities and elaborated social interaction. Furthermore, human rationality and feelings differ drastically from those of other primates in the sense that human needs are controlled by more than the present biological and environmental factors that explain most behavioral patterns of similar primate species (monkeys and apes). The behavioral difference between humans and other animals is often explained by the fact that a human being is a person as well as a biological organism. A person is constituted by thoughts, ideas, rationality, free will, delicate feelings, values besides biological needs, and a persistent identity. The concept of a person has been widely discussed in twentieth-century philosophy and continues to engage philosophers in the

twenty-first century (Laitinen and Ikaheimo 2007). The debate is saturated with difficult issues, such as how persons differ from other living organisms, how a person persists from one time to another, what is it to be a person, what constitutes personhood, whether a person can become a nonperson, what are the normative implications of being a person, and so on. There are many various descriptive criteria to be addressed in accounting for personhood. We may turn to language, rationality, feelings, free will, physical characteristics, personal identity, value-guided behavior, and many others. Moreover, it is even difficult to determine which of these (whether one, several, or all) actually account for being a person as opposed to being a nonperson. If we choose language, what are we to do with inarticulate babies or language-impaired adults? If free will, where do we place a paralyzed individual? And if we trust physical characteristics, which feature determines whether a body or a face is human or not? How, where, or by which means we are to set the boundaries for personhood seems impossible to determine on purely descriptive terms. Problems concerning the criteria for ascribing personhood or not are rife with normative implications to such an extent that most philosophers have tried to steer clear of them by limiting themselves to descriptive questions about the nature and persistence of personal identity. The normative issues are, however, important in relation to the question about scientific methodology. Thus, in the following, both the descriptive and normative dimensions of personhood will be briefly presented. The first section exposes two descriptive approaches to personal identity, whereas the following section addresses some problems involved in the normative dimension of personhood.

The Descriptive Dimension of Personhood: Personal Identity
One of the most complex questions about human personhood arises from the fact that, contrary to that of other living organisms, human identity is not unambiguously stable from birth to death. We may doubt the identity of another human being

and, at times, even our own. This doubt stems from the fact that we normally consider human beings as persons and not just as aggregates of material tissue. But is this assumption actually legitimate from a strict scientific (physical) perspective? Leaving this difficult question aside for the moment, we can start by focusing on the question of personal identity over time. What are the criteria for a person to remain identical from one time to another? How can I be sure that I am identical to the person that I was yesterday, or when I was a fetus, and will I remain identical to what I am now if I somehow end up in a vegetative state? Since the dawn of the twentieth century, the philosophical debate about the persistence of personal identity has centered around two dominant approaches: the psychological and the biological (Olson 2007). As the names suggest, each approach picks out one of the two traditional features of being human, namely, body and mind. The psychological approach claims that identity must be verified with reference to a person's consciousness, whereas the biological approach believes the physical constitution of the person to be the definitive criterion for identity. The two approaches can be characterized very roughly as follows. The psychological approach maintains that there must be some form of continuity or connectedness between the psychological states (memory, experience, ideas, dreams, desires, feelings, and so on) of a person from one time to the other in order to establish the identity of that person. Memory is crucial to this argumentation. Somehow, there must remain in the present state some kind of a remembrance or trace of memory of the past, if the person now is to be considered identical with the person in the past. These memories may not be explicitly conscious but may simply possess a causal dependence expressed in thoughts and bodily movement (I may not remember how I learnt to ride a bicycle, but I know how to now). This approach, however, runs into serious difficulties with respect to questions about the fetus, mental illnesses, or persons reduced to a persistent vegetative state. Are these human beings no longer (or yet) identical with the persons that they used to be (are to become)? It is

difficult to accept such a criterion for personal identity since it seems physically (by means of DNA) and emotionally (from the perspective of parents and loved ones) obvious that a person should remain identical no matter what happens to that person. Thus, some philosophers have rejected the psychological criterion and proposed a biological approach instead, arguing for simple physical continuity as the criterion for personal identity. For more than a century now, the biological sciences have informed us that human beings are physical organisms just like every other living creature in nature. There are no categorical difference between man and other animals, only a difference in degree. Thus, the biological approach claims that only physical continuity can be an acceptable scientific criterion of personal identity. Besides the obvious problems mentioned above, the psychological approach relies on the anthropocentric prejudice that human identity is somehow different from that of other animals: only humans are endowed with an accessible psychological life, and thus only humans can possess a personal identity. It is hereby implied that only a conscious being can be a person, and so the descriptive analysis reveals a normative prerequisite. On the contrary, the biological approach claims to remain scientifically neutral with regard to what constitutes personhood or not. It focuses only on what we can empirically access and verify, namely, our physical continuity. In this sense, it avoids the problems that troubled the psychological approach. No matter what psychological or physical transformation an organism sustains, it remains identical to itself. In this way, the fetus is identical to the adult person, a person suffering from dissociative identity disorder remains identical with every change of personality, and the person reduced to a persistent vegetative state is identical to the person he or she used to be. Although this approach avoids some of the problems involved in the former, it still leaves the question open about what makes human identity so drastically different from that of other animals. Therefore, perhaps the most important gain from the biological approach is the assumption that a descriptive explanation of personal

identity cannot answer the question about what constitutes a human person. The question of personhood appears to involve some kind of normative, or at least metaphysical, account.

The Normative Dimension of Personhood: Values and Responsibility

It seems that an empirical methodology cannot provide criteria for determining what separates a person from a nonperson. On a purely physical basis, there is no substantial difference between the identity of humans and that of other animals. However, on this account, the concept of a person seems to lose its meaning. The fact is that we distinguish, in thought and action, between humans and other animals by means of personhood, and in order to account for this difference, we need to understand what we mean by being a person. There are at least two fundamental questions concerning the notion of personhood: what is a person (as opposed to a nonperson) and is there any difference between human beings and persons? The German philosopher Immanuel Kant (1724–1804) has given a very concise answer to both these questions. He famously wrote that we shall always treat humanity in ourselves and in every other person as an end in itself and never as merely a means to an end. In other words, we are told that every human being is considered a person and that a person is characterized as a being with a purpose in itself that can never just be a means to another purpose. Thus, the influential Kantian account identifies human beings with persons and, furthermore, provides a definition of personhood as autonomy. But Kant saw his account of personhood as a normative postulate and not as an empirical necessity. And we do not need Kant to tell us this. History and everyday life teaches us that human beings are not always treated as persons if personhood is characterized by autonomy. Furthermore, autonomy is a difficult concept. What constitutes the autonomy that makes all human beings persons? It cannot simply be our intelligence, communication, or free will, since humans may lack those characteristics in a vegetative state or under similar conditions. In fact, human autonomy cannot be explained by a description of any part or the sum of the physical and mental constituents of a human being. On the contrary, human autonomy appears to be intrinsically connected to human action and behavior. Contrary to other animals, humans are able to choose *how* to act instead of simply reacting to certain stimuli. Thus, on the Kantian approach, personhood is characterized by how we act and, more particularly, how we treat other human beings. Every human being is a person, but the individual person has the responsibility to express this personhood in action and behavior. A person can choose to act contrary to his or her own personhood by treating himself or other persons as nonpersons. Human personhood is linked to values that regulate the behavior of human beings. Other animals are not persons because they cannot behave as persons. Their conduct is not influenced by values such as those inherent in human personhood. How persons treat nonpersons (animals, nature, or objects) is another, and very serious, matter. Nevertheless, this is not immediately relevant to the definition of personhood. The Kantian solution to the problem of personhood is not final or uncontested. Many critics have noted that his explanation of personhood relies on the unwarranted metaphysical assumption that human beings possess an autonomy or freedom that separates them from the rest of nature. Furthermore, the rationalistic emphasis in the Kantian picture of human personhood has been contested. Nevertheless, although one may disagree with Kant's metaphysical assumptions, arguments, and explanations, his emphasis on the normative character of personhood together with his rejection of a descriptive approach remains an important contribution to contemporary philosophical discussions of what it takes to be a person. It is difficult to see how a definition of the concept of a person can avoid any normative stance. We can meticulously describe every feature and characteristic of personhood, but in order to determine what is not a person, we necessarily argue in accordance with some normative and ethical standards (Korsgaard 2009). In this sense, explanations of personhood surpass the borders of empirical assessment and verification.

Personhood in Relation to Science and Religion

Both the descriptive and the normative dimensions of human personhood have noteworthy implications for the debate about the nature, scope, and limit of scientific methodology. On the one hand, the descriptive approach may yield considerable insight into the problems concerning personal identity but leaves the question about the nature of personhood entirely open. On the other hand, the normative approach to personhood relies on phenomena such as values and personal responsibility, which transcend the legitimate boundaries of empirical confirmation. It is important, however, to notice that these implications do not disqualify scientific methodology in the approach to human personhood. They merely call for a more refined differentiation of the general picture of scientific methods and of science in general. Explanations of human personhood benefit from a scientific approach in the sense that it makes us deal with personhood in objective and rational terms in order to avoid subjective, cultural, or religious influences. It is part of a scientific process to overcome influences that may stem from such prejudices. In this sense, the study of personhood is not different from a study of a bacterium or the chemical composition of a fluid. However, the complex nature of personhood defies the restrictive view of scientific methodology proposed by scientism. We cannot explain human personhood by means of empirical assessment and verification only. The concept of a person involves a normative dimension that surpasses the naturalistic framework proposed by this restrictive version of scientific methodology. In this way, the concept reveals not only the need for scientific approach but also the variegated nature of scientific research. Scientific methods cannot hinge on the physical foundation of the empirical sciences if they are to explain the complex nature of human reality. Besides personhood, there are many aspects of human life and behavior that need a scientific explanation without being reducible to the restrictive methods of scientism. The continuous growth of scientific insight depends on an appreciation of heterogeneous scientific methods that are able to explain the world and human nature by means of the minimalist version of scientific methodology, i.e., objectivity and rationality.

The discussion about personhood and scientific methodology is relevant to contemporary debate about science and religion since this debate is often marred, on both sides, by a restrictive, or at least insufficiently articulated, understanding of science and scientific methodology. The question about personhood challenges a simplistic picture of science by bringing out the need for a diversiform approach to scientific methodology. From the perspective of a religious approach, it is important not to confuse science with scientism. Scientific methodology is not equivalent with reductionist methods or the exclusion of anything that cannot be accounted for empirically, as in the restrictive version presented above. Not all empirical scientists dismiss the need for a broader understanding of scientific methodology. And there is much to learn from the methodology and research of the empirical sciences with respect to religious phenomena and notions like personhood and value. On the other hand, scientific results and discoveries are not to be accepted uncritically and at face value. As the problems concerning personhood illustrate, the nature of a methodological approach must be examined before any judgment, approving or critical, is passed on the final result. From the perspective of a scientific approach (empirical sciences as well as various scientific studies of religion), it is important to be aware which kind of scientific methodology is adopted for a specific study. As we have seen, there are various models of scientific methodology with different degrees of verification. In one approach, for example, research on a certain bacterium, a restrictive methodology is preferable in order to produce pregnant and reproducible results. In others, concerning more impalpable matters such as personhood or religious experience, the scientific methods, in order to be adequate, must be chosen according to a less restrictive methodology. Otherwise, the study runs the risk of ending up with distorted answers that have nothing to do with the initial questions.

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Personification

▶ Anthropomorphism

Pfingstbewegung

▶ Pentecostalism

Phenomenology

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Related Terms

Experiential philosophy; Philosophy of experience

Description

Phenomenology was founded by the German philosopher Edmund Husserl (1859–1938). In his early work, most notably in his *Logical Investigations* (1900–1901), Husserl urged philosophers to attend to experience itself, rather than engage in rationalism, Kantian or Hegelian methodologies, or to begin with abstract philosophical theories. Today, a philosopher may be said to engage in phenomenology to the extent that he or she proceeds to base their positions on how something appears in experience. So, someone might base their view of intentional, free agency on the grounds of what it feels like to undertake action deliberately. Phenomenology today is often thought of as involving the first-person point of view, rather than engaging in a third-person perspective, as one might in science or, in the philosophy of mind, with behaviorism. Well-known phenomenologists besides Husserl include Martin Heidegger, Nicolai Hartmann, Max Scheler, and Edith Stein.

The most recent development involving phenomenology concerns accounts of mental life and the possible limitations on scientific accounts of the mental. In the 1970s, Thomas Nagel and T.L.S. Sprigge simultaneously and independently argued that a third-person description of another person or animal would have to leave out something crucial: what it is like to be that person or animal. This "what it is like" refers (on their view) to what it is like experientially or in terms of conscious awareness. Arguably, you may have a nearly exhaustive account of a bat's behavior and anatomy, yet still not know what it is like for the bat to be aware of itself and surroundings. This line of reasoning has been used to object to forms of materialism that advance a strict identity between the mental and the physical (Husserl 1964).

Self-Identification

Science
Husserl did think of phenomenology as a kind of science; it was a method that generated a body of knowledge, and he aspired to establish phenomenology as an international undertaking. Subsequent phenomenologists did not have the same confidence as Husserl, and while

many phenomenologists such as Dietrich von Hildebrand saw themselves as establishing objective insights into values, they saw themselves principally as philosophers, rather than scientists.

Religion

Phenomenology does not self-identify as a religion. The religious perspectives of prominent phenomenologists have varied widely, from devout, traditional Roman Catholicism (von Hildebrand, Edith Stein) to atheism (Heidegger). The phenomenological study of religion has been significant in the twentieth and first decade of the twenty-first century. A student of Edmund Husserl, Stein brought her phenomenological methodology to bear on the interiority of religious belief. Some of this is brought out in Alasdair MacIntyre's 2006 book *Edith Stein: A Philosophical Prologue* (Stein 1989). Another domain in which phenomenology has had a role in twentieth-century religious thought is through the work of Karol Wojtyla (later Pope John Paul II). Some of Scheler's work may be seen in shaping Wojtyla's work *Love and Responsibility*.

Characteristics

Phenomenology was founded as a subdiscipline in philosophy, but it might better simply be thought of as a methodology and/or a movement. Phenomenology is not unlike empiricism, with its attention to experience, but it is broader than empiricism. Historically, empiricism has tended to be quite reluctant to recognize objective values and necessary truths about virtue and the structure of reality, while phenomenologists have sometimes claimed just that. Scheler and von Hildebrand stand out as having produced a substantial account of objective values.

Relevance to Science and Religion

Many of those in the phenomenological tradition have been interested in science and religion. As noted earlier, phenomenologists have tended to be resistant to scientifically inspired forms of reductionism (accounting for consciousness in terms of nonconscious forces and structures) and, as a rule, they have tended to be open to the kinds of phenomena that are in play in religious belief and practice. So while the atheist Sartre's work on shame and anxiety has been seen as helpful for philosophy of religion, a significant number of theologians (such as Karl Rahner) have been influenced by Heidegger.

Sources of Authority

The success of a phenomenological investigation depends upon whether the description and explanation of the experiences investigated (whether this be an experience of pain or guilt or a sense of the presence of a transcendent, sacred reality) match the experiences of others. What, if anything relevant, has been left out? An objection to Heidegger's famous work in phenomenology, *Being and Time*, is that it gave very little role, if any, to the ethical. Heidegger's work contains much about living authentically, but there is little attention given to human rights, justice, or the foundation of ethics.

Ethical Principles

There are no distinctive ethical principles that are unique to phenomenology as a practice or discipline, though phenomenologists themselves such as Scheler and von Hildebrand have identified a host of what they consider basic, irreducible moral principles (Scheler 1973; von Hildebrand 1952).

Key Values

Phenomenology offer an account of human and other animal life that is an alternative to those that ignore or downplays the role of conscious experience. By putting experience on center stage, phenomenology preserves what seems distinctive about human and some nonhuman animal life.

Conceptualization

Nature/World
Heidegger and Sartre both made use of the concept of the "world." They both sought to capture what it is like for human beings to be temporal, contingent, and mortal agents who find themselves (as it were) thrown into the world. Both thinkers were quite explicit in their embracing of a nonpurposive understanding of the cosmos. There is no provident purpose behind the emergence of human life.

Human Beings
Most self-identified phenomenologists see human beings as conscious, deliberate, intentional, and purposive beings, regardless of whether they see the cosmos itself in theistic or atheistic terms (Merleau-Ponty 1981).

Life and Death
While some phenomenologists have believed in some afterlife (von Hildebrand and Gabriel Marcel), many of the better known phenomenologists such as Heidegger and Sartre did not, and for them, the finality of human life is a great defining dimension of what it is to be human.

Reality
Some phenomenologists are realists and claim to be mapping out objective states of affairs. Some suspend judgment as to the objective world and see themselves as simply offering a description and account of experience.

Knowledge
See above

Truth
See above. But also note that phenomenologists have tended not to think of truth along Platonic, propositional lines. Heidegger introduced a somewhat epistemic notion of truth in terms of a clearing (in Greek "alethia").

Perception
Perhaps the most substantial contribution by a phenomenologist to the nature of perception is Maurice Merleau-Ponty. He stresses the embodied nature of perception, producing a more anchored understanding of perception than one finds in, say, Hume.

Time
For many phenomenologists, time and subjectivity are foundational dimensions of human life.

Consciousness
Phenomenologists have tended to resist reductive accounts of consciousness. Some have been highly critical of appeals to the unconscious, and some have wrestled with the concepts of a false consciousness or self-deception. In a case of self-deception, it seems that the subject has to both lie to herself and yet still know the truth.

Rationality/Reason
Rationality and reason are best seen as operating on experience as opposed to abstraction.

Mystery
Some phenomenologists hold that consciousness is not accountable in nonconscious terms. Consciousness is not thereby a great mystery in the sense that it cannot be known, but it may still be a mystery in the sense that it is basic and not understandable in alternative categories. In 1940s, Gabriel Marcel published a book with two parts, *The Mystery of Being*. Part one is called *Reflection and Mystery*, and the second is entitled *Faith and Reality*.

Relevant Themes

Free will: Some of those in the phenomenological movement (who are sometimes also considered existentialists) such as Jean Paul Sartre were keen defenders of free agency.

Emotion: Some phenomenologists have carried out sustained investigations into religiously relevant emotions, such as guilt, love, and anxiety.

Religious experience: Some phenomenologists have done a close study of religious experience.

Cross-References

► Cognitive Psychology
► Consciousness, the Problem of
► Epistemology
► Experience
► Metaphysics
► Personalism

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Phenomenology of Religion

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One of the major approaches in religious studies originates in the broader phenomenological movement in philosophy (E. Husserl). Phenomenology of religion is represented by P. D. Chantepie de la Saussaye, C. P. Tiele, R. Pettazzoni, R. Otto, G. van der Leeuw, M. Eliade, or N. Smart. Phenomenology of religion is today broadly criticized for its non-empirical and anti-historical nature, its empathy-based approach to religion, sui generis conceptualizing of religion, and vague usage of the term "sacred."

Philology

► Language and Literature, French
► Language and Literature, Spanish

Philosophical Anthropology

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Related Terms

PA; Philosophical discourse on humans

Description

From classical times some treaties are consecrated to Philosophical Anthropology (=PA), or "philosophical discourse on humans," as, for example, Plato's *Alcibiade*, and Aristotle's *On the Soul*. At the dawn of twentieth century, Wilhelm Dilthey distinguished between nature sciences and human sciences (*Einleitung in die Geisteswissenschaften*, 1883). Among the authors who followed this inspiration in the first half of that century it is worthy to recall Max Scheler (*Wesen und Formen der Sympathie*, 1923) and Martin Heidegger (from *Sein und Zeit*, 1927, to *Über der Humanismus*, 1946) in Germany, Jean-Paul Sartre (*L'être et le néant*, 1943) and Maurice Merleau-Ponty (*Phénomé nologie de la perception*, 1945) in France, Miguel De Unamuno (*Del sentimiento trágico de la vida*, 1912–1913) and José Ortega y Gasset (*El tema de nuestro tiempo*, 1923) in Spain; the English speaking world seemingly ignored this tendency.

The second half of twentieth century has known deep changes of paradigm in philosophy, under the fourfold influence of the human sciences, phenomenology, analytic philosophy, and, more recently, the neurosciences. The first three trends presuppose the idea that human

beings are deeply entrenched with the world and the others. The human sciences as economy (Stephen Gudeman, *The Anthropology of Economy. Community, Market, and Culture*, 2001), sociology (Pierre Bourdieu, *Raisons pratiques. Sur la théorie de l'action*, 1994), ethnology (Claude Lévi-Strauss, *Mythologiques*, 1964–1968), and psychology and psychoanalysis (Erik Erikson, *Identity and the Life Cycle*, 1959) imposed their views helping to better describe human beings in their complexity. Phenomenology concentrates its efforts on the structure of consciousness engaged in the world and with others (Jean-Luc Marion, *Le phénomène érotique*, 2003). The analytic philosophy and linguistics, paying attention to common language (Peter F. Strawson, *Individuals*, 1959), clarifies the concepts of society, individual, and person. Neurosciences, with the support of medicine and biology (Antonio Damasio, *Descartes' Error*, 1998), link PA to the natural sciences. Recent developments in bioethics outline several relevant problems of PA.

Self-identification

Science

For the classical Greek world, philosophy becomes the "first science" determining the most universal principles. This pretension remains central to Descartes (*Discours de la méthode*, 1637) and Husserl (*Philosophie als strenge Wissenschaft*, 1911). Today, such a program is no longer accepted, as every science has its own method and recognized domain. PA however represents the attempt of dealing with the essence – unique and complex – of humans, even if that complexity does not allow to pretend to deliver an universal complete and definitive account.

The distinction between "explaining" and "understanding" (Paul Ricoeur, *Du texte à l'action*, 1986) consecrates the division between both realms: the methodology of human sciences is not that of natural sciences; nevertheless all sciences, included the natural sciences, are inscribed on a human quest for meaning, and so they depend ultimately on the reflection of the human on himself.

Religion

All religions are concerned about human beings; and consequently PA is concerned about religion. Since every religion deals with "transcendence," it becomes relatively easy that humans fall prey of self-delusion. PA elaborates criteria inviting religion to respect human beings and their ability to access others. It produces at the same time a critique of modern sciences, which, in their self-reference, conceive their "objects" in function of their own interests. PA presupposes that a distance or a "différance" (Jacques Derrida, *L'écriture et la différence*, 1967) – comprised the religious one – can be sensed in this case.

PA receives from religion a nuance: it is the science of human beings, taking them in their integrity and totality, able to access "otherness." PA is not happy with describing exclusively intentional essences or forms (Gerardus Van der Leeuw, *Phänomenologie der Religion*, 1933; Mircea Eliade, *Le sacré et le profane*, 1965); it becomes a hermeneutic (Jean Greisch, *L'âge herméneutique de la raison*, 1985), attentive to the distance or difference structuring internally human beings and their expression in language. PA cannot ignore the via *negativa*, giving credit to its expression, since the procedures of via *negationis* or analogy (Pseudo Dionys), are imposed to reason to allow thinking "radically different."

Characteristics

PA distinguishes itself from natural and human sciences (economy, psychology, history...) in the same way as does general philosophy. Philosophy shares however the critical spirit of sciences. Every science defines its domain and method, and watches about its own limits; so does philosophy as well. The domain of PA is the human being considered in its totality, and that

means more than just history (human science), or biology (nature science). PA ambition is to take into account all aspects of human being, taking as a criterion its existential unity.

Relevance to Science and Religion

Philosophy has been thought traditionally, since the classical Greeks, as a mediation between sciences and religion. It states that scientific epistemology responds to a requirement of meaning, and not only to a closure of knowledge in definitive proofs. "Meaning" is marked by the wish to know ever more, the desire to know reality which cannot be exhausted by any particular science. Religion is indeed determined by this radical alterity of reality. PA contributes to sciences with a concern of totality, allowing them to avoid closing human being in the particularity of their points of view and helping to enlarge their judgements.

Sources of Authority

The sources of PA come from its statute of mediation. The authority of scientific sources is that which every science confers to its own sources. It is the same for religious sources where, however, authority becomes rather more extrinsic. Particular sciences acquire authority only after they engage on a research that, mediating, overcomes the limits. Likewise PA assumes information received from its own sources of religious life, criticizing them after its own criteria of rationality, and transforming itself under the influence of its conclusions.

Ethical Principles

The first principle of PA comes from its attention to all human being that, at the same time, is individual, person, in society, responsible to herself and to others, a living being in which freedom is in the growing.

Key Values

PA is guided by the conviction of unity of human being, which is not only an object of research but rather the subject creating PA. PA is consequently taught with the aim of helping listeners to unify inwardly current traditions present in their societies.

Conceptualization

Nature/World
It would be possible to define these terms as follows: "Nature" is the universal pole dialectic of human being, unique and irreducible in itself; the necessity in which that being happens to be himself (e.g., the nature of that person is to be human). These concepts design therefore an immanent alterity to singular human beings. Those, as long as they find themselves subjected to these alterations of them in that nature, constitute their "world" (the world of artists, that of politicians. . .).

Human Being
Human being is defined classically as a "rational animal." Reason is our faculty able to represent together many things, of synthesizing them; it is adequate to the universal. However, in the universal, the differences do not disappear. Reason, uniting everything, could reduce the many in a univocal genre. The reasonability is the quality of reason that binds everything without confusing anything, able to receive possibilities of relationships without imposing them arbitrarily. Reasonability completes and balances in this point rationality. First condition for such a function is freedom and responsibility which everybody takes form his/her own activity. In the reasonability, human being becomes personalized with other persons, rendering it – in Aristotle's words – "political animal."

Life and Death
Life and death of persons are at the heart of PA, since ever regarding death (Plato), and more recently regarding life (Hannah Arendt,

The Human Condition, 1958). These issues are understood by PA in terms of finitude of persons (Martin Heidegger, *Sein und Zeit*, 1927), which is thought mainly in function of life, so long there is no death without a prior life – death is therefore thought in relationship to a certain problematic permanence of personal life (as appears in funerals). Life happens in multiplying itself and letting the living in a vital flux not reduced to any particular living. PA assumes the considerations of human sciences about life and death of persons and human sets (races, cultures, religions, etc.); it is not satisfied with the positions of current natural sciences determining with criteria of sheer material need the origins of individual human life; it does not pretend nevertheless be able to substitute biological research – the biological origins of life will not find an adequate explanation in PA, which cannot answer to all the questions about human beings, but just to clarify their human meaning.

Reality

Reality is that what resists. The idea of reality implies therefore those of difference and relationship. The finitude of a person and, at the same time, her consciousness of being in relationship engenders the idea of reality that is both of every singular individual and of all together.

Knowledge

For PA knowledge is not objective, as long as it implies the engagement of a knower; it is reflexive. Linguistic studies, especially those on the performative dimension (John Austin, *How to do things with words*, [2]1955) are essential in this case. The anthropic principle points in the same direction. Scientific knowledge that depends from its own history and the interests of scientists is not objective in an absolute way; it requires steady the engagement of a prudent subjectivity.

Truth

The definition of truth as *adaequatio rei et intellectus* can be assumed so long as the *res* (reality) under consideration here, for PA regards

the human being and the individual and social process. Truth in PA is for that reason teleological and not factual. It proposes an ethic for a practice at the measure of human nature.

Perception

Sensation is submitted to bio-physic determinism. The perception however seizes the perceived putting it into a form. Perception cannot be excised therefore but at the condition that what is sensed is predisposed. It is assumed a relationship "chiasmatique" (Merleau-Ponty) between what is sensed and the perceiver, and the original unity of their mutual relations. That "chiasm" (cf. Husserl, *Idées II*, § 37: when my two hands touch each other, one is touching and the second one is touched, and inversely at the same time) has a meaning at the level of intersubjective empathy.

Time

Cosmic time has a dimension abstractly necessary where the time preceding my life and that following my death. Its chronology fixes the facts under symbolic figures. It means the history culturally memorized and the historians determining its rhythms in function of their options (paying attention to wars, to State heads, popular revolutions, etc.). Human time results rather from the free engagements of everybody and has meaning only through what is lived, entrenching in multiple forms. It becomes expressed resorting to the means of narrative.

Consciousness

Consciousness is bound to the engagement of a person in the human time. It is borne from the presence of a self to a self and expresses the awareness of being at the origin of its activities. To "loss consciousness" means to become absent and irresponsible of its own deeds. Consciousness is freedom that access to the knowledge of its power of action in the world.

Rationality/Reason

Reason is a cognitive faculty that argues after affirmations logically furnished, with series of propositions   articulated   following   logical

criteria. The intellect is rather intuitive and seizes the first principles, metalogical. Reason is enlightened by the principles seized by the intellect and cannot overflow them. The intellect, and not the reason, knows the freedom and its engagement in the exteriority or alterity. This distinction, often nullified by the reduction of intellect to scientific reason, is nevertheless a classic one. The ancient Greek distinction between *dianoia* and *nous*, the Latin distinction between *ratio* and *intellectus*, and the Kantian between *Verstand* and *Vernunft*. The domain of *nous*, of *intellect* or *Vernunft* is the transcendental, and above all, the one of freedom.

Mystery

Mystery is known by intellect, it is not irrational, but more than rational. Gabriel Marcel distinguishes between a "problem" that is submitted to the reason to find a solution; and a "mystery," which involves rather who is perceiving it, in a way that cannot be objectified to be described and solved (e.g., the question of being involves the human being who poses it, because this one belongs to being [Heidegger]). In this sense the human being, its freedom, and its thought are "mysteries."

Relevant Themes

Individual

The word "individual" means "what cannot be divided." Freedom is individual because entire and indivisible, responsible of itself in everyone of its actions.

Person

The definition offered by John Damascene (*Dialectica*) is normative: "person is that who, expressing through his operations and properties, gives a manifestation that distinguishes him from others of the same species." The expression, which creates links between freedoms, unites at the same time that distinguishes; it is essential to a person, in whom the concept means indeed the rational essence of the human being.

Society

The word society comes from the Latin *socius*, the associate, the companion. Society conjoins free individuals without confusing them in a formal community.

Community

The word "community" means "with one," i.e., a set of human beings. The expression "human genre" referring to the human community, can remain just generic, a logical genre whose first species would be "female" and "male." The distinction between genre and species is between the most generic and the individual. The generic "community" is abstract: individuals do not appear as such individuals, but rather as "particular" aspects (a part) of a whole. "Society," composed by individuals considered "members" or "companions," is however concrete. This view consciously reverses the terminology of the traditionally one from the philosopher of history Arnold Toynbee, since seems more etymologically appropriated.

Gender

The current issue of "gender," that is not a "genre" in its abstract ongoing meaning, belongs to the reflection on society rather than about the community. It insists on the presence of all in the distinct beings; "female" and "male" are not part of a whole, but the realized whole; therefore, the sexual differentiation does not determine the belonging to a gender.

Beneath the classical works quoted in the article, see:

Cross-References

▶ Anthropomorphism
▶ Body
▶ Emotion
▶ Existentialism
▶ Freedom
▶ Passion and Emotion, Theories of
▶ Theological Anthropology
▶ Theory of Mind

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Philosophical Discourse on Humans

▶ Philosophical Anthropology

Philosophical Ethics

▶ Ethics

Philosophical Naturalism

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The view that nature is all that there is, excluding all supernatural entities, including God and gods, ghosts, spirits, souls, and so on. The epistemology and ontology of philosophical naturalism is usually closely tied to that of the physical sciences: the avenues of knowing that are available are typified by those found in the sciences and the kind of beings that we should believe to exist are those found in the sciences. Although philosophical naturalists admit that the content of science changes over time and new discoveries are yet to be made, they are confident that the ontology and theories of contemporary science are relevantly close to what any final theory would conclude.

Philosophical Theology

▶ Natural Theology

Philosophy and Way of Life

▶ Judaism: An Overview

Philosophy in Buddhism

▶ Abhidhamma, Southern

Philosophy in Islam

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Related Terms

Arabic philosophy; *Falsafa/hikma*; Philosophy in Islamic intellectual history

Description

The expression "Islamic philosophy" refers to premodern philosophical rationalist traditions in

classical Islamic civilization that have been influenced by Ancient Greek legacies in philosophy in general and by Pythagorean, Platonist, and Aristotelian doctrines in particular. The beginnings of Islamic philosophy can be traced back to the foundational epoch in the first decades of the ninth century (Gutas 1998). The conceptual prolongations of its classical textual sources and teachings are still influential in traditionalist schools of thought in Iran, in addition to being revived in adapted popularized forms by various intellectual movements within the Arab world, and in countries such as Turkey, Malaysia, and Indonesia. The scholarship in modern mainstream academia that focuses on studying Islamic philosophy is mainly undertaken in the context of curricula on medieval philosophy and scholasticism in departments of philosophy or in terms of studying the commentaries on Greek philosophers within classics departments. In more widely practiced classifications of knowledge within contemporary mainstream universities, Islamic philosophy is primarily studied in Middle Eastern, Arabic, or Oriental studies departments and in connection with the broader field of Islamic studies in particular. However, the modern academic curricula on Islamic philosophy have tended hitherto to adopt an approach that is rooted in archival textual documentations rather than examining this corpus in purer philosophical terms. The most recent developments in Islamic philosophy can be broadly connected with modern Islamic thought and its focus on issues associated with politics, social reform, ethics, and to questions related to the role of Islam as a lived faith and culture in modern societies. However, the classical key preoccupation of Islamic philosophers with metaphysics, cosmology, ontology, epistemology, logic, in view of understanding the ultimate principles of reality and of the human condition, all are no longer central to modern Islamic thought. The subdisciplines within Islamic philosophy are determined in terms of their doctrinal leanings and orientations, and these are usually classified as being Aristotelian, Peripatetic, Platonist, Neoplatonist, Neopythagorean, Illuminationist, and at times even connected with what is conventionally

referred to as apologetics in Islamic theology (the *Kalam* legacy), or with mysticism and its underpinning of Sufism (Sharif 1961).

Self-identification

Science

Islamic philosophy can be identified as a classical form of scientific thinking that was anchored in the material culture of classical Islamic civilization, and that rested on logical methods of proof and on rudimentary forms of empirical testing, while aiming at devising rationalized explications of its principal problems, paradoxes, and theories. Islamic philosophers were generally engaged in protoscientific research within the premodern exact sciences and medicine. Most philosophers in classical Islamic civilization (from the beginnings of the ninth century till the middle of the seventeenth century) were also polymaths who composed various compendia and treatises in the exact sciences and on a variety of topics in mathematics, astronomy, logic, and medicine. Many among them were also celebrated physicians. The more recent developments in Islamic thought started to depart from the anchoring of philosophical thinking in the exact sciences and medicine, while showing greater interest in mysticism, scriptural exegesis, and in debating the questions of ethics and politics in comparisons with the revealed text and the prophetic tradition. Islamic thought in its modern expressions is no longer rooted in science, as this was originally the case with premodern Islamic philosophy.

Religion

Islamic philosophy can be identified as a traditional form of religious thinking that was grounded in the material culture of classical Islamic civilization and that rested also on scientific forms of reasoning in terms of logical proof, rudimentary empirical testing, and rational explication. However, Islamic philosophers did not self-identify themselves as being religious scholars or theologians, since they distinguished themselves from the dialectical theologians of

Kalam and from their methods of argumentation that were axiomatically rooted in religious scripture. Nevertheless, Islamic philosophers were generally engaged in central questions that preoccupied the theologians and religious jurists and grammarians, albeit, they treated them in the context of demonstrations in metaphysics and cosmology, instead of theology per se. These were articulated in terms of reflections on the ultimate principles of reality and of the human condition, in connection with nature, and in meditations on divine creation. They treated questions pertaining to debates over the nature of the divine essence and attributes and the relation of the doctrine of the eternity of the universe with the belief in creationism. They also strived to reconcile the adapted theories of the Greek philosophical sources with the monotheistic religious tradition and particularly with the articles of faith in Islam. Not all philosophers in classical Islamic civilization were Muslims, some were Syriac and Sabaean (non-Muslim natives of Syria and Mesopotamia), Christian, and Jewish. However, they all developed their modes of reasoning and thinking in response to an intercultural multiethnic and multireligious *milieu* that was principally marked by the directives of the Islamic faith and its praxis. The identification of Islamic philosophy as a religion can be soundly established in broad cultural terms, in the sense of referring to this discipline and its subdisciplinary branches as a rational intellectual tradition in philosophizing that was anchored within an Islamic *milieu*. Islamic philosophy maintained a balance between the cultural conventions of its monotheistic religious context from one side and its Ancient Greek philosophical sources on the other side. This resulted in counterbalancing the mystical and theological orientations within its modes of thinking with an accentuation of the merits of science and the logical methods of proof and reasoning. Furthermore, and as noted earlier, the more recent developments in Islamic thought started to depart from the anchoring of philosophical thinking in the sciences, while showing greater interest in mysticism, scriptural exegesis, and the controversies over questions of ethics and politics. Islamic thought in its modern expressions is no longer rooted in science, as this was originally the case with premodern Islamic philosophy.

Characteristics

Islamic philosophy can be distinguished from Islamic theology and the classical traditions of science in Islam. Specialized classical scientists and mathematicians, namely, those who only focused on research in arithmetic, algebra, geometry, astronomy, mechanics, and optics, tended at times to cast some doubt about the epistemic value or the soundness and validity of the propositions of the philosophers (Rashed 2011). Mathematicians in the Apollonian and Archimedean tradition, who were also inspired by the Euclidean and Ptolemaic legacies, tended to have skeptical positions with regard to the philosophical doctrines of the Pythagorean, Platonist, and Aristotelian philosophers, in addition to being dismissive of most of the views of the theologians of dialectical *Kalam*. The classical scientists and mathematicians in Islamic civilization were not necessarily philosophers but rather specialized polymaths with expertise in various branches of the exact sciences. The philosophers anchored their thought in the sciences but were not necessarily scientists. Likewise, philosophers treated shared questions with the theologians but were not necessarily themselves religious scholars or jurists. Moreover, religious thinking and theology may have borrowed or mimetically mirrored the methods of the philosophers in logical reasoning and argumentation, but their forms of thinking were dialectical and tended to have apologetic undercurrents.

Relevance to Science and Religion

Islamic philosophy occupied a remarkable historical and epistemic position in intellectual history in Islam in terms of being situated in-between science and religion, and in seeking also to devise ways by which their commensurability can

be demonstrated in view of accentuating the harmonization of their relationships, connections, and distinctions. Islamic philosophers aimed at reconciling Ancient Greek science and logic with religious thinking and praxis in Islam. They endeavored to prove that the sources of antique wisdom confirmed the revealed religious truth and that science assisted in uncovering the ultimate principles of reality and of the human condition in a manner that is complementary and commensurable with religious revelation and the exegesis and hermeneutics of scripture. Islamic philosophers brought also a mystical tendency or orientation in explicating the bearings of the sciences and their contribution to the affirmation of the articles of faith through rational reasoning and logical forms of inference and also by way of empirical and mathematically grounded methods of demonstration. Islamic philosophy offered an ideal framework for bringing science and religion to bear unto one another without reducing them into each other. Philosophy in Islamic intellectual history mediated the relationships and tensions between science and religion while raising ontological interrogations and epistemological questions concerning their theoretical underpinnings and conceptual structures. Philosophizing in connection with religion and science in Islamic civilization assumed a metaphysical stance regarding the positive character of the axiomatic parameters of science and religion in the sense of self-identifying itself as the unrestricted mode of thinking, which is reflective and critical in essence.

Sources of Authority

The sources of authority in Islamic philosophy are judged according to the quality of their philosophical knowledge and the exercising of sound and valid reasoning. This is undertaken through rational deliberation, logical argumentation, critical assessment, and empirical demonstration. The focus of such workings of the intellect is directed toward the elucidation of questions concerning truth, goodness, justice, and beauty, while also focusing on the

central problems of ontology and epistemology (respectively in addressing the question of being *qua* existence and in reflecting on the manner we acquire knowledge about worldly and natural phenomena). Authority is also established in exegetical and interpretive skills in terms of commentaries on the principal philosophers, in the Greek and Arabic sources alike. Excellence in explicating the thoughts of antique masters like Plato, Pythagoras, Aristotle, Plotinus, Proclus, and Philoponus was also central to establishing an authoritative voice and eminent scholarly reputation. The same applies to mastering the teachings of these celebrated philosophers and of the principal thinkers in Islamic intellectual history.

The following paragraphs offer synoptic accounts about some of the main authorities in Islamic philosophy, which are presented chronologically hereinafter, from the beginning of the ninth century till the middle of the seventeenth century (Refer in this section to: Corbin 1993; Fakhry 1983; Gutas 1998; Sharif 1961).

We start with the figure of Abu Yusuf Ya'qub ibn Ishaq al-Kindi (ca. 800–870 CE) who is customarily referred to as the "Philosopher of the Arabs." He was one of the pioneering Islamic philosophers, with Aristotelian and Neoplatonist leanings, who also directed research and translation teams in Baghdad under 'Abbasid patronage (Rashed 2011).

Abu Bakr al-Razi (ca. 841–926 CE) was al-Kindi's contemporary, who in his own right was also a remarkable Persian physician, philosopher, alchemist, musician, and mathematician, known in Europe by the Latinate rendition of his name as "Rhazes."

Abu Nasr al-Farabi (ca. 870–950 CE) was another major luminary, probably of Turkish descent, who became known among his contemporaries and successors as the "second master" to come after Aristotle. He was an influential Platonist metaphysician and political philosopher, as well as a polymath. He composed many works including an encyclopedic treatise entitled *The Enumeration of the Sciences* (*Ihsa' al-'ulum*) and a tract that is akin to Plato's *Republic* and titled *The Virtuous City* (*al-Madina al-fadila*) (Mahdi 1992).

The Ikhwan al-Safa', or the Brethren of Purity (flourished in the second half of the tenth century in Mesopotamia and Syria), were the anonymous members of a coterie of learned urbanites. Their fame emerged in response to their widely disseminated and influential encyclopedic compendium the *Epistles* (*Rasa'il*), which dealt in 52 tracts with all the main sciences of their age in arithmetic, geometry, music, astronomy, geography, logic, natural philosophy, mineralogy, botany, zoology, in addition to psychology, theology, metaphysics, and magic. They cultivated an ecumenical syncretic approach to religion, which appealed equally to the religious teachings of Islam, Christianity, and Judaism, in association also with the antique wisdoms of the Greeks, and of ancient Egyptian, Babylonian, and Persian esoteric sages (El-Bizri 2008).

One of the foremost intellectual minds in the Islamic history of ideas was Abu 'Ali al-Husayn ibn Sina (ca. 980–1037 CE), commonly known as Ibn Sina, and in Latinate renderings as Avicenna. He was a remarkable and highly influential Persian physician, philosopher, polymath, and poet. His thought impacted subsequent philosophers in Islamic civilization till the twenty-first century, and his influence in Europe continued up till the early-modern period in philosophy and medicine. He was inspired by the Aristotelian and Neoplatonist traditions, and introduced novel prolongations to their concepts, and to the evolution of philosophizing in the classical Greek-Arabic-Hebrew-Latin heritage. His most notable works are the encyclopedic compendia in philosophy, the *Kitab al-Shifa'* (*Book of Healing*) and the *Kitab al-Najat* (*Book of Deliverance*), besides his monumental compendium of medicine *Kitab al-Qanun fi al-tibb* (*The Canon of Medicine*) (Goodman 1992; Nasr 1993; Wisnovsky 2003).

Ibn Sina's contemporary and a scholar of great eminence who engaged in disputations with him via remarkable epistles was Abu al-Rayhan al-Biruni (ca. 973–1048), known also in Latin as Alberonius. He was a highly accomplished Persian natural philosopher, mathematician, astronomer, geographer, and anthropologist,

who also cultivated a special expertise in Indian/Indic affairs (Nasr 1993).

Another giant in this constellation of minds, and a contemporary of Ibn Sina and al-Biruni, was the Arab polymath al-Hasan ibn al-Haytham (ca. 965–1041 CE), known in Latinate renditions of his name as Alhazen. He was a remarkable Mesopotamian Iraqi optician, astronomer, and mathematician, who impacted the unfolding of the science of optics up till the time of Johannes Kepler in the seventeenth century, and whose mathematical treatment of natural philosophy in the context of experimental controlled testing laid down the earliest foundations of the protohistory of early-modern scientific methods in research (Rashed 2011).

In the philosophically oriented pantheon of theological thinkers, the most prominent is the Imam Abu Hamid al-Ghazali (ca. 1055–1111 CE) who was a highly influential Persian philosopher, theologian, mystic, and jurist. He is known for his formidable critique of the Aristotelian and Platonist philosophers like al-Farabi and Ibn Sina, as he argued his case in his monumental treatise *Tahafut al-falasifa* (*The Incoherence of the Philosophers*).

The Andalusian polymath and natural philosopher, Ibn Bajjah, known in Latinized renderings as Avempace (ca. 1095–1138 CE), had an influence on later philosophers in the Aristotelian legacy, such as Ibn Rushd (Averroës) in the Islamic tradition and Albertus Magnus in European scholasticism. He was famous also as a botanist, and he composed *The Book of Plants* (*Kitab al-Nabat*).

Abu al-Walid ibn Rushd (ca. 1126–1198 CE), more commonly known as Ibn Rushd, and in Latin scholasticism as Averroës, was a leading Andalusian jurist and Aristotelian philosopher who impacted the thought of figures like Thomas Aquinas and Moses Maimonides. He was a defender of philosophy against its theological critics, and he composed a specific treatise in response to al-Ghazali's attack on the philosophers, which carried the title *The Incoherence of the Incoherence* (*Tahafut al-tahafut*).

The mystical legacy in Islamic philosophy finds perhaps its first most powerful voice in the

teachings of Shihab al-Din Suhrawardi (ca.1155–1191 CE) who was a mystical Persian philosopher of the Platonist tradition and the founder of the Illuminationist school (*al-ishraq*) in sapiential thought.

In the theological traditions that emulated the methods of the philosophers, we can perhaps identify the figure of Fakhr al-Din al-Razi (ca. 1149–1209 CE) who was a Persian Sunni theologian and a critical commentator on Aristotelian natural philosophy and the philosophical tradition of Ibn Sina.

The mystical legacy in Islam finds its most influential expression in the Sufi tradition of Muhyi al-Din ibn 'Arabi (ca. 1165–1240 CE), more commonly known as Ibn 'Arabi, who was an Andalusian mystic and metaphysician and who settled in Syria and became a leading figure of Sufism. His penchant in mysticism and the impact of his spiritual teachings eventually earned him the name *al-Shaykh al-akbar* in Arabic (chief sheikh) and *Doctor Maximus* in Europe. His influence continues to be felt till our century in mystical orders and in Sufi practices within Muslim societies as well as in Europe, Australia, and the American continent.

Nasir al-Din al-Tusi (ca. 1201–1274 CE) was a highly accomplished Persian natural philosopher, astronomer, and mathematician, who was also known for his major astronomical databases and charts, including his revision of the geocentric Ptolemaic model in anticipation of the Copernican heliocentric system. His philosophical works were anchored in the tradition of Ibn Sina and in the Aristotelian doctrines.

Ibn Khaldun (ca. 1332–1406 CE), the Arab Tunisian pioneering historiographer, sociologist, became famed for his *Prolegomenon* (*al-Muqaddima*) in history of civilization. His record of the history of the Arabs and Berbers was rediscovered in European eighteenth-century scholarship and became highly celebrated by nineteenth-century Orientalists as a protohistory of sociology, economics, and historiography. He displayed also the acumen of the natural philosopher in his analysis of history, society, and economics.

One of the last influential thinkers in classical Islamic philosophy was Mulla Sadra (ca. 1572–1640 CE), also known as Sadr al-Din al-Shirazi. He was an influential Persian natural philosopher whose thoughts continue to impact the ontological and theological doctrines of contemporary traditionalist thinkers in Iran, including some of the authoritative clerics in the mainstream Shiite tradition.

Ethical Principles

In the cosmological sense, there is a general emphasis on anthropocentrism and on an analogical analysis of the human being in connection with nature, the cosmos, and the ultimate principles of reality. This is mainly articulated in terms of the microcosm and macrocosm classical analogy. Ethics was marked by a protohistory of humanism in Islam. The ethical main maxim accorded with the Socratic injunction: "Know thyself!" which was furthermore given a religious overtone in terms of being in itself conceptualized as a mode of "knowing nature" and ultimately of potentially "knowing God." The main guiding principle in leading a virtuous life and in the pursuit of happiness was set according to rational criteria by way developing one's own intellective faculties, powers of discernment, and sound judgment. It is through the agency of reason and the intellect that ethical principles are upheld and practiced. Such philosophical wisdom was seen as being commensurable with the sagacity that is embedded in the directives of religious scripture and the pathways that were laid down in rationalized interpretations of the Qur'an and of the teachings of the Prophet Muhammad.

Key Values

The key values in Islamic philosophy rest on the centrality of reason and the intellect in the acquisition of knowledge and in leading through rational deliberation and intellective discernment what amounts to an ethical life, which is in

harmony with the articles of faith and in resonance with the principles governing nature.

Conceptualization

Nature/World

Nature and the world are in general conceived from the standpoint of being governed by their internal laws that are explicable via causal principles. The conception of nature is in general influenced by the Aristotelian doctrines. The main principle that underpins nature is that of motion (*kinesis* in Ancient Greek, *haraka* in Arabic). This denotes change in terms of growth and diminution in size, it also describes the movement from potentiality to actuality in existence, it moreover refers to displacement as a transition or transfer from a given place into another, and it furthermore underlies generation (such as birth) or corruption (like decay, bodily demise, and death). This conception of natural phenomena, as being animated by motion, also presupposes that nature is a plenum; hence that it does not admit the existence of an actual vacuum, but rather that phenomena of nature are interconnected through uninterrupted chains of causes and effects. This philosophical outlook on nature contrasted with the views of the dialectical theologians in Islam, who in general upheld an atomist doctrine that affirmed the existence of the void in nature, and that all natural bodies were constituted from the smallest indivisible entities that cannot be partitioned, namely, the atoms. These atomic indivisible entities adhered together and were segregated apart due to factors that were not intrinsic to their own properties. Being together or apart was accidental to the formations of constellations of atoms rather than being substantial or necessary. In ontological terms, the philosophers argued that the world and nature were conceivable as being coeternal with God, and that they were not created *ex nihilo*, but came to be through a process of hierarchical descending emanation that is modulated by way of a causal nexus. This view refracted the Aristotelian worldview with the Neoplatonist cosmology in explicating divine creation through an affirmation of the existence of internal laws that governed nature.

Human Being

The human being is generally conceived as a *rational animal* in a manner that is akin to the Aristotelian doctrine, while also situating humanity between the animal and angelic nature in a broader religious sense. The human being is considered as a biological living creature that obeys the same principles governing life in general. This conceptualization of humanity is mediated via the microcosm and macrocosm analogy. The human mind, body, and soul are taken to be analogical in essence to natural phenomena that make up the universe and spheres of life and that, likewise, the world is a macro-human that is fashioned in a manner that structurally resembles the constitution of humanity. This carries with it antique echoes from the Neoplatonist, Neopythagorean, and Vitruvian legacies. The principal characteristic of humanity is that of being endowed with intellect and reason. This is also reinforced by a dualist metaphysical distinction between mind and body that resulted in an affirmation of the immortality of the human soul. As a biological entity, the human being is furthermore considered as a living creature equipped with a brain, which is the seat of the faculties of intellect, imagination, memory, discernment, speech, thought, and inventiveness and that enables the development of conceptual categories pertaining to reflections on being, truth, goodness, justice, and beauty.

Life and Death

Life is determined by an animating spirit or soul that passes through living physical bodies of plants, animals, and human beings. In religious terms, and from an ontological standpoint, living is ultimately one of the divine attributes. The ground of all life is rooted in existence and in granting life to the animating agency. Life follows the patterns of physical phenomena in being governed by motion. This takes form in terms of change that is animated by generation as birth, nutrition that results in growth, and corruption as demise and death. Having a soul is

essentially a human property, but it can be shared with animals, at least this being affirmed in some of the philosophical viewpoints. Life is itself accompanied by bodily perishing, while the soul is generally conceived as being immortal. Death is customarily associated with bodily dying and not with a demise of the soul. However, some philosophers questioned the doctrine of the immortality of the soul and necessitated embodiment in the afterlife. This rested on a belief in bodily resurrection that brought the soul into life on the Day of Judgment. Ultimately, the differences in philosophical opinion arose around the assertion of the mind/body dualism versus accounts that stressed the inherent unitary quality of embodiment. Life and death belong to the sphere of biological study and medicine in the broad sense, while also encompassing botany and zoology, but in their ultimate principles, they involve reflections on nature in physics, and meditations on existence in metaphysics, with prolongations in conceptual terms that touch upon theology in connection with thinking about the divine essence and attributes.

Reality

Reality is considered at the physical level in connection with natural phenomena in the world around us as embodied humans, which we can observe with our senses. In its ultimate principles, reality is ontologically determined beyond what presents itself to us in the realm of appearances. It is the broader domain of being that is not restricted to the natural world but goes beyond it into the realm of archetypal forms and intelligible universals and ultimately into what is sustained by God.

Knowledge

Knowledge about natural phenomena and the experiential realms of perception are acquired via the intellect with the aid of imagination, memory, and the faculty of discernment, comparative measure, and judgment. This is undertaken through didactic and pedagogic forms of training and education that sharpen rational deliberation by way also of logic, science, and mathematical demonstration. This form of rationalized

knowledge that is verifiable is however distinct from the sapiential modes of grasping reality as underpinned by mystical attestations, epiphanies, and the psychical *cum* spiritual exercises of the sages among the Gnostic philosophers who adhered to esoteric teachings.

Truth

Truth is grasped as the ultimate reality underpinning existence and its principles. Truth is conceived from the standpoint of rationalized philosophical knowledge as the universal order of the totality of facts about natural phenomena and the modes of using language and the articulation of thought about them. The supreme truth and its absoluteness are furthermore conceptualized as belonging to the divine essence that is revealed in discursive reasoning through the study of nature and the cosmos, while being manifested in mystical forms of meditation and contemplation as an epiphany of divinities. Truth is ultimately taken to be absolute and universal, and that human understanding and spirituality were able to grasp its attributes, even if partially.

Perception

Perception is conceptualized as the manifold conscious sensation of the variegated external influences and effects from the outer physical ambient environment that affect the senses of vision, hearing, touch, taste, and smell. Perception is usually conceived as being underpinned by neurological brain activity that modulates the psychological responses and interpretation of outer stimuli by way of the intellective workings of the faculties of the soul, its discernment capacities, its imagination, and memory. Perception is also vital in acquiring rationalized knowledge and in granting access to factual truths about nature.

Time

There are multiple theories of time, and the most dominant are those that were inspired by Aristotle's *Physics* and natural philosophy. The conception of time is mainly that of a passing "now-moment," which determines what went before and what is coming after in the processes

of ongoing change in nature and in the fields of perceptual experience within the ambient surrounding environments and in our own bodies. The chronological character of time is measurable by the intellect, and some devices were also invented to calculate the periods of its lapses in mechanical and objectified methods of reckoning. This aspect of time is worldly in the sense of being rooted in the ephemeral and temporal attributes of natural phenomena and of living beings that are brought into existence by way of generation, and that also suffer demise and death by way of corruption. However, time is also eternal when thought of in connection with divinity and the entirety of the sphere of being and reality. Time is ontologically determined. It is temporal in relation to beings *qua* existents and eternal in connection with existence *qua* being. Eternity is an attribute of the divine essence and of the pre-eternal and post-eternal character of the world as being coeternal with God as creator. This is conventionally explicated through a conception of creation by way of emanation that is inspired by Neoplatonist doctrines.

Space

There are multiple theories of space, and the most dominant were derived from Aristotle's *Physics* and the Aristotelian conception and definition of *topos* (place) as a "surrounding surface of containment." Space was ultimately reducible to the order of the Aristotelian *topos* or place. The conception of spatiality as an extension that is volumetric and three-dimensional, which became akin to what in later epochs has been known as a "Euclidean space," is attributable to the geometrization of place by the polymath, mathematician, astronomer, and optician Ibn al-Haytham (Alhazen). His geometrical conception of place was commensurable with a conceptualization of the metric extension of space as a postulated/imagined mathematical void. The vast majority of philosophers would have retained a conception of nature as a plenum that does not admit the existence of an actualized vacuum. However, the prevalent theory continued to be rooted in the Aristotelian account of place, with some tendencies among

the mystically oriented philosophers, such as Shihab al-Din Suhrawardi, to advocate some accounts that are suggestive of spatiality in connection with the Platonist conception in the *Timaeus* of the receptacle "*Khora*" (*Chora*), which in relatively modern times is usually translated from the Ancient Greek into the English language as "space."

Consciousness

Consciousness is a relatively modern concept, and the closest notion that is akin to it in the Islamic philosophical traditions pertains to knowing one's own self and acquiring knowledge about other minds and beings. It is a mode of awareness that arises as an alert response to stimuli in the world and in imagined realms or recollected memories by way of reminiscence. Consciousness is closely linked to the notions of knowledge and perception.

Rationality/Reason

Rationality is the most fundamental notion for the pursuit of truth and the acquisition of knowledge about God, self, and nature. Reasoning is the proper mode of grounding perception and consciousness and in leading a virtuous life on the path of goodness. Reason and rationality are conventionally understood as manifestations of the workings of the intellect (*al-'aql*) that is aided also by memory, imagination, and the senses.

Mystery

Mystery is usually evoked in sapiential reflections and mystical meditations in relation to what remains veiled and concealed of the principles of reality and the ultimate truth that is sustained by divinity. It is conventionally a phenomenon that is central to Sufi and Gnostic traditions within Islamic philosophical circles and is rather connected with the Neoplatonist and Neopythagorean schools instead of being central to Peripatetic tendencies in natural philosophy. Mystery points ultimately to that which is as yet unknown or that may always remain unknowable. There is perhaps a deeply seated hope that what is mysterious may potentially become explicable

after the evolution of knowledge, be it rationalistic or based on spiritual exercises.

Relevant Themes

God

The question concerning the divine essence and attributes preoccupied many philosophers in Islam in the context of their response to the dialectical theologians of the *Kalam* traditions. The most representative thesis of the philosophers is perhaps embodied in Avicenna's (Ibn Sina) take on this question. His approach to the divine essence is mediated via his ontology, whereby in the context of reflecting on divinity, he grasped the divine essence as pure existence (being) that is necessary due to its-self and is not caused by anything else other than itself. This is the most fundamental attribute of divinity. However, denying other attributes is problematic from a theological standpoint. For instance, to overcome this difficulty, Avicenna affirms the divine omniscience but in terms of knowing immutable universals and not as being a knowledge of changeable particulars. Ultimately, God's thoughts are the principles of reality and laws of nature.

Emanation and Creation

The classical philosophers in Islam advocated a conception of creation by way of emanation. This notion was anchored in the worldview that the nature of God as creator necessitated that something is effused from his being and is granted existence, namely, that by the nature of divinity, it emanates something out of itself and imparts existence unto it. The derivative secondary existents flow from the more primary ones in a descending hierarchy of causal links. Emanation is distinct from the doctrine of creation *ex nihilo*, since it removes the positing of a will in the first cause, rather beings emanate according to the nature of the One as the primal and immutable first principle, instead of emerging from nothingness by way of divine volition. This process was inspired by the Ancient Greek Neoplatonist doctrines of Plotinus

and Proclus. Existence is granted from the One like an irradiation of light. The world that is given being is also conceptualized in this framework of hierarchical causal links as being coeternal with God. The philosophers generally rejected the view that the world was created *ex nihilo* as proclaimed by the theologians. This resulted metaphysically in combining contingency with necessity by way of affirming that the world was *contingent due to its-self* and was at the same time *necessary due to something else that was other than itself*.

Cross-References

► Astronomy in Islam
► Humanism in Islam
► Logic in Islam
► Mathematics in Islam General
► Medicine in Islam
► Mysticism in Islam
► Optics in Islam
► Physics, Science in Islam
► Theology in Islam

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Philosophy in Islamic Intellectual History

▶ Philosophy in Islam

Philosophy in Judaism

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Related Terms

Jewish philosophy; Jewish theology; Jewish
thought

Description

The relationship between Judaism and philosophy has historically been complex, dynamic, and, at various times, oppositional. Whereas Christianity, in its nascent formation, came almost immediately to think of itself in terms proffered by Hellenism, Judaism, understanding itself in its own terms as covenantal witness to the utterly transcendent and personal God of Abraham, Isaac, and Jacob, has often found philosophy to be an alien mode of thinking in which that personal and covenant-making God is necessarily replaced by an abstract and impersonal first principle – which, to the Jewish mind, more resembles a thing than it resembles any person. Leo Strauss, in his well-known essay (Strauss 1983), asserted the fundamentally incompatible orientations of Athens and Jerusalem and affirmed the essential inability of philosophy to speak of God as God is known by Judaism or to provide epistemological justification for revelation. For Judaism to attempt to articulate itself philosophically, one might conclude, is for it to distort itself to the point of abandoning its nature; reason, unaided by Biblical revelation, can know the God of the philosophers, the first principle, but cannot speak at all of the God who is person and subject – the living, commanding, and redeeming God of the Jewish people.

For some, the non-Jewish origin and Greek-born method of philosophical reasoning has been sufficient reason to proclaim Jewish philosophy a hybridization that has no proper place in Judaism. Yet, it is also true that philosophy has been a fact confronting Jewish intellectual life since Judaism's contact with Hellenism (c. 323 BCE). Moreover, since the destruction of the Second Temple (70 CE), Judaism has had a diasporic existence which necessarily brought it into contact with ideas, customs, and worldviews originating in foreign cultures. It has been forced to contend with these cultural influences, appropriating, reacting to, and re-forming itself in response to many of the influences, the ideas, and the systems of knowledge it has encountered, rejecting those which were in opposition to its perceived basic affirmations while accepting into itself those influences that did not, becoming an evolving, dynamic, and living tradition. Philosophy's long-standing contact with and affect upon Judaism make it difficult to declare it a purely "foreign" or heteronymous entity within Jewish history. Philosophy is a part of Jewish intellectual history, and Judaism's identity includes the results of its having grappled with its influence.

Philosophy, insofar as it includes the rational development of worldviews or the rational establishment of metaphysical principles, must remain antithetical to Judaism insofar as Judaism is understood to represent a set of metaphysical truths acquired by means of revelation. But even this distinction need not prove definitive: In reinterpreting the core onto-theological (Onto-theology) claims of Jewish scripture and tradition, Jewish philosophy has striven to reveal revelation's compatibility (or even its identity) with reason. The works of the Neoplatonist Philo (20 BCE–50 CE) are characterized by just such a rational "unpacking," and may be said to constitute the earliest true example of the thoroughgoing application of Greek philosophical concepts to Judaism. Philo's allegorical method of scriptural interpretation foreshadows much

that was later to become accepted procedure in medieval Jewish philosophy.

The medieval period saw the rise of philosophical thought in Judaism, and this brand of scholarship took root alongside rabbinic studies. The "Greek" mode of inquiry infiltrated the enclave of Jewish intellectual life by way of contact with the works of Muslim theological philosophers (▶ Mutakallimun). The dialogues of Plato and the works of Aristotle, translated into Arabic, became the point of departure for the rationalistic consideration of Judaism, as they had for the Muslim and would for the Christian scholastics. The idea that human reason, while limited, is a gift of God and that the Torah teaches nothing that is contrary to reason became the supporting principles of Jewish medieval philosophizing: The consonance of Judaism and reason became an article of faith for those who saw in philosophy the most proper human opportunity to obey God's Commandment to know Him and to love Him with all one's strength.

Usually regarded as the first truly philosophical Jewish thinker, Saadya Gaon (882/892–942) maintained that the concepts and categories of Greek philosophy represent the workings of universal human reason and that it is impossible for Judaism to be antithetical to reason. Saadya thus held reason to be the final arbiter of truth in cases in which scripture and reason appear in contradiction. Although not all subsequent Jewish philosophizing would go so far as to defer to reason over scripture, Saadya's confidence in the rationality of Judaism served to pave the way for the systematic rationalism of Maimonides, as well as for the Jewish rationalism that would largely define post-Enlightenment modernity (Husik 1948).

With its prime exemplar in the person of Moses Maimonides, the interest of the medieval Jewish philosophers was that of providing a rational account of Judaism and its worldview within the framework of the systematic cosmology and natural science of Aristotle. The works of Aristotle presented a systematized account in which an eternal, unmoved mover and final cause provided the ultimate explanation of the existence of the universe and its contents and

engendered a unified and orderly cosmos. Medieval Jewish philosophers were able to see in this cosmological vision a consonance with the notion of the transcendent Creator God of Jewish scripture and tradition, and through that identification, to unite scientific knowledge of the world with religion and give metaphysical shape to the concepts of the Torah (Manekin 2007). A new horizon of theological discourse was opened: God's attributes, His relation to the world, goodness and knowledge, power, and relation to humanity were given to the mind of the thinker as subjects of inquiry. Knowledge of the nature and workings of the universe became understandable as aspects of a cosmic order directly instituted by God and which had God at its summit. New questions could be posed, and questions that had long since been formulated by the rabbis could receive detailed and reasoned elaboration in a system in which the God of Israel was reckoned according to Greek cosmology and the rigors of logic. Israel's God was now explicitly understood as omniscient, omnipotent, and omnibenevolent, as infinite, and as having created the world ex nihilo; the philosophical problems attending the posit of human free will, predestination, the possibility of God's having knowledge of particulars, made explicit what had arguably been implicit in the theological concepts employed by the rabbis and the notions of God and world narrated in the Torah (Samuelson 1976).

Philosophers such as Gersonides, Crescas, and Nahmanides likewise grappled with the legacy of Greek philosophy, in both its Aristotelian and its Neoplatonistic (Neo-Platonism) forms (In his Duties of the Heart, for example, Bachya understands man's ultimate duty to be love of God which, while unattainable by means of the intellect, nonetheless requires the use of reason insofar as knowledge from authority alone is insufficient aid to such deep love: All natural effort must be made to know God by means of the intellect.). Attempting to understand traditional Jewish convictions as amenable to both the dictates of rational thought and the metaphysics and cosmology of the Greeks, these thinkers followed Maimonides in addressing questions of creation/the eternity of the world, God's

knowledge of the finite world, human free will in light of divine omnipotence and omniscience, and the meaning and possibility of prophecy and revelation, among other topics. Although some medieval Jewish thinkers, such as Yehuda Halevi, eschewed Greek rationalism as a means of framing the Biblical worldview, the majority of medieval Jewish philosophers accepted a version of Aristotle's cosmology and natural science and, affirming the essential unity of all truth, championed the identity of philosophy's first principle and the God of Judaism (Frank and Leaman 2003).

The acceptance by the Jewish philosophers of the Aristotelian cosmology served to give new shape to traditional ideas about God and the world. The Torah's anthropomorphism was rationalized, its picture of God as in possession not only of human physical attributes but also of changeability and emotion were subjected to the rigors of reasoned analysis upon Greek philosophical lines: For Maimonides and others, these Biblical expressions made manifest the understanding of God accessible to finite human beings by attention to the effects of divine attributes and acts – it is by analogy and metaphor that God's nature is known; by way of the observation of the effects of God's acts, and analogy with our own, human beings can attain a working knowledge of God which, while neither exact nor literally true, can serve to facilitate one's upholding the covenant and worship of God (Seeskin 2005).

The rudiments of the Aristotelian account of the world became standard concepts in Jewish theology, both academic and popular, persisting long after the natural science of Aristotle had been abandoned in favor of the science of Copernicus, Newton, and the worldview of early modern science. The relative dearth of Jewish philosophy after the middle ages until the nineteenth century resulted in a freezing of the theological conceptions of an earlier time and a consequent growing chasm between the world as conceived by science and that depicted by religion. Early modern science posed little obvious difficulty for the Jew, for its understanding of the universe, while no longer requiring the posit of God as an explanatory principle, nonetheless

did not in principle prevent that posit. The resulting shift from the medieval conception of the universe and the early modern understanding of the universe as mechanism could largely be ignored by Jewish thinkers, and the conception of God remains largely undisturbed despite the vast changes in scientific paradigm (Samuelson 1989).

Contemporary physics, however, proffers a worldview that has not the same theoretical space for the posit of the God of Israel, in that it represents the universe as a closed system requiring no external "act" by which the universe or its contents are brought from Aristotelian "potentiality" into the "actuality" of existence. Despite the relative ignorance of the contemporary nonscientist of the specifics of quantum physics, the quantum view of the universe presents grave difficulties for the theologian, who must reckon the usefulness of traditional Jewish notions of God and the world in a universe perhaps best described by quantum physics – an understanding of reality that at least prima facie cannot accommodate the most characteristic contents of the Jewish religion. The discrepancy between two apparently contradictory worldviews is reflected in the life of the contemporary believing Jew: As science comes to constitute ever more of the common understanding of the world, so do the concepts of traditional religion become less believable, and the sense that science's truths refute the claims of religion grows ever more unavoidable. The life of the contemporary Jew is characterized by a cognitive dissonance: While the universe is conceived roughly in terms of today's science by the modern Jew, Judaism retains a grievously outdated, Aristotelian, worldview.

The nineteenth century brought a marriage of philosophic rationalism and scientific empiricism that, in the Jewish world, culminated in the work of Hermann Cohen. Cohen's post-Kantian approach saw in Judaism the seeds of a universally valid and rational religion that expressed itself most of all in practical wisdom (ethics). Losing all content of revelation not accessible to reason as well as all Jewish particularity in favor of universality and philosophy,

Cohen's understanding of Judaism as ethical monotheism marked the complete rationalization of Judaism and religion.

Jewish philosophy through the twentieth century has, in the main, been aligned with continental philosophy and removed from explicit concern with natural science. The existentialism of Martin Buber, the critical ethical philosophy of Emmanuel Levinas, and the New Thinking of Franz Rosenzweig sought access to meaning through the analysis of relationship, rather than by means of consideration of the metaphysical nature of the universe, while thinkers such as A. J. Heschel, Steven Schwarzschild, and Joseph Soloveitchik searched for a way to account for the reality of a God who remains inaccessible to the determinations of rationalism and yet present to Jewish observance (Borowitz 1983).

Vast differences of both subject matter and approach characterize Jewish thought and philosophy today, and never since the medieval period has Jewish intellectual life involved as much academic philosophical activity. Some characteristic concerns of contemporary Jewish philosophy include the following: the possible epistemological justification of belief in God (howsoever construed) in the face of the modern scientific worldview which does not require the Deity as an explanatory principle (cause) and provides an account of reality which precludes traditional theistic posit; the possible justification of revelation (howsoever construed) as a source of knowledge; possible accounts of Jewish particularity which provide for the uniqueness of the Jewish people in a way that both avoids racial chauvinism and is consonant with the universal principles of philosophical reason; the questioning of the premodern assumptions concerning the relation of religion generally and Judaism in particular to natural science; the theme of modernity and its failure; the nature and authority of Halakhah in light of modern science and philosophy; Zionism and the significance of the land of Israel and the Jewish people; Jewish feminism and the reconstruction of Jewish tradition with attention to the voice of women; and Holocaust philosophy and theology, which explores the serious difficulties involved in maintaining traditional Jewish ideas about God, Jewish chosenness, and even humanity in the face of the suffering of many and the near decimation of the Jewish people. Many of these themes and concerns are echoed in "mainstream" or secular philosophy; however, in its reference to traditional Jewish sources and ideas, as well as to specifically Jewish concerns about values and peoplehood, Jewish philosophy exists as a body of works and a pursuit in its own right, reflecting both the fact of Jewish distinctness and Jewish life a manifestation of a more universal humanity.

Self-identification

Science

Jewish philosophy does not self-identify as a "science" in the common, contemporary understanding of the term. It does not have directly to do with the empirically based observation of natural phenomena, does not generate quantifiable results, and does not proceed by way of empirical or theoretical experiment or calculation, such that its results can be validated either through repetition or community consensus. Jewish philosophy, as philosophy, is describable as science in the broadest and most originary sense of the term – that of knowledge and the quest for knowledge.

The division of knowledge and inquiry into "science" and "philosophy" was a relatively late development in the history of Western culture. In the ancient and medieval worlds, and even as late as the nineteenth century, "science," as knowledge, was a broad term that encompassed what we today understand as the natural and human sciences and philosophy. "Philosophy" was likewise a term with a broad scope. As "the love of wisdom," a philosophical pursuit was any investigation in pursuit of knowledge: The acquisition of knowledge about the world and about values was recognized as the means by which wisdom – knowledge of the good life for human beings – might be attained. Empirical science was called "natural philosophy," and it treated of the material, as opposed to the theological and spiritual, elements of reality. It was not uncommon for a philosopher also to be competent in one or

more of the natural sciences, nor for a natural scientist to be a philosopher. Although contemporary usage distinguishes between the investigation of nature and speculation concerning transcendent, foundational, ultimate, or ethical matters, the division between philosophy and what is now termed "science" is less clear-cut than might be imagined: Advances in scientific knowledge influence philosophy by raising questions of philosophical importance and by providing much of the subject matter of philosophical thinking; science, for its part, involves philosophical reasoning in the formation and development of its theoretical commitments and paradigms and often finds itself to dovetail with philosophy insofar as its progress demands the formation of an account of nature of both the object known and the investigating knowing subject.

Religion

Jewish philosophy does not self-identify as a religion but is a form of intellectual life within the Jewish religion. Jewish philosophy is the pursuit of speculative knowledge undertaken from the perspective of the Jewish religion, in reference to Jewish concerns, or in relation to canonical Jewish texts. There are many ways in which the relation of this subdiscipline of philosophy to Judaism can be manifested, and its connection with the specific religious content of Jewish tradition can take many forms, from acceptance of the literal truth of Biblical and theological statements to the reinterpretation of the religion as a whole.

Characteristics

Jewish philosophy is philosophy and it is Jewish, and both of these elements serve to distinguish Jewish philosophy from other related traditions and give it its own dynamic and set of problematics.

What precisely makes any philosophy "Jewish"? Simply to denominate any and all philosophy authored by a Jewish person "Jewish philosophy" is to proffer a definition perhaps too broad to be either useful or informative – and there

are Jewish philosophers whose Judaism has little or nothing to do with the subject matter of their philosophical work. Conversely, were we to limit the appellation to only such philosophy as seeks to provide a philosophical account or justification *of Judaism*, we would narrow the definition overmuch, as well as rule out much philosophizing of significant Jewish import. In addition, it should be noted that there is a distinction to be made between philosophizing that takes as its starting point the tenets of revelation and that which seeks to provide philosophical justification of revelation and its contents (the former would best be called "Jewish religious philosophy," and perhaps "theology," and the latter, "philosophy of Judaism"). Jewish philosophy, then, can be seen to take the form of reasoning either from or about the principles of Jewish Biblical faith, to be concerned to provide a philosophical account of the Jewish religion itself, or to provide an overall philosophical account of reality (or of any particular aspect of reality) in a way consonant with or relevant to the tenets of Jewish Scripture or intellectual tradition. The contemporary liberal Jewish philosopher, Norbert M. Samuelson, suggests a broad definition of Jewish philosophy as having the goal of forming "judgments about almost everything relevant to the survival and flourishing of the Jewish people that is likely to be true …." (Samuelson 2009). Whether or not we accept Samuelson's pragmatic focus marrying the practice of Jewish philosophizing and the promotion of Jewish flourishing, a working definition of Jewish philosophy as pertaining to "thought and judgments about the nature of almost everything (an understanding of reality) that is relevant to the fundamental concepts and traditions of the Jewish people that are likely to be true" just might provide sufficient anchor for the survey of so vast and varied an enterprise as Jewish philosophy.

Relevance to Science and Religion

Contemporary Jewish philosophy must address the existence of science, either by contending in a direct manner with the scientific worldview or

by providing a philosophical justification for declaring engagement with the subject irrelevant to its purpose of developing a reasoned account of reality, humanity, Deity, and their interrelation that is important from a Jewish religious point of view.

While the understanding of the universe provided by the Torah remains sufficiently vague as to entail no one specific metaphysical view, there are certain intractable assertions that, it is clear, may not cohere with contemporary scientific notions. More pressingly, the vast majority of premodern Jewish philosophical works hail from the medieval period, and as such, present a view of the universe and its contents, as well as an understanding of God and God's relation to the universe, which is entirely incompatible with the modern scientific understanding of the nature of the universe.

The general understanding of the universe presented by early modern science after the medieval period, while not requiring the posit of the transcendent God of Judaism, was able to support it. As a consequence, Jewish theology did not find itself to be particularly threatened by the advance of natural science. In addition, Judaism's historically multivalenced approach to Biblical interpretation entailed that the tradition did not insist upon a literal interpretation of the details of the Book of Genesis, such that the felt conflict between the ideas of pre-contemporary natural science and Jewish religiosity remained negligible, in contrast to the tension experienced within Christian theological circles.

The intellectual climate of the Western contemporary world has spawned a crisis of faith of a kind never before known. The contemporary believer in any of the three religions of Abraham finds him or herself tasked with attempting to inhabit two cognitively incompatible worlds – the world as understood by religion and the world of modern science. The theological difficulties attending the maintenance of traditional Jewish ideas in the light of modern science are not a problem affecting only theologians and philosophers but are likewise of great moment to the average believing Jew. The apparent incompatibility of the traditional concepts of Judaism and the scientific understanding of the world requires the attention of Jewish thinkers, if Judaism is to remain a meaningful and "live" option for Jews into the twenty-first century.

Sources of Authority

There is no single textual or institutional source of authority that is recognized across the discipline of Jewish philosophy. While all Jewish philosophy in some way involves a relation to Jewish tradition, Jewish texts, or Jewish culture/peoplehood, there is no single manner in which Jewish philosophy as a whole may be said to be related to any aspect or aspects of Judaism.

Although a Jewish philosopher can regard revelation as authoritative and maintain a philosophical position that is built upon the recognition of its authority, much Jewish philosophy is concerned with establishing a rational justification of revelation as a source of truth, often reinterpreting both the nature and content of revelation in ways that differ from tradition. Jewish philosophy is the rational investigation of matters of concern to Judaism, including the rational investigation of all traditional sources of authority.

Ethical Principles

Being Jewish, Jewish philosophy may be said to adhere to the values inherent in Judaism and to share Judaism's characteristic preoccupation with ethics. However, the philosophical investigation of Judaism, the philosophical interpretation of Jewish doctrine, and the task of philosophizing about matters of Jewish concern, need not, as a discipline, understand itself to be bound to Halakhah (the path or the way) as traditionally construed or to any particular articulation of Jewish ethics and values.

Key Values

There is no one set of values that may be said to span the discipline of Jewish philosophy, save

those of the pursuit of truth through reason and a concern with matters of Jewish import.

Conceptualization

Nature/World
Judaism traditionally understands the natural world to have been created by God and insists on the ontological separation of God and His creation, rejecting all forms of pantheism.

In contemporary Jewish thought, the principle of God's complete transcendence of the world has occasionally been less strictly maintained. With the Enlightenment's confidence in human reason as a means of reliable knowledge, empirical science came to supplant medieval metaphysics as the generally accepted worldview. Science yielded a self-sufficient worldview: Unlike any premodern understanding of nature, it did not require the posit of God as a causal explanation of natural phenomena. Mordecai Kaplan's naturalism is a result of this ▶ scientism: Kaplan's anti-supernaturalist stance dispenses with all extra-empirical posits and, reducing "God language" to finite and natural terms, proffers a Judaism purged of its transcendent God, redefining God as that force within (human and extra-human) nature that makes for salvation. Similarly, Judaism's engagement with science today faces the challenge of making sense of religious ideas in a context that perhaps rules out both God and transcendence.

Human Being
Judaism understands the human being to be the creature of God who is created in the image of God. The human being, commanded by God in the Book of Genesis to be fruitful and multiply, to care for and have dominion over the earth and its nonhuman creatures, was created from the dust of the earth into which God blew the breath of life (spirit). For Judaism, the task of the human being generally is understood as obedience of the Noachide laws, while the life of the Jewish human being involves obeying the Commandments that distinguish the particular relationship between the Jewish people and God.

Within Jewish philosophy, the Biblical narrative describing human life is subject to various interpretations.

Life and Death
Biblical tradition holds that God is the author of life and that human mortality is the result of God's punishment of Adam for his disobedience in the Garden of Eden (the first sin). Within Jewish philosophy, the narrative explanation of the origin of death is often understood metaphorically, and a universal and rational (philosophical) account is given which is consonant with the philosophical position espoused.

Reality
In Judaism, reality is all that which is created by God; God gives to all creation its being.

Knowledge
Jewish tradition understands knowledge to be a gift from God and the human use of reason to be incumbent upon one who wishes properly to serve and glorify the Creator. The study of Torah, as revealed knowledge, is a duty (mitzvah); knowledge of the natural world of God's creation is understood to be a means of knowing God through His (creative) acts.

Truth
One of the many names of God given in the Tanakh is "God of Truth" (*El Emet*) (Ps. 31:5). While the Hebrew *emet* does denote truth as that which is real, and the correspondence of a proposition with reality, it likewise connotes firmness, reliability, and, derivatively, responsibility and action. Thus, God, as truth, is the firm presence that can be relied upon, trusted; our acknowledgement of God involves responsibility and ethical action.

Perception
This concept is not of particular interest in the field of Jewish philosophy.

Time
The concept of time in Jewish philosophical tradition has integrally to do with the world's

finitude (as contrasted with the infinity of God) and human history as humanity's struggle for redemption.

Consciousness
This concept holds no special importance within Judaism or Jewish philosophy.

Rationality/Reason
In Judaism, reason is considered a gift of God, and Jews have a duty to make proper use of reason in knowing God through the study of Torah as well as through the investigation of God's handiwork, His creation. With the exception of Maimonides' 13 Principles of Faith, Judaism historically has not emphasized dogmatic belief as requisite to salvation or to membership in the Jewish community. There is thus less of an opposition of reason to faith in Judaism than in other religions (such as Christianity). Medieval Jewish philosophy understood revelation as consonant with reason, although mainly held the content of revelation to be inaccessible to unaided reason.

Mystery
In contrast with ancient pagan mystery cults as well as with its daughter religion, Christianity, Judaism rejects mystery in the sense of any avowal of the Infinite God's embodiment in the finite (as in the Christian Incarnation, its transubstantiated Eucharistic host, or the ritual objects of the mystery cults). Jewish theology does not identify theological contradiction with sacred mystery, although it affirms the human intellect's inability to transcend its finite limitations and arrive at conceptual knowledge of the Infinite God.

Relevant Themes

Jewish philosophy must devise ways of coming to terms with modern science, insofar as science proceeds from a worldview that, at least prima facie, is at odds with how the world is understood within Biblically based religion. If science provides our best current knowledge of how the universe really is, then Judaism, if it is to have a claim to truth, must either be reinterpreted or reworked so as not to be in conflict with this knowledge.

Quantum physics proffers an account of the universe that purports to be inclusive of reality in toto. Unlike the mechanistic worldview of premodern science, the quantum account of the universe is understood to explain not only physical reality but also reality as such. While the mechanistic worldview removed God from His place as Prime Mover within the Aristotelian cosmology espoused by medieval science, theoretical room could still be found for the Deity in premodern mechanism, and God's existence, while not required for explanatory purposes, was not ruled out. Such is not the case in the modern view of quantum physics. In creating a closed-system account of all that exists, quantum physics rules out any posit of a God transcending the universe, and any affirmation of God's causative role in generating the universe is rendered incoherent.

If the worldview of science is understood to describe reality in its every aspect:

- The coherence of affirming the existence of the Biblical God perhaps becomes impossible.
- The nature of the human being as understood by Jewish tradition becomes problematic.
- The notion sanctity of the human person espoused by Judaism cannot be supported.
- The traditional concept of the soul cannot be maintained.
- The universe as understood by quantum physics, excluding purpose and objective value, perhaps excludes ethics.
- The Jewish understanding of human history as metaphysically significant is rendered incoherent.
- The Jewish concepts of redemption and the world-to-come are imperiled.
- The relation of Judaism to truth becomes a question: In what sense can the Jewish worldview be replaced by science and still be called "Judaism"? Are there truth claims so integral to Judaism that their replacement would be sufficient to render its worldview no longer "Jewish" in more than a nominal sense? Could science "disprove" Judaism by

refuting one or more of its central truth claims?

- Does intellectual assent to the worldview of modern science entail an *ontological* commitment to that worldview (is science ontology)?
- Medieval philosophy assumed that theology is a continuation of science's account of the physical universe. Must Jewish theology be grounded on the account of the physical universe proffered by quantum physics, or is the best philosophical account of reality one that would provide an account the worldview of science?

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Philosophy of Aesthetic Experiences

▶ Aesthetics (Philosophy)

Philosophy of Art

▶ Aesthetics (Philosophy)

Philosophy of Being

▶ Ontology

Philosophy of Existence

▶ Existentialism

Philosophy of Experience

▶ Phenomenology

Philosophy of Language

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Description

Introduction

Language is a fundamental human capability. It may be generally defined as the human activity aimed at formulating and communicating information, at expressing feelings, needs, and psychological states, and at influencing other's behavior. It is characterized by the syntactic, semantic, and pragmatic dimensions. Syntax concerns the set of rules and principles according to which the linguistic elements are *combined* to give rise to well-formed complex expressions. Semantics has to do with the *meaning* of linguistic expressions; it is often associated with denotation but may also be understood as referring to

the relations that a term bears with other terms. Pragmatics concerns the *use* of language and of the linguistic expressions as uttered by determinate speakers, aimed at specific goals, dependent on the intentions of the interlocutors, and in general occurring in different contexts.

The expression "philosophy of language" appeared in the 1960s. According to Dummett's *Frege: Philosophy of Language* (1973), this discipline (as a definite branch of philosophy) has been somehow initiated by G. Frege in the late nineteenth century (Frege's 1892 *Sense and Reference* is usually regarded as its "act of birth"). This, of course, does not mean that philosophy begun to deal with language so late in its history; however, the systematic addressing of questions connected with language as a crucial task of philosophy starts in that period. Moreover, according to R. Rorty (*The Linguistic Turn*, 1967), it is with Wittgenstein's *Tractaus logico-philosophicus* (1922) that philosophy posed the issue of language at the very core of its investigations. With the linguistic turn, the philosophical problems are regarded as often generated by the vagueness and ambiguities of language or as related with misunderstanding the real meaning of linguistic expressions. Consequently, linguistic philosophy aims either at eliminating such problems or at solving them by clarifying the proper meanings and functions of the linguistic elements.

Philosophy of language, as it configures in the course of the twentieth century, has a broader scope than "linguistic philosophy" in the strict sense (see, e.g., Block (1981), Lepore and Smith (2006), and Lycan (1999)). It does not claim that all the problems of philosophy and of knowledge in general are problems *of* language. Of course, it does maintain that a better understanding of language may concur to address those problems; in general, however, it aims at understanding language as such, as a human activity with its various facets and connected with other cognitive and anthropological dimensions.

Philosophy of language should not be conflated with linguistics. The easiest way for distinguishing the two is by noting that linguistics is mainly concerned with the syntactic (and the phonological) dimension of language, whereas problems of semantics and of pragmatics are central to contemporary philosophy of language.

Nowadays, philosophy of language in linked in various ways with several disciplines. Logic is surely one of those. In the domain of philosophy, it is also connected with philosophy of science and philosophy of mind. It bears relations with linguistics (of course) and with semiotics (i.e., the general theory of signs). It entertains more or less direct relations with a number of scientific disciplines, e.g., psychology, cognitive neuroscience, evolutionary biology, scientific (or "physical") anthropology. As it will appear in the following, philosophy of language is relevant for philosophical (and even theological) anthropology.

We will focus on the key steps in philosophy of language from Frege on. The scope of this entry is further restricted to philosophy of language in the analytic tradition. The important reflections on language offered by philosophers like E. Husserl, M. Heidegger (especially his late works), and P. Ricoeur will not be dealt with here. More linguistic approaches (F. de Saussure's to mention one) will not be taken into account too – except for N. Chomsky's works. The last section will hint at current lines of scientific research that provide insights also for a philosophical understanding of language. This will also clarify some of the reasons why philosophy of language is relevant for "science and religion."

Philosophy of Language in the Late Nineteenth and the Twentieth Century
From Logic to the "Linguistic Turn"

G. Frege (1848–1925) realized that his "logicist" program (the program of grounding mathematics in logic) required an absolute logical rigor; this, in turn, would have required a deep understanding of the structure of sentences. His explicit intent was of freeing "thinking from the fetters of language by pointing out the logical imperfections of language." His 1879 *Begriffsschrift* ("concept-notation") is aimed at building a "perfect language" to be substituted to the natural ones. Frege's distinction between sense (*Sinn*) and reference (*Bedeutung*) provides the background for much of the research in

philosophy of language. Starting from singular terms (i.e., terms that indicate an individual object), consider the two expressions "the morning star" and "the evening star," which are two singular terms having the same reference, i.e., Venus. If in the two expressions there is nothing more than their reference, then "the morning star is the morning star" should be equivalent to "the morning star is the evening star." However, the first proposition is a mere tautology, while the second one conveys a relevant past astronomical discovery. What distinguish the two expressions, therefore, are their *senses*: The sense of a singular term is *the way in which* it refers to its referent (the "mode of presentation of the referent"). The distinction between sense and reference also applies to concepts or general terms (i.e., predicates). For Frege, a concept is an unsaturated expression (a function) that cannot have a definite truth-value (i.e., that cannot be true or false) unless saturated by its application to an object: The expression "... is Italian" becomes true or false depending on the person of whom it is predicated. The reference of a concept (or function) is the set of all the truth-values that it will assume when saturated by all its possible arguments (where the arguments of a concept – or of a function – are the objects to which it can be applied). Finally, the reference of complete sentence is its truth-value (the Truth or the Falsehood). The sense of a sentence consists in its truth-conditions, i.e., the conditions that have to obtain for the sentence to be true.

The sense of a sentence, moreover, is often understood by Frege as the "thought" associated with the sentence. Therefore, such a thought comes to coincide with the conditions under which the sentence *would* be true. To ascertain if that sentence *is* true (to judge about its truth), however, one needs to pass from the sense to the reference (or, equivalently, from the thought to the truth-value). The reference of a sentence depends on the references of its constituents (this is a rough formulation of the so-called compositionality principle). In other words, the reference of the argument and the reference of the concept (i.e., the set of the truth-values that the concept assumes depending on the argument)

determine the truth-value of a sentence (i.e., the sentence's reference).

Though being close to "a thought," the Fregean sense cannot be conflated with the subjective representation associated with an expression. The representation is private, usually depending on the personal experience of the speakers (their memories, emotions, etc.). Neither the reference *nor the sense* is private: The sense of an expression – the thought associated with it – can be shared by several individuals. This is certainly an aspect of Frege's anti-psychologism attitude. The connection between sense and thought together with the distinction between thought and representation may hint at interesting connections between language and cognitive attitudes (a connection that will progressively acquire relevance in philosophy of language).

To judge about the truth of a sentence requires considering the reference of the terms composing it. In particular, it is crucial that the singular terms do indeed refer to a determinate object. Now, Frege's main interest was about formal languages (precisely about that formal language indispensable for pursuing his logicist program). In such languages, according to Frege, it is always possible to ensure that any singular term has a determinate reference (so that any sentence can always be judged to be true or false); this can be ensured by establishing appropriate conventional definitions and by avoiding the introduction of any single term without fixing its reference unambiguously. Different is the situation for natural languages, and on this point B. Russell (1872–1970) diverged from Frege's positions. On Russell's view, singular terms may be distinguished in proper names – like Aristotle, Dante, Venus, etc. – and expressions such as "the master of Alexander the Great," "the author of the *Divina Commedia*" or "the morning star" that apparently are proper names (and indeed they may grammatically have such a role) but in fact, logically, are "definite descriptions" (i.e., expressions that point to an object by means of ascribing to it such-and-such properties). In Russell's own example (*On Denoting*, 1905), the sentence "the King of France is bald"

is composed by the definite description "the King of France" – which does not refer to a concrete existing individual (at his time like at present) – and by the concept or predicate ". . . is bald." For Frege, such an expression has a sense (i.e., expresses a thought) but has no reference, as it is neither true nor false. In Russell's view, on the contrary, the grammatical form of the sentence hides its truly logical one, which is, "Exist an x that is the King of France and is bald." So reformulated, this sentence has a definite truth-value: It is false since such an x does not exist. In this way Russell shows how, in his view, the Fregean notion of sense is useless, and that reference is the only semantically relevant feature of an expression. In sentences containing a definite description that does not refer to any single existing object, there is actually no element that refers to *any* object: The explicit, logical form of that expression (as analyzed in *On Denoting*) reveals that all the constituents of such sentences do refer, but to *properties* or to combinations of properties, and not to objects. This holds true also for sentences containing definite descriptions that do refer to a single concrete object of which, however, the speakers do not have any direct acquaintance or knowledge. Even in this case, the constituents of such a sentence refer to properties with which the speakers are directly (empirically) acquainted, and not to a particular object (either not existing or not directly known). A name refers to a concrete individual object (i.e., it is a logically proper name) only if the user of that name is directly acquainted with the named object.

In his *Tractatus logico-philosophicus*, L. Wittgenstein (1889–1951) accepts Russell's idea that names have a reference (either the object or the property that they name) but not a sense: The meaning of a name is its reference. Wittgenstein regards the propositions (i.e., any declarative expression) as the pictures of facts. A so-conceived proposition does have a sense, which coincides (following Frege) with its truth-conditions; this means that a proposition, if true, tells how things stand in reality (*Tractatus*, 4.022 and 4.024). Propositions have no reference, however, as they are not names, but pictures

(and do not refer to abstract realities like the Fregean Truth and Falsehood). Propositions have no reference since they are conceived as the sensible expression of a thought (*Tractatus*, 3.1), which, in turn, is understood as the "logical image" of a fact (*Tractatus*, 3). The semantic value of a proposition is given by its capability of displaying, of *exhibiting* the logical form of a fact or a state of affairs (*Tractatus*, 4.1), i.e., of showing the logical relations holding among the objects *or* properties denoted by the names compounding it. Such logical form is what grounds the structural unity of propositions, and in this way Wittgenstein adheres to Frege's compositionality principle by maintaining that a name has a meaning only within the configuration exhibited by the proposition (*Tractatus*, 3.3 and 3.4). A proposition is true if the picture it conveys corresponds to a real state of affairs (i.e., if the logical relations among its elements correspond to the logical relations among the real objects and properties referred to by those elements) and is false if such a correspondence fails (*Tractatus*, 2.222-3, 4.06 and 4.25). The sense of a false proposition is the (possible but unreal) fact that would obtain were the proposition true.

Wittgenstein maintains that the propositions of the ordinary language are logically well ordered as they are (*Tractatus*, 5.5563), but also that language masks the genuine thought and its properly logical form. Hence, "All philosophy is 'critique of language'" (*Tractatus*, 4.0031) having the task of removing the mask of ordinary language from the real logical form of thought. This statement is usually regarded as the debut of the "linguistic turn."

Meaning, Knowledge, and Ordinary Language

The doubts raised by Frege, Russell, and the *Tractatus* of Wittgenstein on many aspects of ordinary language ended up at the Logical Empiricists (or Logical Positivists). This group of scholars aimed at establishing a "Scientific World-Conception." In doing this, they assumed Wittgenstein's views according to which (1) the propositions of logic and mathematics are all tautologies (the "logical side" of the movement) and (2) the meaning of a (factual) proposition

coincides with the state of affairs occurring if the proposition is true (the "empirical side"). This latter point brings to the so-called verification principle. In the formulation of M. Schlick (1882–1936), the principle states that the meaning of a sentence is equivalent to the procedure for its verification (*Meaning and Verification*, 1936). Thus, the verification principle constitutes a criterion for partitioning linguistic expressions in meaningful and meaningless ones. Consequently, Logical Empiricists acknowledged only two classes of sentences as endowed with meaning: analytic propositions of mathematics and logic, and empirical propositions respecting the verification principle (essentially those of physics).

Logical empiricist R. Carnap (1891–1970) studied under Frege at Jena. His early works (*The Logical Structure of the World*, 1928 and *The Logical Syntax of Language*, 1934) can be regarded as an attempt at pursuing the program of building an artificial language suitable for translating scientific knowledge in absolute rigor. Carnap's philosophy underwent a maturation that progressively brought him to weaken both the unconditioned adhesion to the radical formulation of the verification principle – already evident in *Testability and Meaning*, 1936 – and the emphasis on reference at the expenses of sense – operated in *Meaning and Necessity*, 1947. To the Fregean dichotomy of sense and reference, he preferred the extension/intension one (first proposed by Leibniz). In *Meaning and Synonymy in Natural Languages* (1955), he spelled out a formal definition of the intension of a predicate (a point that Frege did not deal with explicitly) together with an operative criterion for ascertaining intensions in natural languages. The intension of a predicate Q for the speaker X (of a certain natural language L) is the general condition that and object y has to fulfill if X is ready to predicate Q of y (in L). In pleading the "intensional" thesis, Carnap argues that for ascertaining the intension that a subject attributes to a word, one should take into account not only existing cases (i.e., not only objects $y_1 \ldots y_n$ that actually exist) but also cases that are merely *possible*. This marks the abandonment of the verification principle as a strict criterion for meaning. This is relevant as far as a strictly referential (or "extensional") account (like Russell's) may be less able to deal with (scientific) theoretical entities (and their historical modifications) than an account attentive to intensions as well.

W. v. O. Quine (1908–2000) was a disciple of Carnap in the Unites States. Much of Carnap's later developments (those bringing to *Meaning and Necessity* and following works) are also due to the interactions with him. Quine's *Two Dogmas of Empiricism* (1951) attacks those that he arguably considers the two main assumptions of Empiricism: the neat distinction between analytic and synthetic truths (or sentences) and the possibility of reducing the meaning of any statement to "some logical construct upon terms which refer to immediate experience." What is mainly relevant here is that, in doing this, Quine develops a sharp critique to the very notion of meaning (i.e., to Frege's senses and Carnap's intensions). He states that any clear notion of meaning should be able to account for the *synonymy* of two expressions and for the *analyticity* of a proposition. Quine shows how any attempt at clarifying the notions of synonymy and analyticity are vitiated by unavoidable circularity, thus concluding that the very notion of meaning as conceived at that time is untenable.

In *Meaning and Translation* (1959), Quine pushes forth his critique to the notion of meaning in relation to the possibility of a "radical translation," i.e., a translation of a completely unknown language into one's own language only on the basis of the behavior displayed by the speakers of the unknown language and of the "immediate experiences" shared by the speakers and the translator. One of the main focuses is again on the notion of synonymy between expressions of those two (completely separated) languages. He concludes that, (1) without the background of an already interpreted language, the identification of the meanings of the unknown-language expressions is impossible and that, (2) once such previously interpreted language is admitted, the ascertainment of how much the translation is good becomes senseless (because a so-obtained translation actually turns out to be a re-moulding

of the unknown language in the translator's one). The radical translation trials our meanings and "discovers that they are nothing."

Quine is often taken as a supporter of a behavioristic attitude toward language. This is due to the fact the his radical translation admits as possible data only the empirical evidence immediately available to the speaker and the translator as well as the speaker's *behavior*, but not the speaker's mental states or conceptual categorizations. Indeed, Quine stresses that the *conceptual schemes* with which the speaker of the unknown language partitions the world are (1) not necessarily similar or compatible with the translator's ones and (2) not accessible at all to the translator. Quine is therefore convinced that the unavoidable background of any special language (artificial, jargonistic, scientific, etc.) is the natural language (which sets the basic conceptual schemes of the speakers). Thus, having such a crucial role, natural language has to be "regimented" to become a more and more useful tool for knowledge.

From Frege on, philosophy of language has almost exclusively focused on *declarative* statements. The approach to language of the Logical Empiricism implied reductionist aftermaths; among others, it excludes, in essence, all the discourses (such as metaphysics, ethics, theology, etc.) but the strictly scientific ones. Against such a strict and limited view of language reacted the *Philosophical Investigations* of the late Wittgenstein (published in 1953 but written mainly between 1941 and 1947). As mentioned, names' reference has a grounding role in the *Tractatus*. In the *Philosophical Investigations*, denotation no longer serves such an office (§§ 39–40), and the functions of language are no longer reduced to the descriptive one. Language is used for a variety of tasks and needs, and in a virtually infinite number of different contexts (§§ 10–14 and 23). The meaning of a linguistic expression, far from being reducible to its sense or its reference, is given by its uses (§ 43). Wittgenstein conceives these different uses as different "linguistic games" (§ 7). The notion of linguistic game conveys (at least) two important ideas in the *Investigations*: that of family resemblance and that of "rule-following." By noting

that there is not an "essence" common to all what is usually called a game, Wittgenstein claims that there is not even a single trait common to all the phenomena that we call "language" (§§ 65–67), but there are many family-resemblance relations linking aspects of some linguistic phenomena with aspects of other ones. The idea of language game brings with it the idea that any game is defined by some set of rules to be followed. However, the rules regulating the uses of language are not conceived as monolithic, exerting their control up to the finest details and fixed once for all, but leave margins for discretion and interpretation (§§ 85 and 185–187) and can be made up and modified "as we go along" (§ 83) in playing linguistic games. As pointed out by M. Beaney (in Hale and Wright (1997)), "Wittgenstein's doctrine that meaning is use and his conception of rule-following ... are inextricably linked" in the *practice* of language as a fundamental human activity. The rules of the linguistic games should not be searched outside the actual practice of those games. Such a practice has an unavoidably public and social dimension, as attested by Wittgenstein's renowned argument against the private language (especially in §§ 256–263; also § 202).

Wittgenstein's later works prompted a broad "discovery" of the multifaceted uses of daily linguistic practice, thus encouraging what is known as the "ordinary language philosophy." A first input in this direction came from *A Plea for Excuses* (1956/1957) by J. L. Austin (1911–1960), which regards language as the repository of all the connections and distinctions considered relevant in the course of many generations, thus attesting a priority of natural language on any attempt at building a "better language." Another key contribution (*How to Do Things with Words*, 1962 posthumous) is the acknowledgment of expressions that are not descriptive but "performative" in the sense that their utterances are not meant to merely describe something but aims at *doing* something (e.g., promising, ordering, etc.): These are linguistic *acts*. A second ordinary language philosopher is H. P. Grice (1913–1988); one of his merits is of having emphasized the notion of "intention" and

its relevance for philosophy of language (*Meaning*, 1957; *Utterer's Meaning and Intentions*, 1969). He attempted at explaining the notion of meaning in terms of the speaker's intentions: The meaning of an utterance is what the speaker intends to produce or effect with that utterance.

From Language to Cognition and Mind

Austin's linguistic acts and Grice's emphasis on intentions converge in the work of J. R. Searle (born 1932). In *Speech Acts* (Searle 1969), he points out that "speaking a language is engaging in a (highly complex) rule-governed behaviour." Soon after, he specifies that such behavior is *intentional* and follows the internal, mental states of the speakers (thus blocking any behavioristic wake). Indeed, what distinguishes something as linguistic, Searle claims, is its being produced with some kinds of intentions. Speech acts (i.e., making statements, asking questions, promising something, etc.) are "the basic or minimal units of linguistic communication." Each speech act has three compounding acts: an utterance act (the actual emission of sounds or marking of signs), a propositional act, and an *illocutory* act. The propositional act conveys the propositional content that essentially consists in reference and predication. Searle understands these terms diverging from "classical" views. For him, referential expression "serves to pick out or identify an 'object' or state of affairs apart from other objects or states of affairs." Predication is any expression somehow attached or attributed to the object or the state of affair identified by the reference. In this sense, both the assertion "John is coming" and the question "Is John coming?" convey the same propositional act. The illocutory act is what specifies the *mode* of the utterance act associated with the propositional act. It is possible to employ the same propositional act for performing different illocutory acts (such as asserting, asking, commanding, promising, etc.).

The theory of speech acts is a theory of meaning. An utterance means something to the extent to which the speaker intends to perform an illocutory act through that utterance; communication takes place when the hearer understands the illocutory act that the speaker intends to perform with its utterance. "On the speaker's side, saying something and meaning it are closely connected with intending to produce certain effects on the hearer. On the hearer's side, understanding the speaker's utterance is closely connected with recognising his intentions" (*Speech Acts*, p. 48). Any illocutory act has its "conditions of satisfaction," which may be seen as a broadening of the notion of truth-conditions for assertions: An illocutory act of assertion is satisfied if it turns out to be true, as well as a promise is satisfied if it is kept or an order if it is obeyed. The illocutory acts should not be conflated with the *perlocutory* act, i.e., the fourth dimension of a speech acts aimed at eliciting a *hearer*'s action, at inducing him to do something or to produce some effect *in his/her turn*. On this point, Searle sharpens Austin's positions by distinguishing the illocutory effect (which is the hearer's *understanding* of what the speaker intends and means) by the perlocutory effect (the *eliciting* of a hearer's action as a consequence of the illocutory effect). Illocutory acts are not always aimed at obtaining a perlocutory effect beyond the illocutory one.

Speech Acts represents an important development in contemporary philosophy of language. Its value, however, would be only partially appreciated if not related with Searle's theory of intentionality. In *Intentionality* (1983), Searle begins with clarifying the notion of "intentional state" by means of the intentions characterizing speech acts, but it soon becomes clear that intentionality is a presupposition for language and, more particularly, that speech acts are made possible by (psychological) intentional states. Searle assumes that intentional states (such as believing, hoping, blaming, disliking, etc.) are prior to speech acts (this assumption is held from both the evolutionary and the developmental standpoint, as well as at the level of the conditions of possibility). The crucial "disanalogy" between the two is that to perform a speech act one needs to *produce some physical entity* (a sound or a mark, etc.) which is not intrinsically intentional, whereas an intentional state is intrinsically intentional: "John couldn't mean that *p* [a speech act] unless

he was ... doing something *by means of which* he meant that *p*, whereas John can simply believe that *p* [an intentional state] without doing anything" (*Intentionality*, p. 29). The crucial question thus becomes how passing from intentional states to speech acts or, in other words, how the intentionality intrinsic to mental states may be passed to not-intrinsically intentional, external physical objects such as sounds or marks. Searle's answer is that "I impose intentionality on my utterances by intentionally conferring on them certain conditions of satisfaction that are the conditions of satisfaction of my psychological state" (*Intentionality*, p. 28).

N. Chomsky (born 1928) has given impressive contributions to linguistics; many of them do not leave philosophy of language indifferent. Reacting to both structuralist linguistics and the behavioristic approaches to language, he took an "internalist" view of the linguistic capability, thus maintaining that language is to be studied from the standpoint of the internal states of the individual. Famously, Chomsky also maintained that the "faculty of language" is innate (and genetically specified). The first reason for this conviction is that in acquiring a language, the stimuli that a child receives are by far insufficient for determining his rapid and punctual learning: "the child knows vastly more than experience has provided" (Chomsky (2000), p. 6). This may be grasped thanks to the Chomsky's distinction between the deep structure and the surface structure. The surface structure is the explicit hierarchical structure of the phrase's components as uttered by a speaker. The deep structure is the formal structure underlying the surface and is related to semantics and to the meaning of the phrase and its components. The deep structure produces the surface structure by means of grammatical transformations (which are mental and abstract operations) on the semantic components of the phrase. Phrases with very similar surface structures may convey quite different meanings that depend on different deep structures. The surface structure not always indicates the deep relations among the constituents of a phrase and "is misleading and uninformative" with respect to the properties of the "deep structure" required for

linguistic competence (Chomsky (2006), p. 33). This brought Chomsky to introduce the idea of an innate "Universal Grammar" constituting the core structure of the grammars of any particular human language: a complex system of rules underlying any grammatical construct. The Universal Grammar was meant as an innate "language acquisition device" indispensable to bring from the limited experiential input (provided by surface structures) to the acquisition of a language (as well as the mastery of deep structures and related grammatical transformations).

Chomsky's program underwent significant revision in the 1980s and 1990s. The idea of an innate set of grammatical rules was abandoned in favor of the idea of an innate *disposition* to acquire a language. This revision brought to the so-called Principles and Parameters approach, which postulates the existence of a network of general principles for language that leave undetermined a number of parameters. The specification of these parameters depends on the specifics of the developmental process of language acquisition (thus determining the particular first language acquired). Such approach has further distilled the so-called Minimalist Program, in which the principles of language are assumed to be unique to the human cognitive system but, at the same time, to be embedded in a complex cognitive system with (many) other subsystems. One of the aims of the Minimalist Program is to ascertain the relations between the principles of language and the characters of the other cognitive subsystems.

Chomsky and Searle may be seen as representing a shift of focus in the study of language where the *analysis* of meaning hand over the priority to the *production* of meaning and its underlying cognitive processes.

Philosophy of Language and "Science and Religion"

Language and the Natural Sciences

Language, especially if regarded as "production of meaning" requires to be studied as inserted in the broader context of the vast array of human cognitive faculties. Contemporary scientific research lines provide crucial insights in such

cognitive faculties, their anatomical substrates and their evolutionary origins. Few insights in such a direction are worth be mentioned here.

To begin with, Chomsky's follower D. Bickerton pointed out the relevance of the evolutionary origin of language for the proper understanding of such a faculty. Evolutionary biology (already at the time of C. Darwin himself) treats the phylogenetic processes that brought to *Homo sapiens*. Nowadays, research in scientific anthropology and *Homo* evolution provides further insights in the evolutionary processes leading to human language. There is mounting evidence that language evolution is strictly linked with another key (and peculiar) human cognitive ability: tool making and using. In particular, language could be coevolved together with the cultural transmission of tool making procedures within social groups. (The interested reader may refer to Nowak and colleagues' 2002 *Nature* paper; Corballis' *From Hand to Mouth*, 2002; Cela-Conde and Ayala's *Human Evolution*, 2007; D. Normile 2012 *Science* article).

Additional evidence for the connection between language and tool using/making comes from the cognitive development of infants. Language acquisition and learning to use objects as tools happen during the second year of human life according to parallel stages and depending on the available environmental and social stimuli. Such developmental studies (which may be traced back to J. Piaget's works) help complementing the Chomskyan "innatist" view. It could be maintained that human being possesses innate neurological and anatomical structures indispensable for language; however, stimuli coming from the children's social environment are as much crucial for acquiring language, thus suggesting that language acquisition is a biological *and cultural* process.

Cognitive neuroscience provides further insights in the matter. A recent burst in "neurolinguistics" research stems from the discovery of "mirror neurons." G. Rizzolatti and his group at the University of Parma (Italy) found a special kind of neurons in the area F5 of the macaque monkey that are activated both when the monkey executes an action and when it observes a similar action performed by another monkey or by the experimenter (hence, "mirror" neurons). Successive research ascertained that an analogous system matching observation and execution of hand grasping movements exists also in the human brain and includes Broca's area. This area is since long known to be involved in language production and in processing grammatical or syntactical aspects. Moreover, Broca's area is specifically activated both in naming and in observing tools. The involvement of this area both in language and in the mirror system for action recognition prompted the formulation of the "Mirror System Hypothesis" aiming at suggesting that the mirror system in the Broca's area might provide a bridge between the ability of learning gestures and the present-day human linguistic abilities. (The interested reader may refer to M. Arbib's "From monkey-like action recognition to human language," *Behavioral and Brain Science*, 2005, no. 28).

Language and Anthropology

Tool using/making is certainly distinct from language in many respects. However, besides the connections between language and tool making envisaged in the previous section from the standpoint of some current scientific research line, these two activities have many other analogies too (Auletta (2011), Chaps. 19 and 23). Both are intentional and goal related. Both display a certain detachment from the immediately present reality (man-made tools have no obvious analogue in natural objects and language may convey meanings with no representational counterpart – e.g., notions like infinity and imaginary numbers, and even virtue or God). Syntactic and hierarchical organization is evident for language, but it is also required for complex tool making procedures requiring the planning and coordination of several steps. Both language and tool making (or, more generally, "technology") are fundamental dimensions of human culture. This suggests that tool making and language share fundamental traits of the *symbolic* faculty. Language, however, is the higher manifestation of such symbolic capability. It is difficult to

conceive symbolic thinking without any form of language. Indeed, symbolic capabilities not only need specific anatomical and physiological characters and cognitive faculties but also the possibility of combining external physical items: Typically, phonemes and graphemes are items of such a kind.

From this perspective, philosophy of language assumes a specific relevance for "science and religion." Indeed, questions concerning the human being (the status of the human person, his nature, and his position in the universe) are central to such a field of investigation. Language, in its connections with the symbolic capability and with human culture, is to be considered one of the peculiarities characterizing the human being. Therefore, the philosophical investigations on language, especially if enriched by current scientific findings, play a central role in understanding the nature of human being, thus contributing to the (philosophical and theological) anthropological research.

Cross-References

▶ Biological Anthropology and Human Ethology
▶ Developmental Psychology
▶ Meaning, The Concept of
▶ Philosophy of Mind
▶ Philosophy of Science
▶ Physical Anthropology (Paleoanthropology)
▶ Semantics
▶ Speech
▶ Truth

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Philosophy of Mind

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Description

Philosophy of mind is a branch of philosophy primarily dedicated to analyzing conceptual and metaphysical issues regarding categories of mind, soul, self, representation, intentionality, thinking, consciousness, self-consciousness, and emotion. Although philosophy of mind is properly understood as a branch of philosophy, it is closely connected to psychology and other cognate disciplines in the cognitive sciences. Historically, philosophy of mind has roots in the writings of Plato and Aristotle, both of whom put forward theories of the human person and made distinct proposals concerning the nature and characteristics of the soul (*psyche*). In the early modern period (seventeenth to eighteenth centuries), philosophers showed new interest in questions pertaining to philosophy of mind, much of this work reacting to the original proposals of René Descartes, who argued that mind and body are distinct substances, with the mind described as a non-extended thinking thing, distinct from the mechanical operations of the body. Interest in the primary questions of the philosophy of mind as now understood waned during the nineteenth and early twentieth centuries but resumed shortly after the 1949 publication of Gilbert Ryle's *The Concept of Mind* (Ryle 1949).

Ryle famously mocked Descartes' mind-body dualism as a "ghost in the machine." Since Ryle, philosophy of mind has been primarily preoccupied with providing accounts of the reality and relation of psychological properties within the framework of philosophical naturalism. Early work focused on explaining the content and character of mental representations as well as the basic question of the relation of mind and brain. By the mid-1980s, consciousness became a major category of theorizing and reflection. More recent work has included understanding the relation of emotion and cognition as well as the concept of self with respect to the environment and new technologies.

Self-identification

Science

Generally speaking, philosophy of mind does not consider itself a science but rather a branch of philosophy. Despite this, the distinction between philosophy of mind and related areas in the sciences (psychology, cognitive neuroscience, artificial intelligence) is not very sharp, and some philosophers of mind have published articles in scientific journals, collaborated with scientists, or engaged directly in scientific research. Specific philosophical theories of mind have on occasion strongly influenced scientific practice, and scientific theories and experiments have historically been of considerable importance for the philosophy of mind.

Characteristics

Philosophy of mind is distinguished from other branches of philosophy by its subject matter, although there are inevitable overlaps between different subdisciplines (e.g., theories in moral philosophy or political philosophy may rely on claims about human nature that intersect with theories in the philosophy of mind). Although important overlap exists between philosophy of mind and related fields in the sciences, philosophy of mind is distinctive in its emphasis on metaphysical, logical, and conceptual questions, rather than on empirical research.

Relevance to Science and Religion

Philosophers of mind have shown very little interest in religion in general or in the relation of science and religion. Because most philosophers of mind embrace philosophical naturalism, they are skeptical of religious theorizing about the human person that invokes supernatural categories, which they will point out tend to suffer from important evidential objections as well. Not all philosophers of mind are philosophical naturalists however, and so individual philosophers of mind may have an interest in science and religion issues, whether or not these are seen to pertain to their work in the philosophy of mind. In addition, the recent development of the new field of cognitive science of religion has drawn the attention of some philosophers of mind (e.g., Daniel Dennett), where the aim is to use the tools of cognitive science to explain why people hold to religious beliefs.

Sources of Authority

Categories of reason, logic, and empirical evidence are the primary sources of authority for philosophy of mind. When study of philosophy of mind reemerged in the mid-twentieth century, the primary influences were those of Anglo-American analytic philosophy and the work of Ludwig Wittgenstein. Although references were made to empirical data, the primary considerations were perceived to be logical and rational, clarifying the meaning of concepts and their implications. More recent philosophy of mind continues to employ this approach, but significant strands are importantly influenced by empirical data. More controversial are the roles of introspection and thought experiments, both of which are widely utilized but also much criticized.

Ethical Principles

The ethical principles of philosophy of mind are those that pertain to academic publication and discourse generally. There is no separate philosophy of mind society and no distinct code of ethics. Philosophers that do engage in empirical research are expected to abide by the standards of the relevant empirical disciplines they are participating in, including ethical guidelines for the treatment of animal and human subjects.

Key Values

Key values of the discipline are those generally found in academic professions, a concern to expand our knowledge and understanding of the world and ourselves. Clarity and precision is highly valued as well as original insight and the ability to bring a fresh perspective to interesting problems. Beyond this, individual values of individual philosophers may, and do, vary greatly.

Conceptualization

Nature/World

Philosophy of mind does not directly engage in defining or conceptualizing the categories of nature and world, although such conceptualizations inform the approach to research, the questions asked, and, to some extent, the answers given. Since most philosophers of mind are philosophical naturalists, the primary conceptualization of the world is in the terms that philosophical naturalism expresses. Since philosophy of mind is closely connected with cognitive science, the categories of science are important for interpreting what counts as natural. An important task of the philosophy of mind is coming to an understanding of the ontological character and status of mental properties and, more generally, the realities explored by the cognitive sciences generally. On this issue, there is considerable disagreement.

Human Being

There is no one theory of human beings put forth by the philosophy of mind. Rather, the philosophy of mind is centrally engaged in exploring the nature of human beings and, to a lesser extent, other cognizing creatures. Contemporary philosophers of mind bring an array of insights, models, and metaphors to understand human persons. Since most philosophers of mind reject any form of substance/supernatural dualism, the primary understanding of human beings is as purely natural creatures, sharing an evolutionary origin with the rest of life on the planet. Thus, the mind just is the brain or at least is realized in the brain in the context of body and environment. Philosophy of mind continues to be significantly influenced by information processing models of mental activity. Although earlier work was inspired by the relatively new advent of digital computers and the theory of computation underlying them, contemporary philosophy of mind is more inclined to speak of information processing in terms of parallel distributed processing and/or neural networks. Beyond this point, positions in philosophy of mind become more difficult to generalize. Philosophers of mind have historically attempted to take the vocabulary of our folk psychology, using terms such as thought, representation, emotion, and self and either clarify their meaning, provide them with some broader theoretical underpinning, or, in some cases, do away with them completely in hopes of finding a better alternative. In this theorizing, the cognitive sciences play an important but not necessarily determinative role.

Life and Death

Questions of life and death tend to be peripheral to the philosophy of mind but are not completely absent. Although philosophy of mind is not centrally concerned with definitions of life, its concern with definitions of mental properties such as thinking and consciousness lends some relevance to this task. Philosophers of mind have extensively explored to what extent computers or robots might be said to think or be conscious, and this is true to a somewhat lesser extent with animals, cellular automata, and possible alien

intelligence. Philosophy of mind can also have some relevance to debates about abortion in moral philosophy, since some arguments depend on claims made regarding the personhood of the fetus, and these in turn can rely on claims about when a fetus or infant can be said to think, be conscious, or experience pain. Similarly, philosophy of mind can also be of relevance to debates concerning euthanasia, especially those cases that involve claims about brain death, vegetative states, and the loss of personhood due to degenerative brain disease, stroke, or injury. An extensive literature in the philosophy of mind deals with the concept of self and continuity of the self, which relates strongly to the conceptualization of death and the possibility of an afterlife. An information processing model of the mind can be suggestive of the possibility of connecting brains to computers and, speculatively, replacing brain tissue with computer chips or even downloading the contents of one's self to a computer or robot.

Reality

A central question in the philosophy of mind is how to categorize the reality of mental properties, which seem prima facie problematic from the viewpoint of philosophical naturalism. Broadly speaking, mental properties may be understood to be either nonexistent or useful fictions, they may be understood to be identical with physical properties, or they may be understood to be realized in physical properties but not identical with any one set or configuration of physical properties (token identity) or real but not identical with physical properties at all, in which case some form of strong emergence or substance dualism would be entailed (Hasker 2001). There exists an extensive philosophical literature on how to characterize qualia (the qualitative contents of consciousness, e.g., the redness of a rose) and the extent to which they can be considered real and physically realizable.

Knowledge

Philosophy of mind approaches knowledge as a feature of cognition. Human beings know, and this knowledge is made possible by the interactions of the brain with the body and its environment. As such, philosophy of mind is partially concerned with characterizing how its perceptions give rise to belief, how these beliefs are stored, and how knowledge is retrieved and utilized. In contemporary philosophy of mind, theories of knowledge may be deeply informed by discoveries and theories in cognitive science, as well as by preexisting philosophical commitments as to what counts as knowledge. Central issues may involve the relationship between knowledge and conscious representation, knowledge and language, and the relation of knowledge to categories of belief, memory, and understanding.

Truth

Philosophy of mind does not centrally engage in theories of truth, though it is informed by such theories and, as in the case of knowledge, may also inquire as to how truth is represented in a particular philosophical theory of mind. The tendency of philosophers of mind is to be realist in their orientation and to hold to either a correspondence or coherence theory of truth. In this respect, philosophers of mind's attitudes toward epistemological questions are sometimes closer to those of scientists in the cognitive sciences than to those in some other branches of philosophy.

Perception

Theories of perception have been of historical and continuing importance to the philosophy of mind, although that role has changed over time. Early modern empiricists such as John Locke were centrally concerned to provide theories of perception in order to provide a solid basis for a theory of knowledge. By the end of the twentieth century, the empirical study of perception had been largely taken over by psychology and neuroscience, which made significant advancements during this time. The data from this work, however, continues to play an important role in thinking about consciousness, representation, and intentionality. While there is broad agreement on key points in psychology and neuroscience, significant disagreement remains on those issues at the heart of philosophy of mind.

Time

Time has not been a central category for the philosophy of mind, although one area of interest has been the subjective experience of the flow of time and how temporal relations are processed by the human subject.

Consciousness

Consciousness as a separate category of philosophical reflection can be found in the writings of René Descartes and the philosophers of the seventeenth and eighteenth centuries who were influenced by or reacting to the claims made by Descartes. When renewed interest in the philosophy of mind began in the mid-twentieth century, theorizing about consciousness was conspicuously absent, likely due to the fact that the dominant philosophical and psychological approaches of the time were either indifferent or actively hostile to consideration of consciousness as a distinct kind of problem. Only by the time of the 1980s did it become increasingly acceptable to theorize explicitly about consciousness, and the 1990s saw widespread publication and consideration of consciousness.

An initial problem is being clear about what consciousness is, with most definitions having a kind of circularity to them, so that consciousness is described as subjective awareness, or the ability to have experience at all, or even the quality that is lost when one falls asleep. Definitional issues are connected to relational ones. Conceptually, consciousness seems like it should be linked to other psychological categories such as perception, thought, representation, and self-consciousness, yet consciousness does not seem to be identical with any one of these; for some philosophers, it seems possible that one can be conscious but unable to see, one can be conscious but not capable of thought, and so on. This difficulty of defining consciousness and stating its relation to other mental properties has led some philosophers to suggest that the concept of consciousness is either not intelligible or must be defined differently.

Granting that there is such a thing as consciousness, a major issue has been the ability of the physical sciences and, more generally, a philosophically naturalistic philosophy to provide an adequate explanation of consciousness (Flanagan 2003). Explanations generally take one of four forms. The first is to assert that there is no problem at all and that consciousness is at best a useful fiction. Eliminative materialists argue that consciousness is one of those terms that derive from a prescientific folk psychology and that, as science advances, we should expect our existing folk psychology vocabulary to be gradually replaced by a scientific one. A second approach is to affirm the existence and reality of consciousness and mental properties in general but to assert that the properties are realized or supervenient on physical ones. A dualism is affirmed in this case, but it is a property dualism, rather than substance dualism. On these accounts, it is not unusual to affirm a token identity – any given mental event just is a physical event – but not type identity: consciousness cannot be identified with just one kind of physical structure, because of the multiple, perhaps infinite ways, that consciousness can be realized in the physical (in human brains, in chimpanzee brains, in robot brains, etc.). This form of dualism is understood to be non-reductive in the sense that the reality of consciousness is affirmed (it is not eliminated by reducing it to its constituents) but still physicalist, as it denies that there is any separate substance that constitutes consciousness and mental properties. Despite the attractiveness of this approach for many philosophers of mind, it has drawn sharp objections over the years, with a major line of argument being that property dualisms, relying as they do on information processing models of cognition, cannot adequately account for the qualitative richness (often referred to as qualia) of conscious experience and perception (Chalmers 1997).

The third route is to give up on existing physicalist models. One option is to argue that the answer to the explanation of consciousness lies at the level of physics, either in quantum mechanics or in some new theory yet to be discovered, a line of argument that has been prominently put forward by physicist Roger Penrose, among others. Similarly, advocates of what is called strong emergence argue for emergent properties

or realities that emerge only under specific conditions. Barring the success of either of these approaches, the only alternative would seem to be to return to a substance dualism, which continues to hold a small number of advocates. The seeming intractability of providing a satisfactory explanation of consciousness has led some to conclude that the problem is in fact unsolvable, perhaps because we lack the very cognitive resources to achieve a sufficient level of understanding. These new mysterians thus express some degree of skepticism about the whole enterprise of the philosophy of mind.

Rationality/Reason

Like consciousness, rationality is of considerable importance to the philosophy of mind, as the two are not infrequently linked. This linkage is found already in Descartes' *Discourse on Method*, where he argues that the presence of reason and language are signs of consciousness, and since animals allegedly do not show signs of either, other animals do not possess conscious awareness. The study of rationality leads further to the question of what exactly rationality consists in, as it is strongly related to concepts such as learning, logic, intelligence, insight, memory, understanding, and even less obvious concepts such as representation. Each of these represents separate areas of inquiry and debate, although the concepts are clearly linked. Underlying much of the philosophy of mind literature is an information processing model of cognition, understood either literally or metaphorically from existing models in the computational sciences. Some early philosophers of mind took the digital computer (a Turing machine) as a straightforward model, but as it has become clear that the human brain does not resemble a digital computer, models employing parallel distributed processing and neural networks have been employed (Churchland 1996). Even so, the model of the digital computer retains appeal because of its apparent similarity to the serial quality of conscious thought, and so philosopher Daniel Dennett has spoken of a virtual Turing machine that is realized in conscious thought processes (Dennett 1991).

Although rationality would seem to be inextricably linked with consciousness, it is commonplace to speak of the cognitive unconscious, as evidence from neuroscience and psychology shows that a great deal of information processing appears to go on in the brain below the level of conscious awareness. Although the cognitive unconscious of modern psychology is not the same as Sigmund Freud's conception of the unconscious, there are strong parallels, even though much of Freud's theorizing has very weak empirical support.

Two continuing areas of interest and controversy address how rationality is embodied and the question of mental causation. Beginning with the work of Noam Chomsky, one strand of thought among philosophers of mind, linguists, and psychologists has been to argue for a modular understanding of human rationality. In the case of language, it has been proposed that there exists a separate language module, located either in a specific area of the brain or in a coordinated set of areas, that explains the ease with which human beings are able to learn languages, an ability not shared with other species. This thesis has since been expanded to account for the variety of forms of reasoning that human beings are capable of engaging in as well as to explain why we seem to be particularly good at some reasoning tasks but not others. Contrasting with this approach is one that emphasizes the unitive character of rationality, which sees the different cognitive abilities of human beings as deeply connected in a single system.

The question of mental causation addresses a very different concern, which is whether and to what extent we can be said to be responsible for the thoughts that we have and whether in turn our thoughts can be said to have any causal power in the physical world. This issue is closely related to that of the issue of consciousness and the theories employed to explain consciousness. If physicalism is true, then it follows that consciousness and rationality are properties that emerge from and are supervenient on the physical. On a standard philosophical naturalist account, the world at the level of the physical is causally closed: for any given event, there is a physical explanation,

a physical cause or set of causes, for that event. But if mental properties supervene on physical properties, the question arises as to how mental properties could be said to cause anything, since a causal explanation is already provided by the physical. Accordingly, it is not thoughts that cause other thoughts, but rather the physical events underlying them, and if our thoughts do not have any causal relation to one another, it follows that there is no basis to have confidence that any of our thoughts, our reasons, are true (Kim 2000). For this reason, theories of consciousness tend to also be theories of rationality, and the problems that arise for how consciousness may be physically realized also arise for rationality.

It is important to note that while theories of rationality tend to be focused on human rationality, they also have important implications for how we think both of animal rationality and also the possibility of genuine artificial intelligence. As already observed, Descartes rejected the claim that other animals are capable of rational thought, but this view has been rendered considerably difficult by the now extensive data available on the cognitive abilities of other animals, especially social mammals. There also exists an extensive literature on the possibility of artificial intelligence. Although this literature directly addresses the possibility of computer or robot thought and consciousness, it not infrequently serves as a testing ground for what we mean by words such as consciousness, thought, and learning, for if computers can be said to think, it would suggest that we ourselves are but sophisticated, biological computers.

Mystery

Mystery does not typically occur as a central concern for the philosophy of mind, although it has been invoked by "new mysterians" who argue that the phenomenon of consciousness is beyond human grasp, and so genuine self-knowledge is impossible. This label is possibly misleading, however, since the new mysterians generally share the physicalist convictions of their opponents, differing only in their explanatory optimism.

Relevant Themes

Free Will: Although arguments and theories regarding the freedom of the will have not been part of the philosophy of mind proper, theories and arguments occurring in the philosophy of mind can have strong implications for conceptions of free will.

Emotion: It is only more recently that emotion as a category has been the subject of examination within the philosophy of mind, paralleling an increase in interest in related areas of cognitive science. This is partly due to a long-standing view in the history of philosophy that saw the emotions as subordinate to reason and grounded more in the body than in the mind, the effect of which was largely to cloud the ability to think. More recent theories engage the relation of biology and culture in understanding emotions, whether the human emotional repertoire is universal or culture specific, and by theories that examine the positive role of the emotions in reasoning and even as the result of rational processes themselves.

Ethics: The study of ethics is separate from the philosophy of mind, but some philosophers of mind apply current theories to issues in ethics. Theories in philosophy of mind can have clear implications for issues such as moral responsibility and agency, as well as specific issues in applied ethics, including abortion, euthanasia, and animal rights.

Cross-References

▶ Functionalism

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Philosophy of Organism

▶ Process Theology

Philosophy of Religion

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Related Terms

Religious beliefs and philosophy

Introduction

In the brilliant book *The Little Prince* (1946) by the French author Antoine de Saint-Exupéry, the author claims, in the voice of the little Prince, that children ought to have a lot of patience with grown-ups. If, for example, the little Prince tells grown-up persons what is the proof of his existence, that is, that he laughs and that he wishes to have a lamb, they shudder. But if the little Prince tells them about his origin in the language of numbers and facts – then they believe him. The conclusion to be drawn, the little Prince argues, is that those who understand life do not care for numbers.

Hence, we may ask whether a person dedicated to philosophy is claiming to understand life according to the little Prince or according to grown-up persons and their interest in number and facts.

Description

Philosophy of religion as a wisdom, therapy, or way of life is dated back to antiquity and the Greeks. The cradle of our history and culture, also when it comes to philosophy of religion, are the three important philosophers, *Socrates* (470 BCE–399 BCE), *Plato* (427 BCE–347 BCE), and *Aristotle* (384 BCE–322 BCE). But there are also several philosophical schools like the Stoics, the Epicureans, for example, that are crucial in the history of the philosophy of religion. We are still nourished from these wells whether we are philosophers or philosophers of religion. However, the way our questions have been formulated has developed from *why*-issues (the questions of origins) to *how*-issues (the questions of how things are connected) to issues of meaning (what does something mean?). By the help of these questioning words we can perceive important changes in interests and topics.

Contemporary philosophy of religion is a branch of philosophy but involves all main areas of philosophy: epistemology, ethics, logic, metaphysics, philosophy of history, language, law and politics, science and sociology, phenomenology, existential philosophy, etc. Philosophy of religion is founded on a long history of Western philosophical thought (Quinn and Taliaferro 2002). Philosophy of religion is not the same as philosophical theology which concerns using philosophical tools within a theistic perspective. Philosophical theology is often referred to as *faith seeking understanding* (Quinn and Taliaferro 2002). Furthermore, philosophy of religion is neither religious philosophy nor a philosophical religion (Dalferth 2000). Philosophy of religion is not a religious enterprise at all. However, the core of the academic discipline has changed over time. The most important change is perhaps the shift from philosophizing

about God to philosophizing about religion. This was a concern for G.W.F Hegel, who complained that "[...] we at least hear much talk [...] about religion, and therefore all the less about God Himself" (Hegel 1962 [1832]; Westphal 2002). Nevertheless, Westphal writes, "it is ironic that we owe to him more than to anyone else the notion that there is a subdivision of philosophy called the philosophy of religion, that he develops this in his *Lectures on the Philosophy of Religion*, [...]" (Westpahl 2002). Hegel's lectures consisted in three parts: firstly, on "The concept of religion"; secondly, "determinate religion"; and lastly, "Consummate Religion."

Contemporary philosophy of religion does not belong to any specific religious tradition. It has to be pursued as investigations independent of confession or specific ways of doing religion. A philosopher of religion writes *about* religion but needs not to have any bond to specific religious interests or practices. This implies the following about the philosophy of religion:

1. It is *normative*, which means that religions and their secular equivalents are not only subject to description but also to critical examination.
2. It is *pluralistic*, which implies that all religions, new as well as old, are studied by philosophers of religion.
3. It is *non-confessional*, implying that the philosopher of religion does not need to have any bond to the religion (or secular equivalent) he or she is studying.
4. It is *anti-confessional*, in the meaning that philosophy of religion would dictate that the philosopher may not share the belief he or she studies.

The task is to reflect upon what distinguishes and defines religion and religious phenomenon. A central question is the criteria of what is "religious" in comparison to what is considered to be "social" and "cultural." Another related question is how religious experience differs from experience in general. Hence, the method of philosophy of religion consists in both conceptual and contextual analyses (semantic and hermeneutic tasks) as well as argumentative analyses (epistemological tasks). Philosophers of religion

may use work in other areas of philosophy such as metaphysics, ethics, philosophy of mind, logics, and so on (see above) to address the philosophical problems of their own subject matter (Quinn and Taliaferro 2002).

In such a matter, philosophy of religion seeks to find reasonable and acceptable ways of reflecting upon and talking about what is supposed to be of divine nature, and secondly, to discuss critically those assumptions that are already made. To *what* and to *whom* do these propositions refer, which claims do refer to the divine? Even though *epistemological* (is belief in God justified, is it rational to belief in God?) and *ontological* (is there a reality independent of the human mind?) questions are still in the foreground within the discipline the last 20 years have meant an interesting change in interests, due to, among other things, a linguistic turn. Questions are raised such as, do religious propositions or sentences refer to something beyond what we see and if so, to what?

Contemporary philosophy of religion is not without tensions. Indeed, four tensions can be identified: firstly, the tension that is a consequence of a meeting between religion and philosophy taking place; secondly, the tension consisting of philosophy of religion working with classical questions while at the same time reflect upon its own identity; thirdly, the tension due to the character of the discipline itself, namely, it operates with time and eternity, what is final and what is not; fourthly, the tension resulting from the discipline being to a certain extent ahistorical while the questions at the same time often are of historical origin.

Philosophy of religion is not static. The linguistic turn, the influences from postmodern and feminist thinking, the influence of the advances of science (neuroscience, cognitive science, microbiology, quantum physics), as well as a newborn interest for existential questions have opened up the discipline to new questions about life and society and interdisciplinary collaborations. Taken together, these tendencies imply a critical attitude to what assumptions that have been considered authoritative and to any unquestioned claims about truth and objectivity.

Different approaches influence and create new ways of questioning reality, knowledge, language, truth, and the meaning of life. Even though we have new questions and perspectives, the old ones are yet not to be forgotten. What keeps philosophy of religion together as a scholarly field, of time and change, is the theoretical attitude, the ability to argue and the continuous questioning and analysis of how a religious reality might be perceived and described.

Self-identification

Science

Philosophy of religion is related to the sciences due to contemporary philosophers of religion taking part in the debate of science and religion. The sciences they relate to both belong to the natural (e.g., neuroscience, evolutionary biology, and physics) as well as to the social sciences (e.g., sociology, anthropology, and psychology). Philosophers of religion may also take part in interdisciplinary research groups of which scientific disciplines take part. Typically, the philosopher of religion will engage in a critical conceptual and contextual analysis of the study or experiments, results and conclusions drawn by scientists studying religious phenomena and practices.

Religion

Philosophy of religion is a discipline that studies religions with critical methods (be it an analytic philosophical, a phenomenological, or continental philosophical method).

Characteristics

Firstly, as mentioned above, philosophy of religion is a branch of philosophy but involves all the main areas of philosophy. Secondly, it is distinctive among the other areas of philosophy because of its subject matters of study which enclose everything that concerns the question *what it is to be a human being?*

Relevance to Science and Religion

See also section Self-identification above. Philosophers have always been interested in natural, psychological, and social/political phenomena. Philosophers of religion became especially engaged with science when Charles Darwin's *The Origin of Species* was published 1859. The argument that every species is a development from previous species, which clearly implies that humans could have evolved from earlier and different forms of life, changed the way of thinking about life, including religion drastically. In *What is Darwinism*, 1874, the perhaps most influential theologian of the Princeton Theological Seminary of that time, Charles Hodge, wrote "In using the expression Natural Selection, Mr. Darwin intends to exclude design, or final Cause" (Livinstone 2001). The problem was that Darwinism was not only in conflict with Christianity but also with Natural Religion defended by Paley and others. The philosophical problem can be framed as *can two such conflicting be related and if so, how, at what price*? Even though the debate is still alive, contemporary philosophers of religion have other scientific fields of interest. Indeed, thanks to modern scientific technology, scientists, not least neuroscientists, have the possibility to study human phenomena that before were only discussed on the philosophers' tables, e.g., consciousness, free will, and religious experiences to name a few, but also gene manipulation, stem cell transplantations, cloning, etc. are subject to analyze by the philosophers of religion. Philosophers of religion also critically analyze fundamentalistic views such as ▶ fundamentalism itself, ▶ creationism, ▶ intelligent design on the religious side, and different types of ▶ scientism on the scientific side.

Sources of Authority

There are many authorities, however, of great importance for contemporary philosophy of religion.

Logical Positivism or the Vienna Circle. The members of the circle were Moritz Schlick

(1882–1936), Otto Neurath (1882–1945), Herbert Feigl (1902–1988), Rudolf Carnap (1891–1970), Kurt Gödel (1906–1978), Friedrich Waisman (1896–1959), and Hans Reichenbach (1891–1953) and A. J. Ayer (1910–1989) as one of its foremost advocates in the English-speaking world. Ludwig Wittgenstein was invited by Schlick but did not become a member of the circle. What makes this source authoritative? Even if they all had different views, the main impact on philosophy of religion was to challenge the *meaningfulness* or religious language. This view became the source for dismissing metaphysics, theology, and religion as systems that make statements which cannot be verified. Perhaps the best known contemporary philosopher of religion endorsing this view is *Don Cupitt* who defends "anti-realism."

Ludwig Wittgenstein (1889–1951). His idea of philosophy was that it should not involve explanation. Philosophy should be principally a contemplative activity. Perhaps the best know philosopher of religion following in Wittgenstein's footprints is the late Dewi Zephaniah Philips (1934–2006). Philips opposed to both skeptics dismissing religious beliefs as meaningless and apologetics trying to demonstrate the existence of God in different ways. To him, the task of a philosopher of religion is primary to help understand religion.

Feminism: It was a reaction against the dominance of men designing philosophy (of religion) during the seventeenth to nineteenth centuries. As Appelros argues in the present encyclopedia, "[The] emergence [of ► feminist philosophy of religion] as a sub-discipline in its own right is fairly recent. For several reasons feminist philosophical reflections on religion took place within departments of theology and religious studies long before they reached the departments of philosophy, where neither religion, nor gender were in high priority. Eventually feminist philosophers began interesting themselves in the subject of religion, in spite of feminism's in general critical stance towards religion, largely identifying religion with patriarchal oppressive systems. Also the need rose within feminist theology for more philosophically stringent work."

Ethical Principles

There are no distinctive ethical principles that are unique to philosophy of religion.

Key Values

Its broadness.

Conceptualization

Nature/World

God stands over nature: The classical view that God created nature and sustains it. This view can be dualistic in essence or dualistic in propositions. This view also reflects classical theism.

God and nature are one: This view is related to pantheistic religions, such as Buddhism, but has also influenced Western philosophers such as, for example, Baruch Spinoza (1632–1677), who saw all material to be parts of God. There are three main understandings of pantheism: (1) God is everything and everything is God (Owen 1971). (2) Everything that exists constitutes a unity and this all-inclusive unity is in some sense divine (MacIntyre 1967). (3) Every existing entity is, only one being. All other forms of reality are either modes (or appearances) of it or identical with it (Owen 1971).

God as in-and-above nature: It is a panentheistic view and a view today defended by many contemporary philosophers of religion. The term was coined by Karl C. F. Krause (1781–1832). One view is that the universe is the body of God but God's awareness is greater than the sum of all the parts of the universe. All parts have some degree of freedom in cocreation with God.

Human Being

Philosophers of religion do not define human being but ask questions about what it is to be a human being. Is a human being different from other species, why or why not and in what sense? What does it mean to be a person? Also the question of ► free will is important in this connection. Do humans possess free will? If so, do

they posses this capacity entirely or partly and in what sense? Similarly, is there a difference between human ▶ empathy compared to other animal-empathy? How to understand human culture, religion, societies? Is human language unique or just a part of evolution open to other species? What does it mean to be conscious and to possess self-consciousness?

Life and Death

Because religions have their specific doctrines concerned with life and death, philosophers of religion investigate such assumptions. Most religions (if not all) have a doctrine that secures life after death in one or another way. Some claim that a physical resurrection will take place, others maintain that it is the soul, not the body that continues in eternity, and yet others see life after death as a part of natural processes in the sense that energy cannot be destroyed, hence, all life is energy, all life continues in one or another natural manner. Again others argue that immortality is to be found in the memory of others. Typically for philosophy of religion, these views are studied by way of conceptual and contextual analyses.

Reality

Earlier most philosophers of religion were occupied with ontological and metaphysical questions, which meant, how the world was created, how religion was "invented" and which reality is real. Metaphysics do no longer dominate the scene in the same way as before. But ontology is still gaining attention. Significantly, the ontological questions do not only focus on the metaphysical reality alone any longer; but around the existential situation and context of the human being. For a broad explanation on reality within philosophy of religion see the entries on ▶ realism by Eberhard Herrmann and Kees Van Kooten Niekerk.

Knowledge

As already mentioned above, a philosopher of religion works with questions concerning whether there is a reality independently of the human mind or not, if and on what ground it is possible to gain knowledge of a reality different from the immediate and the observable world. Another but equally important question concerns whether religious propositions or sentences refer to something beyond what we see and if so, to what? Other questions raised are, for example, what does it mean to think and to have knowledge; what is the difference between belief and knowledge?

Truth

The question of truth was previously in the foreground. Contemporary philosophy of religion is rather interested with the *what*-question: what does it mean when someone says that God exists and what do we understand by that proposition. A distinction needs to be made between believing that something is true and that something actually is true. This line of thinking leaves open the possibility of errors. For instance, Hilary Putnam argues that "is true" can never be substituted by any other predicate P, for example, "is believed by us to be true," since it is always possible to find a statement S such that S might have the property P and still not be true" (Putnam 1978; Strandberg 2005). Truth is not seen as a final goal for human development because that goal is not reachable; however, the cautionary use of "true" is always meaningful (Davidson 1999; Rorty 1991; Strandberg 2005).

Perception

The problem of perception is related to the problem of truth, especially in philosophical investigations of religious experiences. One view is that the experiencer is always passive in relation to her experience, i.e., the world presents itself to the experiencer. . . . Alston, for instance, argues that "to perceive a house is for a house to be directly presented to one's experience" Alston (1991). McDowell (1994) calls a perceptual experience an "openness to the world." The problem is that one can be mistaken about one's perception, something which might be especially the case with religious experiences. This means that in order to tackle these problems theories of perception "need to [give] an account of perception which preserves what they take to be the

central, important or essential features of perception" (Crane 2011). But this apparent fact of openness is threatened by the existence of certain actual or possible phenomena – typically known as illusions or hallucinations. Hence philosophical theories of perception need to respond to this threat by giving an account of perception which preserves what they take to be the central, important, or essential features of perception. Theories that are put forward are the Sense-Datum Theory, The Adverbial Theory, and The Intentionalist Theory. Simply put, the sense-datum theory holds that if somebody has a sensory experience, there is something of which this person is aware (Broad 1923; Moore 1910; Crane 2011). The Adverbial Theory Suggests that when somebody experiences say something red, something is modified in a certain way, but there is no need to involve mysterious sense-data. This theory has less problems than the sense-datum theory because most agree that there are experiences but find sense-data controversial (Ducasse 1942; Chisholm 1957; Crane 2011). Finally the Intertionalist Theory (Or representationalist theory of perception) treats perceptual experiences as a form of intentionality or mental representation. However, there are several versions of the intentionalist theory, Crane (2011) considers the most important to be Anscombe (1965), Armstrong (1968), Dretske (1969), Pitcher (1970), Peacocke (1993), Harman (1990), Tye (1992, 1995), Lycan (1996) and Byrne (2001).

Time

The problem of time within philosophy of religion can be formulated as "If God is understood to be atemporal, timeless, how then could God act in temporal world, i.e., a world that is time dependent?"

Consciousness

It the core issue of the philosophical mind-body problem. Philosopher of religion treats this problem in the same way as philosophers of mind and phenomenologist do.

See entry on the The Problem of Consciousness by Harald Wallach.

Rationality/Reason

The problem of rationality and reason stand aloof from the philosophical movement of ► rationalism. Reason denotes the human capacity to draw conclusions form a set of premises. Rationality concerns our propositions, beliefs, decisions, actions, behaviors, plans and strategies, persons, and so on. Stenmark (1995) makes a distinction between three types of rationality:

1. *Theoretical rationality*, he argues, is concerned with what we (or some other kinds of beings) should believe or accept.
2. *Practical rationality* concerns what we (or some other kinds of beings) should do or perform.
3. *Axiological rationality* then is concerned with what we (or some other kinds of beings) should value or prefer.

The main philosophical question is – What does it mean that a (religious) belief, person, decision, . . . is rational.

Mystery

Mystery can be defined in philosophy of religion. Subject matters of investigation are mysticism (Mystic experiences) (see entry on ► mysticism by Catharina Stenqvist) and ► miracles.

Cross-References

► After-Metaphysical Theology
► Feminist Philosophy of Religion

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Philosophy of Science

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Description

Philosophy of science is concerned with philosophical questions that arise from reflection upon the scientific enterprise. The term encompasses both general philosophy of science, which deals with the epistemological and metaphysical foundations of the empirical sciences, and philosophical study of particular sciences, such as philosophy of physics, philosophy of biology, and philosophy of cognitive science. This entry is concerned with the field picked out by the former, more general sense of the term. To give an idea of the nature of this field, it is useful to survey a range of important problems and trends that have shaped the field and its development over time.

Logical Positivism

Philosophy of science emerged as a distinct area of professional philosophy in the first half of the twentieth century. Its rise was fueled and deeply influenced by a movement known as logical positivism, which originated in Europe, principally Vienna and Berlin, in the 1920s. The logical positivists were deeply impressed with the progress of science, especially physics; they were also struck by what they saw as the lack of progress characteristic of most traditional philosophy. They took this difference between science and traditional philosophy to be explained by the empiricist idea that all knowledge is ultimately based on experience: scientific claims are testable, hence can be known to be true or false by means of observation; philosophical claims – particularly those of traditional metaphysics – are not testable, and hence are not knowable. The positivists elevated this empiricist idea to the status of a basic principle, and asserted that only statements that were in principle testable by empirical means had "cognitive significance." Any statements that were not testable were meaningless, in the sense that they could be neither true nor false. (Such "meaningless" statements can properly be used to express emotions or attitudes, but they do not *assert* anything.) The positivists believed that such a criterion revealed the emptiness of many domains of discourse previously thought to be meaningful – notably metaphysics, ethics, and theology. This was to be the basis of a program of reform that would convince the world to abandon inquiry in domains that did not admit of truth or falsity, and confine its discourse and its research to the verifiable and the scientific.

Over time, enthusiasm for the positivist notion of cognitive significance waned, as repeated attempts to turn the intuitive notion of empirical testability into a precise criterion of significance failed. No formulation put forward could both count as meaningful the more theoretical statements of the sciences and still exclude the statements of metaphysics it was intended to disqualify. These difficulties contributed to the development of a more moderate movement

known as logical empiricism, which dominated the philosophy of science until the 1960s. A central project of the logical empiricists was to analyze the logic of scientific methodology, with the aim of articulating canons of rational inference that would show how scientific knowledge was justified.

Induction, Confirmation, and Falsification

Scientific knowledge is supported by evidence drawn from observation and experiment, and hence inductive inferences are ubiquitous in the sciences. What characterizes an inference as inductive, in the broad sense of that term, is that evidence is taken to support the conclusion without establishing it with deductive certainty. Such an inference is also called *ampliative*, which term emphasizes that the conclusion goes beyond simply restating something contained in the premises. Questions about induction are also discussed under the heading of *confirmation*, a term used to indicate that the evidence under discussion lends some support to a hypothesis. An account of confirmation aims to specify how an observation must be related to a hypothesis in order to count as evidence for it.

One influential account of confirmation is known as hypothetico-deductivism, according to which a hypothesis is confirmed when consequences deduced from it are found to be true. This picture of confirmation seems to fit with the many cases in the history of science when a theory has become widely accepted because a variety of its predictions have been tested and found to be correct. But if any true consequence confirms a hypothesis, as hypothetico-deductivism would have it, unpalatable results follow: take any well-confirmed theory T and conjoin to it any hypothesis H, no matter how irrelevant. Then, since any correct prediction that follows deductively from T alone also follows from the conjunction T-and-H, it follows that every correct prediction deduced from T also confirms T-and-H, even though H is utterly irrelevant to the theory. Or again, any theory T deductively implies T-or-O, where O is any observable fact. Observation can then show that T-or-O is true, which would confirm T. Thus an intuitive

notion of confirmation very quickly begins to look unacceptable when formulated in terms of a purely logical relationship between evidence and hypothesis. The work of Carl G. Hempel (1905–1997) to formulate criteria for confirmation in purely logical terms revealed how extensive were the difficulties confronting this kind of project.

An influential response to the problem of confirmation was developed by Karl Popper (1902–1992). Guided by the insight that a test qualifies as a genuine test only if there is a real possibility of failure, Popper asserted that scientific testing should be seen as an attempt to falsify, rather than to confirm, the hypothesis under examination. He took the distinguishing mark of a scientific statement to be falsifiability; theories or belief systems that claim to be confirmed by empirical evidence, but do not expose themselves to the risk of empirical refutation by making precise predictions, are only pseudoscientific. Emphasizing the conclusive nature of falsification and the provisional nature of the decision to accept a theory that has not yet been falsified, Popper declared that the scientific enterprise does not rely on confirmation at all, but only on strictly deductive reasoning. If a prediction derived from a hypothesis turns out to be false, then the hypothesis is conclusively refuted. If on the other hand the prediction is found to be correct, then the hypothesis can be accepted provisionally and subjected to further testing. On Popper's view it is be a mistake to take any number of successful tests to show that a hypothesis is true or probable; a hypothesis that has passed all tests so far has simply not yet been shown to be false.

Since on his view science does not involve confirmation or any form of inductive reasoning, Popper claimed that his account of scientific reasoning avoided the philosophical problems surrounding confirmation and induction. But Popper's rejection of confirmation gives rise to a serious objection: his account cannot justify scientists' reliance on a theory that has passed repeated tests in preference to an untested theory, when it comes to practical applications requiring predictions about the future. If the only measure of the acceptability of a theory is whether or not it

has failed a test in the past, then all theories that have never yet failed a test must be judged equally acceptable.

An important point about theory testing that was articulated by physicist and philosopher Pierre Duhem (1861–1916) and brought to the attention of the philosophical community by W. V. O. Quine (1908–2000) illustrates the complexities of falsification and confirmation alike. A typical scientific hypothesis has no directly observable consequences on its own, but must be conjoined with some combination of background assumptions, accepted theories, and auxiliary hypotheses in order for it to be put into contact with experience. For example, assumptions about the workings of a device such as a telescope are involved in making predictions about what will be observed by means of the device; and hypotheses about processes of decay and fossilization are required to determine whether a postulated prehistoric organism would have left fossil remains behind. This point may seem obvious, given how far removed from immediate experience most scientific hypotheses are, but it has important consequences. For one thing, it shows that it is a mistake to classify an individual hypothesis as testable (or untestable), except relative to a given body of background knowledge. It also implies that falsification is not as unambiguous as it might at first seem to be. A prediction made for the purposes of testing a particular hypothesis is actually derived from the conjunction of multiple hypotheses, and a negative test result entails only that at least one hypothesis in the set is false. Logic alone does not force the rejection of any particular hypothesis, and so scientists must rely on other considerations – such as how well confirmed they take the various hypotheses in the set to be – to determine which one to reject.

Theory Change

The focus by philosophers on the *logic* of science, conceived of as something that could be understood in abstraction from the circumstances within which theories are actually formulated and evaluated, faced a wave of opposition in the 1960s. A number of thinkers contributed to a shift that turned the focus of philosophers back to the history of science; notable among them is Thomas Kuhn (1922–1996), whose 1962 book *The Structure of Scientific Revolutions* has come to be seen as a pivotal work in reshaping the philosophy of science (Kuhn 1996).

Kuhn rejected the conception, prevalent within the logical approach, of a scientific theory as a set of sentences from which predictions could be deduced, and he introduced the term "paradigm" as the label for his own richer conception of a theory. The core of a Kuhnian paradigm is a concrete scientific achievement that serves as a model for the solution of problems within a particular field. This past achievement is the central element in a broad framework of group commitments, which includes not only the explicitly stated laws emphasized by the logical approach, but also a variety of other commitments common to a particular scientific community – such as commitments to instruments and methods, metaphysical commitments, and shared values.

According to Kuhn, two fundamentally different kinds of process are evident in the history of science, normal science and scientific revolutions. Normal science is science as practiced under a single accepted paradigm. Normal scientific research is not intended to test the fundamentals of the theory – either in the sense of aiming to confirm or to falsify them – but instead takes these fundamentals for granted and seeks to resolve problems from within the framework based on them. The problems worked on are those that the theory itself suggests are both valuable and tractable, and a failure to solve a problem is seen as a failure of the scientist, not of the theory. Within normal science, progress is cumulative and obvious.

A scientific revolution is precipitated when a new paradigm arises as a rival to an accepted paradigm. A debate over fundamentals ensues within the scientific community, and adherents of the rival paradigms strive to persuade their fellow scientists of the superiority of one over the other. If the majority of the scientific community eventually accepts the new paradigm, then a revolution has taken place, and the new paradigm

replaces the old as the basis for normal scientific research.

The most controversial aspects of Kuhn's account have to do with his claim that different paradigms bring with them different standards of evaluation. According to Kuhn, a paradigm determines which problems are considered scientific and what qualifies as an acceptable solution. As a result, the competition between rival theories during a revolutionary period cannot be settled just by appeal to a single accepted set of standards. Where earlier views had portrayed a choice among competing theories as settled solely by appeal to logic and experiment, Kuhn instead used the language of "persuasion" and "conversion" to describe how scientists came to accept a new paradigm, and he insisted on the role of such factors as cultural views, historical accidents, and personal experience in the process.

Critics attributed to Kuhn the view that theory choice is not a rational process; he replied (e.g., in the Postscript written for the second edition of *Structure*) that this was a misunderstanding, due in part to the erroneous notion that theory choice, if rational, would have to be explicable in terms of a method that would uniquely favor one theory over another. Kuhn said that theory choice should instead be thought of as a decision about which problems are most important and about which of the available theories would be more successful in guiding future research. Such a decision can be made for good reasons; notably, it can be guided by values universally accepted in the sciences – values such as predictive accuracy, simplicity, and fruitfulness. But since it is in effect a kind of value judgment, theory choice is liable to the same kinds of disagreements as other value judgments (such as disagreements over how to apply standards in individual cases, and how to weigh considerations of particular values that pull in different directions).

Scientific Realism

Debates about scientific realism are concerned with the aims and epistemic reach of scientific theorizing. Realists contend that science aims at a true description of reality, and that it is reasonable to think that contemporary science succeeds,

to some degree, in revealing the hidden structure of the world. Antirealists reject these statements.

Antirealist motivations come from a variety of sources. One source is a belief in the limited reach of human knowledge. Traditional empiricism, with its emphasis on subjective experience as the source of all knowledge, tended to suggest that human beings are trapped behind a "veil of ideas," without sufficient resources for achieving knowledge about a world behind the appearances. A second source of antirealism is reflection upon the history of science. Larry Laudan (1996/1981) appeals to a long list of examples of once successful but now rejected theories to make the case that throughout the history of modern science, even the core elements of the most successful theories have eventually been rejected as a result of the continued progress of science. Taking the past as a guide to the likely fate of contemporary theories, it is argued, shows that confidence in the essential correctness of current theories is unwarranted (an argument known as the pessimistic induction from the history of science). A third source of antirealist motivation is reflection about the aims of the scientific enterprise. Bas van Fraassen's "constructive empiricism" is a notable contemporary antirealist view based on the contention that scientific theories are human constructs used for a variety of purposes – making predictions, manipulating nature, and explaining what we observe – and that theories can serve these purposes provided that they are correct in what they say about the observable world. Truth about the unobservable is not required for a theory to be successful; hence, there is no benefit to taking the additional epistemic risk of claiming that a theory is correct even in its account of what is unobservable (van Fraassen 1981).

Realists too have argued for their position in a variety of ways. Drawing on the way scientists often argue for the truth of particular theories, realists such as Ernan McMullin (1984) claim that even though predictive success alone may not warrant confidence in the approximate truth of a theory, various other theoretical virtues such as explanatory power, coherence, and especially fertility – characterized by a theory's ability over

time to guide scientists to successful novel predictions and explanations of phenomena outside the theory's original domain of applicability – do warrant such confidence. Current realist discussions tend to argue for realism with respect to individual theories or domains of scientific inquiry, rather than presenting arguments intended to support realism with respect to all of contemporary science. Anti-realist arguments have also led some scientific realists to characterize their views not in terms of truth of theories, but in terms of the reality of entities (so-called "entity realism") or mathematical structures ("structural realism") posited by scientific theories. (See Papineau (1996) for a number of influential articles concerning scientific realism, and Psillos (1999) for a defense of realism that examines arguments on both sides of the debate).

Self-identification

Science

Philosophy of science does not self-identify as a science, but rather as a part of philosophy. However, there is no firm boundary between scientific and philosophical inquiry. Historically, the natural sciences arose out of philosophy itself, in conjunction with various technical and practical disciplines such as mathematical astronomy and medicine. Only after the development of a framework of theory and technique that allowed a community of specialists to use empirical methods to systematically investigate domains of inquiry previously classified under "natural philosophy," did particular sciences such as physics and chemistry come to be thought of as empirical disciplines distinct from natural philosophy.

Even within the natural sciences as we know them, philosophical questions arise. The theoretical and methodological questions that confront a scientist who is constructing a theory or choosing between rival theories are often philosophical in nature, and many great scientists, including Galileo, Isaac Newton, Charles Darwin, Albert Einstein, and Neils Bohr, have made influential contributions to philosophical thought about nature, scientific theory and method, and human

knowledge. Today, philosophers who specialize in the study of particular scientific theories, such as quantum mechanics or evolutionary theory, work to clarify conceptual issues that arise within the theories they study, often in conversation with scientists.

Characteristics

Philosophy of science is distinguished from other subfields within philosophy only by its specific focus on questions that arise from reflection on the scientific enterprise. In fact, there is extensive overlap between philosophy of science and other subfields of philosophy. For example, many of the issues studied in philosophy of science are concerned with knowledge, and hence belong to epistemology. Others are concerned with the nature of reality, and hence belong to metaphysics. Still others belong to philosophy of language, logic, or social philosophy, to name only a few other areas that overlap with philosophy of science.

Philosophy of science also overlaps with fields outside of philosophy, notably history of science and sociology of science. In addition, there is considerable overlap between the philosophy of particular sciences and the more conceptual or theoretical parts of these particular sciences themselves.

Relevance to Science and Religion

One area in which philosophy of science has had significant impact on discussions of science and religion is in discussions of so-called criteria of demarcation, i.e., criteria by which scientific theories can be distinguished from nonscientific theories or belief systems. This is a question of long-standing interest to philosophers of science; the logical positivists and Karl Popper developed influential responses to this question in the first half of the twentieth century, as discussed above. The treatment of this issue by philosophers of science has had more than purely academic significance as well: In the United States, court cases

challenging the constitutionality of laws mandating the teaching of Creation Science and Intelligent Design as alternatives to evolutionary theory in public school science classrooms have seen expert testimony from philosophers of science. In two well-known cases tried in federal courts, namely *McLean v. Arkansas* (1982) and *Kitzmiller v. Dover* (2005), philosophers of science were called upon as expert witnesses to articulate distinctive features of science, and the judges in these cases explicitly drew upon the philosophers' testimony in their decisions, both of which asserted that the theories at issue – Creation Science and Intelligent Design – did not qualify as science and were instead inherently religious belief systems. It should be noted, however, that most philosophers of science regard it as impossible to identify strict criteria for distinguishing science from non-science.

A related issue sometimes treated by philosophers is usually discussed under the heading of "methodological naturalism." The intuitive version of the idea is that a scientific theory cannot appeal to God or other supernatural beings to explain natural phenomena. Philosophers have tried to give precise formulations of this principle, and to present or evaluate reasons why it should (or should not) be considered an essential characteristic of science (see, for example, Boudry, Blancke, & Braeckman (2010)).

Sources of Authority

As in all other areas of philosophy, argument plays a dominant role and authority a comparatively small role. It could be said that rational argument is the primary source of authority for philosophy of all kinds.

In philosophy of science specifically, currently accepted scientific theory and the consensus of the relevant scientific community are quite authoritative. There is a sense that philosophers should be guided by scientific practice, rather than trying to legislate for scientists. Philosophers of science also look to the history of science, and in particular the brilliant scientific

successes of the past, as authoritative sources regarding what qualifies as good scientific reasoning. In a similar way, the philosophical contributions of eminent scientists who have reflected on the nature of the scientific enterprise, on scientific methods, and on the philosophical implications of their theories – thinkers such as Einstein, Darwin, and Newton – are held in high regard and often held up as sources of particular insight.

Ethical Principles

Philosophy of science is guided by the same ethical norms that guide academic philosophy more generally. To pick out these norms, it is helpful to identify virtues that a philosopher should pursue. These would include virtues related to the cultivation of knowledge, such as willingness to cultivate talent and generosity in sharing results; virtues related to the exchange of ideas, such as intellectual humility, charity in interpreting others, and respect for one's interlocutors; and virtues of intellectual honesty.

Key Values

Philosophers value the pursuit of knowledge for its own sake, and in their work they value particularly cogent argumentation, clarity, precision, and insight. In the philosophy of science, the quest to develop philosophical accounts of various aspects of science has tended to be guided by two values that often seem to be in tension with each other, namely, generality and accuracy. More general accounts have tended, other things being equal, to be favored over accounts that are less general (e.g., accounts applicable to a broad segment of the natural sciences have been tended to be sought after as more desirable than accounts specific to one narrow scientific field). But faithfulness to the actual details of science as practiced is also valued, and it is increasingly common for philosophers of science to object to general accounts on the grounds that these fail

to respect the marked differences between the particular sciences.

Another key value of philosophy of science is a very high regard for science. Indeed, the rise of this field as a distinctive part of philosophy is partly motivated by the view that science is an extraordinarily powerful way of gaining knowledge, so that study of this way of knowing might reveal something fundamental about the very nature or extent of human knowledge.

Conceptualization

Nature/World
'Nature' is often identified with the totality of what exists in space and time; it is sometimes identified, more restrictively and more tendentiously, with whatever can in principle be described or explained by the natural sciences (where physics, chemistry, and biology are typically assumed to be the paradigmatic natural sciences) or with that which is subject to natural law.

Human Being
Philosophy of science seeks to understand how human beings come to know about the world via scientific inquiry. Therefore it is concerned with human beings insofar as they are the developers and practitioners of this complex, socially organized, way of exploring the world, and beings who construct scientific knowledge. Of course, human beings are also the *objects* of scientific study, and our understanding of such things as human perception and reasoning and social institutions is properly shaped and informed by sciences including biology, psychology, and social science. Therefore philosophy of science considers human beings as both the creators and objects of scientific knowledge.

Life and Death
Philosophy of science looks to biology to define life and death. Hence life is understood as the presence of (or capacity for) biological activities such as metabolism and reproduction, and death as the absence of these activities.

Reality
Philosophers of science typically take the empirical sciences to be particularly authoritative sources of knowledge of reality. This high regard for science inclines many philosophers of science toward a scientific realism that accepts the theoretical claims of the sciences as accurate descriptions of reality. Scientific anti-realists, on the other hand, are skeptical of the ability of the sciences to provide knowledge of what is unobservable, and accept as accurate descriptions of reality only the claims of the sciences regarding what is observable.

As to the question whether there is anything beyond the natural world: ontological naturalism, which identifies reality with the physical or the natural world, is a fairly widespread view among analytic philosophers in general and among philosophers of science in particular. But this is by no means a universal view, and the question whether reality contains anything beyond the natural world is largely irrelevant to the way most philosophy of science is practiced.

Knowledge
A working definition of knowledge commonly used by philosophers says that knowledge is *justified true belief* – that is, in order to count as knowledge, something one thinks or believes must be *true*, and one must have *good reason* for believing that it is true. This definition of knowledge is subject to some famous counterexamples, but it still widely used as a working definition.

Truth
The nature of truth is a topic of perennial philosophical debate. In contemporary philosophy of science, this issue arises especially in the context of discussions about scientific realism. One traditional way of thinking about truth takes it to be a kind of correspondence between language or thought and reality; critics have always claimed that this conception of truth presupposes what is impossible, namely, a standpoint from which humans could observe both their thoughts and mind-independent reality, and compare the two. Kuhn voiced a contemporary version of this

objection when he noted that, as all knowledge of the world is informed and mediated by theory, scientists have no way to compare a theory directly against some theory-free version of reality. Combining this skeptical response to truth as traditionally understood with Kuhn's emphasis on the social nature of scientific knowledge, some philosophers and sociologists of science embraced the view that what is true for a community is whatever is accepted by that community; but relativism of this sort is hardly recognizable as a conception of *truth* at all. Some philosophers have responded to the deep and divisive debates over the nature of truth by maintaining that we should eschew theories of truth altogether. Arthur Fine (1996/1984) has advocated a version of this position as the proper response to debates over scientific realism: what he calls the "natural ontological attitude" endorses the claims of currently accepted scientific theories, but refuses to burden this endorsement with commitment to any substantive theory of truth.

Perception

Scientific knowledge depends on empirical evidence which itself is ultimately known by way of sense perception. But perception cannot be thought of as a source of data that is wholly neutral arbiter of competing theories. All observation, all perception is theory-laden, in the sense that an observer's prior beliefs about what she is looking at will both direct her attention to certain features of it and inform the way she identifies what she sees.

Time

In most scientific theories, time is represented as a parameter or a dimension according to which physical events are ordered. Intuitive features of time that are not captured by such representations, especially the passage of time and the asymmetry between past and future, have long been subjects of interest to philosophers of science. Some philosophers have argued, for example, that the passage of time is an illusion, since the way time is represented in fundamental physical theories does not include or give rise to

a notion of passage. Others have sought to explain how these features could be grounded in, or reconciled with, scientific representations of time in which they do not appear explicitly.

Consciousness

Questions about the nature of consciousness belong primarily to philosophy of mind rather than philosophy of science, where consciousness is typically thought of as grounded in the neurophysiological structures of complex biological systems. Philosophers of science do discuss questions about the relationship between consciousness and the underlying biological or neurophysiological processes—whether, for example, consciousness and other psychological capacities are reducible to, or emergent from, such processes. These issues are continuous with more general questions belonging to philosophy of science about relationships between properties or systems described by different sciences or at different levels, e.g., between biological systems and their physical components.

Rationality/Reason

Philosophy of science is deeply interested in making sense of the standards of rationality that govern (or should govern) scientific reasoning. Traditional attempts to makes sense of the rationality of scientific inference have sought rules specifying which inferences are, and which are not rational. By far the most popular system of this kind today is called Bayesianism, after English clergyman Thomas Bayes (1702–1761) and the theorem in probability theory that bears his name. Bayesians construe rationality as a matter of conforming one's degrees of belief to the probability calculus; rationality is then a matter of adjusting one's degrees of belief by the appropriate amounts (specified by Bayes' theorem) each time some evidence comes in.

Critics of this kind of approach maintain that the rationality of scientific inferences cannot be assessed solely in terms of universal rules. Some philosophers argue that a scientific inference is typically so dependent on background knowledge specific to the particular domain in question that strictly local standards of evaluation must be

invoked. (For a defense of a local approach to inductive inference, as well as a brief description of Bayesianism, see Norton (2005)).

Another important approach to rationality in philosophy of science follows Kuhn in emphasizing the social nature of the scientific enterprise. On this view, it is a mistake to think of rationality in terms of principles of reasoning that could in principle be applied by individual scientists. The contributions of an individual scientist become part of accepted scientific knowledge only through a complicated process involving the critical evaluation, modification, and application of the individual's ideas by the scientific community. Thus to explain or assess the rationality of scientific knowledge and the process that produces it, one must examine the community structure of science (see Longino 1990).

Mystery

The term "mystery" is not commonly used in philosophy of science, but it might be used informally to mean what is not yet known, or what may never be known.

Relevant Themes

Philosophy of science is concerned with understanding and articulating general conditions under which an empirical fact constitutes evidence for (or against) a theory or hypothesis; it is also concerned with identifying distinctive features of the scientific enterprise; and it shares with all branches of philosophy an emphasis on the formulation and evaluation of reasoned arguments. So it is natural that some philosophers of science deal directly with disputed questions having to do with science and religion in which arguments about evidence and the nature of science play a central role. Philosophers of science have written extensively in recent decades about evolution and creationism, and more recently about evolution and intelligent design theory. They have also written on classic and contemporary design arguments that take scientific knowledge about some particular kind of order within the natural world—e.g., the complexity of functional systems within living things, or the way that the fundamental physical constants of our universe are "fine-tuned" to allow the existence of life—as evidence for the existence and purposive action of God. It is fair to say that most philosophers of science who treat such topics are critical of arguments that purport to show that religious beliefs can be scientifically justified; they are likewise critical of arguments that attempt to support alternative hypotheses primarily by denigrating accepted scientific theories.

Philosophy of science is also concerned with formulating accounts of concepts such as *natural law* and *causation*. This makes it relevant to any topics in the domain of science and religion in which such concepts play a central role, including the topics of miracles and of divine action.

Cross-References

▶ Classical and Quantum Realism
▶ Critical Realism in Theology and Science
▶ Epistemology
▶ Metaphysics
▶ Naturalism, Ontological and Methodological
▶ Philosophy of Mind
▶ Physics
▶ Rationality (Philosophical)
▶ Religion and Pseudoscience

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Physical Anthropology (Paleoanthropology)

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Related Terms

Biological anthropology

Description

Physical Anthropology (or Biological Anthropology) is the biological branch of Anthropology that studies human and primate evolution, adaptation, and variation. This discipline includes a variety of subdisciplines such as primatology, paleoanthropology, paleoneurology, molecular anthropology, human biology, osteology, paleopathology, forensic anthropology, and archaeothanatology. Physical Anthropology was

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The two authors contributed equally to the present entry.

developed in the second half of the nineteenth century and was supported by the first discoveries of human fossils and the general acceptance of the notion of the evolution of species (▶ Evolution). At the beginning of the twentieth century, the concept of race and the (mis)use of anthropometry in the assessment of behavioral characteristics were widely spread. These typological approaches were strongly criticized after the Second World War and are currently obsolete. This critique led to a renewal of the discipline (Henke 2007).

Self-identification

Science

This discipline self-identifies as a natural science. Its methodological and analytical approaches to the study of the human body, human fossils, and populations are the same as any other science. Although some works from the nineteenth and beginning of the twentieth centuries were influenced by philosophical and religious considerations (such as the relationship between consciousness and original sin), anthropologists today emphasize scientific rigor. New discoveries sometimes necessitate a revision of earlier concepts or explanations of human evolutionary history. Such revision is always delicate because a large amount of geological and biological data must be taken into account.

Physical Anthropology proceeds according to the scientific method; new data are routinely integrated into hypotheses, and these hypotheses are revised when they do not explain new facts (Washburn 1953; Henke 2007).

Religion

Because of its interest in the human origin, this field is sometimes confronted with religious and philosophical questions (Origin of Life; ▶ Creationism). Although questions about the development of human cognitive abilities are usually approached with biological data, this discipline can address philosophical issues. Moreover, the question of the unique or multiple origins of modern humans has some theological

and philosophical implications and has long been a controversial topic in paleoanthropology. Reliably dated hominid specimens suggest that anatomically modern humans developed in Africa. There is, however, an ongoing debate, sometimes more philosophical than scientific, about the possibility or degree of interbreeding between modern humans and other penecontemporaneous fossil groups, such as European Neanderthals.

While Physical Anthropology does not define itself as a religion, this science is often confronted with delicate questions that relate to religious concerns.

Characteristics

Physical Anthropology is at the intersection of the natural and social sciences. Over time, it has moved from descriptive studies to the investigation of processes and behavior; this change was brought about by the integration of the problems of human evolution into the field of mammalian evolutionary biology (▶ Biological Anthropology and Human Ethology). However, discussions of the issues raised by this discipline should integrate data and results from paleontology, genetics (DNA), population genetics, and diverse medical sciences, as well as from Cultural Anthropology disciplines like archaeology, ethnology (▶ Ethnology), or even linguistics.

Relevance to Science and Religion

As mentioned earlier, Physical Anthropology is interested in the philosophical and theological boundaries of questions about the origins of *Homo sapiens* and the development of consciousness and language (▶ Humanities; The Problem of Consciousness).

Sources of Authority

The main sources of authority for this discipline are empirical data stemming from fossil remains and from extant modern human populations.

In addition, the work of several prominent scientists has contributed to the emergence and development of this discipline. For example, Charles Darwin's (1859) discussion of natural selection as the mechanism of evolution was reinforced in 1900 by the rediscovery of Gregor Mendel's work on the laws of heredity. Throughout the nineteenth century, increasing archaeological evidence of the antiquity of humankind was found (e.g., Schmerling 1833; Boucher de Perthes 1847–1864; de Puydt and Lohest 1887). Paul Broca, the founder of the Société d'Anthropologie de Paris (1959), established Biological Anthropology as a scientific discipline and was one of the first to use statistical concepts to understand anatomical patterns of variation (Spencer 2007).

Around 1930, R. Fisher, J. Haldane, and S. Wright developed the basic principles of population genetics. Later, the Russian geneticist and evolutionary biologist T. Dobzhansky, the American paleontologist G.G. Simpson, the German evolutionary taxonomist E. Mayr, and the British biologist J. Huxley founded the synthetic theory of evolution that help to reconstruct phylogenetic processes (Henke 2007).

The success of the theory of punctuated equilibrium, proposed by N. Eldredge and S.J. Gould (1972), and the impact of cladistics (a method of classifying fossils and living organisms based on shared homologous derived traits), have contributed to conceptual changes in the representation of human evolution.

Finally, peer review currently helps to produce authoritative research in which new scientific ideas are developed and evaluated.

Ethical Principles

Physical anthropologists face a variety of ethical issues since their research deals with human and animal subjects (▶ Deontology; Turner 2005). In research focused on genetics and extant human diversity, physical anthropologists follow the bioethical principles established by the Nuremberg Code (1947), the Declaration of Helsinki (1964), and the Belmont report (1979).

In the USA, the Animal Welfare Act (1985) set ethical principles for primatologists. Finally, there are several codes of ethics from anthropological associations for skeletal biologists working with local populations and for paleoanthropologists who face questions about access to and ownership of fossil material. These include the codes of ethics from the AAA (American Anthropological Association), the AAPA (American Association of Physical Anthropology), the BABAO (the British Association for Biological Anthropology and Osteoarchaeology), and the AAS (Australian Anthropological Society). The NAGPRA (Native American Graves Protection and Repatriation Act, 1990) regulations also apply to Native American artifacts and skeletal remains, and the UK Human Tissue Act (2004) makes provisions about activities involving human tissue or the transfer of human remains from museums.

Key Values

Because the main goal of Physical Anthropology is to clarify the biological emergence of humankind and the processes of human evolution and adaptation, the field requires the following key values: integrity, empiricism, curiosity, ethical behavior regarding the subjects of research, open-mindedness, idea reappraisal, and doubt.

Conceptualization

Nature/World
Nature is the living environmental frame, and the world is the geographic and geological frame within which human evolution occurs.

Human Being
The classical definition of a "human being" is a member of the genus *Homo*. Following recent developments (Wood and Collard 1999), a specimen can be included in this genus only if it has (1) an estimated body mass and proportions that are more similar to *H. sapiens* than to *Australopithecus*, (2) human-like obligate bipedalism and a limited facility for climbing,

(3) a modern, human-like extended period of growth and development, and (4) a masticatory system closer in relative size to that of modern humans than to *Australopithecus*.

Life and Death
Life refers to any entity that manifests self-sustaining biological processes such as metabolism, growth, reproduction, or adaptation.

Death is defined as the cessation of these biological processes. Among past and extant human populations, the death of one member of a group is often associated with funerary practices (Death, anthropological view). Through the study of taphonomical processes that occurred after the deposition of a dead body, one branch of Physical Anthropology (Archaeothanatology) tries to identify and reconstruct these practices.

Reality
Reality is considered to be the physical world and living nature in which humans evolve and interact.

Knowledge
Knowledge comes from the empirical study of the reality.

Truth
The empirical experience on which Physical Anthropology relies cannot be exhaustive. As a consequence, our knowledge about human origins, evolution, and variation is limited by accessible data. Our conceptions are changing and adapt to new discoveries and new ideas. Ultimate "truth" in Physical Anthropology is therefore unreachable, although empirical data offer true sources of information.

Perception
Perception is the way we feel about reality. It is based on the biological senses but is subject to individual interpretation.

Time
Time, and particularly geological time, is one of the main dimensions of the discipline. It is an

important point that integrates the notions of development, variation, and evolution.

Consciousness

The apparition, development, and degree of consciousness in *Homo* and closely related primates are ongoing and elusive questions in Physical Anthropology (The Problem of Consciousness). Consciousness is probably related to a combination of factors, including the development of the brain, language, socialization, empathy, abstraction, and introspection. Most of these factors cannot be investigated with biological data alone.

Rationality/Reason

As in every scientific field, rationality/reason is one of the primary mental tools used in the analysis of data. Physical anthropologists must apply the basic inductive-deductive rules of science. However, because Physical Anthropology involves the understanding human origins and evolution (i.e., *our own* origins and evolution) subjectivity and irrationality are dangerous possibilities. We must separate ourselves from the subjectivity produced by the close relationship between ourselves and our subject of study.

Mystery

The term "mystery" could be used when a new discovery disrupts the established ideas of the discipline; the discipline will attempt to clarify the new discovery rationally.

Relevant Themes

The evaluation of the development of consciousness during human evolution and the related notion of the origins of "humanity" and "humankind" are central questions for Physical Anthropology and engage with questions of science and religion. While Physical Anthropology relies on empirical data, some interpretations of these data could cross the critical boundary between science and religion.

Cross-References

▶ Biological Anthropology and Human Ethology
▶ Creationism
▶ Deontology
▶ Ethnology
▶ Evolution
▶ Humanities

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Physical Determinism and Indeterminism

▶ Determinism and Indeterminism

Physical Knowledge

Physical Optics

Physical Suffering

Physicalism

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A narrower view than naturalism, although it holds similar views, in ruling out the supernatural. It restricts reality in a metaphysical way to the physical world, and defines the "physical" in terms of what is within the reach of (actual or possible) physics. In contrast to "naturalism," it thus restricts reality not just to what is natural, or accessible to the natural sciences, but specifically to what is explicable by physics. It champions a reductionist position, according to which all science can, and should, be ultimately couched in the language of physics, which can produce a "Theory of Everything." There are no emergent properties, or different levels of reality, open to different forms of scientific investigation. Physics rules supreme, and what cannot be translated into its terms does not exist.

Physics

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Related Terms

Laws of nature; Matter; Physics in Judaism

Description

Physics is the science that forms the foundations for the other sciences and for much of engineering. It is based largely on mathematics– more so than most other sciences. It therefore has a reputation for being difficult. This is apparently at odds with the most thoughtful definition: Physics is that science which considers the simplest systems and then tries to achieve a complete description of them. It is the aim for completeness that causes the difficulty. A biologist cannot hope to produce a complete description of even a single cell. It should be evident that physicists are adept at looking for simplifications. If none appears without oversimplification, then the problem is generally turned over to a different science.

Self-identification

Physicists have considerable self-awareness of their participation in their science. They have undergone a training that emphasizes the unity of the field, in spite of the existence of numerous specialties and subspecialties. Whenever physicists meet, they can find common ground for discourse, even if they specialize in different areas.

Characteristics

Physics is academically a well-defined program, but the boundaries are fuzzy.

Interdisciplinary areas abound: physical chemistry, chemical physics, biophysics, astrophysics, physical oceanography. What makes physics distinctive is the common grounding, in both pre-1900 studies – mechanics, heat, sound, electromagnetics, optics – and post-1900 studies, concerning molecules, atoms, nuclei, fundamental particles, all held together by quantum mechanics. A physicist is expected to have a fundamental grasp of all these in addition to deeper understanding in at least one narrower subspecialty.

Relevance to Science and Religion

Physicists have been participants and leaders in the dialogue between religion and science. To mention only four examples, Ian Barbour, Willem Drees, Robert John Russell, and John Polkinghorne have all been leaders. It happens that all four have professional qualifications in theology as well, but in each case, the initial educational effort was in physics (each has a doctorate in physics; only Drees has a doctorate in theology).

Much of the science/religion interest in physics has centered around cosmology, especially the early universe and its connection to the theology of creation. Physics has a deep interest in investigating the "laws of nature," including many interesting questions, for example: (1) Why are there laws of nature? (2) Why is there something rather than nothing? (3) Which of the "constants of nature" are truly fundamental, and which are secondary? (4) Why do those constants have the values that we measure? (5) Do any of those "constants" change very slowly? (6) Could the universe run in any interesting way with different values of those constants (a test of the validity of anthropic principles)?

Some physicists believe in God, and some do not. Many are not sure. A common attitude is belief that God created the universe and the principles by which it runs; it is our task to find out how (not why) God did it, and to learn those operative principles.

Sources of Authority

Recent articles in peer-reviewed journals are the strongest authority, but only if they are corroborated either by several independent experiments or by strong internal self-consistency. The history of the discovery of the positron is a good case in point. Experimenters in Britain, France, and the United States almost simultaneously observed evidence that was best interpreted by postulating a particle with the same mass as the electron but with positive charge. Such a particle had been predicted theoretically a year earlier by P. A. M. Dirac (1931), but the Americans were unaware of the prediction. Three independent experiments and an elegant theoretical prediction were sufficient to convince all serious physicists that the effect is real (Anderson 1932; Blackett and Occhialini 1933).

Other situations have not been so clear-cut. A large-scale problem in epistemology about a very small-scale question is whether quarks exist. Most physicists would answer "yes" to that question, but the issue is still a bit cloudy, resting on the question of how much authority does it take to convince people of the existence of these subatomic particles (Albright 1982).

As in any walk of life, certain individuals in physics have developed enormous prestige, so that you can often terminate an argument by invoking a result from that authority. One of the most often quoted has been Albert Einstein, whose influence on physics and its philosophy has been immensely beneficial. Yet Einstein made a few mistakes; just because he said something does not mean it is correct.

Ethical Principles

The first ethical duty of physics is to tell the truth, no matter what comes of it. This principle may seem simple enough, but on occasion, it has raised controversy on questions of how much truth should be made public. A celebrated case involved maintaining secrecy about nuclear energy and its potential for weaponry

(Moore 1985, ch. 17). Other occasions have arisen in the middle of large, interesting, and important experiments where the principal physicists maintain secrecy about the results, since they want no premature disclosures that they may later have to retract.

Key Values

High among the key values is logical consistency. Physicists expect this at the root of what they do. Some of the finest advances in physics have come about because there was a basic inconsistency, and the task of setting it right led to a significant unexpected insight. Special relativity, general relativity, and quantum mechanics all came into being because of the desire to eliminate contradictions. The biggest contemporary gap is between general relativity and quantum mechanics, which cannot both be correct in their present form. Quantum mechanics insists on linearity; general relativity is inescapably nonlinear. These are discrepancies crying out for resolution.

Another key value is symmetry. For example, uniform motion of an object in time, space, or angular rotation leaves the object invariant. These symmetries imply (Noether's theorem) (1918, that for a system whose Lagrangian has a particular symmetry; there will be a corresponding conserved quantity), conservation of energy, linear momentum, and angular momentum, respectively (Toretti 1999, 127). The discrete symmetries of charge conjugation, parity, and time reversal were once thought to be enduring, conserved values for a fundamental particle. Since the 1950s, it has been known that in the weak nuclear interactions, these symmetries are not maintained; for electromagnetic and strong interactions, they are valid to a high degree of accuracy.

A really important value is beauty or elegance (Dirac 1939). A theory that is beautiful will look good when written in mathematics. It should be no more complicated than necessary, and it should encompass a wide variety of experimental results, some of which may well be unanticipated. Some theorists have become quasi-religious with claims that God did not make the universe to run according to ugly principles. The difficulty about beauty as a criterion for excellence is that you cannot really define beauty in an objective way.

Conceptualization

Nature/World
Physics usually means by *world* the entire universe, since this is considered the range of validity of the laws of physics as we know them. Astronomical observations have been scrutinized to find faraway deviations from the properties of matter and energy as we see them here on earth. Such deviations have not appeared, and this lack of evidence is not from want of searching.

Human Being
Most of physics is concerned with nonliving entities (except in biophysics). Study of the human as a system is much too complicated for most physicists.

Life and Death
Living systems are too complicated for most physicists, again, except for biophysicists.

Reality
Most physicists who have thought much about the problem of reality end up calling themselves critical realists. There is a strong streak of operationalism: If you cannot – even in principle – measure a quantity, then it is not real. The original spirit of quantum mechanics began by restricting concepts to measurable ones. This attitude did not last long. Quantum mechanics employs many entities (wave functions, raising or lowering operators, absolute phases, and so forth) that cannot be measured, and yet are useful in calculating other entities that can be measured.

Knowledge
It is fitting for a science that purports to study completeness to ask: What constitutes a complete description of a system? The answer varies from one subdiscipline to another. In *classical mechanics*, an expression of the coordinates as

functions of time for every part of the system constitutes complete knowledge.

In *electromagnetism*, if you can express the components of the electric field and three components of the magnetic field as functions of time and the three space coordinates, you have complete knowledge. In *thermal physics*, complete information for a single-component system can be known if you can express the internal energy as a function of the entropy, the volume, and the number of moles. Legendre transformations can change the variables to quantities such as temperature or pressure without loss of information. In *quantum mechanics*, a knowledge of the wave function, *psi*, as a function of space and time constitutes complete knowledge of the system – at least as complete as possible. The possible knowledge in quantum mechanics is less than in classical mechanics. In fact, quantum mechanics denies the possibility of attaining the knowledge that classical mechanics would call complete.

Truth

Ultimate questions of truth in physics are settled in the laboratory. Experiments are the Supreme Court of physics. Close to the frontiers of knowledge, it is difficult and expensive to set up the apparatus and to make the observations. Statements about the outcomes can sometimes be made only in the form of probabilities, especially in cases where independent measurements of the same quantity appear to disagree.

Perception

The concept of perception means a great deal to physicists, since human senses are so limited in scope. Experimental physics is perennially extending the senses. Vision is extended beyond the range of the human eye to infrared, microwaves, radio waves, ultraviolet, X rays, and gamma rays; intensities of light too bright or too dim can be detected by well-designed instruments. Sound waves can be measured outside the frequency and intensity range of the human ear. The sense of touch is extended by many types of thermometers.

An extremely important question at the root of the philosophy of physics is whether nature is continuous or discrete in the small. Schools of philosophy in ancient Greece argued about this and could not reach a scientific conclusion because human senses are too crude to perceive things at such a small scale. In the nineteenth century, chemistry showed that matter is made of atoms and molecules; it is not continuous. One after another, the quantities in physics were shown to be quantized (i.e., discrete, grainy, not continuous): electricity, light, sound, energy levels in molecules, atoms, and nuclei. All these conclusions were reached by extending human perception.

Time

In classical physics, time plays a crucial role, even though it is essentially beyond definition. One can measure time without being able to define it. Newtonian mechanics differs from Aristotelian by proper use of the second time derivative (acceleration) instead of the first (velocity) to be proportional to the force. From this change flows a stream of correct results for mesoscopic phenomena. Electricity and magnetism were unified by James Maxwell, who added the time derivative of the electric field to Ampére's law, and thereby included light in the subject.

A simple and useful way to state the second law of thermodynamics is that the entropy of a closed system increases with time. This fact provides the famous "arrow of time."

Not only classical physics, but also quantum mechanics (Schrödinger equation, Dirac equation) exhibit explicit time dependence. Furthermore, these two equations join with the Maxwell equations and Newton's laws of motion (without friction and consequent heating) in having the property of time reversal. So physics is microscopically time-reversible, but macroscopically not so. It is not easy to visualize how this can be.

Time is also crucial to the special theory of relativity, constructed by Albert Einstein to treat time on the same footing as the individual space coordinates. It is noteworthy that this change allows one to carry Maxwell's equations into special relativity with notational and no other change. The Schrödinger equation contains time, but does not treat it on par with the space coordinates; the

correct treatment of this asymmetry leads to the Dirac equation, which in turn predicted the spin of the electron, its magnetic properties, and the existence of antimatter (Dirac 1931).

Consciousness

There is no consensus in physics about the hard problem of consciousness. It is after all a subtle property of the brain, the most complex entity per unit volume that we know.

Rationality/Reason

Mathematical reasoning has such a marvelous track record for effectiveness that physicists tend to believe that someday, we will have a theory of everything. It is clear that we are far from that position now. It is likely that new forms of mathematics will need to be invented in order to solve some of the problems that physics faces.

The two great theoretical advances of the twentieth century were relativity (special and general) and quantum mechanics. Both of these required not so much novel mathematics as a reformulation of the prevalent physical ideas of space, time, matter, observation, etc. The result was that these theories at first met with disbelief because they were considered irrational. With passing years, much work was done to improve the quality of the logic of these innovations, and now they are looked on as pillars of rationality. Even so, quantum mechanics and general relativity are incompatible; no one expects a move toward irrationality in the future. Rather, one or both of them will need to be modified.

Mystery

In physics, the concept of mystery is taken to mean some question to which the answer is not readily apparent. Several of these come ready to hand; the collective ignorance and hence mystery is not from lack of work. Most of these questions have been the objects of intense scrutiny for a generation, at least.

(a) What is the best way to interpret quantum mechanics? Attempts include the Copenhagen interpretation, collapse of the wave function, many worlds, and others. In many cases, the various interpretations agree on the mathematical results; it is the descriptive interpretation that is different.

(b) A good theoretical framework for understanding *nuclear structure* is still lacking. Great quantities of data exist, and phenomenological theory is adept at fitting certain types of data. There is no beautiful overarching theory to admire.

(c) The *fundamental constants of physics* are always a great source of mystery. Why do they have the values that we measure? Are they really constant? A partial list: electron charge, electron mass, Planck's constant, the speed of light *in vacuo*, the gravitational constant, masses of other elementary particles.

(d) As mentioned above, general relativity and quantum mechanics are incompatible. General relativity is the best theory of gravity we know. Why is it so hard to merge gravity into a system with the other fundamental particles and fields?

(e) How can we understand the *unreasonable effectiveness of mathematics*? Multiple possibilities exist: (1) Perhaps it is just a coincidence. (2) Perhaps a Higher Power made things to run that way. (3) Perhaps physicists are conditioned to look only for the easy solutions to their problems and to use the mathematics that they learned in their younger days. (4) Perhaps we are forever widening our definitions of mathematics to include whatever structures we need in physics.

Relevant Themes

Additional Issues for Science and Religion

(a) Issues of causality, chance, determinism, and free will have been around for centuries. They are still not widely understood, even among scientists.

(b) *Nonlinear science* is a relatively new field because in a precomputer age, its mathematics was too laborious to be attractive. Solitons, fractals, chaos, and complexity are subjects that fit under this heading.

(c) How much responsibility do scientists have for the *technology* that results from scientific

discovery? This became a large-scale ethical problem after the development of nuclear weapons during the Second World War. Since then the issues have not gone away; they have multiplied.

(d) How can physicists fruitfully engage in the process of explaining to the public that the religious fundamentalist assumptions about the origin of the universe are incorrect? The earth is old, not young – plenty old enough for evolution to have taken place.

Cross-References

▶ Causality in Physics
▶ Classical and Quantum Realism
▶ Energy in Physics
▶ Gravity
▶ Mechanics
▶ Ontology
▶ Philosophy of Religion
▶ Philosophy of Science
▶ Quantum Theory
▶ Relativity
▶ Space and Time
▶ Time

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Physics in Buddhism

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Related Terms

Buddha; Quantum physics

There is no widely accepted consensus about the relation between Buddhism and physics. Most physicists and many Buddhists would probably deny that there is any relation at all. Nevertheless, in recent years, a number of authors have argued that there is an affinity between physics, especially quantum theory, and some aspects of Buddhist thought.

The most prominent of these authors is the present Dalai Lama, Bstan-'dzin-rgya-mtsho. Since 1987, he has held a number of dialogues with scientists under the general heading of Mind and Life Conferences (Mind and Life Institute). The 1997 conference focused on physics and cosmology, and a record of the conference was eventually published in book form (Zajonc and Houshmand 2004).

The Dalai Lama's own book on Buddhism and science, *The Universe in a Single Atom*, was published in 2005 (Lama 2005). In the third chapter, he remarks, "If on the quantum level, matter is revealed to be less solid and definable than it appears to be, then it seems to me that science is coming closer to the Buddhist contemplative insights of emptiness and interdependence" (p. 50). He discusses the role of the observer in quantum theory and compares it to the interdependence of subject and object, observer and world, in the Prāsaṅgika-Madhyamaka school of Buddhist thought: "In this Prāsaṅgika-Madhyamaka view, although

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the reality of the external world is not denied, it is understood to be relative ... The notion of a pregiven, observer-independent reality is untenable. As in the new physics, matter cannot be objectively perceived or described apart from the observer – matter and mind are co-dependent" (p. 63).

The Dalai Lama discusses the phenomenon of entanglement in quantum physics as another example of interdependence that is in accord with the Buddhist principle of dependent origination. In this phenomenon, two particles, for instance, that have interacted become "entangled" in a way such that a measurement on one is instantaneously correlated with a measurement on the other, no matter how far apart the particles may have become. The Dalai Lama comments, "There seems, according to quantum mechanics, to be a startling and profound interconnectedness at the heart of physics" (p. 65).

The Dalai Lama concludes this chapter of his book by discussing the problem in physics of reconciling our ordinary world of objects, which seems to be well described by classical physics, with the bizarre world of quantum theory. He suggests that something like the Buddhist notion of "two truths," conventional and ultimate, might be applicable here. He concludes that whether this is so or not, "What the Buddhist philosophy of emptiness can offer is a coherent model of understanding reality that is non-essentialist" (p. 69).

Some younger Tibetan lamas also have an interest in modern physics. For example, Yongey Mingyur Rinpoche briefly discusses physics in his book, *The Joy of Living* (Mingyur Rinpoche and Swanson 2007). He mentions the role of the observer in quantum theory and asserts, "If we are to take the discoveries of modern science seriously ... we have to assume responsibility for our moment-by-moment experience" (p. 91).

In addition to the Dalai Lama's conversations with Western scientists, another interesting example of East–West dialogue is the series of discussions between the Vietnamese-born astrophysicist Trinh Xuan Thuan and the French Buddhist monk Matthieu Ricard recorded in *The Quantum and the Lotus* (Ricard and Xuan Thuan 2001).

Trinh remarks, "The concept of interdependence [in Buddhism] states that things cannot be defined in absolute terms, but only in relation to others. This is, in substance, the same idea as the principle of relativity of motion in physics ..." (p. 277). He goes on to say, "The notion of interdependence leads us directly to the idea of emptiness, which does not mean nothingness, but the absence of inherent existence. Since everything is interdependent, nothing can be self-defining and exist inherently ... Once again, quantum physics has something strikingly similar to say" (Ricard and Xuan Thuan 2001). A quantum object like an electron or a photon can manifest as a particle or a wave, depending on what type of experiment is being done or, in other words, what kind of measurement is being made. Thus "... quantum mechanics has radically relativized our conception of an object, by making it subordinate to a measurement or, in other words, an event" (p. 278) Trinh also compares the Buddhist idea that all conditioned things are impermanent with the ubiquity of dynamic processes of change in physics' picture of the world.

While most comparisons of physics and Buddhism have focused on quantum theory, William Ames, an independent scholar, points out that one can see parallels between classical physics and Buddhist Abhidharma (Ames 2003). Abhidharma systematically analyzes the world into momentary mental and physical phenomena called "dharmas," which are connected by various causal relationships. Similarly, classical physics explains the physical universe in terms of particles of matter that interact through forces described by deterministic mathematical laws. Of course, there are also important differences. "Dharmas are known through examining our own experience ... Particles and fields are known through being part of a theory that is found to be consistent with experiment" (p. 292). Also, most dharmas are mental rather than physical, and they are momentary, unlike the unchanging material particles of classical physics. Ames goes on to compare the transition from classical to quantum physics with the emergence of the idea of emptiness and the rise of the Madhyamaka school in Buddhism.

The late astrophysicist Victor Mansfield was the author of *Tibetan Buddhism and Modern Physics* (Mansfield 2008). His chapter on "Quantum Mechanics and Compassion" discusses the indistinguishability of particles of a given type in quantum theory and compares it with the Buddhist belief that sentient beings are indistinguishable in their desire for happiness and freedom from suffering. "In Tibetan Buddhism, this level of indistinguishability is at least as important as the indistinguishability of particles in quantum mechanics because it is the foundation for universal compassion" (p. 33). A later chapter, "The Physics of Peace," explains how the phenomenon of quantum entanglement implies that entangled quantum systems, no matter how far apart they may become, can influence each other instantaneously and, so, do not really exist independently of each other. Likewise, in Buddhist thought, emptiness means that things do not have independent or inherent existence, and when applied to sentient beings, this fact implies a need for compassion.

Alan Wallace, an independent scholar and former Buddhist monk, has been writing about Buddhism and physics since the publication of *Choosing Reality* in 1989 (Wallace 1980).

In his later book, *Hidden Dimensions* (Wallace 2007), he makes the important point that "[o]ne fundamental difference between scientific and Buddhist views of the universe is that science traditionally seeks to describe the physical world as it exists independent of any observer, whereas Buddhism is concerned only with the world of experience ... which is inseparable from conscious subjects" (p. 87). Moreover, Buddhists use systematic contemplative inquiry to investigate the nature of experience, while physicists use quantitative measurements and mathematically formulated theories to examine external phenomena. Thus "... the methods by which they have drawn their conclusions could hardly be more different" (p. 98). Hence, it is all the more surprising that they have reached similar conclusions about the phenomena that they investigate. In both the Madhyamaka school of Buddhist thought and modern physics, phenomena do not have independent or inherent

existence. "Particularly in quantum physics, when one seeks out the nature of a physical entity as it exists independently of any system of measurement ... one discovers that such an independent entity doesn't exist" (p. 95).

Even if quantum physicists and Buddhist contemplatives arrive at some similar conceptual insights, Wallace sees an important difference in how these concepts are applied. Buddhist methods of meditation make it possible to integrate conceptual insights into one's life in a way that transforms the meditator. "Indirect, conceptual understanding dispels our previous conceptual errors. Then we apply the stability and vividness of meditative quiescence to the conceptual insights ... As a result of such sustained, experiential familiarization, the veils of conceptuality gradually lift, giving way to direct, nonconceptual realization of the empty nature of phenomena" (p. 99).

Wallace breaks new ground in the comparison of Buddhism and physics when he draws an analogy between Dzogchen, or the Great Perfection, and some advanced ideas that link quantum field theory and cosmology. According to the latter, "... over the course of cosmic evolution after the big bang, empty space gradually 'froze,' so that it has taken on internal structure like that of an ice crystal. From empty space emerged gravity, quarks, elementary particles, fields, and all other configurations of space-time and mass-energy" (p. 109). The original state of the universe is described as a "melted vacuum," while its present state is a "frozen vacuum." The melted vacuum "... embodies the laws of nature in their ideal, perfectly symmetrical state, while the frozen vacuum state of the universe in which we dwell reflects the current laws of nature" (Wallace 2007).

Wallace reiterates the point that physicists seek to understand the universe in an observer-independent way, "... so their understanding of the melted and frozen vacuums is necessarily devoid of any notion of consciousness" (p. 110). In the Great Perfection, on the other hand, the universe emerges from the "... primordial unity of space, consciousness, and energy ..." (Wallace 2007). Wallace explains that here, "[t]he absolute space of phenomena is not to be confused with

relative space; rather, it is the ultimate dimension of reality out of which space, time, energy, matter, and mind all emerge . . . This luminous space is the ground from which all possible worlds appear, and it is the ultimate nature of every observer's mind" (Wallace 2007).

Wallace continues, "Much as physicists describe the current universe as 'frozen' with respect to the perfect symmetry of the melted vacuum, so do Buddhists characterize our current minds as frozen with respect to the perfect symmetry of primordial consciousness" (Wallace 2007). He quotes from the present Dalai Lama and the nineteenth-century Great Perfection teacher Dudjom Lingpa to show that even the same analogy of water and ice is used. In this case, symmetry-breaking occurs when phenomena and the mind are taken to have their own separate realities. The mind then reacts to phenomena with desire or aversion or indifference, leading to a chain reaction of karmic action and result, but since even the dualistic, grasping mind is ultimately of the nature of primordial consciousness, the Great Perfection holds that there is a way out. "The way to return to the perfect symmetry of primordial consciousness is to realize how all phenomena fundamentally emerge from and are of the nature of absolute space" (p. 112). As is always the case in Buddhism, this cannot be a purely conceptual understanding. Such understanding must be followed by meditative contemplation in order to produce a nonconceptual, transformative realization.

Cross-References

▶ Buddhism in the West
▶ Classical and Quantum Realism
▶ Consciousness (Buddhist)
▶ Cosmology
▶ Dependent Arising
▶ Modernity in Buddhism and in Islam
▶ Physics
▶ Quantum Theory
▶ Reality in Buddhism
▶ Science in Buddhism

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Physics in Catholicism

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Related Terms

Catholic church; Physical knowledge

The Nature of Catholicism

What could uniquely characterize the Catholic vision? One certainly needs to point out at first the harmony of reason and faith and the capacity to put the communion of all before anything that could lead to focusing on one's difference. This vision has something apophatic about it, since it

is easier to see what the Reformation has rejected from Catholic beliefs on particular points than it is to see what surplus there is in the unhampered essence of Catholicism.

During the modernist crisis, at the onset of the twentieth century, Maurice Blondel partly succeeded in the articulation of such an interpretation by speaking of a tradition that can be implicit but that is also self-consciously facing denials. Marian dogmas such as Immaculate Conception (defined 1854) and the Assumption (defined 1950) show that there is place for an implicit to be disclosed.

Catholicism is a tradition that values the human element in the human-divine union and as such recognizes the need for a visible presence, institutional or through the testimonies of the lives of the faithful, despite all the risks that could be encountered in the process of the unfolding of God's plan of salvation. This means that, while there have been important mystical figures in this tradition, the emphasis has not been on a non-mediated access to God. Christ is the mediator, but the Church also is since she is "Jesus Christ diffused and communicated" (Bossuet). There is therefore a role of tradition in illuminating Scripture, which entails that our situation is *made* meaningful by the Word of God but that it also *gives* it meaning. The Ecumenical Council Vatican II (1962–1965) reasserted the position originally defined at Trent (Session 5, 1546) concerning the Church's role in the interpretation of Scripture but made clear that the Church is to place Christ above both the written word and tradition, however important, since both flow from a unique divine wellspring (*Dei Verbum* §9).

The Question of the Development of Science

When the subject of science and Catholicism is treated historically, some of the following accusations are often raised against the Catholic Church. It dominated the dark and barbarous Middle Ages, whereas Protestantism freed the Western mind from bondage since, by securing religion in a heavenly realm, it permitted its faithful to fully engage in the development of science and technology. One will also hear that the modern world was built around the Protestant work ethic.

Catholicism always maintained that there was a troubled state in the religious relationship between man and God which is located in the *will* but that human *nature* had kept, in a profound sense, its integrity. There is a rational optimism which is part of Catholic convictions, although the ways in which this "faith in the world" has come to play are quite complex. It is remarkable that some religious orders, such as the Jesuits, have had in many cases a tendency to keep looking for a universe directly symbolic, almost hieroglyphic, even if it might have entailed at times an incapacity to give sufficient autonomy to the natural course of things (Ashworth in Lindberg and Numbers 1986:156; Hellyer 2005:221; Principe in Numbers 2009:104–105).

Historians have shown the untenable nature of the exclusively conflictual scheme "science versus religion" even if popularizers of science sometimes still have recourse to it (Cantor 2003). Religion is not an obscurantist force while science would be an expression of freedom; those categories are too wide and are "reifications" (Denton 2005). The problem has to be broken into a look at particular Christian confessions. Each one of those has had its historians who have been vehicles of apologetics. Fr. F. Russo for instance, while complaining about this situation, made himself guilty of it nonetheless in posing as a Catholic Hooykaas (Russo 1963:319). He highlighted the fact that if one reads the Dutch historian of science, the impression one gets at times is that it is Protestantism *as it differs* from Catholicism that has served as a force to promote modern science. To this, he objected that if indeed the former has produced several examples of observation and experimentation, modern science has built itself *against experience* more than it would have looked to confirm it passively (as Koyré, and also Bachelard, argued quite correctly) (Russo 1963:308).

If one looks at the question from the angle of the faith confessed by a practitioner of physics, inquiries have shown that the personal worldview instilled by one's denominational creed was not the most important factor and also that, perhaps contrary to some commonly held assumption, the Catholic faith is fairly permissive in that department if some fundamental dogmatic theses, few in number, are recognized.

Historical Outlook at Some Transitional Moments

For the Greeks, the universe was undergoing cycles of progress and decay, and if they promoted some technology, they were responsible for very little experimental science (otherwise one would incur the wrath of the gods). As J. Abelé recalled, the slaves were associated with the physical basis of geometry, measurements, and as such with the corresponding idea that those never carried with them the perfection of disembodied archetypes, which was an impediment to science's development (Abelé 1961:54). In metaphysical terms, it has been necessary to go through a de-spontaneization of nature as a condition for a confidence in the human capacity to understand her workings. The idealization that has been necessary to launch the modern scientific revolution could have happened easily a thousand years earlier as Whitehead saw. There is still discussion on the motivations for this delay, but certainly, one cannot avoid thinking about the panpsychism that is implicit in the idea of nature as a productive force. The main idea that had an influence on minds, in the physics that came to be diffused and systematized by Aristotle, and which had to be overcome, was that of a motion necessary obtained through application of force by a mover. There was also the attribution of a divine nature to the heavenly bodies and the idea of the perfection of circular motion.

Experimental methodology started at Oxford in the thirteenth century. It took until the seventeenth century for some of Aristotle's ideas in physics to be repudiated. What was physics like at that point? Was it tied to something the Church had to protect and preserve? For Aristotle, no overarching scientific method and demonstrations were possible since one was not to mix entities from different genera. He refused all that is the basis of calculus-oriented physics: the idea of a rate of change was dismissed as confusion while the rise of the concept of fields of smooth, continuous quantities is what unlocked classical physics (Funkenstein 1986:305–306). The changes that took place and configured progressively the modern conception of the laws of nature implied a shift from contemplative knowledge to the capacity to *do* things, a form of "ergetic" knowledge (Funkenstein 1986:296–297).

Galileo and the Consequences of a Thought Revolution

The Catholic Church decree of 1633 against Galileo has been the object of much attention. Although the matter is a complex one, there was more to it than contradicting the prevalent understanding of the reading of Scripture. As Russo observed, Catholics and Protestants would be in the same boat regarding the interaction of astronomy to Scripture, the Protestants having put historically more restrictions on allegorical interpretation of Scripture. It is now clear with hindsight that Galileo had inconclusive arguments, lacked proper means of observation, and refused to declare his vindication of Copernicanism only a theory, stating that knowledge would be true when obtained through observations and necessary demonstrations (Galilei 1957:182–184). In fact, Copernicus' system gave to circular motion an exclusive place; it contained eccentrics and epicycles although he freed himself of their need to account for planetary retrogressions.

Along with the Eucharistic dogma, entailing for Catholics a special presence of Christ to his Church, A. Kojève has argued that the dogma of the Incarnation of the λόγος is the most important conceptual shift that has permitted modern science to appear: the world is no longer unworthy of the presence and descent of God in it (Kojève 1984). To study it directly means learning

something about God's wisdom (Principe in Numbers 2009:105).

The systematization of the great principles of the new physics of Newton carried with it the need for the integration of all phenomena, electrical, magnetic, and chemical. Not only successes will be obtained: if matter attracts matter, how to account for its structural stability? The applicability of Newton's ideas was impressive. For instance, one can think of the Coulomb potential which governs the interaction between electrically charged particles as a particular application of the inverse square law which one could verify all the way from the macroscopic level of pith balls to the minutest components of matter. The overthrow of ancient physics implied the destruction of special qualities that would have accounted for properties inherent in bodies; it replaced essences that bodies, animate and inanimate, were supposed to be striving toward by focusing on systems that operate according to general laws and deploy their effects from initial conditions. If the clock is the metaphor of this era, we must remember that it presupposes for its function mechanisms rightly calibrated and organized, as well as hands that are set correctly, making the clock analogy *mathematical* rather than mechanical. There was a tendency in Newton of retrieving a natural theology by seeing in the order and the stability of the solar system, which it cannot itself account for on its own, a sign of divine intervention.

The next step that is worth noting is the nebular hypothesis and the formation of the solar system which P. S. de Laplace claimed he could account for by positing that the perturbations in the orbits of planets, considered by Newton to be cumulative, were periodic and would self-correct. Laplace conjoined a parable involving an omniscient demon with the idea of an intrinsic conditional probability, later to be replaced by two extrinsic and converse conditional probabilities. His first idea was that chance as epistemic limitation rendered it possible by its progressive eradication to detach the worldly regularities from the decrees of the divine. One could often hear that he eliminated the God hypothesis, but as studies of R. Hahn and others have shown, it is not atheism that one ought to find in Laplace but rather a determination of the fact that a first cause will never be accessible to the scientist's outlook, something more obscure to be kept for the work of theologians.

Thus, there was a passage from a system where we draw theological conclusions directly from the disposition of things to another form of thought where a certain metaphysical determinism, hypothetically applied to reality, makes superfluous the invocations of a divinity *in the natural sciences*. If one can sometimes notice that a God such as conceived by the deists has a tendency to disappear since he becomes useless in serving as a tool for physical explanation (Polkinghorne 2001:53), deism is far from removing its metaphysical necessity, since the world as mechanical and as a machine smacks of a clever engineer.

If we summarize and ask what conditioned the development of classical physics, we can think of:

- The abandonment of an attempt to find general intentionally defined concepts and the adoption of universally workable magnitudes.
- An idealization from local motion to in-principle accessible ranges of experience.
- Temporal sequences coming to replace substantial forms.
- Induction from experiments (promoted in different ways by both Descartes and Newton).

When Dogma Meets Science

It was already pointed out that the Catholic Church did not impose a natural philosophy on her faithful. She did show concern however for the dogmatic consequences of some metaphysical positions. One cannot say that Christian churches, upon hearing of the word "atomism," uttered condemnation. As a matter of fact, an ontology of particles of a Democritean kind was adopted by P. Gassendi, a devout Catholic priest, without being worried. Some Protestant theologians (N. Taurellus, C. Vorstius) did the same in an attempt to defend the Calvinist belief in the Eucharistic presence which entailed the rejection

of that part of the Lutheran account that had kept modified Aristotelian natural philosophy categories (Leijenhorst and Lüthy 2002:395–397). If one shifts the ground and thinks of the tradition of the *plenum*, that of Descartes, Huygens, and Leibniz (the most metaphysically ambitious who sought to reconcile continuity and discreteness), one will find that atomistic elements *with the overarching metaphysical determinism he adduced to them* could be said to have caused some problems to Descartes and later his disciples such as Fr. Méland. To have relegated everything real to primary qualities, while in the Eucharistic dogma only secondary qualities are said to subsist (Hellyer 2005:105–111; Leijenhorst and Lüthy 2002:396) meant that, defining matter as extension, secondary qualities were by the same token defined out of existence.

There remained a difficulty in assessing what was the thesis in ontology that brought trouble to those who like Galileo defended Copernican astronomy, especially when we consider that Copernicus, himself a canon, was asked by Pope Leo X to study discrepancies in the calendar and did it without anything being brought up against him. In view of the awkwardness of a papal commission gathering experts and working intensely for a month to condemn something they helped promote, it has been suggested that the main bone of contention for Galileo might have been not his defense of Copernicanism, of which alone he would have been accused to *protect* him, but rather his adoption of an atomistic conception in natural philosophy (Redondi 1987:165, 247–249).

The Council of Trent (1545–1563) seems to have favored peripatetic categories in some of its definitions regarding the Eucharist, but "substance" in those, in particular that of transubstantiation (session 13, Chap. IV, 1551), is not to be understood as having the technical sense it had in Aristotle's philosophy (Hellyer 2005:108). One can either say that there are different Aristotelianisms and that the meaning of such a natural stance shifted (Leijenhorst and Lüthy 2002:378), or like E. Schillebeeckx that the dogmatic Eucharistic definition never had that technical philosophical sense, as indeed many of the Trent

Fathers would have avoided it if they could have (Schillebeeckx 1966:331). If "substance" meant what one encounters in peripatetic physics, this would signify that Christ's body is still submitted to properties known in human experience, and as such, theologians would hardly have been in a position to blame Galileo or Descartes.

W. Ashworth asserted that nothing in the realm of ontology is refused to a Catholic because he would confess that faith (Ashworth in Lindberg and Numbers 1986:147) and thus was led to look at institutional impediments as more significant concerning hindrance to the development of science. This sociological criterion might imply that Catholics are closer to creatures of mere obedience, but the case of Pascal, which he himself analyzes, testifies otherwise (Ashworth in Lindberg and Numbers 1986:143). Worldviews carry metaphysical implications, such that one cannot believe in metempsychosis and be Christian, as the case of Giordano Bruno would illustrate, irrespective of any judgment on the means by which he was silenced.

If one can say, judging from examples of historical practice of physics by Catholics, that "... the term 'Catholic Science' ... has no meaning whatsoever" (Ashworth in Lindberg and Numbers 1986:147) and if J. Polkinghorne in a similar fashion can dismiss the very idea of a "Christian physics" (Polkinghorne 2001:40), it is important to keep in mind that our usual understanding of the cohabitation, in one's mind, of one's religious conviction, and one's worldview is often oversimplified. The last statement especially only makes sense after centuries of efforts to find the delimitation of respective provinces of inquiry. In this sense, it might be tempting to judge as simplistic whomever would look for a conception of space and of bodies' extension that allows to preserve the meaning of the dogma, particularly the Eucharistic one – sometimes fighting Aristotelianism and sometimes adapting it – but one must not forget that a universe with a beginning in time was deemed repugnant by cosmologists such as A. Einstein, A. Eddington, and F. Hoyle for reasons that have everything to do with metaphysical preferences. As S. Barr argues (Barr 2006:43), this would imply

a metaphysics and might hint at a form of religious commitment with which some of them wanted to have nothing to do. A "Eucharistic physics" is no more an impediment to science than this interference of a religiously-based pagan metaphysics (Hellyer 2005:105–113). G. Lemaître, a Catholic priest who proposed a model of cosmic expansion that went beyond the limitations inherent in the models of Einstein and De Sitter, later to be termed by himself the "hypothesis of the primeval atom," ironically fought against Einstein in the name of truth as harmony with rationally and empirically established facts, while the most famous physicist of the twentieth century was found clinging to theological presuppositions hampering the reconciliation with experimental evidence.

Contemporary Physics and the Worldview of Catholicism

Short of capturing the essence of contemporary physics in a few words, one can identify three clusters of significant work: (1) cosmology, models of the universe and astrophysics; (2) microphysics and quantum theory, and (3) computational chaos and the studies in complexity and self-organization.

Physical Research on the Very Large
The first cluster includes theories of the infinitely large, with general relativity and astrophysics, all the way to string theory and supersymmetry. Einstein understood that the laws of nature must be expressed so that they look the same to all observers, no matter where they are and how they move. Newton's laws of motion would have retained their form only for special observers moving in a simple way, without acceleration or rotation. There happened an important redefinition of purely intellectual evidence around the criticism of absolute simultaneity.

We can summarize the *first* constellation of work in physics by highlighting the following features:

- A modification of the Galilean principle of relativity, affecting the correct idea of an indifference to uniform motion, that had maintained a relationship to elapsed time from one referential to another which could not be salvaged in the context of electromagnetism.
- Inversion of the order of priorities of the physics of the day, since instead of studying properties of matter and aether accounting for those of space and time (contraction of rods and rulers), Galilean relativity was abandoned with the introduction of new transformation formulae.
- Since special relativity forbids traveling faster than the speed of light and Newtonian gravitation was considered to act everywhere instantaneously, a contradiction had to be solved: the result was general relativity, wherein gravity is associated to the curvature in the fabric of space-time itself, described using Riemannian geometry.
- Relativity receives early on a mathematical formulation characterizing it by the action of groups of transformation (the Poincaré group) and becomes the geometry of space-time that underlies all the current work on fundamental particles.

In the years of its early popular dissemination, after World War I, accusations where voiced against relativity, and some, like Cardinal W. O'Connell of Boston, saw in it a contribution to the erosion of the moral sense and an atheism camouflaged as pantheism (Holton Fall 2003:30–31). What was happening in reality had eluded the prelate: here was the challenge put in front of the Catholic Church to state to what extent the God she proclaims is an "outsider" to this creation. The difficulty is formidable indeed since, as previously stated, Catholics have always striven to maintain a harmony of nature and grace, alongside that of reason and faith.

There was with the implications in ontology of general relativity an installation of a rational transparency at the heart of reality which recaptures for man an important and seemingly forever lost place, altering the "principle of Copernicus." The human thinker through his mind is reinstalled at the heart of things, far from being chased from them (Gingerich in Harper 2005:60;

Danielson in Numbers 2009:50–58). Contrary to the Cardinal's fear, it is not a relativization of morality and personal philosophy that was fostered but an absolutism of the knowledge claimed from who has played with God's wisdom in creation (Prov 8), in other words a revival of the claim of Galileo almost three centuries earlier: the God of redemption cannot in his holy books require us to dismiss what is disclosed by the (Pythagoreo-) Christian book of a nature written in mathematical language. As argued by D. Dubarle, with Einstein, we reconnect in a better way with the original Galilean insight into inertial reference frames and we get rid of the encumbering uniform space and time of Newton. Even more beautifully, we find the vindication of a Keplerian epistemology centered on the descriptions of different observers with covariance of the *maßbestimmung* (Dubarle 1971:21).

The universe models invented around Einstein's general relativity are manners of reinserting the local in the global, and one must understand the implications of field equations that define a model of a universe for all the different situations represented. This dialogue between mass-energy and space-time is profoundly intriguing. The to and fro motion between local and global implicit in the Kaluza-Klein geometry insights that opened the road to adding additional dimensions into the existing understanding of space-time – leading to explorations in topology that were to develop into Calabi-Yau manifolds with many more unobservable dimensions – certainly has theological significance. The attempt at generalizing that was done amounted to the adoption of a geometry dictating its properties to the universe. This idea of a perfect rational transparency and predictability as it survives in relativity is that of the lifting of the veil which hides the mystery of things: they become accessible to the scientist achieving salvation through knowledge. The price paid is that the idea of creation and that of miracles become supremely abhorrent. Yet for this to happen, geometry first had to be made commensurable to its object. One would rightly see in this an intimation of the union of two natures signified at the heart of cosmological reality.

R. Feynman asserted numerous times that we do not know what the concept of energy really entails and that it is incomprehensible that there can be so many different ways to measure it. We say that electrical or mechanical work, then heat, are different forms of energy, with a total amount that remains constant. Different forms of energy are measured in different units, and one could draw an analogy with different forms of money measured in so many currencies. When we exchange them, they undergo a conversion *rate*, and this can be considered to have been fixed. The possibility does not always exist to convert them one into the other, since there are exchange restrictions. That restriction in physics is the second law of thermodynamics. If one disregards its effects, one is led to an "it from bit" universe that is a gigantic canvas of information which we could term for short Wheeler's universe. In such a case, there does not subsist any nonformal substratum, with a consequent evanescence of substance. This troubled Einstein himself toward the end of his life, with space-time understood as a structural quality of the field, and is sometimes referred to as the "hole problem," which attempted to show that no generally covariant field equation can be satisfactory. If one were to ask: "how can we keep matter in the picture?," it would be found that the same Catholic faith (in the wider sense including Orthodox Christians and many Anglicans) which at times seemed tilted toward some emphasis on an other-worldly spirituality is in fact the more "materialistic" of the world religions, as emphasized by W. Temple and Derwyn Owen. Not only does she affirm God making himself a part of his creation and abiding by her laws, but she insists on the sacramental continued presence of God to this same world and, far from teaching its disappearance or illusory character, awaits in hope a transfiguration of this our earthly body.

Physical Research on the Very Small

The *second* great constellation in physics is that of the infinitely small, where we have come to realize that energy exchanges which constitute the substratum of the world are done in

consequence of a distribution which does not obey the continuist logic that allowed to imagine metaphysical determinism as prevailing everywhere. In the new picture, even the most established principles such as that of the conservation of energy are *approximately* true, holding on average. It is not that science has grounded, or proven, freedom as we sometimes hear but that it has brought an end to a lasting obstacle to its being physically significant.

If we try to summarize important elements of this reconfiguration of physical knowledge, we find that:

- A distinction had to be made between measurements carried in the microworld and macroworld, since we are too heavy to pretend we could observe subatomic elements without disturbing them; although some magnitudes (e.g., mass and spin) might be obtained with arbitrarily high precision, conjugate magnitudes cannot be simultaneously obtained.
- There is the problem of weak objectivity: we always knew in classical science that our measurements were idealizations, but we thought that we could disregard that which is left out of the initial conditions.
- New rules of probability that are nonlinear.
- Incomprehensible effects in the material universe that can suddenly be explained through quantum tunneling, since there is a nonzero probability that through an interplay of the energy/amplitude relationship, particles behaving as waves will be found to exist outside potential obstacles.
- We realize with hindsight that the universe of classical physics had no inherent stability; the building-up of the internal structure of atoms could have been done in any haphazard way, which means that, had it really predicted the structure of the universe, we should have witnessed a chaos (little did Newton realize that his unease in front of the stability of planetary motions in the solar system in fact applied to the constitution of matter as picturable in his own system of physics).

Physical Research on Chaos and Complexity

The *third* constellation is conceptually related to the second just reviewed, and we can summarize it as follows:

- Unrestricted determinism was found to be unattainable from a calculation viewpoint, following a study of the properties of gases and by drawing the implications of inherent limitations to our retrieving information from the microworld.
- H. Poincaré working on the 3-body problem demonstrated that, for a question to be formulated with classical equations, a multiplicity of possible trajectories would be generated, that were affected by extremely small changes in the setting of initial conditions.
- With more advanced computational techniques, the meteorologist E. Lorenz formulated a more general theory of deterministic chaos.

As Dubarle also noted, the conditions which are required for the grand cosmological models of our first category to work (T-symmetry, equivalence of energy balance) are part of the initial Galilean idealization, but in our universe, which is hospitable to life, they are rarely if ever met. A freedom and an interplay of chances seem to lead to stabilization of structures (Dubarle 1971:25–26).

Fr. P. Teilhard de Chardin (1881–1955) anticipated relativistic physics early on in thinking of matter as a manifestation of energy. The mass-energy convertibility has an operational sense and it was known even before relativity. In Teilhard, it had acquired a religious and a metaphysical sense. How can we capture this difference? Einstein's vision seems to entail pantheism, it affirms our immortality but as impersonal energy distributions in a universal manifold along some fourth dimension (think of his letter of March 1955 to Michele Besso's widow, where he claims that ultimately the difference between past, present, and future is a persistent illusion), whereas for Teilhard, stretcher-bearer during World War I, a vindication of our going down and a resurrection of the flesh was awaited with the rising of dead soldiers. The blood of their sacrifice was the cement of the walls of the New

Jerusalem. It is precisely in the Eucharistic mystery that he found this conviction. The Spinozistic universe which smiles at us and is only hospitable in not ruling out the possibility of our presence shows a supreme indifference to the singularity manifested in our selves and to what we call personhood.

What Catholicism has to say about this is not forthcoming in the guise of one or many categorical statements; however, it helps us see in hindsight that a universe which transformed man into a being made up of aether or celestial matter, regaining a body as a sort of elementary minerality, amounted to an evacuation of human reality. It was to be judged with reference to some Empyrean heaven which never would have seen existing in their individuality but only as a species eternally less than some absolute postulated to be perfect according to a geometric archetype of circular motion. It is not that the quantum theory lays ground for an ontology that would replace the one which is behind general relativity, as is commonly assumed; in fact, relativity is needed to assess some elements that make the internal cogency of quantum mechanics. It is more that, as M. Heller says (Harper 2005:228), Einstein tried to save his view of a universe which is all there is, and when we realize that both relativity and the quantum theory are derivable from Noether's theorem, we come to see that the question is not to have established the reign of stochasticity but rather, as Cantor first indicated with his meditation on transfinite fractals, that the principle of plenitude, liberality, and generosity (*not* a human natural inclination) lay under the fabric of this world. The universe is not only discrete but, as M. El Naschie has argued, it is transfinitely discrete. The notion of transfinite discreteness is homomorphic to fuzzy topology, foliation, and fractal geometry (El Naschie 2005; Nottale 2007).

There is thus an interesting convergence between the rediscovery of the role of time in science – as factor of irreversibility – and this manner for man to imagine that human individual destiny, that of the human nervous system, of the encounters that have brought humanity about must subsist with humanity itself, anticipating a resurrection that would mean infinitely more than some angelization. The very idea of a history of salvation where we can cooperate to what happens to us requires a universe which has a certain openness to the unpredictable.

Awaiting a "Grand Narrative" and the Final Vision of Harmony

Physics and an Unfolding Revelation

The intimations of God in the harmony of the laws and their immanence in the universe, related to our first cluster, are not at odds with the Catholic vision. Some elements speak in favor of this ideal, for example, the fact that God in the Catholic tradition is said to be more dissimilar than similar to us and as such beyond person as we know it (Lateran Council IV, Chap. 2). For Einstein, religion could powerfully influence science, suggesting harmony, flight into the eternal and the perfect, but science could not influence religion, since it describes what is, as much as possible without prior biases, and is value neutral (Einstein 1950:21–24). The Catholic vision achieves a balance between the insertion in the whole that is not encountered in many forms of religious particularism, and the legitimate claims of an individual-centered vision of perfection in some atemporal present. The thrust of all this is to get closer to the idea of a continued revelation mediated through our effort to better formulate the operation of nature's laws and their openness to mutual interactions making possible the coming of improbable and unanticipated states of affairs.

In a Catholic conception of time and of the role of the Spirit informing the Church as the soul of the body she is, information is all given in the enacting of the events of salvation: the event infinitely intelligible for us has taken place, but the development of this information will need the history of the universe and the action of the Holy Spirit to deploy itself. This presence, in its balance with the work of the Son, is a trait characterizing Catholicism, a continuation and a valorization of the in-between, the time of history, and that of the Church acquiring a celestial value.

The universe revealed to us through deterministic chaos, our third constellation, is one where all is interrelated and where we can insert not only contingently inconsequential actions but make do with a sort of hypothetical necessity, understanding that this necessity might be discovered and oriented by gestures that are minute, in the manner of the interventions of the divine in a world of which it would respect all the laws.

The common representation of quantum spontaneity at the heart of atomic disintegrations, a factor of chance in all fundamental interactions, can be pictured as some historical march destabilizing our self-image which turns out looking more like the efflorescence of a decorative effect. Yet this can also reveal a transposition introducing itself in the universe in being patient without dismantling anything, as would a lure.

The Conversation with Process Thinking

Attempts have been made to articulate D. Bohm's vision, which had Einstein's approval, to a Catholic theology valuing the hiddenness of the divine in a cosmic process of enfolding and unfolding (Schindler 1986). If it is customary to see physicists draw connections between oriental Hinduistic or Buddhist teachings and contemporary quantum physics (such as G. Zukav or F. Capra), something to which Bohm himself was driven at times, preceded by Schrödinger, one must say that there is no rigorous basis to establish them. There would be as many reasons to draw connections between Bohm's "holomovement" and the Augustinian and Anselmian tradition, present in Catholicism, which looks at the universe as a gigantic system of signs; this vision suffered an eclipse with the rise of nominalism and the enclosing of the allusory character of the sign within the mind of the signifier but impressive, and as yet unexplored, means of revitalizing it can be found in the semiotics of C. S. Peirce (Auletta in Harper 2005:185–186).

What is likely to complement this search is a renewed account of process (Schmitz in Schindler 1986:119). The organicist philosophy of A. N. Whitehead in this regard has been and will remain a source of inspiration but might very well be found wanting in the end, since firstly it does not respect a necessary apophatism in the knowledge of God (Hill in Schindler 1986:88), and secondly, one might consider that it surreptitiously inserts *our* form of psyche in nature (Shimony and Malin August 2006:272–273). A Catholic outlook on the question would militate for the value of all creatures, since their model is in the λόγος and, welcoming insights of natural theology along with the majority of her theologians that has so interpreted Paul's teachings on the way of the mind to God from the world (*Romans* 1:19–21), recall that there is more to God's relation to this created universe than fulfilling the aspirations of human beings.

A Creation-Centered Spirituality

As already shown, there existed all along another attitude of mind in the Church, which finds the exclusion of the divine from the world distressing and thus seeks to see it present not so much in gaps of scientific explanations (something almost universally reprobated) but rather in an attraction of all things toward their final goal and "solidity" to be achieved only in Christ, who is the archetype through which they were made. It has expressed itself in the search for a creation-centered, cosmic spirituality. It is not unremarkable that chaos theory, through strange attractors, has rediscovered something of this exploration and stabilization around regimes of spontaneous order. The Church asserts the reality of the world, its value in the plan of God when it will pour in the bosom of eternity all of its fruits and time, as suggested by J. Moltmann, "will roll up like a scroll." The Catholic faith is not a vehicle of other-worldly spiritualization but asserts our common destiny with the cosmos through the belief in the resurrection. If it is remarkable that the Church has never condemned a theorem of mathematics and by the same token respected the autonomy of the science of physics since as we saw conceptions of natural order have only been questioned when they clashed with the absolutely central dogmas by which she lives, the transhumanist attitude which makes us a mind by analogy to a computer and a disembodiable software is not in her spirit

(Gagnon 2012). Refraining from any condemnation of mathematics, the Church also never condemned the theory of the evolution of organic forms on earth, only restricting its acceptability for her faithful to forms that have not degenerated in a materialistic philosophy of the self-sufficiency of the process.

Along with fractal ontology and the principle of an order that is coming from order all the way down (Barr 2006:78–9), the Church with her doctrine of the hypostatic union and the conceiving of all intelligible forms in the λόγος through the Spirit can help the science of physics live up to the challenge of reconciling conflicting understandings of cosmic order. If one were to object to this last statement that very often order is, in the words of S. Kauffman, "for free" (Belouzov-Zhabotinski reactions, self-regulatory networks), one would have to account for its usability. The real problem is not just the generation of patterns and redundancy but the "fire in the equations," the breath not so much of life but of a self-referring intimation of personhood wherever the trace of God's creative action is said to extend, which is unbounded like the universe and also limitless.

Cross-References

▶ Astronomy
▶ Astrophysics
▶ Christian Cosmology
▶ Cosmology
▶ Mathematics and Religion
▶ Natural Theology
▶ Physics in Christianity
▶ Physics in Protestantism
▶ Process Theology
▶ Quantum Theory
▶ Relativity
▶ Worldview

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Physics in Christianity

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The discussion on "Physics and Christianity" represents a subtopic of a wider issue on "Science and Christianity" (or Science and Religion). Its aim is not to bring into a simple, naïve correlation the content of contemporary physical practices and theories with the written, verbal, and practical teachings of the Christian Church (its theology) in order to establish a hierarchy in scientific and religious views of the world. The aim is to enquire in the essence and meaning of such a discussion. Indeed, the enquiry into the relationship between physics and Christian theology is counterintuitive: If one adopts a position that physics deals with nature, understood as the visible of this world, accessible to sensible, empirical verification and based in rationality related to the notion of objectivity (i.e., to a conviction that physics has access to reality as it is in itself, independently of the conditions of observability and subjectivity of the enquiring physicist), this runs against the sense of theology whose claims about the world and humanity have deep foundation in a different type of experience of personal communion with the Divine, experience which not only exceeds the capacity of the senses, but also makes reason (including scientific thinking) inadequate and incomplete in

apprehension of this experience. Understood in this way, a comparison of physics and Christian theology does not have sense since it attempts to relate two types of human experience by means of a mental procedure. To succeed in this attempt would imply to transcend both physics and theology and adopt a sort of generic (let us say philosophical position) which would incorporate both of them. However, this hypothetical position can only be an abstract suggestion with no means of justification, because it is problematic to imagine an experience which would exceed both, experience of the world through science and experience of God as well as of the world through communion. This is the reason why the topic of physics and Christianity must be approached in the conditions of its concreteness in the human condition incarnate in material events and history of the spirit. In this case, the problem of physics and Christianity is seen as an existential issue of overcoming different experiences and attitudes to the world in being of one and the same human person. More precisely, the dialogue between physics and theology appears as an encounter of two *traditions* of the human spirit, the traditions which in their apparent fragmentation follow some common *teleology*, which the dialogue attempts to articulate.

Tradition in Theology and Physical Sciences

Elements of History

Tradition in theology means the integrity of religious experience within the Church, its intrinsic catholicity, which is affirmed through the interaction of ecclesial community with the Spirit of God. For theology, tradition is not only constant reassertion of religious events commemorated liturgically or through reciting Scriptures and texts of the Fathers of the Church. It is the constant invocation of the presence of God in the Church and in the world which carries an ontology of forming and sustaining the reality of the Church and its theology (Nesteruk 2008).

Science also follows a tradition which dates back to the inception of Classical philosophy.

To follow tradition here is to be faithful to a particular outlook and the ways of investigation of the world. The very possibility of science, its foundation, and its facticity are related to the philosophical tradition in the West. In this sense, the discussion on physics and Christianity establishes itself through interaction (dialogue) between two historical developments: religious and philosophical traditions. A secular mind which would pretend to be free from all traditional forms of thought and to be "objective" and "dispassionate" here and now would forget that its very ability to transcend the immediately given and to place itself in a sort of transhistorical meta-discourse is ultimately connected with the place of this mind in the overall development of the human spirit in which the split between scientific and theological intentionalities represents, not simply a historical fact, but rather the fundamental antinomy of God's revelation in the world, the antinomy endorsed through the Church's complicated position, as being in this world but not of this world.

The appeal to traditions demands one to position the problem of "Physics and Christianity" in a historical context of interaction between science and Christianity tracing it back to the very beginning of the Christian Church (Nesteruk 2003). There are two different opinions as to the role of Christian thought as regards "secular" knowledge (which included the natural sciences) at the beginning of the Christian era. One of them was that the Church proclaimed the authority of Scripture over all aspects of human experience, rejecting freedom of investigation and any independent judgment on the nature of things. Another opinion argues that Christianity was the only social force able to release pagan science from its view of a divinized nature and which made it possible to develop the natural sciences, which led to modern state of knowledge and technology. Neither of these opinions reflects adequately the historical reality of the interaction between Christian theology and the sciences. The important point to remember is that Christianity preserved, transferred, and transformed the Classical tradition and its forms of knowledge.

Since its very inception, Christianity did not enter a vacuum; it encountered different aspects of the classical Hellenistic culture, including the sciences such as mathematics, physics, music, etc. Christian thought had to explain the function of Christianity with respect to the different aspects of contemporary culture and, conversely, the natural sciences as aspects of this culture had to be interpreted with respect to Christian faith. Christian thinkers spent considerable effort relating their teaching to Hellenistic philosophy which claimed that it had access to truth. The Fathers of the Church, being its spiritual leaders and educated in philosophy, understood well the limited nature of secular knowledge and the "sciences" in what concern their ability to talk about true nature of things and ultimate truth. The major stance was on what nowadays is called apophaticism in knowledge, namely, that knowledge's significative meaning does not exhaust the sense of what is signified. Knowledge deals with contingently given things without being able to address the issue of the very facticity of this contingency. Since then all ancient philosophical hypotheses on the ultimate reality and truth were treated as mere possibilities with no apodictic justification. Christianity attempted to break the futility of any enquiry on the ultimate source of being of things by referring through faith to God as creator and provider of sustenance and sense of things.

Christian thinkers were looking for indications of the presence of the divine in nature, but they never allowed their thought to degenerate into pantheism by maintaining the belief that the transcendent God of the Scriptures created the world *ex nihilo*, but that he is present in all created things through his effected words (*logoi* – the underlying and forming principles) (Lossky 1957). They interpreted the laws of nature as if they were established by God at the origin of the world, that the will of God lies behind the movement of nature. It did not imply that God "set the clock in motion" and then let it run on its own resembling thus deism. God, having created the world, still participates in it through His *logoi* and His grace, guiding the whole nature to its consummation. However, the laws of nature

(e.g., mechanical or thermodynamic laws) are not theologically necessary. They could be different, as could the structural units that are based upon these laws. The laws of nature are providential, for they indicate the purpose of existing things and the way these things receive their most favorable outcome. All knowledge of natural phenomena is incomplete if it is not seen from the perspective of the final causes that are mysteriously present in the deep structure of the natural world.

Science and Philosophy as Cooperating in Truth

Apophaticism in Physics

The attitude to the natural knowledge, originating from physics, is based on a major stance that knowledge, as the transmission of facts and statements about these facts using logical reasoning and shared language, contributes to ultimate truth, the truth based in faith. The usefulness of philosophy and sciences for faith was based upon understanding of truth (related to faith, that is to God) as something which is all-embracing, something which includes all particular kinds of truth. Truth is one, and it is God's truth. Philosophy of scientific truth cannot be identified with divine truth; rather, it is a partial truth. Truth is not attainable from within philosophy or the sciences, though they can contribute to the comprehension of truth. Correspondingly, there is only partial truth in the sciences. Thus, the function of the sciences is to be understood as that of a cooperating cause leading to knowledge of the truth. By cooperating in truth science and philosophy can easily be incorporated by the latter for the purpose of deepening and extending Christian faith (Lossky 1957).

Thus physics has an apophatic sense of delivering partial knowledge of things without exhausting their ultimate truth. But physics itself is based in indemonstrable premises, that is in beliefs which sustain physics but as such cannot be articulated scientifically. Indeed, since ancient times the Aristotelian method of a scientific "demonstration" (similar to syllogism, where

from established premises a new proposition is deduced which is of the same certainty as were the premises, in spite of the fact that the new proposition was not certain before the syllogism had been carried out) was used. In cases where some truth is already established, demonstration means that one tries to find an argument which, by starting from things already believed, is able to create faith in things as yet not believed. This kind of demonstration cannot be applied, however, to the ultimate principles that constitute the basic premises of any demonstration. Since physical knowledge is based on demonstration emerging from the first principles (such as existence of the world and its knowability) that cannot themselves be demonstrated, this knowledge itself cannot be demonstrated. This in turn implies that the very possibility of any knowledge requires the acceptance of first principles, which means faith in them. In this way, knowledge depends on something that is not knowledge, and this is faith. It is faith that allows one to formulate the first principles in a proper way and to assert things that are not seen in the course of demonstrable knowledge. Demonstration then follows after faith, but not the other way around. One needs to explicate faith in existence of the world and its knowability in order to link it to Christian faith.

Hidden Beliefs (Commitments) in Physics

Physics is based in beliefs in reality. This means that the stuff physics studies is already donated to *human* comprehension and through this physics takes it for granted that the material universe exists. In spite of its obvious nature, this belief is indemonstrable and inexplicable in terms of physics itself. In this sense, the reality of that which is called "physical universe" is relational upon those beliefs as well as corresponding historical practices of exploring nature. The theoretical apparatus is thus not a description in the ordinary sense, as presentation of an entity, supposedly given, and of its properties, it is the characterization of something which is not a thing, but a structural path along which a thing comes, from the ultimate horizon of every givenness, to the actual presence in which it is

effectively given to apprehension. Thus the intended "subject matter" of physics (the universe of material things) exceeds the scope of the physical sciences for it refers not only to the content of what has already been manifested, but to the conditions of this manifestation which are not part of the physical description per se. Here is a different level of affirmation of the incompleteness of the physical description of being which follows from the fact that that which is signified by physics is never exhausted through its signifiers (Yannaras 2004). The content of physical theories delivers us only that which is manifest, but not the conditions of this manifestation. Seen in this perspective only, the phenomenal reality is a sort of a static image in the ongoing process of manifestation. By its constitution, physical theories provide us with a particular, logically and physically accessible pattern in the interpretation of the world which, however, does not exhaust the whole sense of human presence in the universe of things as conditions for their manifestation. Here the transcendental sense of physics arrives from the recognition that the universe of things is *the manifestation* related to humanity (Ladrière 1972). In this sense, the universe of physics is always our universe. By its sense, the discourse of physics has to comprise not only the current scope of observations and theories but the whole history of formation of views on reality as well as all philosophical and theological issues on the conditions of its knowledge, the telos of this knowledge, and its value. The universe of things as manifestation implies a constant participation or communion with it which is tantamount to saying that the world as manifestation means life. And it is this life which is gifted to man in the Divine image.

The Possibility of Physics and a Christian Archetype

The belief in existence of the physical world is accompanied by another indemonstrable conviction that knowledge of the world is possible. More than that the major mystery lies in the fact that there is a certain commensurability between the embodied human subjectivity and physical

reality at micro-, macro-, and mega-scales. This conviction is not obvious on purely physical grounds, for the size of the human brain is incomparably smaller than the astronomical universe as well as it is incomparably bigger than atoms and elementary particles. In other words, the knowability of different levels of physical reality implies that human consciousness possesses a property on non-locality and a potency for transcendence beyond the sphere of its actual embodied existence in a human person. Summarizing, the facticity of human consciousness capable of articulating the plurality of physical forms is that ultimate ground and source of physical knowledge. Physics, however, cannot explicate consciousness because it itself works in the conditions of consciousness' givenness. It is here at this point that a Christian conviction that human being was made in the image of God, which provides a theological reference, a belief in the ultimate source of a potentially infinite capacity of human subjectivity.

The analogy comes from two directions: On the one hand it is an indication of a pre-lapserian archetype of humanity being in the likeness of God, according to which the primordial man knew the world as if he was "all in all." Secondly, the Christian archetype gives an indication of humanity's tendency to restore the knowledge of the wholeness of the world in a post-lapserian sense through the fact that Christ, through Incarnation, being fully human and fully divine created a precedence of non-locality in space (and in time) when knowledge is possible on scales beyond the limits of embodiment. The epistemic non-locality of a human being and its physical containment by the universe forms a content of the famous paradox of the human condition (Nesteruk 2008).

Christian theology reacts to this by appealing to the Chalcedonian definition, according to which Christ himself, by being fully human, that is through His belonging to the created world, exhibited the presence of the above paradox. On the one hand Christ was a historical person in ancient Palestine in a particular location in space and time of the universe; on the other hand he was still near the Father, thus holding

and governing the whole creation throughout its space and time (Torrance 1997). By his human nature Christ was contained in the universe, while by his Divine nature he was not contained by anything in the universe. By being the person of the Logos of God, he made visible to humanity that the Divine can be united to the human and created. And the power of upholding the entire universe while being on this planet, which can be explicated in spatial topological terms related to the geography of the Holy history and the entire universe, can be interpreted as an anticipatory sign of what the Divine humanity is endowed with in its microcosmic constitution: namely, by the power of its comprehension human being can hold the entire universe in the integrity of its intersubjectivity, referring thus the universe to its transcendent God-creator. In the same way as the presence of Christ in a particular location in space and time in the universe did not prevent him, as the Logos, from being present everywhere in the universe, the presence of humanity in a particular location in the universe does not preclude this humanity to be present everywhere in the universe through the "inherence" of the universe in the hypostasis of humanity, whose archetype is Christ himself (Nesteruk 2003). The Incarnation of the Logos in flesh at one particular point of the universe, and his simultaneous "presence" everywhere in the universe, including all layers of its intelligible counterpart, provides us with the archetype of how the all-penetrating human subjectivity can affirm itself in the physical universe from a particular position on the planet Earth.

Physics and Eucharist

By relating humanity to Christ, whose hypostasis, after the Pentecost, was transmitted to the Church, theology implicitly affirms that the Christ-event as central for our comprehension of the possibility of knowledge of the entire universe has some cosmological significance. Then one can conjecture that the development of the physical universe has, theologically speaking, a drastically different meaning before the Incarnation of the Logos on Earth, and, after it. It was

necessary for the universe to be in a state of constructive development in order to sustain life on Earth and to allow God to assume human flesh in order to initiate the new stage of salvation history. Humanity then can only be understood in the context of the promise of God for its salvation as constituting the locus point of the meeting of God and His creation, as the mediating agency, which is supposed to bring the whole universe through its genuine knowledge to new creation. In the same way as through Liturgy Christians experience an eschatological presence of Christ, the ecclesial wisdom in the knowledge of the universe through physics discloses to men the presence of the hypostasis of Christ. This wisdom reinstates the existing split between the ecclesial and scientific intentionality in studying the universe to their eucharistic unity, that is unity in communion with God, revealing thus the work of physicists as a *para-eucharistic work* (Zizioulas 1997).

Here the wisdom of Christian Church makes itself distinct from philosophical and scientific wisdom. Philosophies and sciences do not feel the modes of gratitude and thanksgiving as a beginning of thought. If for the ancient (pre-Christian) thought there was nobody who had to be thanked, for the modern thought it has always been a fight against the transcendent who might be thanked. The lack and loss of the eucharistic intentionality in scientific vision of the world results in a desire for unlimited possession of knowledge of things in order to use them for utilitarian goals. To restore eucharistic intentionality in knowledge one requires to exercise *metanoia* (change of mind, repentance) when abstract knowledge and ideas become manifestation of the *image* of God who stands in communion with the human spirit. This *metanoia* represents a mode of ecclesial reality so that the Church as eucharistic mystery gives the knowledge of a universe which was created to become a Eucharist. The physical universe acquires the sense of sacrament, thus being a correlate of the eucharistic intentionality. The Christian Church as carrying and sustaining this intentionality reveals itself as that ultimate multihypostatic

subject (community of scientists) which unfolds the universe in the state of communion and loving relationship.

Cosmic Eucharist

Contemporary dialogue between physics and theology attempts to answer a fundamental question: Can science provide an inference to the Divine, or can science transcend? In other words, what indications of the Divine can be detected by science? Within the Christian frame of mind it was a conviction that the very rational structure of the universe, its knowability point toward the Divine Logos, the second Person of the Holy Trinity, by whom and through whom, according to the Christian Creed, everything was made. The world was created by the Word (Logos) of God, everything exhibits his presence, and the principle of this presence is Christ who is both God and man. It is through his Logos that God gave an order to the universe that it is comprehensible by man, and it is through this comprehensibility that man can know about God from *within* creation. Ancient writers made use of astronomical examples such as the regular motions of the sun and the moon, the stars, the sunrise, etc., in order to infer that there is a consistent order in the universe, where opposite motions and differentiated objects are not ordered by themselves, but have a maker distinct from themselves who orders them. The order among things is not self-produced, but is maintained by God by means of uniting, balancing, administrating, ordaining, and reconciling created things. However, according to the teaching of the Church Fathers, it was not enough for God just to create an ordered world in order to teach men about the God-Father. It was the role of the Son-Logos of God, who by his ordering of the universe reveals the Father, through his Incarnation, thereby using another means to teach those who would not learn from the works of his creation about God. Indeed through the affirmation of the unique position of Christ in the world as being in body locally at a given point in the vastness of cosmic space, and still being co-inherent at every point in space because He is in everything as the Word of God one can infer an implicit principle of order in the universe which ensures that every place in the universe, as a place of the "presence" of the Word, is theologically co-inherent with the place where God is bodily incarnate, i.e., on earth.

The problem that arises is how to understand the presence of the Logos within the created realm and to what extent can physics advance the manifestation of this presence? Christian approach to physics lies in the conviction that the world in its entirety and in every detail is an effected word (logos), a personal creative activity of God. The contemplation of the logos is not the same as either empirical perception or mental comprehension. It is a mode of spiritual vision of reality, where the ontological roots of things and beings are seen as having their grounds beyond the world. This Christian contemplation of creation as it were "from above," or "from within" – and not through external sensible or internal mental impressions – is significantly different from what is now normally accepted as taking place in scientific experience. Indeed, science usually thinks of itself as starting from experiments and measurements, from things which constitute our sense of ordinary reality, though sometimes mediated by experimental apparatus. There is, however, another aspect of all scientific investigation which involves the shaping of contingent empirical findings into a theory. This requires access to symbolic language, that is to mathematics, which makes it possible for us to talk about the entities standing behind the outcomes of our measurements. This takes place regularly when physics invokes the notions of elementary particles, fields, global geometry, the totality of the universe, etc. All these "objects" are known to us only through their effects, and are representable in our mind only by means of symbolic images. In other words, their physical existence is affirmed in terms of their symbolic images. The reality of matter in this case is an effected event accessible to man as a possibility of reason. We understand at present that this way of looking at reality corresponds to what we call rationality as a meeting of human reason with another reason. The knowledge of nature is thus analogical, or dialogical. The source of this rationality is hidden in reason

which is characteristic of the human person, understood as an initial possibility of existence, the source and ultimate foundation of any other eventuality of hypostatic actualization. It is human persons who meet God's creative command "Let there be light" which contains the meaning of the world and its temporal beginning (even though it should, according to physical cosmology, be billions of years away from now) in the inmost core of personal existence, because there is in human person that the personal bearer of this command is revealed, the Logos, Word of God, Jesus Christ. It is because of this that the truth of the physical world is for the community of the Christian Church inseparable from the knowledge of God, that is from the person of Christ (Yannaras 1998). This movement of man into the spiritual contemplation of the unity of things, their purposes and ends in Logos-Christ can be qualified as communion with God through nature as an effected word of God as a liturgical process on a cosmic scale: the "cosmic liturgy."

Cross-References

▶ Classical and Quantum Realism
▶ Divine Action
▶ Energy in Physics
▶ Philosophy of Religion
▶ Philosophy of Science

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Physics in Judaism

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Related Terms

Judaism and physics; Physics

Description

Physics and Premodern Jewish Religious Thought

A clear sense of the historical relationship between physics and Judaism must be guided by an understanding of three fundamental historical facts.

The first involves the relative developmental timelines of physics and Judaism. Although it has some roots among the ancient Greeks (e.g., Aristotle, Archimedes, etc.) the broad contemporary field of science known as physics began to develop in the sixteenth and seventeenth centuries in the work of such iconic figures as Copernicus, Galileo, and Newton, and grew to its current level of depth and breadth in the twentieth century. By contrast, the broad set of religious traditions, laws, values, and community structures known as Judaism is rooted firmly in the Hebrew Bible, composed in the first millennium BCE, and then experienced massive growth and development in the Talmudic period (the four to five centuries following the destruction by the Romans of the Temple in Jerusalem in 70 CE), and had laid down much of its classical philosophical and religious literature by the end of the Middle Ages. Thus, by contrast to Protestantism, for example, which began to flourish just as the modern field of physics was coming into existence, or to Roman Catholicism, which began an important developmental phase at the same time (at least in part as a response to the Protestant Reformation), Judaism had settled comfortably into its classical phase at least a century before

Copernicus began to describe a heliocentric universe. This means that many of the doctrinal and political conflicts that characterized the early relationship between the Church and physics because of the confluence of their early developmental stages had no homologue in Judaism.

The second fundamental fact of relevance to the relationship is that several of the founders of modern physics, most notably Copernicus, Galileo, and Newton, were closely associated with the Church. This meant that their scientific work was inevitably closely watched and evaluated by Church leaders to determine its theological ramifications. During this period in European Jewish history, however, there was significant mistrust between Europe's Jews and the Church. The Roman Catholic Church's relationships to Jews and Judaism can be fairly, if somewhat broadly, characterized by the anti-Jewish sentiments and actions of the Crusades and the Inquisition (Steinberg 2008). And the Protestant Reformation's attitudes toward Judaism, as attested, for example, in the writings of Martin Luther, were likewise filled with vituperation and hostility (Oberman 1983). This historical picture meant that Jewish thinkers and scholars in the formative period of physics, because of their fear and mistrust of, and resultant isolation from, the Christian intellectual world, were little aware of its discoveries and little affected by the revolutions it fomented in how we see the universe in which we live. (On the lack of awareness of the work of Copernicus among Jewish astronomers, for example, see "The Astronomy of Rabbi Moses Iserles" in Langermann (1999).)

But by far the most important fact that should inform one's sense of the relationship between physics and Judaism is the way Judaism, as it developed in the Talmudic period, deals with doctrinal truth regarding all matters, including the understanding of Scripture. Talmudic Judaism clearly based itself on an absolute belief in, and adherence to, the words and principles of the Torah, which it considered to have been revealed directly to the people of Israel by God. Yet it was equally clear in its commitment to the notion that the understanding of, and therefore, obedience to, the Torah required human (i.e., rabbinic)

interpretation. In a sense, the entire religious program of the Talmudic era was devoted to the creation of a vast system of interpretation that would transform the Torah into a document that would guide every imaginable aspect of the life of the Jewish people. Such interpretation was necessary because the Torah often seems to provide only a bare minimum of guidance, omitting the details that would be necessary in order to live a fully compliant life. Thus, to cite just a single, very common example, the Torah absolutely prohibits work on the Sabbath. But it is all but silent on what constitutes work. In order for Sabbath observance to become a cornerstone of Jewish life (as, in fact, it did), a tremendous amount of interpretive detail had to be added to the system. The sum total of this added interpretive detail was referred to by the rabbis as the Oral Torah (Hebrew: *Torah she-b'al peh*), as distinct from the Written Torah (Hebrew: *Torah she-bikh'tav*), and although the rabbis often made claims for its divine origin, it is quite clear that the Oral Torah is the product of human analysis, interpretation, and creativity. This Oral Torah is concerned almost exclusively with matters of correct understanding of and compliance with Jewish law (Hebrew: *halakha*), and cares rather little about matters of belief. Thus, the Talmud and the legal literature it spawned in the centuries following its completion focused on proper observance of Sabbath and festivals, of dietary laws, of ethical conduct between persons, of civil law and criminal jurisprudence, of laws governing the human life cycle (e.g., circumcision, marriage, divorce, and the rituals and requirements surrounding death), of agriculture, of prayer, and of many other such behavioral issues. But these literatures have little to say about the doctrinal aspects of Jewish life. They provide no creed and lay down no specific requirements for belief. (See below for Maimonides as an exception to this generalization.) Thus, for example, the Oral Law presents a plethora of intricately detailed requirements regarding the recitation of daily prayers. These include the times of recitation, the texts to be recited, whether the recitation should be audible or silent, whether the worshipper should stand or sit, what sorts of locales are appropriate, and

which are inappropriate for prayer, what to do if one is prevented from praying at the proper time, what sort of mental attitude one must maintain during prayer, and much more. But it says little about what one ought to *believe* about prayer or its effect on God or the world. This has led many to claim that the most traditional forms of Judaism should be referred to as Orthoprax (meaning "correct practice"), rather than Orthodox (meaning "correct belief"). In addition to its nearly exclusive focus on behavior and its virtual silence regarding doctrinal matters, the Oral Torah is characterized by a complete tolerance for – it may not be an exaggeration to say a *love* for – multiple interpretations, differing opinions, and multiple truths. Rabbinic literature is filled with accounts of major disagreements among the sages over every conceivable issue. And far fewer than half of such disputes are resolved. Instead, after examining both sides in depth, the text moves on, satisfied to leave the issue unresolved. Thus, in the rare cases in which the rabbis express themselves on matters of belief, they generally maintain a great tolerance for alternate opinions and interpretations. Therefore, unlike the case in the relationship between the Church and physics, Judaism, to the extent that it was aware of them, never saw revolutionary ideas about the universe as threats to doctrinal orthodoxy, since it cared little about such orthodoxy and, on the rare occasions when it did, it was little perturbed by nonstandard views.

An important exception to the foregoing observations is found in the work of Moses Maimonides (also known as Rambam, 1135–1204, Spain and Northern Africa). In his 14 volume legal work, entitled *Mishneh Torah*, he broke with tradition and set down simple legal rulings, without citing either earlier sources or alternative views. This radical approach led many to condemn the work when it appeared, although in subsequent generations, it gained enormous influence and is hailed today as a major landmark in the development and codification of Jewish law. In his other works (his *Commentary on the Mishnah* and his philosophical magnum opus *Moreh Nevukhim* or *Guide to the Perplexed*), he does present what he deems required beliefs for all

Jews. So influential were his views that his creed, in two poetic settings (the song *Yigdal* and the so-called 13 Principles of *Ani Ma' amin*), are included in almost all traditional Jewish prayer books to this day. Nevertheless, even Maimonides' views could never have led to major conflict in the face of the discoveries of modern physics, since he went to great pains to teach that the human mind can know nothing of any certainty about God. Rather, when we make statements about God, we are actually describing not God's attributes but God's *negative attributes*. Thus, for example, when we say that God is One, all that we really can mean is that God is not many. In other words, because God is unique, we cannot compare God to anything else, or even imagine that a word applied to God means the same thing that it does when applied to something else. This view prevents any possibility of reading Scripture literally.

In light of all that has been said, the following statements may be made regarding the historical relationship between physics and Judaism:

1. Because the revolutionary discoveries of physics from the sixteenth century onward have little bearing on the practice of everyday life, Judaism as it developed in the Talmudic era and the centuries following the completion of the Talmud has been little concerned with these scientific discoveries. This is quite unlike the case of biology, where new discoveries often have legal and ethical ramifications about which Jewish legal tradition cares a great deal (e.g., issues of definition of life and of death, palliative care, reproductive medicine, and so on).

2. Because Judaism, as it developed in the Talmudic period, has maintained a high tolerance for multiple views regarding theological issues, even if the discoveries of physics had posed challenges to Jewish orthodox beliefs, those challenges would have been of relatively minor consequence.

Medieval Jewish Thinkers

These conclusions are not meant to imply that Jewish thinkers and writers throughout history had no interest in the issues of physics.

Indeed, there has been consistent interest in, and attention paid to, issues of cosmology since the Talmudic era. Specifically, the questions of whether the universe is eternal or was created in time, and whether its creation was ex nihilo (Hebrew: *yesh me-ayin*, literally, existence from nothing) became focal points for much debate among medieval Jewish philosophers. So, for example, Solomon Ibn Gabirol (eleventh century, Spain), although his sympathies lay with neoplatonism, nevertheless tried to argue for creation ex nihilo, while Saadya Gaon (early tenth century, Baghdad) couched his laborious arguments in favor of creation ex nihilo in terms very similar to those of the proponents of Kalam. Maimonides declares that the question of whether the universe was eternal or created in time cannot be definitively determined by the philosophers or by reading the Torah, and thus chooses to adopt a belief in temporal creation solely because doing so is compatible with maintaining a belief in God's ability to perform miracles and make free decisions, and these beliefs are crucial to Jewish life (see his *Guide to the Perplexed* 2:25). This reasoning is important, for it shows that, although medieval Jewish philosophers argued about questions of cosmology, they did not regard them as being terribly central to Jewish belief. What was most crucial to them, and, generally speaking, to all premodern Jewish thinkers, was maintaining the system of Jewish life, with correct practice based on obedience to God's commandments (Hebrew: *mitzvot*) as expressed in the Written Torah and interpreted in the Oral Torah. As long as questions of the origin of the universe and the circumstances surrounding it did not materially affect the integrity of a life lived in accordance with the Torah, the philosophers never saw such topics as being critical to Jewish doctrine.

Modern Jewish Physicists

With the dawn of modernity, and especially under the influence in Europe of the Enlightenment and Emancipation, many Jews abandoned traditional Jewish belief and practice to a greater or lesser extent, and opted instead to participate fully in the cultural and intellectual life of the societies in which they lived. This historical shift led many Jews to seek secular education, and one result was that a very large number of Jews became distinguished physicists. In the twentieth century, this was the case especially in pre-Nazi Germany, in the Soviet Union, and in the United States. The list of important figures in the development of modern physics who came from Jewish families is remarkable. It includes (the following is only a partial list):

Niels Bohr, David Bohm, Max Born, David Deutsch, Bryce DeWitt, Albert Einstein, Richard Feynman, Murray Gell-Mann, Sheldon Glashow, Alan Guth, Robert Jastrow, Lev Landau, Benoit Mandelbrot, Albert Michelson, Hermann Minkowski, John von Neumann, J. Robert Oppenheimer, Wolfgang Pauli, Arno Penzias, Saul Perlmuter, Boris Podolsky, Ilya Prigogine, I. I. Rabi, Carl Sagan, Julian Schwinger, Lee Smolin, Edward Teller, Steven Weinberg, Eugene Wigner.

This list includes only those who names are known to the wider, nonscientific population, and constitutes only a small fraction of the total number of prominent Jewish physicists. To put the numbers in perspective, as of 2009 the Nobel Prize in Physics has been awarded to 187 individuals, of whom 44, or about 23.5%, have been Jews. These Jews have been and are, for the most part, uninvolved in and occasionally even hostile toward Jewish religious life. The group includes a number of individuals from intermarried families (i.e., with one Jewish and one Gentile parent), and some instances of conversion (Pauli's father, born Jewish, converted to Catholicism before his marriage to Pauli's mother who was raised by her Catholic mother and Jewish father; Wigner's family converted from Judaism to Lutheranism when Wigner was in his teenage years). One of the few well-known exceptions to this overall lack of involvement in religion in general or Judaism in particular was Albert Einstein, who considered himself religious (although he defined this as "veneration for this [subtle, intangible, and inexplicable] force beyond anything we can comprehend..." (Jammer 1999a)) and spoke

often of God. He felt a close kinship with the pantheistic thought and commitment to absolute determinism of Baruch/Benedict Spinoza, the famous, mid-seventeenth-century Dutch Jew who was ultimately excommunicated by the Dutch rabbinate. He was not drawn to traditional Jewish religious practice or belief, although for a period of his youth, from about the age of 6 to the age of 12, perhaps inspired by a private Jewish tutor engaged by his parents to teach him the fundamentals of Judaism, he did observe Jewish ritual enthusiastically. Throughout his career, he made frequent references to God. Most famously, in a 1926 letter to Max Born, he wrote, "(quantum) theory says a lot, but does not really bring us any closer to the secret of the 'old one' (i.e., God). I, at any rate, am convinced that *He* does not throw dice." On the specific question of the relationship between religion and science, Einstein asserted that, "science without religion is lame, religion without science is blind." Although his views on religion were often condemned by the Christian community, they were often embraced by the liberal Jewish community in the United States. In response to a 1930 essay by Einstein in the *New York Times Magazine* entitled "Religion and Science," Rabbi Nathan Krass, a well-respected liberal rabbi and professor of homiletics in New York City, said in a sermon, "The religion of Albert Einstein will not be approved by certain sectarians, but it must and will be approved by the Jews" (Jammer 1999b). Irrespective of his theological agreements or disagreements with traditional Jewish beliefs, Einstein felt a close sense of personal identity with the Jewish people on a cultural, ethnic, and national level. He was devastated by the news of the destruction of European Jews by the Nazis, and expressed deep hatred for the perpetrators, even though his beloved Spinoza had counseled that hatred "can never be good." He also identified as an active and proud Zionist, although when he was offered the presidency of Israel after the death of the first Israeli president (and Einstein's friend) Chaim Weitzman, he regretfully refused. All in all, he stands out among the great physicists of his time

as one of the very few who comfortably embraced his Judaism, even when he disagreed with its doctrinal orthodoxies or ignored its ritual requirements.

Contemporary Jewish Physicists on Judaism

Beginning early in the 1990s, there appeared a small number of books written by contemporary physicists who are themselves observant (i.e., Orthodox) Jews, addressing the relationship between physics and Jewish tradition. These works were first produced in the same cultural milieu that had produced such well-known works as physicist Fritjof Capra's *The Tao of Physics* (1975) and Gary Zukav's *The Dancing Wu Li Masters* (1979), which described parallels and similarities between the "new physics" and spiritual (usually mystical, eastern) traditions. Most notable among these Jewish authors is Gerald Schroeder, whose Ph.D., in Physics, was from the Massachusetts Institute of Technology. Since the publication of his first book, *Genesis and the Big Bang* (1990), he has devoted himself more to teaching and writing in the field of Jewish religious studies than in science. In that work and the several that he has written since, Schroeder argues that the creation narrative of the Torah (Pentateuch) is not only not in conflict with modern cosmological theories, but matches them, and in fact, anticipates them, quite well. Relying on traditional Jewish interpretations of the biblical text (especially those of Moses ben Nachman, or Nachmanides, thirteenth-century Spanish rabbinic authority and mystic), he argues that the order of the creation narrative in the first chapter of Genesis precisely accords with what has been learned from cosmology, geology, paleontology, archeology, and other modern scientific disciplines. He reconciles the apparent difference between the biblical report of creation taking place in 6 days with the scientific estimate of roughly 15 billion years by appealing to Einstein's Theory of Relativity. Focusing on Einstein's insight that time and the measurement of time are not absolute, but are critically dependent on inertial reference frames, he argues that

...the first six days of Genesis were six 24-hour days. This means that whoever was in charge recorded the passage of 24 hours per day. But who was there to measure the passage of time? Until Adam appeared on day six, God alone was watching the clock. *And that is the key*.

During the development of our universe and prior to the appearance of mankind, God had not yet established a close association with the earth. For the first one or two days... the Earth didn't even exist! ... Because there was no Earth in the early universe, and no possibility of an intimate tie or a blending of the reference frames, there was no common calendar between God and the Earth.

According to Einstein's law of relativity, we now know it is *impossible* in an expanding universe to describe the elapsed time experienced during a sequence of events occurring in one part of the universe in a way that will be equal to the elapsed time for those same events when viewed from another part of the universe. The difference in motions and gravitational forces among the various galaxies... make the absolute passage of time a very local affair....

The odyssey that stretched between the stuff of the Big Bang and the matter of today was too complex, too varied, to be timed by a single clock... We humans, and everything else in the solar system... are the debris of bygone stars.... To which atoms of carbon, nitrogen, or oxygen would the time relate?... Until the formation of the Earth, the processing of the cosmic stuff of which we are composed occurred in a myriad of stars.... Each star and each supernova had its own gravity, its own speed, and so its own space-time reference frame....

[A] compromise had to be made to describe the sequential development of the universe. This compromise was to choose, for the time preceding Adam, the Creator's own reference frame that viewed all the universe as a single entity....

...[I]t was at the moment of Adam's appearance that the part of the universe where man dwells started to operate in the same space-time reference frame as its Creator. (Schroeder 1992)

This passage is completely typical of Schroeder's method. By a clever application of modern physics, he is able to demonstrate a deep compatibility between the understanding of the universe that has been developed by modern science and what he considers the revealed truths about the universe available in the Torah. The apparent goal of such work is to prove the ultimate truth of Torah to a generally secular population that has a high regard for science and its truths. In effect, it is a sophisticated form of Creationism in which, instead of claiming, for example, that fossils were created by God, or that each "day" of Genesis actually consisted of 3 billion years, Schroeder uses the tools of modern physics to "prove" that the biblical account is literally true, if we will only read it with a degree of sophistication due to a complex and nuanced work. In this, Schroeder's agenda is similar to that of other Orthodox Jewish writers on topics relating to physics and Judaism, such as the proponents of the Bible Codes. That agenda is to use modern science to prove the divinity, and thus the authority, of the Torah. All the authors involved in such work are personally committed to Orthodox Judaism, and their writings are designed to use rational, scientific arguments to convince readers of the ultimate truth of this form of Jewish life.

Liberal Jewish Approaches to Physics

At roughly the same time that Schroeder and others were beginning to argue that modern physics constituted a strong justification for the truth of Orthodox Judaism, liberal Jewish thinkers from outside the world of physics were beginning to turn to physics (primarily to cosmology) in a non-Orthodox move to find new meaning in Jewish life. Foremost among these thinkers is Daniel C. Matt, former professor at the Graduate Theological Union and acknowledged as one of the world's greatest authorities on *Kabbalah* or classical Jewish mysticism. In his 1996 book, *God and the Big Bang* (not to be confused with Schroder's *Genesis and the Big Bang*), Matt proclaims that in his approach to the scientific and the spiritual he will "...experiment with seeing each in light of the other... to bring the two into dialogue" (Matt 1996a). Where Schroeder uses cosmology to demonstrate the literal truth of biblical text, Matt, the kabbalist, focuses on mystical descriptions of God such as *Ein Sof* (literally "no end" or "no boundary"), a moniker that has a startling resonance in physics (cf. the "Hartle-Hawking no-boundary condition") but that is neither mentioned nor hinted at in the Bible or the Talmud. Rather than trying to prove or convince us of anything,

he uses poetic language drawn both from the ancient terms of Kabbalah and from the fundamental concepts of cosmology to suggest how both disciplines might be understood as hinting at a meaning that transcends the ordinary and the mundane. He writes:

> There are moments when the self uncovers its vast ground of being, its interface with all that exists. Mystics have no monopoly on such moments... As members of the cosmos, we derive from the big bang. Each quark within each of us was present at the beginning... Through science the deductive mind... gropes its way back as far as possible... to the beginning of time and space. Through contemplation, the meditative mind... gropes its way back. The two approaches, while not the same, are complementary paths from our limited, human vantage point to the beginning. (Matt 1996b)

Employing this approach, Matt provides evocative suggestions of parallel meanings to be found in cosmology and in Jewish mysticism. For example, he presents an extended explanation of the kabbalistic doctrine of the "breaking of the vessels" (Hebrew: *shevirat ha-kelim*), a description by the sixteenth century mystics of Safed (in northern Israel) of how the perfect and undifferentiated divine light shattered early in the creation process and led to the created and flawed world that we know. He then discusses the "symmetry breaking" by which the four fundamental forces split apart in the moments after the big bang. He observes:

> We exist today in our present condition, with all our flaws and imperfections, because of broken symmetry, just as Jewish tradition teaches that our jumbled, blemished reality derives from the breaking of the vessels. (Matt 1996c, p. 85)

By focusing on the philosophical implications of modern scientific cosmology, he points to similarities between some of the insights one may reach through its study and notes their similarity to insights that one may reach by studying Kabbalah.

A similar approach with a somewhat different agenda is found in the 2005 book, *Judaism, Physics and God: Searching for Sacred Metaphors in a Post-Einstein World*, by liberal rabbi and academic David W. Nelson (2005). Like Matt, he explores the conceptual landscape of modern physics in order to find links with Jewish meaning. But where Matt is mainly interested in Kabbalah, Nelson's main goal is to generate a set of new metaphors for God. Arguing that all we can say or know about God is metaphorical, he examines several areas of physics in an attempt to create modern God-metaphors that may be more appealing to a modern Jewish audience than the ancient metaphors of King, Father, and so on. So, for example, he suggests using the Big Bang as a metaphor for God, he uses chaos theory to suggest that God is fractal-shaped, and he describes the extra "tiny curled up spatial dimensions" posited by string theory as a way to think about God's invisible and pervasive presence in the world. He also discusses new understandings of premodern notions of God. In his examination of Special Relativity, for example, he considers how the ancient biblical metaphor of God-as-light (see Psalm 27:1) might be understood anew by taking into account Einstein's insights into the constant speed of light. Nelson's use of physics is clearly designed to present a new framing of traditional Jewish concepts and beliefs that he believes will be more accessible to a modern, scientifically minded Jewish world.

The work of both Matt and Nelson is far less polemical than Schroder's. Both are designed to be evocative rather than didactically to prove the truth of their positions. It is important to note that, whereas Schroeder is a professional physicist with extensive knowledge of Jewish tradition, Matt and Nelson are scholars of Jewish thought with amateur interest in physics, although it is clear that both received significant assistance from professional physicists.

The Future of Jews and Physics

It has been observed anecdotally that, whereas Jewish students comprised a significant portion of those entering high-level physics programs in the United States throughout much of the twentieth century, the proportion of this group has been decreasing since the 1990s. This trend is nearly impossible to demonstrate with statistical precision and confidence, yet those who believe it to be a fact conjecture that as the

American Jewish population becomes increasingly far removed from the immigrant experience, its drive to societal advancement through higher education wanes. Were this perceived trend determined to be real, one might expect, in decades to come, to find substantially reduced numbers of Jews in all areas of physics.

Cross-References

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Physics and Orthodoxy (Physics and Eastern Christian Theology)

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The Orthodox Christian Church has its roots in Christ Himself and in his Apostles. The Orthodox Church was founded in an era in which it could have had no part or influence in the broader culture around. The first century found the Church simply trying to survive and to expand spiritually as well as in numbers of people. However, the science of medicine attracted the attention in the Church. Medicine was considered to be a ministry of the Christian Church, and several important advances were made during the Byzantine era. In the mid-400s, a Christian school of medicine was flourishing in the eastern city of Edessa. This school, which was operated by Nestorian Christians from Constantinople, was closed by the emperor in 489. The teachers and students of that school moved into the Persian Empire and founded a school in the Nisibis. This medical school also moved to Jundishapur following the Nestorian Christian Hunain Ibn Ishaq, and a synthesis of medical knowledge began to form a new medical and pharmacological corpus.

Physics and the Other Natural Sciences

Interest in continuing the development of the physical sciences, which had begun in both Egypt and Greece in the centuries BCE, was pursued with great interest. Physics and mathematics were equally important in all aspects of everyday life but particularly within the realm of military engineering activities. Much of the scientific interest was devoted to military defense. The invention of "Greek fire" by the engineer Kallinikos of Heliopolis was among the advances made through research driven by

military purposes, as were advances in shipbuilding and defensive machinery. During this era, those who were occupied with scientific matters, such as Leo the Mathematician (c. 790) and John Philoponus (490–570), were laymen. Philoponus realized that there were problems with Aristotle's concept of motion. While he did not arrive at the proper conclusion (acceleration), he took understanding a step further by positing impetus. Anna Comnena (1083–1153), daughter of Emperor Alexius Comnenus (reigned 1081–1118), who wrote on medicine and astronomy, demonstrated a considerable knowledge of science. She included references to the scientific accomplishments of a number of women. There is a considerable list of scientists in the Orthodox Christian world of the Byzantine Empire, including a number of the emperors and churchmen. Their interests were wide ranging. One could find many examples which are highly relevant but now have a predominantly historical significance. However, if there is one connecting thread that could be traced from the first centuries of the Orthodox Church through the present, it would be the dynamic vision of reality, both uncreated and created, together with a subtle epistemology that goes beyond the chasm between visible and invisible. Interestingly, the special connection of the theology of the Orthodox Church with concepts of physics became far more prominent with the advent of quantum physics.

Orthodox Theology and Physics

Orthodox Christian theology is very much concerned with understandings rooted in the concepts of energy and light. Energy in particular has always been understood in the Orthodox Church to be about relationships. Both energy and light "communicate." What we call "grace" is understood to be the uncreated energy of God. The understanding of "created energy" and "created light" has been of significant theological interest. Our relationship with God is mediated through the uncreated energy and light with which He reveals Himself to us. Created energy

and light are at the basis of the universe and of mankind. It is in this context that physics has always been of interest in the Orthodox Church. In this regard, Saint John of Damascus (c. 676–749) says that:

> "energy is the natural force and activity of each essence: or again, natural energy is the activity innate in every essence: and so, clearly, things that have the same essence have also the same energy, and things that have different natures have also different energies. For no essence can be devoid of natural energy. … Natural energy again is the force in each essence by which its nature is made manifest. And again: natural energy is the primal, eternally-moving force of the intelligent soul: that is, the eternally-moving word of the soul, which ever springs naturally from it. And yet again: natural energy is the force and activity of each essence which only that which is not [does not exist] lacks."

Developments in physics and other areas of science in the twentieth and twenty-first centuries have required a response from Orthodox Christian theologians, and this challenge has led a number of Orthodox hierarchs and priests into the study of science. Some of the priests are also working scientists. The development of genetic science has also raised issues which require both a moral response and a reassessment of our understandings of humanity which includes some of its fundamental moral concepts.

The appearance of quantum mechanics in particular has been of considerable interest. Many Orthodox Christian theologians have seen a kind of complementarity between the epistemological approaches of Orthodox theology and quantum physics, and this has brought the Orthodox Church into a more comprehensive involvement in modern physics. The idea of complementarity stems as much from the methods of both quantum physics and Orthodox theology as from other perspectives. It is understood that both these domains offer us models of reality but not reality itself. In the language of Orthodox theology, this is known as the "apophatic" approach which is grounded in the refusal to exhaust knowledge of the truth in its formulation. What this means is that the pursuit of truth has a fundamental experiential and existential component without which

it becomes impossible. When Niels Bohr says that "the purpose of science is not to know the essence of nature, but to discover what can be known about nature," we are reminded of St Gregory of Nyssa's words in his discussion of the concept of the Trinity that we are not describing the essence of God but that "we are only using the best words available to us in human language to describe a relationship."

The essence of reality at all levels and in every dimension remains an ultimate mystery. We do not suggest that the world, which we experience with our own senses, is not reality; nevertheless, what we perceive is the surface of reality, which can be penetrated to some extent only with great effort over time. The more deeply we penetrate into this perceived reality, the greater the mystery becomes.

A factor in Orthodox Christian interest in modern physics is the fact that it deals so much with energy and light. Orthodox Christian theology and spiritual experience are very much concerned with energy and light. This concern is both concrete and metaphysical because in terms of spiritual realities, Orthodox theology divides energy and light into the created and the uncreated. Energy is understood in terms of relationships between constructs. Energy (uncreated) communicates and mediates the relationship between God and man, between human beings, and between all objects. Light also is understood as communicating energy as well as understanding. It is a medium of participation. We cannot be passive observers of these fundamental phenomena; rather, every encounter with them has a mutual effect on both that which is encountered and the one who is encountering. The Orthodox Church fathers were certainly not the first to realize that our universe is in a state of flux. Nothing is permanent and immutable, but everything in our world is in a state of change. Indeed, life and all that we see consists in processes rather than in "things." This condition often screens our vision from reality, and when we do encounter reality beyond the surface appearance, we are reminded of the word of St Dionysius the Areopagite that "as we plunge into that darkness which is beyond intellect, we shall find ourselves not simply running out of words, but actually speechless and unknowing." This reminds us of the words of Werner Heisenberg that "in quantum physics we have no framework for correlating the mathematical symbols of it with the concepts of our language, nor can we satisfactorily discuss atoms in normal language." This area of convergence between Orthodox theological experience and quantum physics is important. It arises from the clear fact that not all truth and not all reality can be discovered or defined rationally or by logical means nor can it be expressed accurately in human tongues. One must be open to paradox in both modern physics and in Orthodox apophatic theological experience. Since Orthodox theology is existential and experiential rather than based in reflective reasoning, the unfolding of the concept that existence is filled with mystery. This mystery which gives rise to a (mystical) reality that can neither be expressed in the ordinary human languages nor be successfully visualized without creating distortions is completely accessible to the Orthodox theologian. Much of the deeper interest in modern physics on the part of Orthodox theologians and in part what has led priests and hierarchs into the study of physics has been this recognition of a complementarity between their theological experience and modern physics.

So far, we have spoken about a theological-spiritual understanding of energy and light we can and have seen how Orthodox theologians are being drawn toward modern physics. Orthodox thinkers do not conceive the idea that energy and light must always be understood in some metaphysical dimension. Rather, energy and light are seen as primordial or fundamental to understanding the natural universe, while at the same time, energy and light in another (spiritual) dimension are seen as fundamental in spiritual life. No attempt is made to blend or merge science and the spiritual in these areas. However, this connection has led to a greater interest and respect for science on the part of contemporary Orthodox theologians. Another aspect of this interest lies in the problem of visualization which will be discussed briefly later.

The Nature of Theology and the Nature of Physics

"When God speaks of a place, He does not mean a space which can be quantitatively measured, but rather by using the analogy of a measurable surface, He is guiding the reader to a reality which is infinite and without limit" (St Gregory of Nyssa).

Quantum physics may no longer be an adequate term, since its newly unfolding development merges quantum and relativistic theory. The term microphysics seems to be more embracing. Microphysics is the study of the fundamental relationships of physical reality. What is interesting about it in the context of this discussion is its approach to the understanding of interaction processes rather than to the observation of entities. There is a similarity between this approach and the Orthodox approach to theology.

Medieval nominalists advanced the development of science by refocusing investigation upon particulars rather than abstractions. This idea was gradually clarified and refined, and rapid increases in the understanding of macro level reality followed. Ultimately, however, all physical reality arises from the micro level. In order to comprehend micro level reality, the method of investigation had to refocus once more. This refocusing has taken several decades as three important facts became clear. It was first necessary for physicists to realize that they could not be external observers at the quantum level. The very act of observation and quantization (which always involves a process of measurement) interjects the observer into the process of observation and interacts with that which was being observed. The second realization is that both quantum and relativity theory cannot be treated in isolation in the understanding of micro level physics. It is necessary to engage the two together for successful investigation of the microworld. If relativity does not function at some level, then an explanation for this needs to be found. The third transition, and the main aspect of the refocusing, has been to move away from the attempt to study and analyze particles as specific material objects, and away from the concept of entities as material

structures, toward the observation of interaction processes, in which the distinction between energy and matter is not so sharp or is even indefinite. It may be that being itself is a series of processes which not only shape our reality but in which we constantly participate.

What we call "theology" and what we call "Orthodox Christian spiritual life" are one and the same thing because our theology does not focus on doctrine as a legislated point, a philosophical posit, or logical "entity." Orthodox theology is not concerned with static "facts"; rather, it is concerned with interactive processes or, rather, with processes of personal and hypostatic relationships. There can be no better declaration of this fact than the words of Gregory of Nyssa:

> Seeing that you have stretched forth that which is before you with a great desire, and you never experience complete satiation in your progress, nor are you aware of any limit to the good, as your longing calls you on to ever more and more: here is a place that is so vast that he who runs in it will never be able to reach the end of his course. And yet from another point of view, this course has stability; for God said, "I will set you on the rock" (Ex.33:22). But here, we have a very great paradox: motion and stability are identical. For usually speaking, one who is rising is not standing still, and the one who is standing still is not rising. But here, one arises precisely because he is stationary.

What, precisely, is the suggested connection between the interactive processes of modern physics and the relational processes of Orthodox theology? First of all, the processes of Orthodox theology are revealed in the life of grace, the life in Christ. They lead us to truth by means of the experiencing of truth. This is accomplished not by dry legalistic "facts" but by entering into the interactive processes within the whole Body of Christ which includes the relationship with God Himself. The lives of the saints and martyrs, the holy fathers and mothers, are not remote from us but impact upon us and our struggle. The quest for an understanding of the things created by God turns out to require a similar concept, although, obviously, on a radically different level and dimension. Modern physics, at least at the quantum level, cannot be "done" except by interjecting

into the interactive processes of that which is being "studied." In fact, this affects the general point of view and philosophy of the physicist and ultimately has an effect on the way people reason in general. It is possible to utilize this fact in a positive way in expounding the Orthodox faith to those outside the Church. Moreover, should it be thought strange that both pursuits which are helping us to approach an understanding of the "hidden qualities of the Creator" should have something in common in their approach? Orthodox theology understood and practiced this concept long before the mind of science perceived it, and that is normal also. The connection between the two, the processes of science and the processes of our theology, are not identical in essence, but in a real sense, they are related in the way they use their concepts. Could it really be otherwise when modern physics is a careful study of "the things that were created," in view of the fact that God has promised us that such a study would reveal to us "the hidden qualities of the Creator"?

If there were no other conclusion to reach from this comparison, it would be enough simply to realize that modern physics – modern science, in general – is not a devious plot which must be feared by Orthodox Christians, by any Christian, or by anyone at all.

The Problem of Visualization in Orthodox Theology and Modern Physics

"As we plunge into that darkness which is beyond intellect, we shall find ourselves not simply running out of words, but actually speechless and unknowing" (St Dionysius the Areopagite).

In quantum physics, we have no framework for correlating the mathematical symbols of it with the concepts of our language nor can we satisfactorily discuss atoms in normal language (Werner Heisenberg).

Plato (ca. 430–348 B.C.) developed earlier ideas about the meaning of reality into a more refined and sophisticated system. What is of interest here is his concept that the material world of our senses is but an echo or imitation of the reality of the ideal and eternal forms of the divine "jurisdiction" or, as he suggests in his parable of the cave, reflections of eternal reality moving like waves of shadow on the wall of a cave.

What concerns our subject is the implications of all this for later religious thought. Plato had a lofty conception of what all this means, and he may even have intended for it to evoke aspirations and the effort to purify the intellect. Over time, however, and particularly in the Medieval Era, these concepts were literalized in a peculiar way – perhaps the very reverse of what Plato intended. Looking briefly at the problem, the notion evolved that if the material universe is a shadow, reflection, or imitation of the ideal forms of eternal reality, the eternal reality must be a subtle form of the material world. Thus, "things yonder" were visualized and given concrete, physical, and material forms (often not at all subtle) even when the descriptions of them were metaphors for psychological states.

It is worth looking at one important result of the artificial "tandem" between religious philosophy and what we could now call "the old physics." In classical physics, the physics which still bore the influence of Aristotle and Plato, and in the Medieval Era, every phenomenon was visualizable. The influence that this type of philosophical physics had on theology is quite interesting. It actually helped paganize the Western view of God. God was conceived of as being also visualizable, and therefore, He was anthropomorphized and, like the pagan Greek gods, had foibles and passions common to fallen humanity (vengeance, juridical justice, the need for satisfaction, etc.).

The problem in physics occurs when one attempts to visualize micro level phenomena in terms of macro level conceptualizations. The same problem occurs in the theological life when one attempts to visualize that which is unseeable and ineffable on the level of the clearly visible – not merely does one distort that which is said to be apophatic by visualizing it as kataphatic, but one seeks to seize upon what forever remains a mystery and render it common. So also, in Aristotelian science, every theory was

thought to have a one-on-one correspondence in physical reality. It was supposed, therefore, in both antique physics and Scholastic theology, that reality could be rationally determined, codified, linguistically defined, and visualized in a constant form.

In its development, physics gradually departed from this philosophical milieu and came, by stages, to the point of quantum physics, in which practically nothing is visualizable, but the clear evidence of reality can only be expressed symbolically by a mathematical formalism, rather than metaphorically or allegorically.

The idea of visualization requires some discussion. We have a certain tension between the micro and the macro levels of reality in physics and between the created and the uncreated, the noetic and the sensually visible in theological experience. The created universe we experience is reality – a macro level reality – and we see it and verbalize it in language which is a combination of symbolic, metaphorical, and concrete. Nevertheless, the macro world emerges from the micro one. If we looked at this in terms of picture rather than image, we might conceive the picture as a halftone with a very tight dot-per-inch configuration – so tight that it appears to the eye (and is expressed verbally) to be continuous tone. What we see at the macro level is visualized which means that what is seen is linguistically interpreted. The suggestion here is that seeing involves the reception of an image, while visualization involves interpretation in the realm of linguistically based assumptions. On the other hand, we also visualize what we cannot see but hear – or hear about. In this case, what we hear is also interpreted in the realm of visually based assumptions, and the two – linguistically and visually based assumptions – are not separate. It is a combination of these two that constitutes "visualization." We always interpret within the framework of our visual experience. For example, my first concept of the wave function of a particle is that it constitutes the bow shock and wake of a dense moment of energy moving in space-time. Doubtless, this perception is induced by a visualization of the word "wave." Whenever we visualize or visually interpret at the quantum

level, we distort and perhaps even falsify reality. Precisely the same thing occurs in Orthodox theology when we visualize the uncreated in terms of our created, macro level reality, which is the only frame in which we can visualize and linguistically interpret.

As an example, in physics, the photoelectric effect can be examined only by visualizing the waves of electromagnetic radiation as particles, which we must then name, so we call them photons. Electrons, on the other hand, must be conceptualized as waves in the context of electron diffraction. However, these necessary conventions, which while explaining a state of affairs, are not actually true. The same problem arises when one tries to visualize that which is unseen and that which does not yet exist. In each case, visualization distorts and all linguistic expressions are always metaphorical, never concrete, never complete.

The character of our visual experience dominates our descriptive apparatus; thus, the breakdown in the classical description of reality observed in relativistic and quantum phenomena occurs precisely because, in these two realms, we are moving out of the range of normal visualizable experience. It is for just this reason that linguistically based assumptions lead to errors in our understanding of the divine and the eternal, the nature of heaven, the nature of hell, and the relationship between body and soul in human beings. Linguistically based assumptions are derived from the presumption of visualizability. Language develops on the matrix of vision and is a developed system of imitation of, and metaphor for, things heard and seen. Idolatry, I surmise, can arise from the impulse to linguistically describe and define the unseen. This impulse results in metaphor or allegory. When the metaphor for the unseen is visualized, some form of idolatry results, and this is just what St Gregory the Theologian warns us against when he says, "Every concept of God is merely a simulacrum, a false likeness, an idol: it cannot reveal God Himself."

Orthodox Christian theology stays away from kind of idolatry by the concept of apophatic or "negative" theology, according to which we can

never describe or define anything that God is but only circumscribe our understanding of Him by saying what He is not – thus, we cannot describe or visualize anything of the essence of the Deity, even though we know God in Jesus Christ and have an intimate relationship with Him by means of His energies. In this regard, the words of Abba Isaac the Syrian are extraordinarily important when he says: "Speech is the language of this world, but silence is the mystery of the age to come," by which he also precludes the visualization of "things yonder." One could add to this statement the words of St Dionysius the Areopagite, cited above, that "As we plunge into that darkness which is beyond intellect, we shall find ourselves not simply running out of words, but actually speechless and unknowing."

This is interesting because it shows us that the ability to visualize in material terms and to describe in language are interrelated, and that noetic things are subject to neither. For whatever visual and concrete concepts or ideas one has about the nature of heaven, hell, the Divinity, the partial and last judgments, and all things "yonder," they are without fail delusion and phantasy. This precludes all visualizability or language-based descriptions of noetic experience. It is worth pointing out that visualization in the realm of quantum mechanics might lead to similar distortions of the real state of affairs, and that mathematical formalisms are an expression of speechlessness but that they, too, can be turned into idolatry.

Visualization is a form of reductionism. In fact, in the process of transformation and emerging psychology of our visual conceptualization, our tendency to visualize our words has reduced our world to a picture, and already beginning with the movement from symbolic to "realistic" art during the rise of humanism, man began to conceive the passion of the moment to be reality. Ivan Ilich, in a paper not yet published, expresses the modern visual conceptualization as "show" and will suggest, as I understand it, that "show" absorbs us and makes us passive in that we are not really in the picture but are, perhaps, manipulated by it.

Paradox and Ineffability in Orthodox Theology and Quantum Physics

"So soon as I conceive the One I am illumined by the splendour of the Three: As soon as I distinguish Three, I am carried back into the One. When I consider any of the Three, I think of Him as the whole...I cannot grasp the greatness of the One so as to attribute a greater greatness to the rest. When I contemplate the Three together, I see but one torch, and cannot divide or measure out the undivided light" (Gregory the Theologian).

There is another area of convergence between Orthodox theology and quantum physics that has drawn Orthodox theologians into the study of physics. This convergence arises from the clear fact that not all truth, not all reality can be discovered or defined rationally or by logical means nor can it be expressed accurately in human tongues.

We touched on this elsewhere, but we must look at it again briefly. Earlier, I mentioned the fallacy, cited by Kafatos, of surmising that in physics, every point of theory must have a one-on-one correspondence with physical reality. The equivalent theological fallacy is the idea that every point of dogma and/or doctrine has a one-on-one correspondence in spiritual reality – or even farther afield, a correspondence in physical reality. The first fallacy arises in classical physics, which was based in Aristotle, while the second arises in Scholasticism, which is also based in Aristotle.

Orthodox theology is both intentionally and inevitably paradoxical. God has clearly revealed Himself to us and is intimately known, yet He is, has always been, and will always be totally unknowable. We may never know His essence, but we both receive and know His divine energies. God, Who is known to us, is unlike anything we know or could possibly know. He exists but in a manner which cannot be called existence. Perhaps, the most startling paradox of all is the Incarnation itself.

In the Orthodox context, dogma has no relationship whatsoever to the Western concept of codified and defined doctrine. Dogma is not

something learned or defined by any rational process nor is it comprehended by logical processes. It is a reflection of faith; it is not the faith itself. Dogma is that which the holy fathers have apprehended in a vital, living experience with God; it is the result of a mystical process, and in the end, it can only be expressed symbolically. We know in silence and express that which is experientially known symbolically, primarily in the Divine Liturgy. Dogma is not uncovered by rational expositions of texts of Scripture nor by any process of reason. Dogma is discerned by theoria, by which we do not mean simply "contemplation." Theoria, in the Orthodox Christian concept, may only be defined as prayerful, experiential contemplation, and it must include the notion of "vision" and "intuition." Dogma is the expression of interaction, participation, and relationship and presents no more than a framework – a hint and shadow of reality. Thus, there is no one-on-one correspondence between every point of theology and spiritual reality (and certainly not physical reality).

Something similar pertains to quantum physics, and though it is on a different plane and dimension, the principle is the same. In physics, the explanation of inexpressible reality is mathematics, in much the same way that liturgical worship serves as a symbolic opening up of ineffable mysteries of hidden reality.

Theory in quantum physics is also paradoxical. As an example, almost anything we say about atomic and subatomic particles – the actual "stuff" of existence – no matter how true remains untrue. We see objects as solid bodies, and we conceive them as being indivisible, material "things." Yet, objects have mass only because they are a form of energy. The "stuff" of which all things are made is immaterial material. They are particles, but they are fields of energy. They are particles, but they are waves. Whichever paradox we choose, following the principle of complementarity, both paradoxical descriptions are partly accurate and partly inaccurate – but both are completely true. At the quantum level, which is the basis of physical reality, we must completely rethink the meaning of material, particle, and entity. When we

measure one thing about a particle, we automatically exclude knowledge of any other thing about it. Nevertheless, the field of every single particle interacts and has unity with the field of every other particle in the universe. Clearly, then, there can be no one-on-one correspondence between every point of theory and physical reality. At this level, the physicist is operating in the realm of a different form of theoria. More surprisingly still, all this has no real metaphysical dimension but is simply the state of affairs.

It is evident that there are aspects of reality in every dimension which can be ascertained by differing types of theoria but which cannot be expressed in concrete, logical, or rational terms. These aspects are expressed paradoxically and symbolically. In physics, the process is experimental, and theoria is informed contemplation of the results of experiments, aided in a great part by intuition. Its guidelines are quantum and relativistic theories. In Orthodoxy, the process is experiential, and this kind of theoria is involved in both the experience and the contemplation of the experience. Its guidelines are Scripture and the sacred tradition of the faith.

In both modern microphysics and in Orthodox theology, there is no separation of the observer and the observed. The observer in both instances is not extraneous to that which is being observed; rather, he is a participant in it at different levels of experience. He is part of the process and state of affairs he has interjected himself into by becoming an observer, by seeking to understand and quantify it. In the case of Orthodox theology, the "observer" has intentionally involved himself in the hope of becoming a part of it, a part of the vital stream of the living theology of Orthodoxy, and being changed by it. In the case of modern microphysics, the observer impacts directly on the object of his observation and actually becomes part of the process being observed – and this is inevitable.

These aspects of complementarity have opened Orthodox theologians to modern physics in many ways. Among those Orthodox theologians convinced of this complementarity and pursuing these paths are professional scientists who are also clergymen, Metropolitan Nikolaos of

Mesogaias, Greece, and Archbishop Lazar Puhalo, and several Romanian Orthodox priests including Razvan Ionescu, Cristian Badilita, Teodor Baconschi, Bogdan Tataru-Cazaban, and Mihai Valentin Vladimirescu. Orthodox laymen who are both physicists and theologians include Dr. Alexei Nesteruk, Dr. Stoyan Tanev, Dr. David Bradshaw, and many others. It has also been the basis of a series of conferences in Romania over the past 5 years on Orthodoxy and Modern Physics, A Necessary Dialogue. These conferences have involved the Romanian Academy of Sciences, the Romanian Orthodox Patriarchate, and theologians and scientists from around the world.

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Physics in Protestantism

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Related Terms

Body of knowledge; Reformation

The development of Protestant thought in Europe from the early sixteenth century onward had perhaps much to do with the rise of modern empirical science, especially modern, physics. While in this secular and pluralistic age one tends to assume that the emergence of science followed its own trajectory independent of late Medieval theology, intellectual historians for some time have noted how the two approaches were joined at the hip from the start. It was really only in the eighteenth century that science and theology went their own separate ways for the first time. But even so the visible Protestant footprint within the genealogy of modern physics remains unmistakable.

In order to espy the historical, if not the present day, affiliation between physics and Protestantism, it is crucial to see the larger impact of Protestantism on the birth of modern science as a whole, which has been closely examined by researchers in recent years. At the same time, we must caution that Protestantism had its own distinctive trajectory that did not always intersect with the history of science, and the maturation of what we name today the "scientific method" was shaped by many different sets of circumstances, only a few of which were clearly distinctly

"religious." Sudden progress in mathematics during the seventeenth century had as much to do as anything with the transformation of what had long been considered "science," since the age of Aristotle (384–322 BC). The revival of an interest in mathematics arose for the most part from the Italian Renaissance and its flirtation with the ancient Greek conviction, represented in Pythagoras and Plato, that ultimate reality is based as much on the numerical as on the divine will. The new astronomy pioneered by Copernicus and Galileo were largely the result of efforts to test out certain speculations about how the universe was made up that had been inspired earlier by pagan thinkers, heretics, and mystics. René Descartes (1596–1660), the great European philosopher celebrity, and Blaise Pascal (1623–1662), who invented probability theory, maintained their own style of Catholic orthodoxy throughout their lives.

In fact, the many, though not necessarily the majority, among the Medieval intelligentsia had always venerated the sciences, with keen curiosity concerning a diversity of concrete phenomena around them. The English Franciscan friar Roger Bacon (1214–1294), for example, pioneered a style of inquiry he termed *scientia experimentalis*, urging less reliance on classical philosophical texts and more attention to simple observation of what can be found in the everyday world which we experience everywhere around us. Bacon's version of *scientia*, a term ancient Greek times implying "wisdom," was not in any way a prelude to the *philosophia prima* of Francis Bacon (1561–1626) four centuries later.

Francis Bacon is generally credited with having devised the theoretical framework and justification for modern empirical science. The latter Bacon, who became one of the most influential English statesmen under King James I, sought a "reform of the sciences" founded on the method of induction in contrast with the traditional manner of resolving disputes through *deductive* reasoning, as embodied in Aristotelian logic and the formal syllogism. The notion that science proceeds by offering tentative hypotheses that can be later revised through investigation and observation was the backbone of the inductive approach. During his political career, Francis Bacon was a key player in the establishment of the Royal Society, which sponsored collaboration and discussions among eminent scientists and which historians generally consider the motivating force behind England's rapid ascent as the leader of the new sciences during the seventeenth and eighteenth centuries.

While Catholic Europe produced theoretical geniuses, it was thus Protestant England that gave birth to modern empirical science and eventually enabled the technological inventions that fueled the industrial revolution of the nineteenth century. If it had not been for so-called British empiricism, founded by Francis Bacon during the Elizabethan era, modern science would have remained largely a speculative branch of "natural philosophy." What were some of the key factors that contributed to the alliance of Protestantism with empirical science – or what is popularly known as the "scientific method" of experimentation and the gathering of factual evidence?

Historian Kenneth J. Howell has argued that the deciding factor in the migration from Medieval metaphysics to modern science was Protestant "hermeneutics," the theory of how properly to interpret texts. One of the main battle cries of the Reformation, first enunciated by Martin Luther (1483–1546), was *sola scriptura*, "by Scripture alone." Luther maintained that ultimately all truths of God, including the secrets of the universe itself, were to be found in the Bible, and the Bible only. Whereas previous European thought had been built around a complex hierarchy of suppositions and propositions centering on the pronouncements of ancient authorities and the traditions of the Catholic Church, Protestantism demanded that any knowledge out of step with what could be discovered in Scripture was invalid. Although Luther and the other major Reformers had been preoccupied less with what the Bible said, or did not say, about "nature" and more with questions of the soul's salvation, the principle of *sola scriptura* inevitably resulted in the later insistence that even questions of

"science" be Biblically authorized. Modern fundamentalism and creationism are the logical outgrowth of this tendency.

However, the Reformers' "return to the text" – the pure, original text stripped of all previous glossary or commentary – had further implications than merely laying the groundwork for the twentieth century Protestant doctrine of "Biblical inerrancy." The shibboleth of *sola scriptura* also fostered a preference for literal interpretation of the written word, enshrined in the modern rule of uncovering the genuine "authorial intention" in the texts themselves. Medieval hermeneutics had been multilayered and complex, even though it also provided a coherent and unified methodological structure that allowed for the interpreter to ferret out mystical and allegorical meanings that often proved paradoxical. Moreover, the Medievals had regarded the natural order itself as a genuine "book" authored by God, open for adventures in understanding like the Bible and the preserved classics. They relied on earlier "natural philosophers" such as Ptolemy, Archimedes, and Aristotle as a means of guidance for their own interpretations, in much the same way as contemporary students of literature regularly fall back on published secondary sources, including outlines, summaries, and so-called Cliffs notes both to secure and to enhance their understanding of major books assigned.

For the Scholastics, according to Howell, nature like all knowledge was contained in books. But the preoccupation with Scripture among Protestants, who subordinated all knowledge to matters of salvation, contributed to what scholars have termed the "disenchantment" of nature, which was part of the historical process of secularization. In its reverence for the "Book of Nature," Medieval thinkers had been more concerned with tracing the symbolical, allegorical, and "anagogical" (i.e., the connection of the visible to the invisible) relationships among all phenomena. They considered these phenomena in many ways as high-level "textual" problems. The Reformers also rejected the reliance on allegorical interpretations. Scripture "meant" what it said, and did not need to be compared with other texts or systems of ideas in order to ascertain its fundamental implications.

In addition, the Book of Nature was no longer viewed as a book, let alone a text. It consisted mainly in a realm that had been darkened and toward which our minds had become confused, according to the Reformers, as evidenced in the doctrine of the Fall as well as in the apostle Paul's declaration that because of original sin human beings' "thinking became futile and their foolish hearts were darkened."(Romans 1:21, NIV). Finally, as Peter Harrison has remarked, the Protestant disdain for allegorical readings and their suspicion of the capacities of the light of "natural reason" gave rise to a skepticism about any genuine interdependence of "words and things." The "things" of nature no longer function as signs of a comprehensive, epistemological order embedded in what Thomas Aquinas had dubbed "sacred doctrine." Words no longer functioned as signs of things, but stood on their own and could be considered more significant and dependable when they were expressed in terms of the Word of God.

While major Protestant theologians such as John Calvin (1509–1564) held that the natural world was a suitable arena in which to learn about God's beneficent and providential workings, they did not regard it as the supreme object of inquiry our intellectual pursuits. Calvin believed such pursuits should be directed toward a "revealed knowledge" that can be acquired solely in the study of Scripture. In his *Institutes of the Christian Religion*, first published in Latin in 1559 and in French a year later, Calvin asserted that through the study of science, we only attain "knowledge of God the Creator" (Calvin 2007). Through the theological study of Scripture, we arrive, nevertheless, at "knowledge of God the Redeemer." Following Saint Augustine in his *Confessions*, Calvin also gave priority to self-knowledge, a constant spiritual and moral inventory that discloses our own finititude and sinfulness. In the *Institutes* Calvin developed what came to be known as the *duplex cognitio Dei*, the "double knowledge of God." We can only grasp that the redemptive knowledge that Jesus Christ is our savior once we have

thoroughly scrutinized our failings and our essential need for salvation. "In order to apprehend God," Calvin wrote, "it is unnecessary to go farther than ourselves." (John Calvin, Institutes of the Christian Religion, I.V.3). Therefore, natural knowledge is irrelevant to our ultimate concern, which should be about our relationship with God and our heavenly salvation.

The emphasis on personal salvation through introspection and the illumination of the mind by the study of Scripture, however, did not necessarily encourage Protestants to ignore science. Instead it persuades them to segregate science from the study of texts and to do so for purely practical and utilitarian, not theoretical, reasons. The German sociologist Max Weber (1864–1920) in his magisterial treatise *The Protestant Ethic and the Spirit of Capitalism* (Weber 2010) demonstrated how the Calvinist obsession with personal salvation led them to adopt an attitude of "worldly asceticism" as a sign of God's favor, which in turn promoted hard work and the discipline of financial accumulation. Likewise, his twentieth century heir Robert K. Merton (1910–2003) maintained that Weber's analysis applied as well to the emergence of empirical science in England, not just to the emergence of the market economy itself.

As already indicated, it was in light of these broader historical eventualities that physics, especially in Protestant lands, replaced theology as the "queen of the sciences." From the seventeenth up until the close of the nineteenth centuries, the overwhelmingly dominant branch of the sciences was physics. Since Aristotle's day, physics had been considered the "science of motion." Theories about the motions of the celestial spheres went hand in hand with the development of the science of physics. The Aristotelian legacy, at the same time, was used to support an *organismic* paradigm of the universe apparent in the Medieval conviction that all reality was held together in one gigantic "book" of creation.

Aristotle, who coined the word "physics," maintained that motion could be explained by a four-fold schema of "causal" connections. The Latin word *causa*, a translation of the Greek *aitia*, refers simply to any component in

a system of reasoning whereby two or more phenomena can be linked with each other and hence accounted for. Aristotle named these cause "material," "formal," "efficient," and "final." Material and formal causation had to do with the substance and structure of things known or experienced. For example, the "formal" cause of a specific human being was its genetic archetype. The "material" cause was the stuff – the blood, flesh, and bones – out of which it was composed. Final causation was related to the ultimate purpose toward which a thing grew and unfolded. Thus, in Aristotle's world picture, the "final cause" of an acorn would be an oak tree. The "efficient" cause was that thing, or set of conditions, that prompted such change. Therefore, sunlight and rain would be the efficient cause of the acorn turning into an oak tree.

In his observations of how bodies fell, Galileo Galilei (1564–1642) was the first to suggest that causation had nothing to do with any "teleology" or purposiveness – for instance, the "desire" of the object to return to earth. When Isaac Newton (1642–1727) revolutionized physics, improving significantly on the work of Robert Boyle (1627–1691) as well as Galileo, with the publication of his *Principia* (Newton 1999) in the late 1600s, he eliminated all rules of explanation other than efficient causes. The general Newtonian picture of the cosmos as "bodies in motion," which reigned until Einstein overthrew it three centuries later, was the broad consequence of this move on Newton's part.

The actual "causal" connection between Newton's Puritanism and his breakthroughs in physics has been a topic for conjecture and debate. Like Catholic thinkers, Newton as a religious man insisted that God was the supreme, "metaphysical" mainstay of any scientific account of how the cosmos functions.

But in eliminating final causes, Newton may have been influenced in a broad way by the Calvinist image of the omnipotent, perhaps even arbitrary Deity, whose will more than anything else determines the destiny of human beings. In contrast, Catholic thinkers following Aristotle were more interested in the "end" or "aim" – i.e., the final purpose – for which God created the

world. Aristotle's God, whom he named the "Unmoved Mover," was the source of attraction for all things in motion. But Newton's Deity simply put the whole cosmic apparatus together in accordance with certain immutable laws of motion. God was, as the eighteenth century described him, the cosmic "watchmaker" who conceived and designed the watch we know as the natural world. The intricacies of the watch itself could be discovered through scientific inquiry, but God did not necessarily have to exert a hand in its operation, only adjust or repair it from time to time.

Protestant literalism, as the backdrop to the Newtonian science of motion, henceforth fomented over the years a new kind of "mechanico-materialism," in which all mystical, arcane, or even "humanistic" considerations were purged from the outlook of modern science. A century later the French physicist Pierre-Simon Marquis de Laplace (1749–1827) in his *Celestial Mechanics* decided that the elegance of Newtonian science did not require at all what he termed the God "hypothesis." The laws of nature were sufficient in themselves to explain what happens. With the coming of the industrial revolution and the invention of the steam engine, the universe itself gradually came to be seen throughout the 1900s as one, enormous, self-regulating, and self-propelling "machine" in light of which even human behavior became intelligible.

It was because of the ubiquity of the Newtonian, mechanistic model that Protestantism eventually became an enemy of modern science rather than its incubator, as it was presumably during the early seventeenth century. The watershed moment for this shift was the publication by Charles Darwin (1809–1882) of his *Origin of Species* in 1859. Darwin advanced the thesis for the first time from a "scientific" (Darwin 2011) standpoint that human beings were direct, lineal descendants of primates and that appearance and disappearance of different species over time was due to a long process of random selection, leading to the "survival of the fittest." Darwin's evolutionism, particularly the concept of "natural selection," was an extension of Newtonian mechanism to biology. Because it contradicted so dramatically the Biblical account

of the creation, Darwin's theories quickly met with ecclesiastical scorn and attacks by many prominent figures and intellectuals. In the first major, modern example of science becoming the center of a political storm, Darwinism was attacked by prelates of the Church of England, whose aristocratic ties lent it more influence than in other Protestant nations on the scientific establishment.

Slowly at first, nevertheless, the Protestant mind of the late nineteenth century tended to accommodate, rather than recoiling against, Darwin's theories. By the early twentieth century, Christian thinking had slowly acquiesced to, to "evolutionary" principles, mainly as they applied to social theory. The Progressive Era just before the Great War had nurtured the so-called social gospel, stressing the role of the churches in combating human suffering and exploitation. The earlier types of predatory capitalism exemplified in the economic dislocations and excesses of the Gilded Age had used Darwin's idea of the "survival of the fittest" – a mechanistic explanation in itself – to excuse the practices of the notorious Robber Barons. This view was called "social Darwinism." It was morally acceptable, so far as the social Darwinists were concerned, to exploit the weaker sectors of society because such policies encouraged a "natural" selectivity among who would be economically fit and who would fall by the historical wayside. Their demise was preordained and unavoidable. The Progressives, on the other hand, turned this notion on its head. They cited evolutionary thinking and the belief in "progress," fashionable since the eighteenth century, to justify humanitarian intervention, mass education, and conscious efforts of governments and social institutions to mitigate the effects of ruthless economic competition in the industrial era.

Darwinism strongly influenced what came to be known alternately as religious modernism, or liberalism. Modernism took all forms of science, especially physics, as compatible with the Christian understanding of nature. On the eve of World War I, however, the special theory of relativity, advanced by Albert Einstein (1879–1955), brought to an abrupt end to the monopoly of Newtonian physics and introduced

a new dimension to the ongoing interplay between physics and theology. In one blow, the mechanico-materialist description of the universe lost its allure and the heavens and the earth seemed less tight-knit and less deterministically ordered, and even somewhat more mysterious. One philosopher familiar with Einstein, while sympathetic to Christianity, was the British thinker Alfred North Whitehead (1861–1947). A mathematician by profession with a strong interest in both physics and metaphysics, Whitehead combined many of the ideas surrounding relativity with evolutionary theories, to create what came to be termed "process philosophy (Whitehead 1979)."

The central thrust of process thought was against the Aristotelian concept that everything, including God, must be ultimately defined as a timeless subst*ance*. Ancient Greek metaphysics identified the real with the perduring, relegating change and temporality to an inferior level of existence. In process thought, the ancient Greek prioritization of being over becoming is turned on its head. Being must be equally understood as a "process" whereby "things" are primarily intelligible as temporal sequences, which have both a synchronous and diachronous structure that entails other entities. Whitehead gained something of a following among liberal Protestants in the second half of the twentieth century, whereby his views served as the general framework for what came to be dubbed "process theology." Process theologians tend to stay closely attuned to the latest innovations in theoretical physics, and have been instrumental in the sustained conversation at an academic level between Christian thought and physics.

Cross-References

▶ Christianity
▶ Epistemology
▶ Mathematics and Religion
▶ Mathematics, Modern
▶ Natural Theology
▶ Physics in Christianity
▶ Revelation

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Physics, Science in Islam

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Related Terms

Islam and science; Islamic science

Description

Physics is taught as part of the curriculum in schools, colleges, and universities in all 48 Muslim-majority countries. The content is, for the most part, fairly standard. In some countries, there is often an extended attempt to show the consistency of science with Islamic principles and to stress the achievements of ancient Muslim scientists. Specific Muslim responses to major scientific developments such as Einstein's theory

of relativity, quantum mechanics, big bang cosmology, or chaos are hard to find. Only a few little-known Muslim writers have argued that these major ideas of science are in conflict with Quranic teachings. They have essentially echoed criticisms common in the last century in the West wherein, for example, Einsteinian relativity was taken to imply moral relativism and quantum mechanical uncertainty was criticized for limiting God's power to know. However, these are isolated examples, and the majority attitude has been to essentially ignore such philosophical issues and to passively accept the results of physics research without critical examination of its theological implications.

The research productivity of Muslim physicists residing in their own countries is low. This will be evident from statistics quoted later in this essay. Muslims living abroad in scientifically advanced countries are relatively much more productive. Several have been credited with important scientific discoveries. Mohammed Abdus Salam is by far the most significant. Together with Steven Weinberg and Sheldon Glashow, he received the Nobel Prize for physics in 1979 for work that unified the weak and electromagnetic interactions. Salam was also the most articulate and effective proponent of Muslim scientific development. As founder-director of the International Centre for Theoretical Physics, he created an organization that played an important role in stimulating scientific research in developing countries by inviting thousands of researchers to participate in research conferences and workshops in Trieste, Italy. The Third World Academy of Sciences, an offshoot of the ICTP, was also headed by Salam and received some financial support by Muslim countries. It should be noted, however, that Salam's Ahmaddiya sect, while it continues to claim adherence to Islam, was officially declared non-Muslim by an act of the Pakistani parliament in 1974.

Academic research in physics appears to be strongest in Turkey and Iran, both of which are considered the most secular among Muslim countries. In applied nuclear physics, also considered as the domain of medium-high technology, Pakistan has relatively the most advanced program among Muslim countries. It has one Canadian-supplied power reactor as well as two Chinese-supplied ones and a third one currently (2010) in the process of installation. It also has an extensive uranium enrichment program using centrifuge technology derived from Holland and Belgium. It is the only Muslim country which currently has nuclear weapons capability with an estimated 80–100 nuclear warheads. Iran is investing heavily in nuclear technology and has developed advanced centrifuges that, when cascaded together, can provide enriched uranium for a number of nuclear power plants or for warheads.

Physics Within the Context of the Other Sciences

Physics is firmly based upon the scientific method and its development goes hand-in-hand with other branches of science: mathematics, chemistry, biology, and various engineering disciplines. In effect, science goes as a package – it is rare for one branch to progress by itself. In a nutshell, the Muslim experience of science consists of a golden age extending from the ninth through thirteenth centuries, subsequent collapse and modest rebirth in the nineteenth century, and a marked reversal away from science and modernity beginning in the last decades of the twentieth century.

There was no science in Arab culture in the initial period of Islam, around 610 AD. (A detailed account of Muslim scientific achievements can be found in George Sarton's monumental 5-volume work, *Introduction To the History Of Science*, Vol. I & II, New York, 1975.) But as Islam established itself politically and militarily, its territory expanded. In the mid-eighth century, Muslim conquerors came upon the ancient treasures of Greek learning. Translations from Greek into Arabic were ordered by liberal and enlightened caliphs, who filled their courts in Baghdad with visiting scholars from near and far. Politics was dominated by the rationalist *Mutazilites*, who sought to combine faith and reason in opposition to their rivals, the

dogmatic anti-reason Asharites. A generally tolerant and pluralistic Islamic culture allowed Muslims, Christians, and Jews to create new works of art and science together. The Arabic language held sway in an age that created algebra, elucidated principles of optics, established the body's circulation of blood, named stars, and created universities. In addition, Greek learning was transmitted to Europe through a major translation effort by Muslim rulers.

Over time, the theological tensions between liberal and fundamentalist interpretations of Islam – such as on the issue of free will versus predestination – became intense and turned bloody. A resurgent religious orthodoxy eventually inflicted a crushing defeat on the *Mutazilites*. Thereafter, the open-minded pursuits of philosophy, mathematics, and science were increasingly relegated to the margins of Islam. (*Islam And Science – Religious Orthodoxy And The Battle For Rationality*, by Pervez Hoodbhoy, London, ZED Books 1991. A critical account of the relationship between the scientific spirit and Muslim orthodoxy, covering both present and medieval times.)

Centuries later, the introduction into Islamic societies of European post-Renaissance science, technology, and thought was pioneered by several outstanding Muslim leaders. In nineteenth-century Egypt, following the Napoleonic occupation, Muhammad Ali seized state power and ruled from 1805 to 1848. During this period, he made bold attempts to transfer French and British technology into the country, relying principally on European expatriates. (*Science And Science Policy In The Arab World*, by A.B. Zahlan, London, 1980. A valuable, if somewhat dated, work on science and technological levels in Arab countries.) He introduced the first printing press – a device initially condemned by some of the *ulema* as having a belt of pig's skin. But this resistance was overcome, and the Bulaq press in Cairo published 81 Arabic books on science between 1821 and 1850. Technology for irrigation, textile manufacturing, surveying, prospecting and mining for coal and iron, and military hardware received high priority. Major earthmoving and civil engineering projects were embarked upon.

Even more significantly, technical schools with foreign teachers were established with the aim of generating manpower. More than 400 students were sent to Europe to study various branches of science, including military tactics.

However, the success of Muhammad Ali's industrialization policies was mixed. (*The Muslim Discovery Of Europe*, Bernard Lewis, New York, 1982. Details the encounter of Muslims with the modern civilization of the West.) The quality of domestically produced products, such as textiles, was poor. Technical schools provided insufficient exposure to theoretical science and did not succeed in creating a base of technicians or engineers of sufficiently high caliber. The reasons for this have been debated. (See, for example, A.B. Zahlan in "A History Of Technology In The Arab World, 1800–1977.") After Mohammed Ali's death in 1849, these schools were closed down under the rule of Khedive Abbas and Khedive Sa'id, and the scientific momentum ground to a halt. Among other Arab rulers, Sultan Sa'id bin, Sultan of Oman (1806–1856), is notable for his interest in acquiring European technology. He made numerous attempts to have sugar refineries installed in Zanzibar, an Omani possession. He also made unsuccessful attempts at ship building. Emir Abdel Kader of Algeria, whose rule extended from 1832 to 1847, engaged various experts to build small ordnance factories and appears to have understood the importance of technology for progress.

The Turkish Ottomans had established an extensive and magnificent empire in the sixteenth century and had recognized the utility of military technology, particularly cannons, which they readily borrowed from the West. But there were strong religious taboos which, for example, prevented the use of the printing press or of public clocks. Travelers to Turkey in this period remarked on the lack of interest in matters of science and learning. Sweeping changes in civil administration and education came with Sultan Selim III (1761–1808), who was the last and the most radical of the Ottoman reformers. Selim established a new military corps armed and organized in the most modern techniques of warfare

in Europe. Gun founding was introduced, printing presses were set up, and the works of Western authors were translated into Turkish. To sustain the modern army the subjects of algebra, trigonometry, mechanics, ballistics, and metallurgy were introduced into the teaching curriculum.

Like Muhammad Ali, Selim III had no choice but to import teachers from Europe for these subjects. The importance of theoretical science as a basis for continued development appears not to have been recognized. The major impetus to scientific and industrial development came after the revolution brought about by Mustafa Kemal Ataturk (1881–1938) in 1924. Prior to this, education had been limited to the cities and controlled by religious authorities. (*The Economic History of The Middle East, 1800–1914*, Issawi, Charles (Ed.), Chicago, 1966.) But after the secularization of Turkey, the control was taken over by the state and the curricula revised to include modern science, mathematics, world history, etc. Among Muslim countries, Turkey is today among the most advanced in scientific research and in terms of the quality of its universities.

On the Indian subcontinent, modern scientific ideas and techniques came in the wake of the English conquest. In the decades preceding this, the rule of the Moghuls had produced a civilization known for impressive architecture, literature, and poetry but with few achievements in the realm of knowledge. The Moghuls did not set up any universities or centers of learning. Some transmission of Western technology had taken place in the reign of Emperor Akbar (1542–1605), when Europeans had come as traders. (*Science And Empire – Essays In The Indian Context*, Delhi, 1991. Kumar, Deepak (Ed.) A useful collection of essays detailing the introduction of science in British India.) Notably, ships of large tonnage and shapes similar to English ones were built. But these lacked compasses, gimbals, navigational charts, etc. Reading glasses were greatly admired by Akbar, but they appear to have been imported from France. After the banishment of the last Moghul emperor Bahadur Shah Zafar in 1857, the English consolidated their rule and later introduced modern

education. A combination of hurt, pride, defiance, and conservatism led Muslims to resist Western learning. Consequently, Muslims were at a substantial disadvantage relative to Hindus; it is recorded, for example, that between 1876–1877 and 1885–1886, 51 Muslims and 1,338 Hindus took the B.A. degree at Calcutta. In 1870, only two Muslims, both of whom failed, sat for the B.A. while, in the same year, 151 Hindus took the examination of whom 56 received the degree.

The resistance of Muslims of the subcontinent to modern ideas motivated Syed Ahmad Khan (1817–1898) into becoming a forceful proponent of modern science and thought. (*Sayyid Ahmad Khan – A Reinterpretation Of Muslim Theology*, by C.W. Troll, Karachi, 1978. This book traces the evolution of Sayyid Ahmad Khan from a staunch Muslim conservative into the most outstanding exponent of modernism in British India.) He was convinced that the subjugation of Muslims to the West was a result of their scientific backwardness and that this in turn was a consequence of the dominance of superstitious beliefs and rejection of *maaqulat* (reason) in favor of blind obedience to *manqulat* (tradition). He therefore set about the monumental task of reinterpreting Muslim theology, making it compatible with post-Renaissance Western humanistic and scientific ideas. Syed Ahmad Khan founded the Aligarh Muslim University, which provided Muslims of the subcontinent a unique opportunity for higher education. His articles in the periodical *Tahzib-ul-Akhlaq*, which included translations and explanations of scientific tracts as well as his interpretations of religious issues, were highly influential among upper class Muslims. To maintain consistency with science, he argued that miracles – such as Noah's Flood – must be understood in allegorical rather than literal terms. This innovative position brought Syed Ahmad Khan widespread condemnation and numerous *fatwas* against his life.

Syed Jamaluddin Afghani (1838–1897), also a supporter of Western science and modern ideas, but an implacable opponent of Syed Ahmad Khan, was a determined anti-imperialist who

inspired Muslims in Turkey, Egypt, Iran, and India. (*An Islamic Response To Imperialism*, Nikkie Keddi, University of California Press, 1983. An authoritative account of Jamaluddin Afghani's life and thought, and his encounter with the anti-science orthodoxy of his times.) Like his mentor Mohammad Abduh (1849–1905), Afghani held that there was no contradiction between Islam and science and that Islam encouraged rational thought and discouraged blind imitation. In 1870, because of pressure from the clergy, Afghani was expelled from Istanbul for advocating the setting up of *Darul-Funun*, a new university devoted to the teaching of modern science. He is known for his vitriolic criticism of those *ulema* who opposed modern ideas and science.

Modernization and the introduction of science have inevitably brought about the issue of having to choose between traditional and modern education for Muslims or perhaps devising an acceptable synthesis. Traditional Islamic education, with its emphasis on teaching of the *Quran* and *Sunnah* and on perfect memorization, had remained essentially unchanged since the Nizammiyah curriculum was devised under the rule of Sultan Nizam-ul-Mulk in the eleventh century. (*Islamic Education*, A.L.Tibawi, London 1972.) Ibn Khaldun, in a comparative study of education in Muslim lands of the fourteenth century, pointed out that only in Muslim Spain and Persia were subjects such as poetry, grammar, and arithmetic included in the syllabi.

Elsewhere, subjects unrelated to the Quran were regarded as too secular to teach to children. The Nizammiyah curriculum was faithfully passed on to subsequent generations and also adopted in unchanged form in Mughal India, until somewhat modified by Shah Waliullah (1762) to include arithmetic and logic. However, Al-Azhar University in Cairo did have some scientific subjects in its teaching syllabus, including mathematics and astronomy, even prior to the Napoleonic invasion. These largely reflected knowledge which had long since been superseded. The astronomy taught, for example, was based on a Ptolemaic model requiring the sun to go around the earth.

Thus, it was a prime goal of Muslim modernists to effect the transfer of Western models of universities and schools into their societies. The spread of science teaching in several Arab countries, such as Egypt, Syria, Iraq, and Lebanon, and on the Indian subcontinent, was greatly aided by Christian missionary efforts. Although their purpose was primarily evangelical, they brought considerable intellectual stimulus coming from new developments in the West. The first Western scientific institutions in the Arab world were the Syrian Protestant College and the Jesuit St. Joseph's College, both in Beirut.

Current Muslim Scientific Achievements

The metrics of scientific progress are neither precise nor unique. Science permeates our lives in myriad ways, means different things to different people, and has changed its content and scope drastically over the course of history. In addition, the paucity of reliable and current data makes the task of assessing scientific progress in Muslim countries still harder.

The following four metrics appear to be reasonable:

1. The quantity of scientific output, weighted by some reasonable measure of relevance and importance
2. The role played by science and technology in the national economies, the funding for S&T, and the size of the national scientific enterprises
3. The extent and quality of higher education
4. The degree to which science is present or absent in popular culture

Only the first two shall be commented upon here. The reader may find additional details in reference. (*Science and the Islamic world – The quest for rapprochement*, Pervez Hoodbhoy, Physics Today, August 2007, pp. 49–55.)

Scientific Output. A useful, if imperfect, indicator of scientific output is the number of published scientific research papers, together with the citations to them. Table 1 shows the output of the seven most scientifically productive

Physics, Science in Islam, Table 1 The seven most scientifically productive Islamic countries in 2007 compared against a selection of other countries. This data is from the Philadelphia-based science information specialist, Thomson ISI

	Physics papers	Physics citations	All papers	All citations
Malaysia	656	1,650	10,930	40,007
Pakistan	809	2,862	7,662	25,867
Saudi Arabia	866	2,390	15,700	56,416
Morocco	1,584	5,720	10,344	38,579
Iran	2,165	8,628	22,635	67,605
Egypt	3,099	10,743	26,829	90,597
Turkey	4,827	20,562	83,961	280,622
Brazil	18,467	102,605	125,132	627,441
India	26,627	139,841	203,989	788,852
China	71,782	275,963	400,917	1,480,743
USA	208,695	2,483,089	2,831,004	37,822,213

Muslim countries for physics papers, over the period from 1 January 1997 to 28 February 2007, together with the total number of publications in all scientific fields. A comparison with Brazil, India, China, and the USA reveals significantly smaller numbers. A study by academics at the International Islamic University of Malaysia (*Scientometrics*, M. A. Anwar, A. B. Abu Bakar, **40**, 23 (1997)) showed that OIC countries have 8.5 scientists, engineers, and technicians per 1,000 population, compared with a world average of 40.7, and 139.3 for countries of the Organisation for Economic Co-operation and Development. (For more on the OECD, see http://www.oecd.org.) Forty-six Muslim countries contributed 1.17% of the world's science literature, whereas 1.66% came from India alone and 1.48 % from Spain. Twenty Arab countries contributed 0.55%, compared with 0.89% by Israel alone. The US NSF records that of the 28 lowest producers of scientific articles in 2003, half belong to the OIC. (For additional statistics, see the special issue "Islam and Science," *Nature* **444**, 19 (2006)).

The situation may be even less favorable than the publication numbers or perhaps even the citation counts suggest. Assessing the scientific worth of publications – never an easy task – is complicated further by the rapid appearance of new international scientific journals that publish low-quality work. Many have poor editorial policies and refereeing procedures. Scientists in many developing countries, who are under pressure to publish or who are attracted by strong government incentives, choose to follow the path of least resistance paved for them by the increasingly commercialized policies of journals. Prospective authors know that editors need to produce a journal of a certain thickness every month. In addition to considerable anecdotal evidence for these practices, there have been a few systematic studies. For example, (*Chem. Biodivers*, M. Yalpani and A. Heydari,. **2**, 730 (2005)) chemistry publications by Iranian scientists tripled in 5 years, from 1,040 in 1998 to 3,277 in 2003. Many scientific papers that were claimed as original by their Iranian chemist authors, and that had been published in internationally peer-reviewed journals, had actually been published twice and sometimes thrice with identical or nearly identical contents by the same authors. Others were plagiarized papers that could have been easily detected by any reasonably careful referee.

Islamic countries show a great diversity of cultures and levels of modernization (*Islamic Cultural Identity And Scientific-Technological Development*, Klaus Gottstein. This collection of papers deals with questions of cultural diversity and identity, and science and development in Muslim countries) and a correspondingly large spread in scientific productivity. Among the

larger countries – in both population and political importance – Turkey, Iran, Egypt, and Pakistan are the most scientifically developed. Among the smaller countries, such as the central Asian republics, Uzbekistan and Kazakhstan rank considerably above Turkmenistan, Tajikistan, and Kyrgyzstan. Malaysia – a rather atypical Muslim country with a 40% non-Muslim minority – is much smaller than neighboring Indonesia but is nevertheless more productive. Kuwait, Saudi Arabia, Qatar, the UAE, and other states that have many foreign scientists are scientifically far ahead of other Arab states.

National Scientific Enterprises. Conventional wisdom suggests that bigger science budgets indicate, or will induce, greater scientific activity. On average, the 57 OIC states spend an estimated 0.3% of their gross national product on research and development, which is far below the global average of 2.4%. But the trend toward higher spending is unambiguous. Rulers in the UAE and Qatar are building several new universities with manpower imported from the West for both construction and staffing. In June 2006, Nigeria's president Olusegun Obasanjo announced he will plow $5 billion of oil money into R&D. Iran increased its R&D spending dramatically, from a pittance in 1988 at the end of the Iraq–Iran war to a current level of 0.4% of its gross domestic product. Saudi Arabia announced that it spent 26% of its development budget on science and education in 2006 and sent 5,000 students to US universities on full scholarships. Pakistan set a world record by increasing funding for higher education and science by an immense 800% over the past 5 years.

But bigger budgets by themselves are not a panacea. The capacity to put those funds to good use is crucial. One determining factor is the number of available scientists, engineers, and technicians. Those numbers are low for OIC countries, averaging around 400–500 per million people, while developed countries typically lie in the range of 3,500–5,000 per million. Even more important are the quality and level of professionalism, which are less easily quantifiable. But increasing funding without adequately addressing such crucial concerns can lead to

Physics, Science in Islam, Table 2 High-technology exports as a percentage of total manufactured exports (World Bank Development Report 2006)

Malaysia	58%
Pakistan	1%
Saudi Arabia	0%
Morocco	11%
Iran	2%
Egypt	0%
Turkey	2%

a null correlation between scientific funding and performance.

The role played by science in creating high technology is an important science indicator. Comparing Table 1 with Table 2 shows there is little correlation between academic research papers and the role of S&T in the national economies of the seven listed countries. The anomalous position of Malaysia in Table 2 has its explanation in the large direct investment made by multinational companies and in having trading partners that are overwhelmingly non-OIC countries.

Although not apparent in Table 2, there are scientific areas in which research has paid off in the Islamic world. Agricultural research – which is relatively simple science – provides one case in point. Pakistan has good results, for example, with new varieties of cotton, wheat, rice, and tea. Defense technology is another area in which many developing countries have invested, as they aim to both lessen their dependence on international arms suppliers and promote domestic capabilities. Pakistan manufactures nuclear weapons and intermediate-range missiles. There is now also a burgeoning, increasingly export-oriented Pakistani arms industry that turns out a large range of weapons from grenades to tanks, night-vision devices to laser-guided weapons, and small submarines to training aircraft. Export earnings exceeded $300 million in 2009. Although much of the production is a triumph of reverse engineering rather than original research and development, there is clearly sufficient understanding of the requisite scientific principles and a capacity to exercise technical

and managerial judgment as well. Iran has followed Pakistan's example.

The global diffusion of modern technology has profoundly altered lifestyles in Muslim countries and has become an inseparable part of modern existence. It is not, however, easy to decide on the status of a country in the field of science and technology in a simple quantitative manner. But one important indicator of the level of scientific-technological development of a country is the extent to which industry and manufacturing are part of its economy. This, in turn, is estimated by the "value added" in manufacturing, which includes machinery and transport equipment, chemicals, textiles, etc. Data on "value added" is published yearly in the Development Report of the World Bank, which the reader may consult for estimating the relative levels of progress of individual countries. Indonesia and Malaysia are among the fastest growing economies of the world, partly because of their success in attracting foreign investment and partly because of high investments in human resource development. There has been a steady rise in "value added" for most Muslim countries, but absolute levels are still low: In 1983, of 46 Muslim states, only 24 produced cement, 11 produced sugar, 5 had heavy engineering industries, 6 produced textiles, and 5 produced light armaments. By and large, Muslim states are consumers of technology and producers of raw materials, oil being the most important one of these.

Muslim Reactions to Modern Science

In defending the compatibility of science and Islam, Muslims argue that Islam had sustained a vibrant intellectual culture throughout the European Dark Ages and thus, by extension, is also capable of a modern scientific culture. The Pakistani physics Nobel Prize winner, Abdus Salam, would stress to audiences that one-eighth of the Quran is a call for Muslims to seek Allah's signs in the universe and, hence, that science is a spiritual as well as a temporal duty for Muslims. Perhaps the most widely used argument one hears is that the Prophet Muhammad had exhorted his followers to "seek knowledge even if it is in China," which implies that a Muslim is duty bound to search for secular knowledge.

Generally, attitudes of Muslims toward technology are far friendlier than toward science. In earlier times, the orthodoxy had resisted new inventions such as the printing press, loudspeaker, and penicillin, but such rejection has all but vanished. The ubiquitous cell phone, that ultimate space-age device, epitomizes the surprisingly quick absorption of black-box technology into Islamic culture. Popular new Islamic cell-phone models now provide the exact GPS-based direction for Muslims to face while praying, certified translations of the Quran, and step-by-step instructions for performing the pilgrimages of Hajj and Umrah. Digital Qurans are already popular, and prayer rugs with microchips (for counting bend-downs during prayers) have made their debut.

As an epistemological enterprise, science has elicited three principal types of response from Muslims.

The first response could be characterized as a pragmatic one – let science and religion go their own separate ways. Vagueness suffices. It is, from this point of view, inessential to look too closely at what Islam says about science. Most Muslims would probably be content to simply live with the thought that the two are not in conflict.

A second, diametrically opposed, reaction is articulated by Sayyid Qutb of Egypt and Syed Abul Ala Maududi of Pakistan. (*Modern Technology And The Dehumanization Of Man*, Maryam Jameelah, Lahore, 1983. A scathing criticism of science and modernism from the Muslim orthodox perspective; *Taalimat* (Urdu) by Abul Ala Maudoodi, Lahore, Islamic Publishers, n.d. A critique of modern education and sketch of the Islamic alternative by one of the leading conservatives of the century.) They are overtly hostile to science and do not see lack of Muslim scientific progress as particularly regrettable because, in their opinion, modern science is guided by no moral values but only naked materialism and arrogance. Science and modernity emphasize ceaseless change and are seen as working against the immutable and constant values of Islam.

Claims to high achievement arising for the exercise of human reason are decried as amounting to man worship. Therefore, according to this view, scientific development is not desirable in an Islamic society.

A third reaction, largely syncretic, was prominent among nineteenth-century Muslim modernists. They worked to reinterpret the faith in order to reconcile the demands of modern science and civilization with the teachings and traditions of Islam. This school of thought has a historical tradition with roots going back to the rationalist Mutazilla movement of the ninth century and the work of Ibn Rushd, particularly his book *Tahafut-al-Tahafut* in which he refuted the antirationalism of Imam al-Ghazali. In this "reconstructionist" tradition, it is argued that the word of God cannot be wrong but also that the truths of science are manifest and real. Therefore, the only issue is to arrive at suitable interpretations of the Quran, through careful etymological examination, wherever there is an apparent conflict between the revealed truth and physical reality. It was held that Islam in the days of the Prophet and the *Khilafat-e-Rashida* was revolutionary, progressive, and rational and that the subsequent slide into stultifying rigidity was due to the triumph of *taqlid* (tradition) over ijtihad (innovation). Mohammed Abduh, Rashid Rida, and Syed Ahmad Khan were the leading proponents of this point of view.

It is interesting to examine Muslim attitudes toward major developments in science, of which Darwin's theory of evolution provides the most contentious example. The first major debate, which pitted traditionalist Muslim and Christian Arabs on the one side against rationalists and radicals on the other, was initiated in 1884 following the publication of a work in Arabic by Shibli Shumayyil (1853–1917) favoring Darwinism. Expectedly, religious conservatives denounced Darwin's theory as amounting to the denial of God and a refutation of the Quranic and biblical theories of creation. Even Jamaluddin Afghani, otherwise a powerful proponent of science, derided Darwinism – although it appears that he had not understood, or even read, any of Darwin's work. A few Muslims, such as the writer Ismail Mazhar (1891–1962), did make serious efforts to understand Darwinian evolution and asserted the need to reinterpret Islamic theology in the light of established facts. Others, such as the theologian Hussein al-Jisr (1845–1909), sought to reconcile elements of Darwin's work with Islam. (A comprehensive account of this historical debate may be found in *Western Science In The Arab World – The Impact Of Darwinism, 1860–1930* by Adel A. Ziadat, London, 1986. The author concludes that an author's religion – whether Muslim or Christian – was of secondary importance in this debate. Rather, it was largely a debate between religious men on the one hand and secularists on the other.) In the contemporary Muslim world, attitudes toward Darwinism are mixed. Teaching of the theory of evolution is allowed in Turkey, Egypt, Iraq, Iran, Indonesia, and several other countries. However, it was removed from the syllabus in Pakistan in the regime of General Zia-ul-Haq and is expressly forbidden in Saudi Arabia and Sudan.

Unlike the vigorous science versus religion debates in post-scientific revolution in Europe, there seems to be little discussion on the philosophical implications of modern scientific issues in Muslim countries, with Turkey and Iran being partial exceptions. The reason for this relatively low-level interest may be the increasing specialization of science and the difficulty of translating its ideas into ordinary language, as well as the reluctance of the ulema to be drawn into new fields. However, some time-honored issues continue to be routinely debated and commented upon. One such issue is whether the new moon must be visually sighted or whether its position can be predicted in advance with modern astronomical techniques. This becomes important and contentious especially around the time of *Eid-ul-Fitr*. In Pakistan, a *Ruet-i-Hilal* (moon-sighting) committee has been formed by the government to make final decisions on this matter. Weather prediction is an issue on which there has been a considerable softening of the traditionally hard position – that Allah alone knows and decides if and when it will rain and that He has prescribed the *namaz-i-istisqa* (prayer for rain) so that believers may supplicate him. Presently, all

Muslim countries maintain some form of meteorological department and provide weather information. Whereas orthodox *ulema* continue to maintain their position against the dissection of cadavers for medical training, blood transfusions, and organ transplants, this is essentially disregarded almost everywhere in Muslim countries now.

In recent years, the applications, methodology, and epistemology of modern science have been severely criticized by growing numbers of Muslim conservatives. (*Knowledge For What*? Proceedings of the Seminar on the Islamization of Knowledge, Islamic University, Islamabad, 1982. A useful compendium of papers setting out the orthodox Islamic perspective on the nature and purpose of knowledge.) At one level, in close similarity with the radical critiques of science by the German "Greens" as well as European Marxists and anarchists, it is argued that the development and application of a supposedly value-free science is the prime cause of the myriad problems faced by the world today – weapons of mass destruction, environmental degradation, global inequities in the distribution of wealth and power, alienation of the individual, etc. Others go a step beyond this and reject the validity of the scientific method as well as the notion of science as knowledge, believing that the goals and techniques of modern science – which are considered distinct from those of medieval age science – will inevitably damage the fabric of Islam. Knowledge for the sake of knowledge is declared to be a dangerous and illegitimate goal, and the only form of legitimate knowledge is that which leads to a greater understanding of the Divine. The most articulate representation of this point of view is by the Iranian born scholar Seyyed Hossein Nasr who also argues that the word *ilm*, whose pursuit is a religious duty, has been willfully distorted into meaning science and secular learning by Muslim modernists in an effort to make science more acceptable in Islamic societies. (*Islam And Contemporary Society*, S.H. Nasr, London, 1982. An attack on the foundations of modern science and an appeal for a science based on Islam by one of the best known opponents of Western science.)

The reaction of Muslim orthodoxy to the teaching of modern science in schools has been to demand basic changes. These include some or all of the following: introduction to all scientific facts by reference to Allah, dilution of the cause-and-effect relation to accommodate the Divine Will, rewriting of all science books by people of sound Islamic beliefs, highlighting of the former Muslim supremacy in science, and removal of names associated with specific physical laws (e.g., Boyle's law and Einstein's theory). It should be noted, however, that the Iranian clergy has allowed science taught in Iranian schools to maintain its secular character.

Islamic Science

Exponents of the so-called Islamic science argue that it offers an Islamic alternative to the challenge of modern Western science, which they consider as reductionist and incapable of accommodating Islamic beliefs. Individual proposals for creating this alternative science have emerged in large numbers since the 1970s. However, given the absence of a centralized religious authority – an "Islamic church" – the validity of these proposals cannot be clearly certified from the religious point of view. One fairly common definition of "Islamic science" is that every scientific fact and phenomena known today was anticipated 1,400 years ago and that all scientific predictions can and must be based upon study of the Quran. This has been the concern of dozens of conferences in numerous Muslim countries, including Egypt, Pakistan, Malaysia, and Saudi Arabia. Maurice Bucaille, a French surgeon who turned into a spiritualist, enjoys enormous popularity across the Muslim world. Bucaille's major book is "The Bible, The Qur'an, And Science." This book, which seeks to establish that the Quran correctly anticipated all major discoveries of science while the Bible was flawed in places, has been translated into several languages and read widely in Muslim countries.

Another opinion is that Islamic science is that which is based on Islamic values and beliefs such as *tawheed* (unity of God), *ibadah* (worship), and

khilafah (trusteeship) and which stands for the rejection of *zalim* (tyrannical) science as well as science for the sake of curiosity. Revelation rather than reason ought to be ultimate guide to valid knowledge. Seyyed Hossein Nasr demands that "a truly Islamic science cannot but derive ultimately from the intellect which is Divine and not human reason . . . the seat of the intellect is the heart rather than the head, and reason is no more than its reflection upon the mental plane." He provides no further clues of how the new science should be organized. Other Muslim authors insist that the study of natural disasters, which constitutes Islamic environmental science, must begin with trying to understand God's will because earthquakes, volcanic eruptions, floods, etc., are events under His direct control and part of a grand systems scheme. One of the most articulate advocates of the Islamization of knowledge, including science, was the late Isma'il Al Faruqi.

One should distinguish science practiced by Muslims – whether in the present epoch or in the "Golden Age" of Islamic civilization – from "Islamic science," which is supposed to reflect specifically Islamic characteristics. Whether an Islamic science of the physical world is a meaningful notion or concept can be challenged on at least three grounds. First, decades of efforts to create a specifically Islamic science have failed. The fact is that Islamic science has not led to the building of even a single new machine or instrument, the design of a new experiment, or the discovery of a new and testable fact. Only post facto explanations have been provided, never a prediction. Second, specifying a set of moral and theological principles – no matter how elevated – does not permit one to build a new science from scratch. There are numerous examples of scientists subscribing to very different philosophical assumptions and having very different emotional and psychological dispositions, who have arrived at very similar results in their scientific investigations. Although a scientist may be inspired toward making a particular discovery as a consequence of his belief, his claims of discovery must be validated by a system of science which relies on experimentation and testing as its basis. Third, there has never existed, and

still does not exist, a definition of Islamic science which is acceptable to Muslims universally. Many of the great Muslim scholars of medieval times, including Al-Kindi, Al-Razi, Ibn-Sina, and Ibn-Rushd, suffered persecution at the hands of the orthodoxy on account of their nontraditional religious and spiritual beliefs. The sectarian divisions within Muslims today would be reflected in any endeavor to establish a common set of rules. It is also worthy of note that all suggestions of creating a new epistemology of science based on ideological or moral principles have failed to be of little value because they are far too vague and ill-defined.

Current Trends in Science Development

Muslim leaders today, realizing that military power and economic growth flow from technology, frequently call for speedy scientific development and a knowledge-based society. Often that call is rhetorical, but in some Muslim countries – Qatar, the United Arab Emirates (UAE), Pakistan, Malaysia, Saudi Arabia, Iran, and Nigeria, among others – official patronage and funding for science and education have grown sharply in recent years. Enlightened individual rulers, including Sultan bin Muhammad Al-Qasimi of Sharjah, Hamad bin Khalifa Al Thani of Qatar, and others have put aside some of their vast personal wealth for such causes. No Muslim leader has publicly called for separating science from religion.

A pragmatic approach, which seeks promotion of regular science rather than Islamic science, is pursued by institutional bodies such as COMSTECH (Committee on Scientific and Technological Cooperation), which was established by the OIC's Islamic Summit in 1981. It joined the IAS (Islamic Academy of Sciences) and ISESCO (Islamic Educational, Scientific, and Cultural Organization) in serving the *ummah* (the global Muslim community). But a visit to the websites of those organizations reveals that over two decades, the combined sum of their activities amounts to sporadically held conferences on disparate subjects, a handful

of research and travel grants, and small sums for repair of equipment and spare parts.

Cross-References

Physiological Psychology

Physiology and Psychology of Visual Perception

Physiotherapy

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Description

Physiotherapy (physio- [prefix] from ancient Greek physis = nature) relates to treatment of diseases, bodily defects, or bodily weaknesses by physical remedies, such as massage, special exercises, etc., rather than by drugs.

In 1999, the World Confederation for Physical Therapy proclaimed the following definition of physiotherapy:

> Physiotherapy is providing services to people and populations to develop, maintain and restore maximum movement and functional ability throughout the lifespan.

Physiotherapy is a profession. Physiotherapists frequently receive prescriptions from physicians indicating type and frequency of treatment as indicated for individual patients. While treating patients, physiotherapists make their own clinical judgments and specific treatment choices and practice reflections, i.e., reviewing their own behavior and success in their work and taking action as appropriate to solve problems they identify in themselves.

Physiotherapists work with a broad variety of physical problems, especially those associated with the neuromuscular, musculoskeletal, cardiovascular, and respiratory systems. They may work alone, with physiotherapy colleagues or teams, and with other health-care professionals in multi-professional teams and in a wide variety of health settings such as intensive care, mental illness, stroke recovery, occupational health, and care of the elderly.

In the last decades, physiotherapists' activities were characterized by professional diversity and involvement in patient care in many areas such as:

- Outpatients – treating spinal and joint problems, accidents, and sports injuries.
- Intensive Care Units – keeping limbs mobile and chests clear.
- Women's Health – ante- and postnatal care advice, exercise and posture, managing continence, and post-gynecological operations.
- Care of elderly – maintaining mobility and independence, rehabilitation after falls, treatment of arthritis, Parkinson's disease, and chest conditions.
- Neurology – helping people restore normal movement and function in stroke, multiple sclerosis, and other conditions.
- Orthopedics and trauma – restoring mobility after hip and knee replacements and

spinal operations and treating patients after accidents.

- Mental illness – taking classes in relaxation and body awareness and improving confidence and self-esteem through exercise.
- People with learning difficulties – using sport and recreation to develop people and assessing and providing specialist footwear, seating, and equipment.
- Occupational health – treating employees in small to large organizations and companies and looking at work habits to prevent physical problems such as repetitive strain injury.
- Terminally ill (palliative care) – working in the community or in hospices and treating patients with cancer and AIDS (acquired immune deficiency syndrome).
- Pediatrics – treating sick and injured children, those with severe mental and physical handicaps, and conditions like cerebral palsy (weakness due to brain damage during pregnancy or near birth) and spina bifida (developmental spine closure deficits).
- Community – treating a wide variety of patients at home and giving advice to carers.
- Private sector – working independently in private practice, clinics, hospitals, and GP surgeries and treating a wide range of conditions.
- Education and health promotion – teaching people about many conditions and lifestyle choices. This may include back care, ergonomics, and taking exercise classes and cardiac rehabilitation groups.
- Sports clinics – treating injuries in sportsmen and women and advising on recovering fitness and avoiding repeated injury.
- Voluntary organizations – advising and consulting for organizations supporting and caring for people with multiple sclerosis and Parkinson's disease.

Self-identification

Science might be viewed as knowledge attained through study or practice, or knowledge covering general truths of the operation of general laws, especially those obtained and tested through scientific method [and] concerned with the physical world.

Academic physiotherapy is a science since its methods are subject to both research evidence addressing issues of relevance for its theoretical concepts (e.g., basic science) and to clinical research, e.g., clinical trials assessing treatment effects of physiotherapeutic approaches.

Characteristics

Physiotherapists try and bring the patients into an active role to help make the best of independence and function. Core skills used by physiotherapists include manual therapy, therapeutic exercise, and the application of electrophysical modalities.

Relevance to Science and Religion

Physiotherapy is relevant to science in that its specific methods, e.g., manual therapy, therapeutic exercise, and the application of electrophysical modalities, add to the medical therapeutic knowledge in the above mentioned areas of health care to the extent that its remedies are supported by scientific evidence.

Physiotherapy is interested in science in that it – as an academic discipline – thrives to expand its knowledge base for its clinical applications.

Evidence-based physiotherapy can be described as a commitment to use the best available evidence to inform decision-making about the care of individuals that involves:
- Integrating physiotherapist practitioners
- Individual professional judgment with evidence gained through systematic research

The World Confederation for Physical Therapy (WCPT) believes that physical therapists have a duty and responsibility to use evidence to inform practice and to ensure that the management of patients/clients, their carers, and communities is based on the best available evidence. Evidence should be integrated with

clinical experience, taking into consideration beliefs and values and the cultural context of the local environment. In addition, physical therapists have a duty and responsibility not to use techniques and technologies that have been shown to be ineffective or unsafe.

Sources of Authority

At least as early as the days of Hippocrates, massage was used and the history of physiotherapy was begun. The practice of physiotherapy has evolved through the centuries from the earliest forms to the complex system of treatment it is now.

In 460 B.C., Hector was using a type of physiotherapy called hydrotherapy, or water therapy. Professionals use this type of therapy today, although it is more specialized for each type of condition that the patients have.

The year 1894 saw the first evidence of a group of nurses in the history of physiotherapy with a Chartered Society. Within 20 years, physiotherapy programs were set up in other countries. New Zealand's started in 1913 and America's in 1914.

The first American professionals in the history of physiotherapy were from the Walter Reed College and Hospital in Portland Oregon. Rather than being called physiotherapists, they were called reconstruction aides. These aides were nurses and they had a physical education background. They were important in the recovery of many World War I veterans.

In 1921, the Physical Therapy Association was formed by Mary McMillan. This group later became the APTA, arguably the most influential organization in the American history of physiotherapy.

The Georgia Warm Springs Foundation was started in 1924 to deal with the ever-growing epidemic of polio. The foundation offered physiotherapy for these patients. Sister Kinney was known nationally for her work with polio victims. She practiced at the Mayo Clinic. The polio epidemic was a turning point in the history of physiotherapy.

PNF (proprioceptive neuromuscular facilitation) stretching is a physical therapy procedure designed in the 1940s and 1950s to rehabilitate patients with paralysis (weakness due to nervous damage). Herman Kabat, a neurophysiologist, began in 1946 to look for natural patterns of movement for rehabilitating the muscles of polio patients. He knew of the myotatic stretch reflex (muscle reflex), which causes a muscle to contract when lengthened too quickly, and of the inverse stretch reflex, which causes a muscle to relax when its tendon is pulled with too much force. He believed combinations of movement would be better than the traditional moving of one joint at a time. To find specific techniques, he started an institute in Washington, DC and, by 1951, had two offices in California as well. His assistants Margaret Knott and Dorothy Voss in California applied PNF to all types of therapeutic exercise and began presenting the techniques in workshops in 1952. During the 1960s, the physical therapy departments of several universities began offering courses in PNF.

In about 1950, chiropractic manipulations came on the scene in the history of physiotherapy. This was most common in Great Britain.

After that time, the history of physiotherapy moved from hospitals into other arenas of service. There were, and are, physiotherapists working in clinics, private practices, nursing homes, and schools.

Dr. Karel Bobath, a physician, and Berta Bobath, a physiotherapist, were born in Berlin and moved to England during World War II. There they developed their approach to the evaluation and treatment of children and adults with lesions of the central nervous system, nowadays called the Bobath concept. The first center opened in 1951 and there the first course was conducted. Since then, many thousands of therapists and doctors have been trained worldwide.

The World Confederation for Physical Therapy, which was founded in 1951 to represent physical therapists internationally, champions the principle that every individual is entitled to the highest possible standard of culturally appropriate health care provided in an atmosphere of trust and respect for human dignity and

underpinned by sound clinical reasoning and scientific evidence. The World Confederation for Physical Therapy was founded in Copenhagen, Denmark, with 11 founding member organizations from Australia, Canada, Denmark, Finland, Great Britain, New Zealand, Norway, South Africa, France, Sweden, and the United States of America. The confederation is a nonprofit organization comprising 106 member organizations which, together, represent more than 350,000 physical therapists worldwide.

During the history of physiotherapy, training and practice have changed and improved. Many brilliant pioneers have left their marks in the literature and organizations of the field. Physiotherapy is a well-respected profession as a result.

Ethical Principles

As for every medical subdiscipline and allied health services, physiotherapy is guided by the oath and law of the ancient Greek physician Hippocrates (born 460 B.C.) who is considered the so-called father of medicine. This "Hippocratic Oath" has been supplemented by the rules of the Declaration of Helsinki of 1971.

The World Confederation for Physical Therapy (WCPT) expects physical therapists to:

- Respect the rights and dignity of all individuals
- Comply with the laws and regulations governing the practice of physical therapy in the country in which they practice
- Accept responsibility for the exercise of sound judgment
- Provide honest, competent, and accountable professional services
- Provide quality services
- Be entitled to a just and fair level of remuneration for their services
- Provide accurate information to patients/clients, other agencies, and the community about physical therapy and the services physical therapists provide
- Contribute to the planning and development of services which address the health needs of the community

Key Values

Physiotherapy is a science-based health-care profession which views movement as central to health and well-being. Physiotherapists aim to identify and make the most of movement ability by health promotion, preventive advice, treatment, and rehabilitation. Physiotherapists believe it is of vital importance to take note of psychological, cultural, and social factors which influence their clients.

Cross-References

▶ Body
▶ Neurology in Europe
▶ Occupational Therapy

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Pietism

▶ Mysticism

Pilgrimage

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Related Terms

Journey; Landscape; Place; Ritual

Pilgrimage is a ritual journey undertaken by a person or a group to a specific, religiously defined location in landscape in order to reach

an objective not achieved at home or in ordinary religious practices (Morinis 1992; Turner and Turner 1978).

Through the three elements of pilgrimage, location, journey, and person, the physical movements in geographical space are connected to a religious journey in mythological space. Pilgrimage sites are often said to be the location of mythological events, the journey or a reenactment of earlier journeys taken by religious figures in past mythological times or an anticipation of future journeys after death, or the pilgrim may be considered different from the ordinary social person.

Pilgrimage is a common practice in many religious traditions and is known from all over the world and from ancient times, when people visited sacred places in the landscape, through the Middle Ages, when Europe was crisscrossed by pilgrimage routes, and up to today. Due to increasing possibilities of long distance travel, globalization in general, and the revitalization of embodied religious rituals in Lutheran countries, pilgrimage is more popular and widespread than ever (Morinis 1992; Reader and Walter 1993). As a ritual, pilgrimage is a sequence of practices that separates the pilgrim from home and everyday life and relates the pilgrim with religiously defined values (Morinis 1992; Turner and Turner 1978). Pilgrimage situates this separation and relation in the landscape as distance and location. The journey along the pilgrimage route thereby separates the pilgrim from home and leads the pilgrim toward a valued location both in geographical and religious terms. The pilgrimage site is a location in the landscape that is believed to stand, somehow, in a special and close relation to cosmology, mythological events, historical periods or persons, or other types of religiously defined values and powers of change. In order to be in contact with those values or powers, the pilgrims approach and interact with the location and the pilgrimage site, in certain, often well-defined mode of movements. The pilgrims embody this movement in order to relate themselves to the pilgrimage route and site and the associated religious meaning.

Pilgrimage is constituted by three elements: the place, the person, and the journey that connects place and person. The different pilgrimages and religious traditions differ in emphasis on these three elements (Morinis 1992).

The pilgrimage site is traditionally defined as the center of the cultural world and pilgrimage as a journey to the center of cultural values. But pilgrimage sites are more often located in cultural border regions, and pilgrimage sites were often established in order to mark the foreign or untouched landscape in new religious terms. The same site can therefore be disputed and contested, when more than one religious traditions or more than one group within the same tradition argue or fight over the symbolic and/or territorial control over the pilgrimage site (Coleman and Eade 2004; Eade and Sallnow 1991).

Pilgrimage sites are the alleged locations for cosmological figures and mythological and historical events and are often placed at special landscape features, like mountains, rivers, springs, caves, etc. These places function as commemoration of these figures and events but are also a source for their continuing relevance for the believing pilgrim.

The pilgrim commences on a pilgrimage for a series of reasons. Penance, blessings, good deeds, religious obligations, healing, etc., are religious motivations often combined with adventure, tourism, or commerce, sometimes making pilgrimage difficult to separate from other practices. In general, pilgrimage is a voluntary journey available for all independent of religious position, earlier initiating ritual, or social status. This equalitarian character makes pilgrimage a predominantly lay practice with less restriction on interpretation. Even when a pilgrimage site is well established as unique for one religious tradition, the lay pilgrims may bring their own interpretations of the site and the connected practices. The institutional establishment and the visiting pilgrims may therefore be in some conflict about interpretation and practice, the clergy often emphasizing soteriological goals and institutionalized interpretation, whereas pilgrims prefer worldly and practical gains, such as fertility, wealth, and god health and interpretations informed by popular, folk religion.

Completing a pilgrimage increases the religious and social status of the pilgrim on her or his return home. Occasionally, a new name or a specific title is given to the successful pilgrim. A pilgrim may have undertaken the journey on behalf of another person or as representative of the whole family, and on the return, the acquired benefits must then be passed on. Soil, plants, relics, or other material substances collected or bought at the pilgrimage site may embody such transfer or can be broken up or collected water dissolved into a bigger solution to be distributed to close ones. The pilgrim leaves as an individual, even when in a group, and returns with new religious status to a social context (Turner and Turner 1978).

The journey is central to pilgrimage. A pilgrimage requires some distance between home and the pilgrimage site and a journey to the site (Morinis 1992). The actual distance is not important, but often the journey will bring the pilgrim in contact with unknown areas. The journey may be done in specific modes of movements. Pilgrims sometimes crawl on their knees or make full body-length prostrations to or at the pilgrimage site. Minor altered mode of movements, such as a slower pace, or changing the appearance of the walk, like wearing specific clothes or using a walking stick, all indicate to others and to the pilgrims themselves that it is no ordinary journey. Instead, pilgrimage is a journey that relates the pilgrim to the located value and potential change. Sometimes the journey itself is the goal of pilgrimage; the pilgrimage site merely being a location in landscape that indicates the end of the pilgrimage, not the actual goal. As such, the journey and the pilgrimage route are important, where the movement from A to B along the route is a geographical metaphor for a change that occurs in time, before and after the pilgrimage.

At the core of pilgrimage lies this assumption that the changes wished for in the religious, social, material, or other realms can be mapped onto the landscape. The movements in space and approaching a location in landscape can be transferred back onto these domains. To journey along a route in a specific mode to a defined location in landscape is newer only spatial transport but also a temporal transference from one situation to another. The pilgrims move through landscape and reach some defined goals in their own life.

Cross-References

▶ Body
▶ Cosmology
▶ Experience
▶ Landscape
▶ Myth
▶ Religion, history of
▶ Ritual
▶ Space
▶ Space and Time
▶ Worldview

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Pilgrims

▶ Latino Studies

Place

▶ Ecological Psychology
▶ Pilgrimage

Planck Length

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It is conjectured that there might be a smallest unit of length – one that is incapable of being subdivided. Max Planck argued that, were there to be such a minimum length, there must be a formula for it – one that depended on the fundamental constants: the gravitational constant, G, the speed of light, c, and Planck's constant, h, governing quantum effects. The simplest formula yields a value for the length of approximately 1.6×10^{-35} m. This is 20 orders of magnitude smaller than the size of a proton and means that it is very unlikely we shall ever be able to check whether there is a smallest unit of distance.

Cross-References

▶ Space

Planck Time

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It is conjectured that there might be a smallest unit of time - one that is incapable of being subdivided. Max Planck argued that were there to be such a minimum interval of time, there must be a formula for it - one that depended on the fundamental constants: the gravitational constant, G, the speed of light, c, and Planck's constant, h, governing quantum effects. The simplest formula yielding a quantity with the dimensions of time gives a value of approximately 5.3×10^{-44} seconds. This is 27 orders of magnitude smaller than the smallest time interval measured so far, and means that it is very unlikely we shall ever be able to check whether there is a smallest unit of time.

Cross-References

▶ Time

Plasma

▶ Transfusion Medicine

Plasticity

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Related Terms

Neural plasticity; Neuroplasticity

Description

Plasticity is the capability of the brain to alter its functional organization as a result of experience. As such, plasticity refers to the phenomenon of change, not to the specific underlying mechanisms. The word itself originates from the Latin word *plasticus*, literally meaning that which can be molded. No single morphological or physiological change comprises the phenomenon of plasticity, as it applies to the nervous system. Instead, many different processes from genetic to subcellular to cellular to systems level contribute to plasticity. Similarly, brain plasticity involves several cell types, including neurons, glia, and endothelial (or vascular) cells. One of the important morphological structures that is known to undergo plasticity is the chemical

synapse. Hence, synaptic plasticity is a term that describes long-lasting changes in the efficacy of chemical transmission across the synapse resulting from certain patterned activities of the presynaptic nerve. Further, behavioral experience can induce changes in cortical maps, so that those body parts engaged in the behavioral task come to be represented over larger cortical territories. Such *cortical plasticity* is also known as *cortical remapping*. Cortical plasticity has now been demonstrated in widespread regions of the cerebral cortex, including the somatosensory, auditory, visual, and motor cortex, and thus, is considered to be a basic property of cortical circuits. While *developmental plasticity* had been accepted for decades, most neuroscientists thought that the nervous system was relatively fixed after certain critical periods of development. The importance of this subdiscipline is that it suggests that the brain is mutable throughout life.

An important demonstration in 1973 of a specific form of synaptic plasticity showed that a test electrical pulse could activate a greater number of synapses if preceded by brief trains of pulses (Bliss and Lomo 1973). This phenomenon came to be known as *long-term potentiation*, and is thought to be the synaptic basis for learning and memory. These studies set the stage for brain plasticity studies to follow in the later part of the twentieth century. Throughout the 1980s and 1990s, a large number of studies demonstrating the phenomenon of *cortical plasticity* were conducted (Buonomano and Merzenich 1998). The cerebral cortex contains a representation, or map, of the sensory receptors in the skin, and this representation is laid out in an orderly arrangement. As the result of specific types of sensory experience, details in the map can be altered. For example, a peripheral nerve injury might disrupt the map representing the injured nerve, and subsequently, neurons in this region will become responsive to other nerves. Some of the most compelling data came from nerve transection experiments demonstrating that a decade after the transection of a peripheral nerve innervating the hand, the representation of the face in the cerebral cortex expanded into the former

hand territory (Merzenich et al. 1983). Such examples of cortical plasticity were found in every cortical area studied, including somatosensory, auditory, visual, and motor cortex. In the 1990s, and continuing to the present, an increasing number of neuroimaging studies in brain-injured and intact humans have demonstrated brain plasticity at the tissue and network level of analysis. In parallel with the development of human neuroimaging studies, laboratory experiments in animal models have revealed details of the cellular and molecular basis for brain plasticity. These studies have included demonstrations that neurons are altered anatomically. Changes include axonal sprouting or neuroregeneration, increases in synapse number (synaptogenesis), dendritic spine length, and branching of dendrites.

Self-identification

Science

Plasticity is self-identified as a science to the extent that the phenomenon has been demonstrated through empirical studies. In its early beginnings, plasticity emerged as a hypothesis, but significant skepticism prevailed in the scientific community for several years. While most neuroscientists were willing to accept the concept of plasticity during the early development of an organism, the notion that the adult brain was modifiable in structure and function was not universally accepted. As the phenomenon was demonstrated in increasingly varied circumstances at several levels of analysis, skepticism gave way to acceptance that brain structure and function was mutable throughout life. The body of evidence demonstrating brain plasticity, and its underlying rules and assumptions, now amounts to a well-established theory.

Characteristics

As a subdiscipline of neuroscience, plasticity is distinct in its emphasis on change. Other subdiscplines such as neuroanatomy and neurophysiology examine the structural or functional

state of the nervous system at a given point in time. Plasticity phenomena can be described based on neuroanatomical or neurophysiological end points, but emphasizes the change in those end points that result from a modulating influence, such as behavioral experience. A unique subfield of plasticity that has garnered attention recently focuses on the degree to which current state of the nervous system influences the magnitude or direction of plasticity. This form of plasticity was termed *metaplasticity* by Abraham and Baer (1996).

Relevance to Science and Religion

While plasticity focuses on natural events, there has rarely been any specific discourse regarding its relationship to "Science and Religion." However, the notion that the nervous system is alterable throughout life is a major paradigm shift that departs radically from the previous concept of the nervous system as being fixed in adulthood. As such, brain plasticity has clear philosophical, if not religious, implications related to the concept of "free will." An alterable brain, modifiable as a direct result of experience, implies that our core being is not entirely preordained, but rather, can be consciously shaped. A provocative example of communication between scientists and religious leaders on the issue of plasticity occurred in the 1990s when the Dalai Lama became interested in this subdiscipline and encouraged monks to participate in neuroimaging studies. The results suggested that the physiology of the brain could be altered by meditation training (Brefczynski-Lewis et al. 2007).

Sources of Authority

While the term "neural plasticity" was reportedly coined by Polish neuroscientist Jerzy Konorski, a student of Pavlov, in the 1940s, the concept of brain plasticity has its origins in the writings of neurologists and psychologists at least as early as the mid-nineteenth century (Finger 1994). However, firm empirical evidence has only been available in abundance since the 1980s. Focused studies on the alterability of the nervous system began in earnest in the laboratory of Sir Charles Sherrington at the beginning of the twentieth century. Sherrington, widely regarded as the father of modern neurophysiology, stated in his Silliman Lectures that "Mere experience can...mold nervous reactions, insofar as they are plastic." His students, especially Sir John Eccles and Graham Brown, carried on with this work and established some of its early principles. Eccles began studying plasticity at the level of the neuromuscular junction and then moved into the spinal cord, where he established some of the early principles of activity-dependent synaptic plasticity. In the 1930s and 1940s, the work of American psychologist Karl Lashley and his student, the Canadian physiologist Donald Hebb, was very influential in establishing testable hypotheses regarding neural plasticity. Hebb's book "The Organization of Behavior" is still one of the most influential books in the field of neuroscience (Hebb 1949). In this book, Hebb outlined his hypothesis for synaptic plasticity, based on the temporal contiguity of pre- and postsynaptic activity. This hypothesis was given firm credence with the work of Bliss and Lomo and their landmark studies in 1973 on long-term potentiation of synapses in the hippocampus. Long-term potentiation is a phenomenon of synaptic communication in which a test electrical pulse can activate a greater number of synapses if preceded by brief trains of pulses. Under different stimulating conditions, the test pulse can activate a fewer number of synapses. This phenomenon is known as longterm depression. These early studies set the stage for influential experiments demonstrating *cortical plasticity* in adult nonhuman primates in the 1980s by Michael Merzenich, Jon Kaas, and others. Within a decade, modern neuroimaging studies confirmed the phenomenon in humans, and the theory developed wide acceptance in the field of neuroscience. In each instance, these scientists became advocates for the existence of the phenomenon of plasticity based on their own empirical work. Their authoritative influence on the field was grounded in thorough, careful experimentation.

Ethical Principles

Ethical principles guiding practitioners in plasticity are based on the foundations of ethics common to all human subjects and nonhuman animal research. With respect to human subjects research, principles dictate (a) respect for the dignity of all subjects in research, (b) the need for free and informed consent to participate in research studies, (c) the importance of protecting subject confidentiality, (d) equity in the selection of subjects and distribution of risk, and (e) the right of subjects to withdraw participation at any time without penalty. These ethical codes were summarized in the oft-cited Declaration of Helsinki in 1964, but have been refined throughout the ensuing decades, most notably in The Belmont Report. Practitioners in the field of plasticity research conducting nonhuman animal research also adhere to a strict code of ethics. This is especially important since many plasticity experiments are necessarily invasive. Specific guidelines vary from country to country, but generally follow similar principles, such as those outlined in the Guidelines for Ethical Conduct in the Care and Use of Nonhuman Animals in Research developed by the American Psychological Association. In both human subjects and nonhuman animal research, oversight boards to monitor conduct of studies and adherence to ethical guidelines play an essential role in this process.

Key Values

The key values of plasticity as a phenomenon of brain function are both theoretical and practical. From a theoretical perspective, plasticity suggests that the state of the nervous system at any point in time is the product of the organism's life experiences, but especially recent experiences. The alterability of the brain at the synaptic, cellular, and network level provides an entirely new perspective on understanding of neural function. From a practical standpoint, brain plasticity implies that both acute and chronic neurological disorders may be treatable. While some

self-repair in the brain after injury has now been established, further understanding of the alterability of neural tissue may lead to major new treatments for neurological disorders.

Conceptualization

Nature/World
Nature refers to the physical world. With respect to the brain, it refers to the neuroanatomical constituents, as well as biochemical and physiological reactions. It encompasses observable, material events.

Human Being
The human being is any member of the species *Homo sapiens*, possessing a uniquely complex brain and accompanying unique behavioral attributes, such as fine dexterity of the hand, language, ethics, and culture.

Life and Death
Life is the state of an organism in which basic biological processes continue to function. These include metabolism, reaction to stimuli, growth, and adaptation. Death is the cessation of these processes.

Reality
Reality is the perceived physical world. As such, reality is not identical in all organisms, since considerable variability exists among species regarding the precise physical information that can be perceived. For example, humans perceive a limited range of wavelengths of light that we refer to as the visible spectrum. Extreme ultraviolet and infrared wavelengths are not perceived, and thus, are not part of our reality unless manufactured devices are used to transduce them.

Knowledge
Knowledge is the sum total of factual information about a given topic.

Truth
Truth is an irrefutable fact or principle. Based on the scientific method, absolute truth is never

attained, only approximated. Thus, a preponderance of evidence results in a probabilistic likelihood of truth.

Perception

Perception is the interpretation by the brain of sensory signals. Thus, the brains of different individuals can perceive the same sensory experience as quite different.

Time

Time is a fundamental structure by which humans measure the intervals between sequences of events.

Consciousness

Consciousness is used variably to refer to a state of alertness and arousal, or to a state of self-awareness. With regard to the former, consciousness can be altered by various pharmacological agents or, pathologically, by brain injuries. The latter is used in the context of psychology and is alterable in certain psychological disorders.

Rationality/Reason

Rationality is the process of sound inference, based on existing knowledge. It often obeys traditional rules of logic.

Mystery

Mystery is anything that is unexplained in science. An inference common among scientists is that the mystery will ultimately be explained pending further scientific query. Mystery is often a powerful motivating factor in science, encouraging its practitioners to discover information about the natural world that was formerly unrealized and unappreciated.

Relevant Themes

The notion that the brain is alterable throughout life implies that each brain is highly idiosyncratic. This realization has important implications for our understanding of individuality. While all brains are organized based on similar fundamental principles, details of experience-driven network properties differ substantially, contributing to the uniqueness of human individuals.

A recent issue that is drawing increasing attention by individuals interested in ethics of modern technology surrounds the topic of brain-machine interfaces. Increasingly sophisticated microelectronic devices are becoming available to assist neurologically injured persons. For example, in a paralyzed individual, neuronal signals can be derived from the individual's brain and used as command signals to drive external devices, such as a cursor on a computer screen, or even the contraction of the patient's own muscles (Hochberg et al. 2012). These devices rely on *neural plasticity* to allow the nervous system to adapt to the presence of the artificial microelectronics and the new control algorithms that are required. As so-called smart prostheses become more sophisticated and available clinically, an ethical dilemma may be raised. As human brains are interfaced with microelectronic devices, at what point does the organism cease to be human? As cybernetic organisms move from science fiction to reality, our sense of humanity may be challenged.

Cross-References

▶ Biological Psychology
▶ Cognitive Neuroscience
▶ Experience
▶ Neuroethics
▶ Neuroimaging
▶ Neurophysiology
▶ Philosophy of Mind
▶ Recovery
▶ Science in Buddhism
▶ Transcranial Magnetic Stimulation

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Platelets

▶ Transfusion Medicine

Pleasure

▶ Happiness

Plot

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The organizing theme or structure of a narrative, the sense of a narrative or story. Following Paul Ricoeur, the plot is understood as the "synthesis of the heterogeneous" in several ways. First, the operation of the plot organizes what would otherwise be purely an enumeration of incidents into an intelligible whole, having at least a basic beginning-middle-end structure. Second, the plot integrates different components such as different protagonists, their activities and their feelings, and knowledge and intentions into the dynamic identity of a particular story located in space and time. Third, the plot distils a meaningful temporal unity from an otherwise chronological sequence of unrelated episodes.

Pluralism (Religious)

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Related Terms

Diversity; Ecumenism; Interreligious dialogue; Plurality

Description

The term "pluralism" appears within a number of different disciplines, such as Science, Philosophy, Economy, Law, Art, and Religion. From a general point of view, it is used in two different senses. In the first sense, it is used simply to refer to the fact of plurality when it comes to, for example, methods, systems, religions, or values. In the second sense, it stands for the view that this plurality is something to be acknowledged, promoted, or reconciled. Scientific pluralism denotes the view that there is no unified scientific method but that multiple explanations are required to account for the nature of certain observed phenomena.

The focus here is on religious pluralism and the use of the term within the subdisciplines of Philosophy of Religion and Theology of Religion(s). In this context, the term is used to indicate openness

and tolerance from within one religion toward other religions. In this sense, some religious traditions are more prone to pluralism than others. In recent decades, the term has in the academic world come to appear within a certain typology used to classify possible theological positions toward alien religions. This is the threefold typology of exclusivism, inclusivism, and pluralism. Generally speaking, exclusivism is the view that it is only the home religion that is true and salvific. Other religions are simply false. Inclusivism stands for the view that the home religion is the only universally true religion. Other religions can be partly true and adherents to them can attain salvation, but this is done surreptitiously through the power of the home religion, which alone is truly salvific. Pluralism is then the view that the home religion is not the only true and salvific religion.

These different standpoints become paradigmatic for how one understands the interreligious situation and for one's attitude toward interreligous dialogue. Pluralism is generally considered the most conducive for a creative engagement with the religious other. There are, however, different variants of religious pluralism.

One variant is the view that there is a common ultimate reality as the ground for the plurality of religions. The different religions are equally valid expressions of this universal ground. This does not mean that the particularity of each religion should be dismissed but, rather, that no one religion can be considered superior to the others (Schuon 1959).

Related to this variant of pluralism is the view that all the great world religions are salvific, which means that they lead to a common goal, that of transformation from self-centeredness to Reality-centeredness, even if this is differently conceived of as salvation, liberation, or enlightenment. The doctrines and stories of the various religions are not literally true, but they facilitate this transformation (Hick 1989).

In opposition to these is the view that the various religious traditions are radically different, that there is no common ground or even conceptual contact between the religions. Even the concept of religion is problematic since it is difficult to determine how what we call religions really are examples of a single category. In this view, interreligious dialogue is not an exploration of commonalities but rather an encounter with otherness and an openness to mutual transformation (Cobb 1982).

Still, another form of pluralism is the one that focuses on tolerance between religions. It emphasizes the fact that our world is religiously plural and that this is the reality, not that there is an ultimate reality behind the religions. The religions are complementary expressions that together comprise the universal whole. They are not competing expressions of a common ground (Dalai Lama 2010).

A further variant of pluralism focuses on the religions as dynamic processes rather than essentialist belief systems. Through phenomenological studies and dialogical engagement, this variant attempts to discern parallel processes, moods, and insights from the various traditions and creates new concepts and categories to further the understanding of religious phenomena. Here, the promotion of understanding is the central incentive. Feminist approaches to religious diversity are generally in line with this variant of pluralism (Pfändtner 2010).

Cross-References

▶ Feminist Philosophy of Religion
▶ Interreligious Studies
▶ Philosophy of Religion
▶ Typologies in Science and Religion

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Plurality

▶ Pluralism (Religious)

Poesy (Archaic)

▶ Poetry

Poetry

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Related Terms

Poesy (archaic); Verse

Description

Poetry is a language art characterized by composition in lines, dense use of figurative language, and repetitions of sound and meter. The primary unit of meaning in a poem is generally considered the line and the secondary unit of meaning to be the stanza or strophe; poetry is thus distinguished from *prose*, in which the primary unit of meaning is the sentence, and the secondary unit, the paragraph (although the nineteenth and twentieth century has seen many examples of hybrid work, particularly the prose-poem, in which the primary unit of meaning is, in fact, the sentence).

The English word "poetry" derives etymologically from the Greek *poiesis*, which means "to make." Aristotle used the term to refer to anything that is made, including practical tools as well as epics, calling that which is made "a productive science." French Romantic poet Alphonse de Lamartine gives an exultant definition of poetry when he writes, "Like all that is divine in us, it can be defined neither by one word nor a thousand. . .. It is, at the same time, sentiment and sensation, spirit and matter; and that is why it is the complete language, the language *par excellence* that seizes man by his entire humanity; ideas for the mind, sentiments for the soul, images for the imagination, and music for the ear." British Romantic Poet William Wordsworth calls poetry the "breath and finer spirit of all knowledge; it is the impassioned expression which is the countenance of all science." Most definitions give some combination of either the imaginative, technical, spiritual, philosophical, or emotional aspects of the art.

Poetry originated from an oral tradition, in which stories, genealogy, and spiritual/religious rituals were passed from person to person, generation to generation, via speech that was organized through patterns of sound (repetition, alliteration, rhyme, and meter). These patterning devices of sound may have been employed for mnemonic reasons; that is, people were more likely to remember stories, rituals, hymns, etc. if they were told with a repetition of sound or meaning, or in the form of a song. In this way, poetry is a distinct part of the evolution of civilization – it was one way that humans cultivated to retain its collection of knowledge over time.

These patterning devices are often arranged structurally, creating what is called poetic form. Form may be as simple as the repetition of a particular metrical and/or rhyming pattern, or

may denote stanza length, repetition of lines or phrases, or even content of the poem (the elegy, for example, is reserved for mourning, the epithalamium for marriage). Other popular forms are the pantoum (Malay), haiku (Japanese), canzone (Italian), ghazal (Persian), sestina (Italian), ode (Greek, English), and elegy (Greek, English).

Until the twentieth century, poetry was usually written either in a codified, recognizable form (such as the sonnet or elegy), or else employed regular stanza divisions with lines of equal metrical length (12 quatrains written in iambic pentameter, for example). Jules Laforgue and Walt Whitman were famous in the nineteenth century for practicing what is now known as "free verse," in which line and stanza length are variable, and the poet does not follow rules for the composition of the poem. At the turn of the twentieth century, and particularly following WWI and WWII, free verse became, in Western poetry, the rule rather than the exception.

Taxonomy of Poetry: One of the earliest attempts to taxonomize poetry can be found in Aristotle's *Poetics* in which he delineated three "species" of poetry: tragedy, comedy, and epic. Both tragedy and comedy, however, would be classified, according to contemporary standards, as "dramatic." Current generic classifications of poetry tend to focus on three primary types:

Epic – a long narrative poem that recounts the long and arduous journey of a hero. The earliest extant epic is the Sumerian epic of Gilgamesh. In the Western tradition, Homer's *Illiad* and *Odyssey* and Virgil's *Aeneid* are considered quintessential examples of the epic (between 12,000 and 15,000 lines each). Few modern examples of the epic exist; Derek Walcott's *Omeros* and Alice Notley's *Descent of Alette* are two of the few epics written in the twentieth century.

Lyric – a short, typically non-narrative, poem characterized by first person expression, apostrophe, and density of figurative language. There have been lyric poems as short as two lines and those that extend past 800. Common themes include death, desire, love, mysteries of nature, and spirituality. The ancient Greek poetess Sappho is typically considered to be among the first lyric poets, but we can trace early examples of lyric compositions as far back as the tenth century B.C.E.

Dramatic – a long narrative poem written for multiple voices in dialog with one another. A dramatic poem is, essentially, a drama (tragic or comic) written in verse lines. Euripedes and Sophocles are among the oldest recorded writers of dramatic verse, although the genre remained popular through the Renaissance, practiced by writers such as Shakespeare and Marlow.

Our oldest records, those of the Old Kingdom of Ancient Egypt, indicate that poetry was composed with musical accompaniment, though details about these performances are sparse. Repetitions of rhythm and syllabic sound in ancient Egypt suggest that poetry could have been sung or chanted. At least a millennium later, around 2100 B.C.E., ancient Sumerian poetry, probably influenced by the Egyptian tradition, was composed in verse lines and recited orally as songs, sometimes sung with lyre or harp; Sumerian praise poetry in particular was sung by one or more voices, and was often accompanied by drums.

Ancient Greek choral poetry was accompanied by an aulos, a precursor to the flute. Epic poems were accompanied by a lute (a precursor of the guitar), and lyric poems by the kithara or lyre (a precursor of the harp), from which it derives its name. This close performative relationship between poetry and music remains throughout the Middle Ages (in the troubadour tradition), though during the Renaissance, poetry began to grow away from accompaniment, which is a relic of its oral roots, and began to be written for the page, to be read silently. As this happens, lyric poetry takes on greater metaphorical complexity, and becomes a site for deep internal reflection, rather than outward performance, though the practice of composing lyrics for instruments is still practiced widely today. Most scholars would distinguish, however, lyrics (written for music) from poetry (written for the page), despite the fact that in their geneses, they were one-and-the-same.

The histories and expressions of poetry and spirituality are deeply entwined; according to

Egyptologist John Lawrence Foster, ancient Egyptian poems were "almost exclusively religious. Ancient peoples seemed not to have atheism, agnosticism, or skepticism as options in the constellation of their beliefs." Hymns to a creator God, to Aton and other gods, as well as poems that speak of the soul in relationship to the divine, can be found among the ancient relics of this time. In the twenty-first century B.C.E., for example we find:

> The generations come and go among mankind, and God, who knows all natures, still lies hidden.
>   ….
>   The gone soul journeys on to whence it came.
>   (1–2, 8)

Ancient Sumerian poetry evidences similar spiritual themes, and expresses a power of the divine over the natural world, as in this fragment to the moon god Suen:

> The Glory of Heaven has undone the halters of those grazing cows, of that grazing herd.
>   (7,8)

In the Western tradition, poetry continued to explore the relationship between man and the divine, whether through Sappho's fragments, Dante's *Divine Comedy*, the sonnets of Petrarch, John Donne's Holy Sonnets, or Hopkins "The Wreck of the Deutchland." There are far too many examples to give anything near a comprehensive list; sufficed to say poets over many millennia have used poetry as a vehicle of exploration and communion with the divine.

Poetry is not at all, however, exclusively bound to spiritual themes. In ancient Greek verse, one site of contention for Aristotle was the idea that anything written in verse (or metered lines) was a poem: Indeed, medical, philosophical, "natural science," or other didactic texts were often written in rhyme and meter. The Roman poet Catullus made himself very famous by writing bawdy, political poems. In the twentieth century, in particular, we find a shift from the regular consideration of spiritual themes to more secular content in poems. In the scope of the history of poetry, however, these poems constitute a mere fraction of a percent of what has been written. By and large, the history of poetry is bound very

closely with the history of humanity's spiritual expressions, as well as its pre-Enlightenment scientific expressions. But poetry has always been one of humanity's most cherished records of itself; it is, to quote Lamartine, "man himself, it is the instinct of all his ages, it is the internal echo of all his human impressions."

Cross-References

▶ Creative Writing
▶ Imagination
▶ Language and Literature, French
▶ Philosophy of Language

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Policy

▶ Ecological Psychology

Political Ideology

▶ Political Theory

Political Philosophy

▶ Political Theory

Political Principles

► Political Theory

Political Science

► Ecclesiology

Political Theology, Theological Politics

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The concepts "political theology" and "theological politics" are controversial since they cannot be understood as value-neutral ways of forming ideal types of different ways of conceiving the relation between theology, faith, and politics. This chapter will concentrate on how these concepts can be understood in a Christian theological context.

There is of course a long tradition of thinking about the relation between Christian faith, theology, and politics within the Christian traditions. Theologians such as Augustine, Aquinas, John Calvin, or Martin Luther all formulated important contributions to Christian political thinking. In the twentieth century, the *Barmen Declaration* (1934) in Nazi Germany, opposing the Nazi influence in the church, can be seen as an important example of a political theological statement. Not least did Karl Barth contribute to the interpretation of the political consequences of Christian faith in Europe during the 1930s and 1940s (Rasmusson 1994).

The thoughts of Augustine, Luther, and Aquinas, the theologians of the radical reformation, or for that matter, eighteenth- and nineteenth-century liberal theology, all contain theological reflections on politics and the relation between church and state. However, it is during the latter part of the twentieth century that "political theology" became a distinct concept (for an interesting analysis, see De Vries & Sullivan 2006).

Political Theology in the Twentieth and Twenty-First Centuries

According to the Swedish theologian Arne Rasmusson (1994), political theology can be understood as a way of theological thinking that developed among Protestant as well as Roman Catholic theologians from the 1960s onward in response to the challenges of modernity. Political theology in this sense might then be described as a Christian theological response to radical political movements that grew up in the 1960s and 1970s. The reforms of the Second Vatican council created a more open theological climate in the Roman Catholic Church, which also contributed to the growth of various versions of political theology. The meeting of the World Council of Churches in Uppsala in 1968 also contributed to the growing interest in political theology (Rasmusson 1994).

Political theologies hold in common that Christian faith in God cannot be politically neutral. God is radically taking sides with those who are oppressed. The methodology of political theology could therefore be described as a method of correlation. The political and social problems at hand are identified and analyzed and then put in relation to God's liberating will. Political theology, thus understood, can be divided into several subgroups, among whom, Latin American liberation theologies; feminist theologies in the Northern and Southern hemispheres, respectively; gay and lesbian liberation theologies; ecotheologies; and various culturally (or ethnically) oriented liberation theologies (black theology, mujerista theology, Asian theology, etc.) are the most important. Some versions of queer theology might be labeled "political theology" while other forms of queer theology might better belong to what will be discussed as "theological politics" below. In a broad sense, much of modern political

theology is inspired by the methods and perspectives of Marxist critique of the modern capitalist society even if the Marxist or Socialist traits must not be exaggerated (Rasmusson 1994).

According to Rasmusson (1994), the theology of the German theologian Jürgen Moltmann (born 1926) naturally belongs to the type of theology that can be labeled "political theology," as does the theology of the Roman Catholic theologian Johann Baptist Metz (born 1928). Both Metz's and Moltmann's theologies are written against the background of the terrible history of Europe during the twentieth century. Not least are the atrocities of the Second World War and the decisive role that Germany played in that history an important background to their theological thinking. At the same time, theology should be a theology of hope (Rasmusson 1994).

The "classical" text of Latin American liberation theology is Gustavo Gutiérrez' book *Teología de la liberación* (A Theology of Liberation), published in Spanish in 1971. Gutiérrez argues that theology must take its starting point in the situation of the poor, since "poverty is an evil and therefore incompatible with the Kingdom of God" (Gutiérrez 1974). This does not mean that Gutiérrez questions the universality of God's love. But he does not perceive God as a politically neutral God. Not least has theology to be seen as praxis – growing from the communities of the poor – rather as mainly an academic discipline.

Latin American liberation theology has had a vast influence on theological thinking and practice through theologians such as Gutiérrez, Leonardo Boff, Ivone Gebara, Juan Luis Segundo, or Jon Sobrino. It has also inspired other forms of liberation theology such as Asian theology and black theology.

Feminist theologies can be understood as an especially influential form of liberation theology. In her classical work *Sexism and God-talk* (1983), Rosemary Radford Ruether states that "the critical principle of feminist theology is the promotion of the full humanity of women. Whatever denies, diminishes, or distorts the full humanity of women is, therefore, appraised as not redemptive." (Ruether 1983) Feminist theologies

criticize the apparent sexism and male bias in theology and society and want to formulate theological visions that are liberating for both men and women. This has been – and is – done along many different lines. Some feminist theologians/thealogians such as Daphne Hampson or Mary Daly have concluded that Christian faith is beyond redemption and argued that it is impossible to be both a Christian and a feminist. Other feminist theologians have remained within a Christian context. Elisabeth Schüssler Fiorenza's extremely influential book *In Memory of Her* (1983) argued that women had a much more central role in early Christianity than in the later church. Schüssler Fiorenza and Radford Ruether's pioneering work in feminist theology has led to a rich theological tradition within Christian theology.

At present, the future development of Christian feminist theology seems to be at a crossroad. On one hand, feminist theologies' critical perspectives on androcentric theological and ecclesiastical traditions are of continuing relevance. The need for the development of constructive alternatives to patriarchal theological thinking is still very much present in the theological debate. On the other hand, earlier versions of Christian feminist theology have been criticized for not paying enough attention to contextual differences. Feminist theologians of the South often point out that Northern feminist theology is embedded in a Western liberal discourse which cannot easily be applied to the situation of women and men in the South (Althaus-Reid 2004). Important feminist theologians in this tradition are, for example, Chung Hyun Kyung, Kwok Pui-Lan, and Rita Nakashima Brock. Jacquelyn Grant's book *White Women's Christ and Black Women's Jesus: Feminist Christology and Womanist Response* (1989) is an influential example of black women's theology, which, as is evident from the title, is often labeled *womanist* in a certain distinction from the concept "feminist."

A relatively new theological stream is the various forms of ▶ queer theology. Queer theology should not too easily be associated with gay and lesbian theologies, being forms of liberation

theology aiming at the liberation of gay and lesbian people. Queer theology can, of course, in many ways be seen as a liberationist theological project, striving toward a way of doing theology that does not reproduce heteronormative patterns in Christian theology. But queer theology shares the critique of queer theory in general in the understanding of *sexual identity* in both feminist theology and gay and lesbian theologies. An important contribution to this field is Gerard Loughlin's (ed) *Queer Theology. Rethinking the Western Body* (2007).

Theological Politics

Theological politics can, methodologically, be understood as something of an opposite to political theology. This observation should not, however, be interpreted as saying that *theological politics* in its actual way of doing *politics* is less radical. But it starts from another angle and often out of a critical stance toward political theology.

Political theology can – even if this is a simplification – be understood as a theology of correlation. It tries to relate the Christian traditions to a contemporary political situation, which is analyzed not least through various social scientific or philosophical perspectives. One example could be early liberation theology's use of concepts and theories borrowed from Marxist social science (Rasmusson 1994).

Advocates of *theological politics* often criticize political theology for accepting the conditions of a secular or even secularist culture and argue that Christian faith in itself contains a different social theory and political practice. There is, to borrow an expression coined by the Swedish theologian Arne Rasmussen in his book *The Church as Polis* (1994), an "ecclesial theological politics" that has its distinct traits.

One of the most influential theoretical works in this tradition is John Milbank's *Theology and Social Theory – Beyond Secular Reason* (1990) where it is argued that modern social theory, whether in Weberian, Marxist, or any other "▶ secular" tradition, is inherently secularist. Theology, therefore, should not try to make use of secular social theory. Instead, Christian faith has a comprehensive view of society stemming from its own sources. There is no good reason, so it is argued, for Christian thinking to capitulate to secular reason (Milbank 1990). Milbank's book has become one of the important pillars for the theological movement named *radical orthodoxy*.

As with political theology, *theological politics* cannot be pinned down to just one way of doing theology. It is rather an umbrella concept which can be used for such different theological perspectives as those of Stanley Hauerwas, John Milbank, Graham Ward, and Catherine Pickstock. Its common core is the critique of Western liberal and secular thought and of those theologies which are perceived as accepting or even embracing secular theory as an important instrument for theology.

Christian Realism

Another perspective on the relation between Christianity, theology, and politics can be said to be offered by what is sometimes called *Christian realism*. This view would argue that although Christian faith and the Christian church cannot be politically neutral, it is nevertheless not the task of the church to be active in day-to-day political struggles and activities. *Christian realism* has been closely connected with what has been called the "method of middle axioms," the principles of which was laid out by e.g., Josef H. Oldham in his and Visser't Hooft's book *The Church and Its Function in Society* (1937). Other advocates of Christian realism are theologians such as Reinhold Niebuhr, William Temple, and Ronald Preston. According to Christian realism, Christian faith contains some basic ethical values and beliefs of quite a general kind, as, for example, the command to love one's neighbor. Ethical ideas of such a general nature are not, however, possible to use as practical guidelines for politics. The task of theology in relation to politics is to reflect on these core values of Christian faith and to formulate "middle axioms" – i.e., standpoints based in central Christian values that can be used

as moral guides in political action. Most advocates of Christian realism, however, make a distinction between middle axioms and standpoints in day-to-day politics (Kamergrauzis 2001).

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Political Theory

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Related Terms

Justice theory; Political ideology; Political philosophy; Political principles; Political values; Theories of governing; Theories of government

Description

Political theory is political philosophy. Political theory is about defining the fundamental bases of political relationships between the government, individuals, and/or groups. Where political science predominately studies the political processes, structures, and institutions, political theory studies the normative principles that define, inform, guide, and establish the relationships between persons and society, and the government. Political theory explores and advances what political relationships ought, and ought not, be.

Understanding political theory begins with defining "government." Fundamentally, government is the systematic use of force within a defined geographic area to control (to varying degrees) human behavior. The government is essentially power, coercive power. Political science explores and describes the government's use of that coercive power. Political theory, however, seeks to understand the purposes, reasons, and justifications that explain and perhaps legitimize, the government's use of that power. Political theory seeks to elucidate and illuminate the moral or normative underpinnings of the government's exercise of coercive power (Weber 1918; See also Janda et al. 2009).

To what end should this coercive power be used? Political theory sets out three general purposes for the government's use of power. First, government should protect life and property. This is the oldest purpose of government. The military, and police and fire departments are examples of how government protects life and property. Second, government can also use its power to provide for the public good and general welfare. This can be seen in the government's establishment of schools, parks, and health clinics to name a few. Finally, government may be used to promote and advance equality. This is a more modern conception of governmental purpose. This purpose can be seen in laws and constitutional interpretations that end discriminatory practices, laws that enable minority programs, and laws that provide equal opportunity of advancement and/or equal social and economic outcomes. These three purposes can stand alone or be combined in various measures depending on how society chooses to prioritize and advance underlying fundamental and core values (Janda et al. 2009).

Political theory mobilizes five essential concepts in describing the political "ought to be." The first three essential concepts are freedom, order, and equality. Defining and prioritizing these core concepts make up the fundamental debates of political theory. ▶ Freedom can have many definitions. The more common understanding of freedom is the absence of governmental restraints or interference. This type of freedom is commonly seen in the American Bill of Rights and similar type Constitutions and governing documents elsewhere. These are, for example, the freedom of speech and freedom of religion concepts. Freedom can also be defined as the ability to do, or means to actually accomplish, something. This definition of freedom looks at, for example, whether one is really free to go to college or to the beach when the means are not available to actually get there. This type of freedom (effective freedom), however, is perhaps better viewed as an equality issue, which is discussed below.

The second core concept that political theory seeks to define is order. Order typically has two definitions: First, order is defined as the government's police powers. The police power is the government's ability to use force or coercive power. This is the idea that government should protect life and protect property. For example, the government arresting, prosecuting, and imprisoning persons for breaches of criminal codes is the type of order associated with police powers. Second, order can be seen in a society's historical associations and traditions. Long-standing social norms and traditions also contribute to order. Such traditions may be, for instance, how marriage is defined.

The third core concept that political theory engages is equality. ▶ Equality is defined essentially in four ways: equality of opportunity, equality of outcome, social equality, and political equality. Equality of opportunity is defined as everyone having the same chance at a desired outcome, not that such desired outcome will occur in reality. Equality of outcome, however, ensures that a desired result or outcome actually occurs. For example, determining school admission on random selection of a limited number of students from an eligible group is a type of equality of opportunity. Predetermining and guaranteeing that a particular student body will have certain demographics is equality of outcome. Social equality seeks to provide consistency and sameness in the distribution of wealth, property, education, and other resources. Political equality is typically understood as no one individual having greater influence or control over the government and its ultimate use of power. Allowing one person to have and exercise one vote is a form of political equality (For a good discussion of freedom, order and equality, see Janda et al. 2009).

Political theory further includes explanations of how persons, either individually or as groups, interact with the government. The interaction between government and persons or society may be described in three basic forms. First, interaction and participation may be based upon an individual's sole efforts. Second, participation and decision-making on a simple majority basis is defined as majoritarianism. That is, fifty percent plus one of eligible participants (usually voters) decides how the government ultimately defines and prioritizes the core concepts of freedom, order, and equality. Finally, interaction with the government may be based on interest group or small group participation. This model of interaction, as described by Robert Dahl, is called pluralism (Dahl 1967).

While political theory was historically seen as a linear (left/right) progression across the political spectrum, contemporary political thought views political theory as a multidimensional amalgam of core values and concepts. Deciding which values are fundamental and core, however, is the work of political theorists proposing, discerning, and defining the fundamental values. Political theorists provide the formulations of how such defined values ought to be combined together, in what amounts and importance, and for what end purposes. Political theorist, both historical and contemporary, struggle with whether there is a fundamental and core value upon which all theories can be built. Political theory continually searches for a universally agreed upon axiom which can forever serve as

the starting point for creating a political philosophy, expounding a theory of justice, and building a political system. To date, such political axiom remains elusive.

Contemporary debates in political theory begin with John Rawls and his 1971 publication *A Theory of Justice* and his 2001 book *Justice as Fairness: A Restatement*. Rawls ushered in the contemporary political theory debate with this book *A Theory of Justice*. In that work, and the later restatement, Rawls sought to create a defense for a political theory that hinges on a unique combination of freedom and equality. The conceptualization of freedom and equality, for Rawls, is derived from the social contract theory of John Locke. Rawls's social contract, however, is developed out of a hypothetical discussion among society's members who have been deprived of knowing who they are, what attributes (physical and mental) they possess, their ultimate social status, and the like. The members creating the social contract, those in the "original position," would develop and agree upon a political system while under this "veil of ignorance."

For Rawls, crafting a political theory and system while secluded behind a "veil of ignorance" would result in a just society and social contract, with justice defined as both freedom and equality. The freedom (or liberty) and equality that arise from Rawls's hypothetical original position means that each person has "an equal right to the most extensive total system of equal basic liberties. . .," and any social and economic inequalities are to be arranged for the greatest benefit of the least advantaged allowing for fair and equal opportunity for all (Rawls 2001; see also Wolff 2006). The resulting society would be a just society, according to Rawls, if freedom were equally held and any other inequalities (economic for example) would only be accepted if such inequalities make everyone better off. Under Rawls's political theory, inequalities in economic opportunities would be tolerated only if society's worst off were improved, and not further disadvantaged, as a result of any occurring inequality (Rawls 2001; see also Wolff 2006). Rawls's political theory envisions a prioritization and blend of freedom and equality. In the end, Rawls's society developed from the "original position" and behind a "veil of ignorance" could only rationally result in a political and government structure, in which the members opt for maximum freedom bounded by equality.

Robert Nozick continued the contemporary discussion, and replied to Rawls, with his 1974 work *Anarchy, State, and Utopia*. Unlike the Rawls's conception of justice wherein society's members agree to what is fair ahead of knowing crucial circumstances, Nozick advances a political theory that holds proper political associations and government arise only by respecting the right to own one's self. Owning one's self includes owning, utilizing, and disposing of all physical and mental attributes and talents associated with each individual self. In addition to owning one's self, Nozick agues that individuals own legitimately held and acquired property (Nozick 1974). Moreover, and in contrast to Rawls, Nozick argues that one should be free (uninterfered with) to dispose of said talents, attributes, and property as one chooses. The government that evolves under these conditions is concerned with protecting the individual's right to property and right to dispose of said property as one chooses. Unlike government established through Rawls's original position, Nozick's government evolves from the overriding desire to protect individual talents and attributes and to preserve private property rights that arise there from. Where Rawls's theory of justice results in redistributive government activity, Nozick's theory of justice confines the government to protect persons and property from unwanted intrusion and redistributions.

Rawls and Nozick rekindled contemporary debates in political theory. Since that time political theory has been reconceptualized in a multitude of contemporary offerings. Four contemporary areas generating discussion in political theory are multiculturalism, communitarianism, feminism, and ecologism. These are by no means the only areas generating contemporary discussions. They are areas, however, that garner a good deal of attention.

▶ Multiculturalism defines political relationships through group and community identity. Multicultural theory expresses itself in terms of equality of social differences and freedom within social traditions, orders, and contexts (Hoffman and Graham 2009:365). The earlier course of multiculturalism centered on whether justice was served by providing color (or gender or disability)-blind rules. It was thought that minority groups could attain equality by creating a political process that ignores differences of the diverse minorities. That understanding of multiculturalism was criticized because it maintained the status quo. While multiculturalism as "difference-blind" may not increase inequality or injustice, it perpetuates pre-existing political disabilities historically imposed on minorities. The use of difference-blind rules failed to correct the already existing forms of injustice and discrimination; difference-blind rules in the end maintained the pre-existing political inequalities in the form of facial neutral decisions, policies, and laws (Kymlicka 2002:365).

Multiculturalism now understands that strictly adhering to "difference-blind" rules perpetuates systemic disadvantages and inequalities for the minority groups (Kymlicka 2002). Contemporary multiculturalism seeks to correct inequalities on a more case-by-case basis. In some instances it may benefit a minority group by having "difference-blind" rules. However, historical and modern day inequalities may be better remedied by a system in which differences are acknowledged and inequities are directly addressed by rules specifically crafted with the differences in mind (Kymlicka 2002:366). Contemporary multiculturalism avoids institutionalizing political inequality by crafting political systems, rules, and laws that openly acknowledge and consider minority differences, rather than ignoring them.

Communitarianism is a theory in which society's conception of what is "good" or what "ought to be" takes priority over individual desires to the contrary. Traditional western political theory orders society and political relationships around the concept of self-determination and individual autonomy. Communitarianism, however, offers an alternative to that traditional view. Communitarianism asserts that an individual's political rights should be abandoned (or at least subjugated) in favor of communal politics. That is, the community's conception of the "common good" should be advanced and applied over individual conceptions of the "good" to the contrary (Kymlicka 2002:212).

Communitarians doubt the quality and usefulness of individualism (or using individual decision-making as the basis for political thought and action) because individuals, acting as such, often fail to make good choices. In fact, many choices made or allowed on the basis of self-determination are actually harmful to the person making the choice. For example, individuals engage in many forms of risky behavior that negatively impact the individual and the community. Such risky behavior can include such things as using illicit drugs or even opting to buy things other than basic health insurance. In order to prevent the harmful effects of bad individual decisions and to enable beneficial decision-making, communitarians place community standards of the common good over individual desires and bad choices (Kymlicka 2002:212).

Feminism generally encompasses efforts to eliminate the factors that assign lesser social and political roles to women and/or make women conform to subordinate roles within society (Kymlicka 2002:377). Beyond the basic definition, however, feminist theory is abundantly diverse. There are two schools of thought that freedom and equality are conceptualization in feminist political theory.

Feminism as equality focuses on women obtaining equal status as men in society, particularly in the work place. Equal access is a traditional argument of feminism. It is an argument based on the principle of equal opportunity. That is, women should be able to enter into the roles and fields historically dominated by man. Gender, it is argued, should not be used to discriminate against women who wish to pursue traditionally male-defined roles (Kymlicka 2002:382–383).

Feminism as freedom focuses on empowering women to create female-defined, or gender-neutral, roles in society. This form of feminism

seeks freedom or autonomy for women. Being allowed to enter male-dominated roles as equals with men is different from the autonomy (or freedom) to reject the society's norms and standards that place women in subordinate roles (Kymlicka 2002:384). Moreover, women should not only be free to reject historical standards and norms but also be empowered to create, define, and establish norms and standards for themselves.

Ecologism defines itself as a political theory in which nature and all things within the natural world are inseparably interconnected and equally worthy as human beings in all moral and political considerations. Ecologism as a political theory is distinguishable from environmentalism. Environmentalism, as a political concern, typically finds itself attached to other ideologies. Environmentalism sees nature's value tied to human needs and concerns. For environmentalism, how the environment is subordinated to human concerns is largely dependent on the position of other ideologies (Hoffman and Graham 2009:364). Ecologism, however, is not human-centered.

Ecologism asserts that nature holds value independent of human beings. The focus of ecologism is nature itself. Human beings are one part, but not the superior part, of a wholly interconnected natural world. Ecologism reverses the traditional view of human dominance over nature by asserting that human life only has value within the natural world's interconnected web of all things, animate and inanimate alike (Hoffman and Graham 2009:364). Sometimes this is referred to as "deep ecology" to distinguish the political from the scientific field of ecology (Dobson 2007).

Both ecologism and environmentalism significantly contribute to the political debate about man-made global climate change and global warming. They differ, however, in the approach society should take to combat the effects of man-made global warming, pollution, and/or global climate change. Where environmentalism seeks to incorporate itself into other existing political ideologies, ecologism stands alone in its belief that nature requires equal moral consideration to humans.

These four particular theories represent contemporary examples of the various conceptualizations occurring in the field of political theory. Many others exist. While these contemporary theories tend to focus on group identities or community classifications, there remains a branch of theory devoted to maintaining, explaining, and developing the theories of individualism, autonomy, and self-determination. Such theories can be read and explored through the works of notable authors as John Stuart Mill, Friederich Hayek, Ayn Rand, and Robert Nozick, to name a few.

Self-identification

Science

Political theory is political philosophy. Political theory is about defining the fundamental bases of political relationships between the government and individuals and/or groups. Where political science predominately studies the political processes, structures, and institutions, political theory studies the underlying and normative principles that define, inform, guide, and even establish the relationships between persons and society, and the government. Political theory does not seek to empirically describe or test (in a social science if manner) political relationships; political theory explores and advances what such relationships ought, and ought not, be. Political theory is about philosophical discourse and not about scientific methodology. However, advancements in science and technology can inform political discussions. For example, privacy rights are redefined in the digital age, and abortion/right to life claims are challenged as technology and medical advancements now allow for nearly indeterminate storage of fertilized human embryos.

Religion

A religious doctrine can form a basis on which a political theory is built. Political theory (and the political systems that flow there from) can be directly influenced by theological premises. Political theory can be expressed in terms of, and justified by, the same sources as theological

positions. That is, religion and political theory can be based upon both Holy Scripture and divine revelation.

There are many ways in which the major religions of Judaism, Christianity, and Islam (and perhaps minority religions as well), inform political theory (Strauss and Cropsey 1987:318–319). Political theory is informed and impacted by religion through divine revelations and scriptures. Political theory and religion wrestle with the relationship between natural, positive, and divine law, church and state relations, and the duties and obligations of citizens, subjects and rulers, just to name a few areas (Strauss and Cropsey 1987:319).

For Judaism, political philosophy is derived from the interpretation of the Torah and the Talmudic writings. The political out growth of Judaic Biblical interpretation assumed a legalistic form. Interpretation of divine revelation provided direction, order, and regulation for government and society.

Judaic thought is not the only place where religion directly informs political theories and systems. A venerated Islamic political and religious philosopher, Alfarabi (870–950), worked to harmonize the political thought with Islam. The Quran contains divine law as revealed through the prophet Muhammad. The Quran, in combination with other religious writings, provides the bases for Islamic law or Shari'a. The Shari'a serves as a means of applying divine law to followers in many areas of daily life including politics.

Judaism and Islamism incorporated divine revelation into nearly all inclusive laws and political order that dominate and regulate all aspects of life, public and private (Strauss and Cropsey 1987c). Christianity, on the other hand, did not. While Judaism and Islam applied and adapted divinely revealed laws into social and political order, Christianity sought to separate and distinguish the earthly from the divine. Christianity did not come as a divine source of comprehensive set of laws and societal regulations. Rather, Christianity came as a fundamental belief system that left believers largely at liberty to organize their political and social lives around principles that are not necessarily religious (Strauss and Cropsey 1987c). Christianity, however, has been used through history to justify various political ends. Christianity has been used to establish political authority, question authority, engage in war, justify slavery, and advance freedom and civil rights. The Church's canonical laws also provided a fundamental framework for western law (See generally: Berman 1983, 2006).

Political theory can be informed by religion, but political theory usually is not identical to religion. In some instances, political theory and religion are inextricably linked. While political theory typically does not self-identify as religion, political theory can be directly and indirectly influenced, informed, and even justified by religion.

Characteristics

Political theory is distinctive from other philosophical studies in that political theory focuses on relationships between the government, individuals, communities, and/or groups. Moreover, political theory, unlike general philosophical studies, explores and advances what political relationships and political systems ought to be.

Relevance to Science and Religion

Political theory is interested in the scholarly area called "Science and Religion" to the extent that political theories intersect and frequently collide with religion. There are essentially three models by which political theory and the law address religion's role in society. First, religion and political theory can be one and the same. Second, the political theory can allow religious participation, and governments can make a variety of accommodations for religion in the public sphere. Finally, the political theory can be used to exclude religion entirely from the public and political sphere.

The first example of the political theory and religion combining to be essentially the same is found in countries such as Iran and Afghanistan

(before 2001). In Iran, following the 1979 Islamic Revolution, the Ayatollah Khomeini ushered in an Islamic state that replaced the ruling monarch with a theocracy. This Iranian theocracy based its laws, and in particular its criminal codes, on Islamic religious law. In Afghanistan prior to 2001 the Taliban did much the same. The Taliban established an Islamic state based upon the strict use and interpretation of Islamic religious laws. These countries (and 10 others) demonstrate the merger of and fusion between political theory and religion.

The second example of political theory and religion interacting are countries that enforce purely secular laws, but nonetheless establish a state religion. Here there is an incomplete fusion of religion and political theory. England is one such example. In 1689, the Church of England was firmly established and granted a variety of legal and political privileges. The head of this State established religion is the ruling monarch (currently Queen Elizabeth II) who holds the title of Supreme Governor of the Church of England. There are 60 such states in the world where a church is officially sanctioned by the government (Kuru 2009). While England and other numerous other countries maintain a governmentally sanctioned church, there is an incomplete fusion between church doctrine and political theory.

An additional example of political theory and religion interacting is in the United States. The United States, like England, enforces purely secular law. Unlike England, however, the U.S. does not maintain a state-sanctioned or official church. In the United States, political theory and law allow various amounts of religion in the public realm. The amount of influence and participation religion has in the public sphere in the United States is often in flux. Typically the debate centers on three political theories of what religion's role ought to be.

To begin with, religion is addressed in the Bill of Rights (the first 10 Amendments) of United States Constitution. The First Amendment was ratified in 1791 and addresses religion in two ways: It allows for the free exercise of religion and prohibits the governmental establishment of religion. The Amendment specifically states in pertinent part "Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances." (U.S. Constitution, First Amendment, ratified December 15, 1791). That Clause meant different things to the American founding fathers. While the separation between government and the religion was thought to be advantageous to both, there was no single compelling and unifying purpose found among the founding fathers (Chemerinsky 2006:318–319). Justice Brennan once stated that "The historical record is at best ambiguous, and statements can readily be found to support either side of the proposition" (Abington School District v. Schempp, 374 U.S. 203, 237 (1963); Brennan, J., concurring; Chemerinsky 2006:318–319). History shows that at least three main views were held by the American Founding Fathers at the time the First Amendment was written. Professor Laurence Tribe summarized them as follows:

> At least three distinct schools of thought... influenced the drafters of the Bill of Rights: first, the evangelical view (associated with Roger Williams) that "worldly corruptions... might consume the churches if sturdy fences against the wilderness were not maintain"; second, the Jeffersonian view that the church should be walled off from the state in order to safeguard secular interest (public and private) "against ecclesiastical depredations and incursions"; and, third, the Madisonian view that religious and secular interests alike would be advanced best by diffusing the decentralizing power so as to assure competition among sects rather than dominance by any one (Laurance 1988; Chemerinsky 2006:1184).

Without a clear, unified history as to what the Establishment means, the courts are left to fashion an analysis often as cases arise. The Establishment Clause's meaning in the twenty-first century, and more importantly how to determine violations, depends on how the Supreme Court approaches the issue presented.

U.S. Supreme Court decisions suggest three competing approaches in analyzing

Establishment Clause issues. The approaches are a strict separation analysis, an accommodation approach, and a neutrality theory. Adherents to a strict separation approach assert government and religion should disassociate from each other to the greatest extent possible. That is, government should be exclusively secular and that religion should be relegated and confined to private society (Chemerinsky 2006:1193). The strict separation approach adopts the Jeffersonian view that there should be a "wall of separation between Church & State" (Thomas Jefferson 2010, Letter to Messrs. Nehemiah Dodge, January 1, 1802; Chemerinsky 2006:1193). However, that has not always nor completely happened.

The accommodation approach to church/state relations maintains that "Government should accommodate religion by treating it the same as nonreligious beliefs... the government violates the establishment clause only if it establishes a church, coerces religious participation, or favors some religions over others" (Chemerinsky 2006:1197). The accommodation approach essentially advocates that religion should not suffer any disability in the public realm. Rather, religion should play a role equal to any other belief. Anything short of the government formally declaring a state religion, according to those advocating the accommodation approach, is acceptable (Chemerinsky 2006:1198; see also McConnell 1985).

The last approach within the Establishment Clause rubric is the neutrality approach. The neutrality approach essentially requires governmental action be neutral toward religion. Government cannot favor religion over the secular and cannot favor one religion over another (Chemerinsky 2006:1198). In analyzing whether government action is religiously "neutral," the Court adopts a two-step analysis. First, determining whether government action is neutral toward and among religions, the Court looks first to whether the law facially differentiates among religions. If there is a facially apparent differentiation, then an Establishment Clause violation is found and the Court does not need to move to the second test (Hernandez v. Commissioner 490 U.S. 680 1989). If there is no facially apparent

differentiation, then the Court, when useful, turns to a traditional balancing test (Lemon v. Kurtzman 403 U.S. 602 1971).

The balancing test looks to whether the law at issue has a secular purpose, whether religion is advanced or inhibited, and whether the government and religion will become excessively entangled (Lemon, 403, at 612). This balancing test, however, is not the exclusive means by which the U.S. Supreme Court analyzes Establishment Clause issues. There have been a number of instances were Establishment Clause claims have been decided without this balancing test (Chemerinsky 2006:1202. Chemerinsky cites Board of Education of Kiryas Joel Village School District v. Grumet, 512 U.S. 687 (1994); Lynch v. Donnelly, 465 U.S. 668 (1984), and Marsh v. Chambers, 463 U.S. 783 1983).

There is no governmentally established church within United States. However, political theory, law, and religion play a dynamic role within the country. Generally, religion plays a part (and sometimes a large part) in the political discussions. How the government, and more specifically the Court, handles religion's entrance into the public sphere varies from mandating a strict separation, to being neutral, to allowing full acknowledgement of religion short of formal establishment. Interestingly, religion in the United States plays an active role in molding contemporary political debates, but unlike England there is no officially sanctioned church.

The third example of political theory and religion encountering one another is where the government specifically excludes religion from the public and governmental realm. France is a contemporary example. France is a purposeful secular state. In fact, its Constitution declares France to be a "secular republic." (Kuru 2009:4) Unlike the United States, France does not allow religious symbols in schools and has even banned the wearing of Muslim head scarves in school. Moreover, excluded from French political spheres are ceremonial acknowledgments of religion such as "In God We Trust" as found on U.S. currency as well as oaths of office which end with "So help me God" (Kuru 2009:8–9). France is an aggressively secular nation wherein

religion and political theory remain purposefully apart (Kuru 2009:8–9).

These are three examples by which religion and political theory interact. The first is a nearly complete fusion between the two. These are countries such as Iran and also Afghanistan while under the Taliban. The second is where religion plays a role in the public sphere, but that role is limited to varying degrees. The Church of England and the First Amendment to the U.S. Constitution provide the spectrum of how religion's role is incorporated into the governing political theory. The final example, as seen in France, excludes religion from the public and governmental realm. While these three examples show the basic combinations of political theory and religion, other variations exist.

Sources of Authority

The writings of political philosophers comprise the authoritative sources of political theory. The political philosophers noted below were leaders in the field and contributed in ways that not only changed the way people and government thought about political philosophy but changed the entire discipline in ways still felt today. Such philosophers and political theorists include the ancient Greeks with the unmatched writings of Plato (427–347 B.C.) and Aristotle (384–322 B.C.). The subsequent Islamic political writings of Alfarabi (870–950), which leaned heavily on Plato, and the work of St. Thomas Aquinas (1225–1274), who incorporated Aristotle into western Christian thought, contributed mightily to the area of religion and political philosophy. Later writings of the sixteenth and seventeenth centuries include many noted philosophers such as Niccolo Machiavelli (1469–1527), Martin Luther (1483–1546), Thomas Hobbs (1588–1679), Rene Descartes (1596–165), John Locke (1632–1704), and Benedict Spinoza (1632–1677). The prominent eighteenth-century political philosophers include Jean-Jacques Rousseau (1712–1778), David Hume (1711–1776), Edmund Burke (1729–1797), and Immanuel Kant (1724–1804). The nineteenth century produced the works of Alexis Tocqueville (1805–1859), John Stuart Mill (1806–1873), Karl Marx (1818–1883), Friedrich Nietzsche (1844–1900), Max Weber (1864–1920), and Edmund Husserl (1859–1938). The twentieth century brought us the notable works of Friederich Hayek (1899–1992), John Rawls (1921–2002), Robert Nozick (1938–2002), and Michel Foucault (1926–1984). The political theorists in the twenty-first century will be equally prolific and will no doubt address the challenges in political theory and philosophy that await them.

Ethical Principles

The ethical principles within political theory center on what the government or State ought to do (or not do). There are three basic principles that guide government action or are considered (but not without controversy) proper government functions. The first, and the oldest, is that the government should protect life and property. Second, the government should provide for the public good and general welfare. Finally, the government should promote equality.

Key Values

A key value in political theory is "Justice." The expectation is that the State should act "justly" or "do the right thing." Defining expectations about how government should act depends on how one defines "justice." For the government to use its coercive power, it must be somehow be "justified" in doing so. Defining what counts as justification is the primary role of political theory.

Political theory looks to conceptions of "justice" in terms of what people (individuals, groups, or society as a whole) expect from each other and from the government. Such expectations lead to identifying the duties individuals or people have in relation to one another and with the government. And, perhaps more important for political theory, is defining when the government should use its coercive powers to enforce the accepted form of "justice." The conception of

justice depends on how one, from a political theory perspective, defines and prioritizes the core concepts discussed above.

Another key value is "Fairness." One expects the political systems that arise out of the debates and struggles with the core political concepts to render a system that people believe to be acceptable and one that acts in a fair manner. How one defines fairness comes from how one defines and prioritizes the core concepts of freedom, order, and equality. Of course, fairness may be defined differently in a democracy, a theocracy, or under an authoritarian regime.

Conceptualization

Nature/World

"State of nature" as defined by Hobbes is a position of fear, danger, and war where life would be "solitary, poor, nasty, brutish, and short." Nature, for Locke, is state of perfect freedom and equality tempered only by natural, physical laws.

Human beings

Persons, people.

Life

Life's meaning differs depending on what, when, or at what stage something living is given rights or is otherwise protected.

Reality

Objective natural existence or the total aggregate of phenomena.

Knowledge

Information or awareness acquired, discovered, or held either through the use of reason and through experience or received by revelation.

Truth

Comporting to reality.

Perception

To gain knowledge or become aware through use of the senses.

Time

(Normal dictionary definitions apply)

Consciousness

(Normal dictionary definitions apply)

Rationality/Reason

The way the brain/mind identifies and utilizes experiences to acquire knowledge. Means by which choices are made. Balancing of possible outcomes.

Mystery

(Normal dictionary definitions apply)

Relevant Themes

There are two issues especially relevant to contemporary discussions in political theory and religion. Those issues are religious fundamentalism and the emergence of new minority religions (NMRs). Recall that political theory explores and advances what society's political relationships ought to be. Political theory is distinct from religion, but religion does inform and may guide political relationships.

Religious fundamentalism is defined as an effort by some religious believers to return to and preserve their distinct religious identity, which is threatened by a contemporary and more secularized era (Hoffman and Graham 2009:389). The attempt to return to a philosophical time before modernity may significantly impact political theory when fundamentalists become social and political activists. Moreover, religious fundamentalism is often advanced by a small group of believers. The political model based upon majoritarian participation and democracy is typically eschewed by fundamentalist. The political model based on pluralistic participation is also avoided in that competing interest groups are disallowed. The reason for rejecting the typical models of political participation is that fundamentalist reject the idea of debate and political discussion. Fundamentalists, having already decided what ought to be, reject out of hand different points of view.

In rejecting such dialogue, fundamentalists champion their cause in a more aggressive, dogmatic, and all too frequent violent manner (Hoffman and Graham 2009:390, 392). In avoiding accepted models of political participation, rejecting debate and dialogue, and often resorting to violence, fundamentalists challenge contemporary notions of political theory. That is, fundamentalists reprioritize the modern rankings of freedom, order, and equality and reject contemporary political discussions of what "ought to be."

New minority religions (NMRs) challenge traditional order, norms, and political relationships within a society. NMRs challenge traditional values and separate themselves from dominant religions in society. In doing so, NRMs also challenge the historical hegemony of the dominant church(s) and strain relations with secular governmental entities. While NMRs find it difficult to develop followings in culturally homogenous countries, they do exist. For example, China has been challenged by the presence of the Falun Gong and Japan endured the deadly attacks by Aum Shinrikyo. Some former Communist block countries such as Uzbekistan and Turkmenistan are challenged by various Muslim groups. In China, and other places, the NMRs are not tolerated and are even declared terrorist organizations. Whether any particular NMR is or is not a terrorist organization is beyond the scope here. However, connecting NMRs with terrorism allows for greater control over emerging and minority religious groups. Such characterization of the minority religion also places greater traditional political order over religious freedom generally (See generally: Richardson 1999, 2007). While not all NMRs are labeled terrorist organization, NMRs are routinely referred to as "cults" or "sects," which carry a rather negative, if not scary, connotation. New minority religions, whether violent or just different, stand in opposition to the traditional political order. In doing so, new minority religions find themselves often struggling for political freedoms and asking for social tolerance. Whether NMRs obtain political freedoms or are accepted within a society depends on how each particular society realizes its underlying political theory (see generally: Richardson 2006).

Cross-References

▶ Biblical Studies
▶ Christianity
▶ Islam: An Overview
▶ Judaic Studies
▶ Justice (Philosophically)
▶ Political Theology, Theological Politics

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Political Values

▶ Political Theory

Politics of Sexuality

▶ Sex and Gender

Polytheism

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The notion *polytheia* was first used by Philo with regard to ancient non-Jewish religions (De mut. nom. 205). *Polytheos* meant in Aeschylus that one altar is consecrated to many gods. Polytheism more generally means agency of many personal gods (Detienne, Gladigow), and it is conventional to speak about representations of those gods within the framework of polytheistic systems, god being the autonomic nonhuman subject (Gladigow 1998). The ensemble of those deities makes up *pantheon* ("all gods" in translation from Greek, *pantheia* in the plural). It is only theologically that one can speak of the idea or notion of god, but only a few polytheistic religions have elaborated theologies using those terms.

Egyptian (with the exception of Akhenaton's theology), Sumerian, Babylonian, Canaanite, Greek, Roman, Hinduism, Minoan, Eblaite, Etruscan, Iranian, Celtic, Baltic and Slavic, German, Mesoamerican, and Shinto religion might be referred to as polytheistic theologies. Many religions combine monotheistic (see ▶ Monotheism) and polytheistic traits and can be discussed in either context. What is most actively debated is the dynamics of these two orientations which is made difficult by insufficient theologization of polytheistic systems. The use of the notion polytheism is heavily affected by the way polytheism and idolatry, paganism, and superstition are seen in Protestantism. Even the ongoing debate on the legitimacy of scholarship on polytheism bears traces of a revived ancient battle between Greek polytheists and Jewish Christian monotheists (for example, Detienne) (Detienne 1986). According to the thesis of original monotheism (Ur-Monotheismus thesis, W. Schmidt, see ▶ Monotheism), polytheism is a phenomenon of decline or at least of deviation from monotheism, which is close to the understanding of sin in monotheistic religions. According to the thesis of religious evolution, polytheism is a case of deficient development (it is located between fetishism and monotheism in Comte, between animism and monotheism in Taylor and Spencer, and between the communal stage of religious development and monotheism in Wallace). In both theories, polytheism means something deficient or transitory. On the other hand, Geo Widengren maintained a reversed evolutionary theory, according to which polytheism emerges as a differentiation of the high god (Hochgott). This theory is not far from the theory of *Ur-monotheismus*. Similar views were held by Pettazzoni as well. From this point of view, polytheism is a phenomenon to be explicated. Debates about polytheism involve hermeneutical problems of understanding. Scholars in early postwar years confessed their incapability to understand polytheistic religions (Brelich). Some scholars like Topitsch and Gladigow chose to use "understanding Sociology" by Max Weber which endowed deities with some "sense" proceeding from their acting modes, and this "sense" had to be

understood hermeneutically. This view is to some extent compatible with the way Wittgenstein reflected on knowing what foreign religions "mean." Wittgenstein, however, held that understanding requires a stronger engagement with the religious person's way of life where the religious concepts (of deities) are embedded to come to a full and authentic expression. This "sense" is explicated through the divine order and design revealing divine intentions (Dumezil). Polytheism proves to be a kind of action theory, where the deities intervene (Vernant 1991), have functions, represent antagonisms and alternatives, and take over roles ("mother," "ruler," "healer," "fighter," and others). "Deity" and "agent of action" are used in this regard as complementary notions. It may even be said that the notion or definition of action was performed first in religion as the shaping of the world and reality, the consequence of which is all other shapings of the world and reality.

The greatest contributions to scholarship of polytheistic systems were made by structuralism. Marcel Detienne understood under polytheism a classification system of different active powers and their mutual delimitations. The definition of modes of action has to specify the principal deities of the pantheon (Detienne) (Detienne 1986). Georges Dumezil stressed the role played by three partitions in polytheistic pantheons: there are three "functions," magic and juridical sovereignty, military action, and the function of fertility which are distributed between the personages of the pantheon (Dumezil 1952). The definition of a deity is necessarily a differentiation and classification that cannot be performed by means of static notions, but only by considering the whole entity of all the positions this deity holds. Immediate data of polytheism are the structures themselves, first of all elementary agencies, then couples of powers or triads of powers. Each aspect of one deity (say Mitra) necessarily implies one contrasted aspect of another one (say Varuna), the way the right implies the left. Should Poseidon and Athena receive cultic worship on neighboring altars as patrons of horses, two different complementary deities and ways of patronage are nevertheless involved: while Athena intervenes with

technical tools, Poseidon does it with violence (see ▶ Violence) and uncontrollable animal power. What is characteristic of polytheism is that altars are devoted to the plurality of gods, sanctuaries are consecrated to several gods all at once, and festivals and rituals associated with different deities are brought together for a particular occasion, becoming now two different aspects of a single power, contrasted by their respective modes of sacrifice. There are exemplary collections of deities, in circumstantial or recurrent groupings and in monumental or ephemeral configurations (Detienne 1986).

The main structural problem is inner relations within the Panthea. A special problem is restricting the number of acting deities. The unifying of Sumerian city-states with subsequent restructuring of a pantheon is one good historical model how the building of a polytheistic pantheon works. The action of deity is characterized through the difference between divine possibilities and intentions, capabilities and actually performed acts. Pantheon's inner structure manifests through dramatization patterns, represented in myths. The main tool of dramatization is the mutual battles of deities, although not all gods do engage in fight (Zeus, Apollo), with some just supervising these battles. God's battles renew the divine order and – representing conflicting images and symbols – give structure to culture and resist irrationality. There are different types of divine battles. Kippenberg stresses that the inner structure of a pantheon combines elements of cooperation (alliance) and battle (Kippenberg) (Kippenberg 1984). Battle is not a universal trait of polytheistic *panthea*. In polytheistic constructions of the African world, figures of a pantheon are seldom linked with each other according to dramatic or narrative patterns.

Struggle between deities may be permanent (German myths), related to the current moment, or may have taken place at the beginning of the world (Mesopotamian and old-Iranian mythology, where the fight is actually over). Wakemann calls the latter "space model," because the monster is the world itself. He calls the battle for kingship in Heaven the "time model." It may be demonstrated with a succession of ruling gods

or, in Hurrite-Hethite and Greek system, with a new system of divine coalitions as a result of infringement and revenge, which rules out any further struggle and leads to stability. In this way, a new, just world order is established in Hesiod; there being no evil (see ▶ Evil) deities, only victorious and subordinate gods. Gods are often ambivalent and complex (Odin, Mithra, Ahura, Mazda, Varuna). Their antagonism requires systematizing in the cognitive, emotional, or social sense. Univocity can be won through complex precision and differentiation (Luhmann) as a removal of "classificatory equivocality" (Douglas). Polytheism attracted the attention of psychoanalysts who no longer saw in deities of polytheistic religions heuristic models, but rather exemplary phantasms (G. Devereux). The research on group dynamic with psychoanalytic touch tries to shed light on the relationship between ambivalent gods and human beings (Ph. E. Slater). These antagonisms are less frequently explicated through conflicts of social (Honko) or ethnical groups. The antagonism of gods is directly related to the pluralism model which dominates current discussions on pluralism. Polytheism entails epistemological problems like the monistic (see ▶ Monism) or pluralistic anthropology (Landmann) or leads to a pluralistic end of day's vision, for example, in Frank, Bohrer, and de Vries.

Names and attributes of gods are construction elements as well; they embed deities into social schemes (Brelich, Gladigow). On the other hand, to give a name to god means to give a singular form or a shape to him, that is, to individualize him. The images of gods confer the evocation power of a visible presence of deity (Detienne) (Detienne 1986). Satisfactorily, individualized gods are able to differentiate themselves in different figures during ritual (see ▶ Ritual) practices. The latter accommodate to these successive positions cohabiting on the same altar. Polytheism uses those action models which are closely related to the functioning of society and forms of political organization. Altars, statues, and sanctuaries are inseparable from the invention of political space. Gods are mobilized in every practice of social life here. This type of society defines itself in conjunction with "affairs of gods" and "affairs of humans." The famous "spatial turn" in humanities runs as parallel development to this structural research on polytheistic systems. Social relations are inseparable from the symbolic dimension represented in the polytheistic system. Polytheistic systems are systems of representations marked with multiplicity and diversity of divine powers, and they constitute the whole armature of the symbolic function in a large number of ancient and traditional societies (Detienne).

Because polytheistic religions are orally transmitted, polytheistic theologians are frequently called "administrators of memory." They transmit not only the most conscious beliefs but also all that was abandoned to the historical subconscious of the language and the civilization that language conveyed. Detienne is going to propose experimenting in the field of polytheism that requires a resolute pragmatism, if not "positivism." This is the knowledge of the ethnographic context that helps an analyst of polytheist complexes to learn everything possible about the fauna, the flora, and the customary practices of games, hunting, and warfare, in fact all the material and concrete aspects of a particular culture. The analysts of polytheistic complexes have to investigate the way in which the divine powers are linked in dozens of aspects with the objects and phenomena of social life and the natural world (Detienne 1986).

The number of gods in a pantheon is limited and does not exceed 10–20 (Brelich). In this regard, one can speak of coherence and unity of the worldview (Gladigow) and propose the economy of symbols as an explanatory model (Luhmann). This fact is probably rooted in ethological background (Tiger, Fox) and explains the understanding of polytheism as a model for sociality: necessary and possible relations between gods become more differentiated, relations between gods and humans getting stronger in the general context of social processes. There should be some economical limits to this number of gods (the number of priests is limited as well). Some paradigmatic groupings of gods are those in Egypt containing

2, 3, 4, 8, and 9 members (Hornung), or in Greece where an "undifferentiated triad" and number 12 were preferred.

In each city, the regnant deity reorganizes the pantheon anew according to the local hierarchy of gods and rivalries between many powers pretending for sovereignty on the same territory (Detienne 1986). Universal (and present in almost all panthea) is genealogy as a principle of divine organization. Significant is displacement or flight of some deities to another region (or underworld) that corresponds to labor distribution and political order.

Difficulties in the scholarship of polytheism can be explicated with the dominant position of evolutionism (see ▶ Evolution) in religious studies beginning with the nineteenth century, which contributed little to this field. But neither have reaction to it – antievolutionism and phenomenology of religion – done much (Brelich 1960). Another problem is that there is no polytheism – there are many polytheistic religions lacking its dogmatic conceptualization that would have been able to determinate its essence. Angelo Brelich pointed out correlation between developed agriculture and polytheism (Brelich 1960). Guy Swanson and C. Lemert sought correlation between complexity of society and presence of polytheism (Swanson 1960; Lemert 1974). This line of research was outrivaled by exploration of this same correlation in monotheism, a much more complex stage of religious development (see ▶ Monotheism).

Topitsch pointed out the link between the hierarchization of pantheon (king, other gods as vassals) and centralization of power in society. When there is a tension between creation of pantheon and regionalization, where not all gods are available, the cult objects in the latter case are either mobile, or one has to set out on a pilgrimage to the places they are located. Another development is the concentration of several qualities in one or several deities (polytheism's retreat tendency). One can interpret Henotheism as a reduction of regionalization (Gladigow). Elativistic/laudatory and superelativistic/extreme laudatory predications were introduced and taken back again (in the case when a regional or temporal connection was given up. The history of religion emancipated from Christian theology tends to postulate that polytheism is a normal case, but monotheism – an exception and discusses the question of how monotheisms (henotheisms) – might be integrated into polytheisms (Gladigow). It is not polytheisms that have to be explicated but rather monotheisms according to this line of reasoning. There emerges a paradox that singularity and elevation above others in a row of deities are at the same time manifested in prayer as equal predicates, whereas theologies ask how polytheistic impulses can be integrated in monotheistic systems (Lohfink).

Two attempts have been made to establish polytheism in early modern times. Gemistos Plethon undertook the first one in the fifteenth century on the basis of ancient polytheism with a neoplatonistic touch in the tradition of Zarathustra. The aim of this reform was to establish both a rational state and a rational religion. The German idealists (Schelling, Hölderlin, Hegel, Schiller: "Greek gods," 1788) formulated in the eighteenth century the so-called Earliest System Program of German Idealism that invited to build polytheism of imagination and arts, which was understood as a full-blown religion as well (a "new religion") directed against monotheistic theology, on the one hand, and the rationalism of Enlightenment, on the other hand. (It was characterized as "monotheism of heart, polytheism of imagination and arts"). The myth is taken here "seriously" and seen as something more original and universal than religion. Christian desacralization of ancient culture was partially reversed here. Mythology and polytheism no longer overlapped each partly going its own way so that there could have been polytheism without mythology and mythology outside of polytheism. Early romanticism made this "discovery of polytheism" that merged with individualization of religious feeling. To this tradition belongs Schleiermacher who wanted to see all religions in one infinite religion and moved toward Pantheism.

Polytheism within the framework of romanticism and neo-romanticism emphasized their proximity to nature and promoted the emergence

of neo-paganisms in late modernity. It was presumed that the hidden gods of polytheism manifest themselves in nature and myths, rites and images being the appropriate forms of this manifestation. The main conflict of the eighteenth century was the one between nature and scripture. Within this framework developed a vision on the Greek god Pan as a possible bearer of environment ethics (See ▸ Ethics; ▸ Environmental Theology). Reproaching monotheism with insufficient attention to the problems of environment belongs to the permanent arsenal of arguments produced by people with polytheistic preferences. An attempt was made to emphasize the philosophical value of ancient paganism (Auge: "Le genie du paganisme") against philosophical monotheism. Recent scholarship on philosophical monotheism in late antiquity makes this line of argumentation substantially weaker. The notion of paganism as a substitution for polytheism still remains ambivalent, because it constitutes and affirms itself in opposition against monotheism. Polytheism of proximity to nature is no alternative to that conflict (Gladigow); it rather defines itself as an alternative to monotheism and therefore maintains its claims for exclusive truth. Nietzsche saw the "greatest utility of polytheism" in human ability to create gods and even proceeded from the structure of polytheism in substantiating the individual. He held both God and gods as human projections, the former of the individual self and the latter of the collective self of mass morality. So monotheism was for him mass-consciousness, whereas polytheism implied creation of individual norms and experimenting with them (Gay Science, II, 134–135).

William James expressed similar ideas moving in the direction of polytheistic anthropology. He interpreted gods as constructive and useful projections of the extended self. Although he defended the polytheistic creed, it was in fact pluralism of myths and no real polytheism. These gods might be like Epicurean gods who were imagined as human shaped, appearing in human dreams and visions, but existing in interspaces between universes and not intruding in human matters. So there was no danger that any

other activity than emulating those gods would lead to practical worshipping or to "real polytheism." Secular anthropologies are challenged through this defense of polytheism directed against the monotheization and de-anthropomorphization of religious imagery (Funkenstein 1994). What Xenophanes used to deconstruct as mythological anthropomorphizations of gods, James perceived as a realm of meeting with the divine, a kind of projections of the divine in the subconscious parts of our consciousness so that these projections form an extended self. This divine domain (power) need not be necessarily one in number. James speaks of "many finite gods." Polytheism means that universe is a collection of selves as mutilated expression of these powers, with no absolute unity realized at all. James speaks here in terms of possibility of polytheism ("polytheism's hypothesis"), for there are many selves, there are many deities adjusted to their tempers. The experience itself acquiesces to a plurality of perspectives which are neither complete nor inclusive. Polytheism is the religion of common people exposed to such experience. Funkenstein presumes that James' polytheism does not follow from his pluralistic dispositions in other realms.

It is in recent time that the thesis on modernity of polytheism has come to the fore again on the continental scene. Odo Marquard formulated "praise of polytheism" as a kind of "polymythia" implying "mythological freedom" and "distribution of power within the Absolute ... through a plurality of gods." He postulated that "the great human principle of polytheism" is compatible with Enlightenment and stated that an "enlightened or secularized polytheism follows after the end of monotheism." Both monotheism and natural science were made responsible for the "dedivinized nature," in which we are to live today. Egyptologist Assmann translated this polytheism into cosmotheism. Having discovered this trend in both Egyptian religion and European Enlightenment, he borrowed the term itself from German idealist thinker Jacobi, thus drawing closer to Panentheism (see ▸ Panentheism). Further attempts were made to formulate on this basis the "political theology" as an alternative to

Christian theology (for example, Peterson). Jacob Taubes, however, diagnosed "conjuncture of polytheism" in late modernity, an Apology of paganism in the scholarship of history of religions and even philosophical praise of polytheism, which is nothing but production of the mythical state of spirit going back to "repetition of Julian's apostasy" (Taubes 1996).

David Hume not only postulated the original character of polytheism as a form of religion (this thesis was discarded by scholarship) but also its advantages. Nevertheless, this originality in his view was without any positive cognitive sense, – polytheism was simply superstitious. By no means did he think that polytheism could be free from idolatry. Being a spokesman for pure theism, he saw Protestantism as more progressive than Catholicism with its worship of icons and theism the most perfect religion. The enthusiastic revival of polytheism today often quotes some passages from Hume without giving attention to his contempt for cognitive incapability's of this kind of religious belief.

It was Max Weber who by referring to John Stuart Mill linked together two different phenomena – the pluralism of values (with the implied notion of freedom that supports this pluralism) and "gods' battles," rooted in modernity: "Many old gods, disenchanted,... strive for power over our life and begin their eternal battle with each other" (Weber 1991). Polytheism is one of the main categories in his sociology of religion and stands for a form of religious experience, where sublimation of fight of different principles in human life is represented through gods of polytheistic religions. The paradigmatic meaning of polytheism marks the current state of civilization torn between antagonistic values. Sometimes, the term "polydemonism" was used – as in de Van der Leuw – to give expression to the state of antagonism of values ending in the insurmountable battle between god and devil, or as it was expressed in a more sophisticated way, the god of the one becoming the devil of the other. Polytheism assumes internal divisions in society. Polytheism reigns within groups, between members of one caste, and not between castes. Polytheism is a religious configuration that immediately corresponds to human experience." (Brelich argues against this view: Polytheism is historical, not a universal human experience. It is hardly understandable to modern man (Brelich 1960)). Weber ruled orgiastic and Dionysian experience out of his picture of polytheism, attributing the latter to animism indifferent to the mythic dimension of polytheism. "Gods of polytheism" are bearers of values like justice, prudence, and interests as well. What polytheism ignores are characteristics like universalism or heresy, and it manifests high tolerance. So Weber returns to this classical theme of modern theism. Nevertheless, real polytheism can be reconstructed out of impure monotheism as in the case of Catholicism or even Islam. Weber held only Judaism to be pure monotheism. According to him, polytheism is a heuristic concept in sociology that replaces ancient gods by viewpoints or values which are no longer personified entities, but philosophical or ideological abstractions. Legitimacy of each of them can only be based on subjective convictions. Ancient *pantheia* of gods offers no image of peace, only that of permanent conflict between envious deities. Modern times give us a similar picture where conflicts between values are unsolvable. While ancient mythology cannot reconcile Themis and Dike, modern justice itself is an object of irresoluble controversies, despite all appeals to ethics. Minerva was a goddess of wisdom and war at the same time. Battle is the immanent law of polytheism, while monotheism, by allowing for antagonisms, strives to transcend them through its universalism. There is a difference between ancient and modern polytheism as well: polytheism of values responds to decline of religious spirit and to mass mentality dominated through disenchantment. The mythos assumes another meaning; its goals lack eschatological (see ▶ Eschatology) prestige, because they ought to be achieved in this world, not beyond it. They may be chiliastic and even lead to revolution. But what is especially important is that Weber never held that polytheism of values could become pagan because it is not able to depart from mainstream monotheism.

Nevertheless, it is quite possible that ancient polytheism becomes a component of intellectuals' religiosity today by their illusionary ability to reconcile all viewpoints. By using the term polytheism metaphorically, Weber rules out any possibility that his use can be interpreted as a call to return to polytheism in the proper sense of the term.

Value pluralism appears to be an unavoidable consequence of historical processes, full of tensions, and conflicts, and we only have to accommodate ourselves to that without any hope of overcoming it in the foreseeable future. Rationalization of modern life does not mean disenchantment: polytheism rationalizes animism and monotheism rationalizes polytheism. Disenchantment is a rationalistic way (intellectualism) of perceiving rationalization itself where no mysterious power appears to... interfere in our life, and we perceive ourselves as being able to cope with all things through prevision. Value pluralism/ polytheism means insurmountable conflicts opposing economics and politics, arts and science, each of which follows a specific pattern of development in fight with others. Science is one of "deities" of the value pantheon and is able to trigger conflicts. It may be contested and even rejected for the sake of other values, for example, "mystical" or "ecological." The validity of science itself is not demonstrable scientifically: it can become an object of fight with religion, morale, politics, or economics. Value neutralism takes account of legitimacy of this fight. Science is even indefinite with regard to truth and cannot validate either morale or politics, unless it is within the framework of the fight of value polytheism. If it nevertheless tries to do that, it goes beyond its own limits and its own essence. "Beauty," "goodness," "truthfulness," and "holiness" are incompatible indeed. The best intention can have terrible consequences (Weberian paradox of action). Life possesses insurmountable tragic. Even in its commonness, life possesses the enchantment of polytheistic supra-empirical powers. It is only rationalization that believes it can cope with them, mastering of which only the rationalization can deem itself. This state of affairs, full of tensions between intellectual lucidity and a vital sense of the tragic, between value neutralism and the paradox of consequences, was designated by Weber as "mystical, but inner true plastics." It manifests a confrontation between (monotheistic) providence and polytheistic fate. This value pluralism by no ways means relativism with Weber. The decision ought to be made not only between god and devil: each time one has to define... who is who/what is what. The opposition between monotheism and polytheism is insurmountable as well. Philosophically, it reflects the opposition between the intelligible and the sensible, if monotheism can be related to metaphysics of intelligibility and polytheism to metaphysics of action. The questions discussed in this context are as follows: Is it appropriate to describe this state of affairs as "remythization" (Habermas) or "neopagan regression beyond autonomy and individuality," or is polytheism only a "softening of monotheistic principle" (Bellah), can the revived polytheism of mythology be identified with "lively polytheism" (Gladigow), and what the latter is, does it define the cognitive and ethical orientations of modern man? The notion of polytheism that heavily influenced the current discussion on pluralism, value pluralism, and individualization of religious feeling is gradually disappearing from scholarly discourse as a genuine object of investigation.

A number of substitutes have been offered. William Shepherd coined the notion "polysymbolic religiosity, which is meant to replace religious exclusivity. For David L. Miller in his "The New Polytheism" (1974) polytheism is an organizing metaphor that means diversity of religious orientations and disparateness in symbolic explanation and in life, which are organized and shaped in new polytheism and cannot be reduced to some monistic solution. Polytheism is deemed as a legitimate model for individualized symbolical systems where gods are not to be trusted but to be used; man makes himself by making his own gods (see ▶ Self). Barbara Hargrove diagnosed polytheistic culture in the basic sense for North American society. At the same time, she regretted that this society is less united than ancient polytheistic societies. What seems the most valuable is "to see will,

human, and divine, as manifestations of nature," by nature meaning mainly sexuality and death. Ellwood gave polytheism the name of "liberation religion" of "being free in the world." As a reaction, one can see arguments of Christian reconstructionism: Gary North in the spirit of neo-Puritanism insists that there cannot be any neutrality; he translates pluralism back into polytheism again, understanding (and condemning) relativism and social disintegration by the latter.

Cross-References

▶ Environmental Theology
▶ Eschatology
▶ Evil
▶ Evolution
▶ Monism
▶ Monotheism
▶ Ritual
▶ Violence

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Popular Culture and the Mass Media, Sociology of

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Related Terms

Cultural studies; Media studies; Sociology of communication; Sociology of culture

Description

The sociology of popular culture and the mass media studies the relationship between mass communication and society, using the methods traditionally established in the sociological analysis and their variation within the so-called media and cultural studies. The media, conceived at the same time as framework and content of popular culture, are often analyzed in the general frame of the cultural processes. In the academic research, an important role has been played by the study of the identity dimension of cultural consumption and, more generally, by the research upon the relationships between communication and popular culture.

The most influential scientific handbooks agree in identifying the emergence and development of the discipline in the late nineteenth and early twentieth century. A symbolic date can be represented by the 1900s Great Universal Exhibition of Paris, when the process begun in the *Great Exhibition of the Works of Industry of all Nations* of London 1851, seemed accomplished: Technological goods and products of the popular culture became the actors of a new social representation, in which commercial goods began their transformation into commodities.

In the years of the social consolidation of the press and the development of cinema and radio, many pioneering studies are made. In those years, among other things, the "technical reproduction" of the art is defined by the German philosopher

Walter Benjamin as a cultural turning point. Benjamin identifies the technical reproducibility of the cultural manufatcs as a shift in the relationship between masses and art. In the same period, a new collective subject emerges: the mass public, viewed with suspicion by the psychologists of crowds and analyzed with greater optimism from US sociology. It may, indeed, speak of mass communication only in relation to two poles: on one hand, the development of technical support that enable the widespread use of the goods of cultural production, on the other hand the birth of the mass audience and a strong imaginary industry (now more often defined as "creative industries"). It is no accident that the public will soon become a major "sociological issue" from Gabriel Tarde to Georg Simmel, from Emile Durkheim to the Chicago School, until the US functionalist approach to the mass communication (*communication research*).

The sociology of mass media and popular culture has devoted great attention to study the characteristics of socio-communicative basic principles. In particular, recently John B. Thompson (1995) has identified some key features of mass communication. They can be summarized as follows: (a) commodification of the symbolic goods and attribution of an economic value to cultural products and, consequently, the birth of the imaginary market; (b) the structural separation between the production of symbolic forms and their reception: The context of production and reception, in fact, is always disjoint. This assumption, which constitutes an important reference point for the research on popular culture, has been partially put into discussion with the emergence of cooperative authorship in the so-called web 2.0; (c) extended accessibility of symbolic forms in space and time; (d) public diffusion of symbolic forms; (e) importance of the technological dimension of communication technologies (but anyway in a theoretical frame which rejects any forms of technological determinism).

The separation between the contexts of production and reception, and the technical

reproducibility of the cultural products technique facilitate the access to the symbolic forms not only to several kilometers away, but even at different times. The concept of time-space distanciation was also used by Anthony Giddens (1984). According to Giddens, in the *high modernity* we can remark two phenomena: The first one is constituted by the separation between time and space: distanciation space, in other words, does not necessarily imply even the time dimension. The second one concerns the separation of spaces and places: This phenomenon is given in connection with the eradication of social contexts of interaction and the fragmentation mechanisms of the same interaction. The possibility of developing actions and forms of interaction distance is, in effect, a result of this detachment. The disjunction of time and space elements is culturally important to the development of modern sociology of mass media.

The relationship between media and society represents a major theme in the social sciences and it is the very essence of the whole sociology of mass media. The media (it means media institutions, individuals who are part of and popular culture) have kept a strong relationship with the society, to whom they belong. The media play an important role in contemporary societies and the "media institutions" are inside a very dense network of relationships (Hesmondhalgh and Toynbee 2008). This concept is connected with the question of "power," one of the key aspects in the cultural studies approach (in particular in the frame represented by the Birmingham's Centre for Contemporary Cultural Studies, which has been very influential to create linkages between the media studies and the sociology of culture).

One of the most studied mechanisms of the sociology of mass media and popular culture concerns the relationship between media institutions and audience (Burton 2005). This mechanism applies to a specific power of the media, which covers the meaning's building and relates to the processes through which media texts (i.e., television programs, movies, information, etc.) produce "effects" and/or "influence" over the

public sphere. The media effects study has been a very important topic in all fields of media studies and, in particular, in US communication research (whose most influential authors are Harold Lasswell, Paul F. Lazarsfeld, Elihu Katz and, in more articulated and original perspective, Robert K. Merton).

About the question of the media as instruments of "power" in the logic of construction of social meaning, Denis McQuail identifies two types of media power and six main features of it. The two types refer to the so-called models of hegemony and that of pluralism, while the six main characteristics of the media power are the following: (1) ability to attract and to direct public attention, (2) ability to persuade in matters concerning opinions and beliefs, (3) ability to influence behavior, (4) ability to structure the mechanisms of reality definition; (5) ability to confer status and social acceptance; and (6) ability to provide information quickly and broadly (Sorice 2009).

Finally, several general models have attempted to explain the relationships between media and society. A simple classification is the one who lists the different theoretical approaches following the linkages that the media establish with the society. We can use a tripartite division which refers to: (1) macro-social models, (2) micro-social models, (3) dynamic models. The macro-models are those who consider social media able to impose itself on society, influencing or determining specific effects. In this frame, we can place the sociological approaches to the idea of communication as transmission. In this context, we may be place many scientific approaches that of determinism, some Marxist perspectives, some aspects of the political economy of the media (in particular those related to multiple forms of socioeconomic determinism and actually anchored to the idea of economic rationality), and most of the theories and interpretation models born in the functionalist context. The micro-social models are those that are based on the idea that the society "uses" the media: the media, in other words, operate in social dynamics and provide tools for connection and/or self-representation that the society uses

more or less consciously. In this area, we can place the reception studies, some Cultural Studies–based approaches, and some tendencies of the Audience Studies (Hall 1997). The expression dynamic models, finally, refers to those approaches, theories, and modeling which consider the media and society as always interconnected, in an interactive way activating a dynamic of mutual influence. No longer, therefore, the media as variables that deterministically intervene to change the society (macro-social models), and no longer the media that are used by people without any consequences (micro-social models): With dynamic models, scholars moved toward the rejection of effects theories but however accepting the logic of social influence. In other words, the dynamic model refuses the simplistic deterministic approach in favor of a holistic look at the relationship between media and society. In this context, we can place the interactionist approaches, the latest trends of audience studies and recent research directions on the relationship between media and identity.

Self-identification

Science

Sociology of popular culture and the mass media are strongly rooted in the social sciences tradition. It uses both qualitative and quantitative methods to study the relationship between media and society, the social texts and cultural products, the media impact on the public sphere. Sociology of popular culture and the mass media self-identify as a science. Current scientific literature confirms this self-identification. It is not a religion but a social science.

Characteristics

Sociology of the mass media represents a specific area of sociology; it is anyway distinguished from the broader general sociology. In the last decades, it has developed its own specific concepts and a peculiar research methodology.

Relevance to Science and Religion

There is generally great interest for sociology of the mass media and popular culture among the "science and religion" scholars. It happens because sociology of popular culture and the mass media concerns questions of human interest, even involving important topics such as control and manipulation, freedom, pluralism, social meanings, and social and personal identities. There are also some "religious" approaches to media studies (i.e., catholic perspective, personalist approach to media studies, etc.). Almost all the religions have a great attention to media and culture and many religious leaders use to speak about media and society (i.e., the annual Pope's message for the international day of social communications).

Sources of Authority

Empirical data, repeatable social experiments, and their publication in peer-reviewed papers are authoritative for Sociology of popular culture and the mass media. Their authority is self-derived by the peer-review process and from the underlying assumption of science that empirical data are the most reliable means of learning about the subject. Many sources are also consolidated during many decades of study and researches.

Ethical Principles

The deontological approach to the social research represents a point of reference for the discipline. It is an empirical and nonjudgmental science; these characteristics are strongly connected with its general ethos. In the same time, many international associations have defined rules and ethical principles.

Key Values

Honesty, human interest, grounded based methodology, centrality of the individual (Glaser and Strauss 1967).

Conceptualization

Nature/World
As all the social sciences, it considers itself in the frame of the world but it does not study nature.

Human Being
Individuals and/or member of a human society. All the individuals have the same rights.

Life and Death
It is out of disciplinary field.

Reality
Empirical matters but also social construction.

Knowledge
The results of the empirical study of reality.

Truth
The empirical knowledge is only an approximation to reality. "Truth" is not pertinent to an empirical science.

Perception
All observations/measurements of social reality are biased for many reasons. Perception is very important because even many empirical data are the findings of subjective process of perception. In the same time, it is sufficient to provide empirical and not exhaustive analysis of the society.

Time
Time is one of the fundamental dimensions of social life. It represents (with space) one of the key topics of the discipline.

Consciousness
Consciousness is a higher mental state, involving, both personal skills and collective interactions. Sociology of popular culture and the mass media has a great tradition of study in the theorization of consciousness (i.e., Anthony Giddens' analysis on society's structuration).

Rationality/Reason
Rationality/reason is one of the primary perspectives for an empirical science. The different

approaches to sociological methodology are all based upon rules of logical reasoning, deduction, induction, abduction; the research findings must follow rationality schemes to be acceptable to the scientific community.

Mystery

Sociology of popular culture and the mass media consider the mystery as a social topic to investigate. It does not study the mystery as "unknown" or "divinity," but it can be interested in how people deal with it.

Relevant Themes

The discipline is human centered. Many communication models refer to the concept of dialogue and subjectivity. These are strongly related even to Science and Religion engagement; at the same time, they represent critical turning point because of the scientific discussions about them. Another key concept is constituted by "community," widely used in the analysis of social identity, the role of the media and the relationship between popular culture and the constitution of the public sphere. It is also a concept variously used and submitted to many different interpretations.

Cross-References

▶ Cultural Studies
▶ Functionalism
▶ Functionalism in Sociology
▶ Humanities
▶ Media Studies
▶ Political Theory
▶ Sex and Gender
▶ Worldview

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Positive Psychology

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Related Terms

Psychology of positive human functioning; Science of happiness; Science of human strengths and virtues; Study of character strengths

Description

Positive psychology (PP), a subfield of psychology, is the study of optimal human functioning. PP aims to understand and promote the factors that allow individuals and communities to thrive. PP is a fairly new subdiscipline of psychology, yet it has spurred a flurry of research activity at the beginning of the twenty-first century.

The field is specifically concerned with redressing the overuse of disease and disorder models that guided most psychological research in the later part of the twentieth century.

Prior to World War II, psychologists embraced three major research aims: (1) curing mental illness, (2) making the lives of all persons productive and fulfilling, and (3) identifying and cultivating high talent and genius. However, events succeeding WWII, namely, the foundation of the Veterans Administration (VA) in 1946 and

the National Institute of Mental Health (NIMH) in 1947, narrowed the focus of psychology to primarily curing mental illness. Both organizations encouraged the utilization of mental disease models; the VA provided monetary incentive for psychologists to treat mental illness in veterans, and NIMH was more likely to fund research endeavors framed in terms of pathology. While the formation of these agencies led to great gains in understanding mental illness and providing therapeutic care, their advent abetted neglect toward the other two aims of psychology – facilitating fulfillment for all persons and cultivating talent.

Martin E. P. Seligman highlighted this historical trend in his 1998 presidential address to the American Psychological Association and invoked his fellow psychologists to research "positive" human attributes and processes, that is, to examine the sources of psychological health and wellness and to provide models for understanding mental *health* (as opposed to illness). Since this inaugural call to positive psychological research, the field has grown immensely. Seligman and other key psychologists (such as Mihaly Csikszentmihalyi, Ed Diener, Christopher Peterson, George Vaillant, Ken Sheldon, Robert Emmons, and Barbara Fredrickson) have deliberately utilized a sociology of sciences approach to construct the subfield of PP. In addition to building on the structural forces that comprise psychological science generally (e.g., generating a special issue of the American Psychologist devoted to PP; Seligman & Csikszentmihalyi, 2000), positive psychologists encouraged rapid growth in the field by attaining major sources of funding from such donors as the Templeton Foundation, Gallup Organization, and Mayerson Foundation and by forming scientific communities and publications to promote and disseminate PP research (e.g., International Positive Psychology Association; *Handbook of Positive Psychology* Snyder & Lopez, 2002; *The Journal of Positive Psychology*).

PP has set for itself several research goals and has made significant progress toward them thus far. The discipline seeks to understand human flourishing at multiple levels, including biological, experiential, personal, social, institutional, cultural, and global strata. Three overarching domains of research organize and guide inquiry into thriving: positive states and experiences at the subjective level, positive traits and persons at the individual level, and positive institutions and societies at the group level. First, considering the subjective level, PP examines positive emotions and cognitions based on past experience (well-being and satisfaction), positive emotions and experiences of the present (joy, flow, happiness, sensual pleasures), and constructive cognitions and feelings about the future (hope, optimism). At the individual level, PP abounds with research concerning positive individual traits, such as gratitude, capacity for love, courage, perseverance, mindfulness, forgiveness, creativity, and wisdom. One of the striking contributions in this domain of research is the *Values in Action* taxonomy of character strengths, formulated by Peterson and Seligman (2004). Akin to the American Psychiatric Association's authoritative classification of mental illness, the *Diagnostic and Statistical Manual of Mental Disorders*, the *Values in Action* taxonomy of strengths is intended to serve as a manual of mental health. Finally, looking at research on positive groups, institutions, and societies, PP examines the organizational factors of social structures that promote optimal functioning.

Self-identification

Science

PP, as its superordinate discipline of psychology, identifies itself as a science because it uses the scientific method to generate hypotheses and models that are subjected to empirical testing. At the same time, positive psychologists are mindful of the limits of empirical methods to answer all of the questions that are at the heart of what makes life good and desirable.

Religion

PP does have interests that overlap with those of religious philosophies, such as describing

virtuous approaches to living or considering the contributions of religious institutions to the development and promotion of character strengths. While PP may also examine how religion affects persons and the psychological processes involved in religious thoughts, emotions, and behaviors, the discipline restricts itself to examination of psychological questions and does *not* address metaphysical questions. For example, positive psychologists may examine how religious beliefs affect well-being, but they will not address if the actual content of a belief is true or false. As a science, PP is only interested in hypotheses that are empirically testable, verifiable, and falsifiable.

Characteristics

PP is distinct from other subdisciplines of psychology in several ways. First, it is specifically concerned with redressing the historically negative bent of psychological research; by self-definition, positive psychology is distinct in its focus on the positive aspects of human behavior, emotions, and cognitions. Positive psychology utilizes human strengths and mental health models, as opposed to the disease models that are so prevalent in the broader field. For instance, instead of looking at posttraumatic stress disorders, positive psychologists are interested in the avenues of posttraumatic growth – that is, in the positive development of individuals in the aftermath of tragedy.

While PP is distinct in its strong emphasis on the positive aspects of human functioning, it in no way maintains a monopoly over such topics. Since the foundation of psychology as an academic discipline, there have always been at least some psychologists concerned with the "positive" side of the field. For example, the Humanist Movement of the 1960s and 1970s was highly engaged with trying to understand human thriving and the development of individual potential (e.g., Maslow's work on ▶ self-actualization). PP does not seek to ignore or discredit previous work that has not identified itself as part of PP. Instead, PP seeks to provide an integrative platform to both organize and communicate research on positive psychological topics. Additionally, PP research may be done within the environs of other subdisciplines of psychology (e.g., personality or developmental psychology).

Moreover, PP's distinct focus on positive constructs does not entail a repudiation of more "negative" psychological models and processes. For example, PP encourages research on positive emotions such as gratitude and happiness. However, PP does not cast aside the importance of research on negative emotions such as fear or sadness. Instead, PP does confirm that many "negative" topics are vital avenues of research that warrant continued exploration. In the framework of ▶ Hegel's thesis-antithesis-synthesis model, PP sees itself as the antithesis (a focus on the positive) to the reigning thesis (a strong concentration on the negative) in psychological inquiry. Likewise, PP envisions an eventual integrative synthesis whereby both positive and negative aspects of human psychology are well represented in the broad discipline of psychological science (Linley et al., 2006).

Relevance to Science and Religion

PP does see itself as somewhat relevant to the area of "science and religion" in that (1) positive psychologists are interested in the impact of religious behaviors, beliefs, emotions, groups, and institutions on well-being and thriving, (2) some positive psychologists study spirituality (a primary component of religion) as a human strength, and (3) PP is focused on understanding character strengths, which often overlap with the virtues of many world religions (e.g., kindness, hope, forgiveness). In these points of contact, positive psychologists may in some ways participate in research that could also fall under the subdiscipline of psychology of religion. Particularly in regard to the first facet of overlap, PP is utilizing scientific methods to examine the impact of religion on people, and it is thus entrenched in the overlap between science and religion. Moreover, PP is fascinated with questions of human purpose and meaning making, and

both of these considerably overlap with questions posed in religious domains. Though PP is quite interested in questions of "science and religion," it is necessary to reiterate that it is a science. Although PP may address questions that have religious significance, it examines only those questions that are answerable through the scientific method. In many ways, PP serves as a conduit for conversation between mainstream psychology (which often has an apathetic or antagonistic attitude toward "science and religion") and religious or philosophical traditions.

Sources of Authority

PP considers recently published peer-reviewed journal articles the most authoritative source of scientific understanding in the discipline. Similar to other sciences, evidence continually accrues either supporting or disconfirming theories as new data is analyzed from both empirical and qualitative research studies. Considering that PP is a very young subdiscipline of psychology and that overarching paradigms of the field are still being established, discipline-specific publications (i.e., *The Journal of Positive Psychology, Handbook of Positive Psychology*, Snyder & Lopez, 2002; *Oxford Handbook of Methods in Positive Psychology*, Ong & Van Dulmen, 2007) do play a major role in demarcating the field. However, research falling under the PP umbrella is published in a plethora of peer-reviewed psychological journals (e.g., *Journal of Personality and Social Psychology, American Psychologist, Psychological Science, Developmental Psychology, Journal of Counseling Psychology*).

Ethical Principles

As a subdiscipline of psychological science, PP subjects itself to the ethical principles and code of conduct delineated by the American Psychological Association (a copy of the most recently approved ethics code can be found at www.apa.org/ethics). Overall, the APA sets forth specific guidelines for research with human and animal subjects that support the five main ethical principles of the organization: beneficence and nonmaleficence, fidelity and responsibility, integrity, justice, and respect for people's rights and dignity. More specifically, PP utilizes the specific research protocols established by the APA, such as obtainment of approval from institutional review boards and procurement of informed consent from participants, to ensure that all participants are treated ethically.

Key Values

Several values are deeply entrenched as the keystones of PP. Most obviously, the subdiscipline values positive experiences, traits, and institutions, and it seeks to understand human thriving and flourishing. The positive includes what is both good and desirable, individually and collectively. Similarly, PP endorses humanistic values and is quite optimistic in its evaluation of the propensities of people to do good, be good, and feel good.

As a science, PP highly esteems theory building and empirical validation/disconfirmation of theories through hypothesis testing. Perhaps more so than other sciences, PP values cross-disciplinary exchange as well as the process of applying empirical evidence to historically significant theories of thriving originating in religious, philosophical, and cultural traditions.

Also highly valued in PP is the focus on bridging the gap between basic research and the application of findings in therapeutic and "real-world" settings. Evidencing this value, top leaders in the field conduct research specifically aimed at effective implementation of positive interventions in therapeutic and nontherapeutic contexts (Seligman et al., 2005). Moreover, leaders in the field have created training programs for PP practitioners; for example, University of Pennsylvania's Positive Psychology Center offers a masters degree in applied positive psychology. Likewise, *The Journal of Positive Psychology* by its own designation is "dedicated

to furthering research and promoting good practice," and Martin Seligman highlights the importance of positive prevention and therapy in his introductory chapter of the *Handbook of Positive Psychology*.

In the same vein, PP actively strives to disseminate research findings to the general public and seeks high profile outlets for the promotion of positive psychological research. This push for publicity highlights another key goal of the subdiscipline: to motivate research and promote an interest in positive psychology.

Conceptualization

Nature/World

PP conceptualizes nature in a variety of ways. Theoretically, nature is regarded as an environmental affordance that facilitates or constrains optimal human functioning. Positive psychology is drawn toward understanding people within their social-environmental context. Positive psychologists are concerned with promoting and maintaining social-environmental conditions that facilitate positive functioning, including educational, familial, and religious environments. In the *Values in Action* taxonomy of strengths, the appreciation of beauty and nature is a positive trait included under the broad virtue of transcendence, that, together with other strengths, contributes to a fulfilling life.

Human Being

Various perspectives on what it means to be human are compatible with PP. PP does not make essentialist claims about human nature or the human condition. PP assumes that humans share an identifiable and unique set of tendencies and characteristics that are cross-culturally recurrent and that distinguish them from other species. In the spirit of virtue philosophers such as Charles Taylor and Alasdair MacIntyre, PP operates under the assumption that humans are moral, social beings that have desires, beliefs, and feelings as well as the ability to have evaluative metacognitions concerning these mental states. These evaluative metacognitions contain the

recognition that humans have the potential to transform these desires, beliefs, and feelings for the betterment of their lives, and therefore, humans are motivated to enact and sustain a moral order.

Life and Death

Positive psychology is not particularly concerned with the origins of life. Various theories of life origins are compatible with PP. On the other hand, PP is quite interested in cognitions and feelings about death. For example, considerable research has been conducted on terror management theory and emotional well-being. From a different vantage point, the study of positive aging, a specialty area within PP, has focused on the factors associated with contemplating one's own dying (Hill, 2005).

Reality, Knowledge, Truth, Perception

For PP, these four concepts are interconnected. PP maintains that humans are uniquely gifted with the ability to acquire self-knowledge. Humans are the only species that engage in extensive self-reflection and imagine best possible selves and lives. This reflective nature of the human mind allows for insight into the self and provides the person with the freedom to enact change to actualize the full potential of the self.

However, PP recognizes that knowledge and reality are constructed by the individual and that it is this constructed knowledge and reality (rather than some "pure" knowledge, external circumstances, or others' perceptions of reality) that truly shapes a person's ability to thrive and flourish. In the broader field of psychology, perception refers to the brain's interpretation of raw sensory inputs, and it is recognized that sensory input is not necessarily represented in the mind nor experienced by the person as it actually exists outside the organism. Similarly, PP recognizes that people are not passive recipients of knowledge; instead, when people perceive the world, they integrate new information with preexisting knowledge structures.

To illustrate, it is consistently found that nondepressed persons hold many positive illusions about the self and maintain many positive

biases in their perceptions of the self. Thus, their knowledge of the self and construals of reality may not actually match more objective measures, but these biased constructions are actually quite adaptive and lead to thriving. Conversely, depressed persons often utilize a more pessimistic style of thinking, which leads to more objectively realistic views of the self. However, these "realistic" views generally lead to less thriving as the person will disengage from goals more quickly when challenges arise.

Just as humans are the only species particularly gifted with self-reflective abilities, they also seem to be the only animals that are concerned with questions of ultimate truth or meaning. Moreover, the manner in which a person deals with such existential questions greatly impacts flourishing. A strong sense of meaning and ultimate truth can be an extremely powerful motive while an absence of meaning or existential crisis can lead to despair and disengagement from life.

Time

Time perspective (TP) has been used as a way of parsing optimal human experience. The categories parsed are past, present, and future, and positive psychologists have proposed that a balanced time perspective, including the ability to move flexibly between these frames, is conducive to positive functioning. TP has been conceptualized as a personal characteristic that refers to the relative dominance of past, present, or future in a person's consciousness. In this sense, TP can predominate a person's outlook so that they are chronically biased toward one of the three temporal perspectives. Of the three "time zones," future orientation tends to show the most robust relations with indicators of well-being and positive functioning, such as optimism, hope, and self-determination.

Consciousness

In PP, there is particular interest in very positive states of consciousness or the positive effects from certain ones, such as those attainable from mindfulness meditation (MM) practices or flow states. MM is a state of consciousness that involves consciously attending to one's moment-to-moment experience. It has its origins in Eastern contemplative traditions but has largely been unmoored from its original spiritual roots. In the context of mindfulness practice, paying attention involves observing the operations of one's moment-to-moment, internal and external experience, and its practice is recommended for virtue development across spheres of functioning. Flow involves gaining the control over the contents of one's consciousness in order that default tendencies toward boredom, dissatisfaction, or anxiety can be overridden (Csikszentmihalyi, 1990).

Rationality/Reason

The concepts of rationality and reason have multiple meanings in PP. One conceptualization of rationality refers to the term embedded in the widely accepted theory of a dual-process mind. As articulated by Kahneman, scientific evidence supports the existence of two mental processing systems: the first system is automatic, fast, and more emotional, whereas the second is conscious, linear, controlled, and rational. In this framework, rationality may be considered the logical rule-governed outputs of the conscious processing system.

Rationality can also refer to scientific and practical rationality in PP. Scientific rationality in PP proceeds as it does in other scientific fields where psychologists employ scientific rationality to investigate other human phenomena. For example, the elements of the good life (positive experiences and positive traits) can be abstracted, reductively classified, operationally described, quantified, and measured. Practical rationality, on the other hand, takes place in reference to concrete life situations and is concerned with deliberation and choice where opinions vary on the proper course of action. The two are related in that the scientifically deduced good life will enable people to become better decision makers with choices, preferences, and the possibility of becoming masterful, efficacious, stronger, and more productive. Living a good life is, in fact, the end result of practical reason.

Additionally, the terms of practical rationality and reason relate to what PP refers to as wisdom.

Wisdom can be defined as "the reasoned search for specific ways to ensure well-being and the implementation of those discoveries in daily existence" (Schloss, 2000). Wisdom is an ideal endpoint for human development and is thus a concept at the heart of positive psychology. The religious conception of wisdom as reflected in perspectives as diverse as the biblical wisdom tradition and Eastern mysticism points to self-transcendent knowledge that reflects a compassionate concern for others and a generative concern for society.

Mystery

PP would define a mystery as something that cannot be understood or explained from a materialist perspective. While psychological science may investigate phenomena commonly understood as mysterious (e.g., meditative experience), the field is only really interested in the knowable aspects of the human psyche. PP recognizes that there are ways of knowing beyond the scientific method, but the field restricts itself to inquiry that is testable and falsifiable. Therefore, mysteries (which are inherently unexplainable) do not fall under the realm of PP; instead, human interactions with mysterious entities, perceptions of mystery, and experiences of the numinous are of great interest to the discipline. Having said this, it should be acknowledged that human happiness, a cornerstone of PP, has historically been viewed as a mystery incapable of being penetrated by scientific psychology. However, positive psychologists would disagree with this assertion.

Relevant Themes

Religiosity/Spirituality as a Human Strength: Definitional Issues and Positive Outcomes

As previously mentioned, one major link between "science and religion" and PP is that PP considers spirituality a character strength, akin to creativity, bravery, kindness, leadership, self-control, etc. Within this milieu, spirituality and religiosity refer to practices and beliefs embedded in the supposition that there is a transcendent (nonphysical) dimension of life.

Religion has also been formulated as a search for significance and meaning in avenues related to the sacred. While definitions of religiosity and spirituality are still somewhat controversial (particularly the debate surrounding the degree of their similarity/distinctiveness), PP does consider religiosity and spirituality as two components of the same essential construct.

Looking at the positive outcomes of religiosity/spirituality, researchers have repeatedly corroborated that religiosity/spirituality is linked to higher life satisfaction (controlling for a variety of personality variables); is associated with positive youth development; mitigates antisocial and risky behaviors; evidences increased social support; is a robust predictor of altruism, volunteerism, and philanthropy; serves as a powerful coping mechanism; and is correlated with positive health outcomes. While there are also demonstrable negative effects of some forms of religion and spirituality, PP is not particularly concerned with the negative aspects of these. On the whole, PP endorses the evolutionary psychology perspective and generally views religion/spirituality as adaptations with functional value (at least in prehistoric environments). Thus, rather than framing religion as some neurosis (a la Freud) or disease that should be eradicated from society to improve mental health, positive psychologists are more prone to depict religiosity/spirituality as adaptations beneficial to the self and the community in a variety (though not all) contexts.

Positive Religious/Spiritual Emotions

One of the main objectives of PP is to examine positive emotions and experiences, which until recently have been poorly understood. Barbara Fredrickson's ▶ broaden-and-build model has greatly enhanced comprehension of positive emotions and their adaptive value. The theory maintains that positive emotions function to expand the organism's cognitions and behavioral tendencies and also argues that this expansion leads to the acquisition of new resources (such as relationships, physical assets, or skills) across time.

Some of the most profound of such positive emotions – including awe, wonder, and

gratitude – greatly overlap with what historically been described as religious and spiritual experiences. In fact, scholars argue that an emotion such as awe be designated a spiritual or religious emotion as it broadens the individual's perspective to the point of self-transcendence.

Research by Newberg et al. (2001) corroborates this self-broadening characterization of religious experience. In their imaging studies of cerebral blood flow of Tibetan monks and Catholic nuns (using single-photon emission computed tomography, SPECT), they have found decreased activity in the parietal lobe of the brain during meditative and prayerful states. The parietal lobe, specifically the orientation association area (OAA), is the region of the brain responsible for delimiting the self and giving a sense of orientation in space and time. Thus, during deeply religious states of meditation and prayer, the OAA receives little sensory input, but it still continues to search for limits of the self. As the OAA finds no markers of self/not self, the person experiences an expansion of the self that leads to feelings of unity, awe, and self-transcendence.

Although scholars may argue about the designation of certain positive emotions as "spiritual emotions," there is no doubt that the investigation of these deeply moving positive experiences is an area of inquiry that most definitely engages the area of "science and religion."

Cross-References

▶ Emotion
▶ Evolutionary Psychology
▶ Happiness
▶ Love (Alterity, Relationship)
▶ Methodology in Psychology
▶ Personality Psychology
▶ Virtue
▶ Virtue Ethics

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Positivism/Neopositivism

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Positivism is a philosophical approach, based on the idea of objective truth, meaning that observational evidence together with its logical and mathematical treatment is the exclusive source of all worthwhile information. The positivist approach has been a recurrent theme in the history of western thought from the Ancient Greeks to the present day, but it has been significantly developed from the early nineteenth century until the mid-twentieth century. Postpositivism, mainly influenced by Sir Karl Popper's falsification theory and Thomas Kuhn's theory of the paradigm shift, still maintains the idea of

objective truth, but believes that human knowledge is based not on unchallengeable, rock-solid foundations but rather upon human conjectures.

Posthuman Condition

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Related Terms

Posthumanism; Transhumanism

"Posthuman condition" (PC) is a complex and multifaceted concept that covers many assumptions and definitions of human being and becoming. These definitions are generally inspired by the development of contemporary technoscience.

We can talk about a substantial ambiguity of the concept of PC, which can be declined according to two fundamental meanings: human has become posthuman because of the hybridization with technology (we could name this concept of PC "cultural posthumanism"); human is going to be overtaken by a new posthuman form of life emerging from the huge changes driven by technology (we could name this concept of PC "transhumanism" or "hyperhumanism" or "hyperbolic posthumanism" or "speculative posthumanism").

These two main concepts of PC have a different relevance to the dialogue between science and religions. Both of them are grounded on the technology-driven transformation of the human condition. In the first case this transformation is explicitly placed *within* the human nature: this becomes the result of the everlasting reshaping by the human being itself, with possible theological implications regarding the idea of a human nature as created by God. In the second case the transformation of human condition is leading us to a chronologically posthuman nature which is generally assumed as "perfect" and at least eternal: a kind of atheistic eschatology.

According to the first aforementioned meaning, the PC can be read within the postmodern perspective as a metaphor of the relational and hybrid contemporary human condition. Such a metaphor is the result of different theoretical sources: postcolonial thought, feminism, poststructuralism, and queer theory among others. Several authors can be included in such a declination of PC: Donna Haraway, who references to the *cyborg* as the icon of the present human condition (Haraway 1991); Katherine Hayles, who says we have always been posthuman (Hayles 1999); Rosi Braidotti, with her "nomadic subject" (Braidotti 2002); Elaine Graham, who outlines that contemporary technoscience calls into question our assumptions informing notions of normative and exemplary humanity (Graham 2002); Joel de Rosnay, with his concept of Cybionte (De Rosnay 2000); and others.

According to the second meaning, the PC is the final result of the transhuman condition of the present humanity that is becoming posthuman. The transhumanist literature is already quite large and ever growing: as main representatives of the movement we can cite Drexler 1990; Vinge 1993; Kurzweil 1999; Moravec 1999. The core assumption of the tranhumanism is that contemporary technology, especially through its enhancing effects, is transforming us in a new form of life, which we cannot predict in details but which we can be sure will be "better than human": to enhance and improve our condition is a fundamental right and a real civil duty.

Thus the latter interpretation of the PC, which has been referred to as *hyperbolic posthumanism* or *speculative posthumanism* or *hyperhumanism*, can still be included in a humanistic view of the human condition: such a concept of PC fails to displace the categories, paradigms, epistemologies, and ontologies of Humanism, risking to repack the dualistic and anthropocentric outcomes of a certain humanistic view.

Thus, the PC can be assumed as the metaphor of the hybridization of human identity or as the description of the final stage of the present human transformation. In both cases technology is the force informing our dynamic identities: given the

new form of technology, which is no longer limited to the external body, but can enter inside it, we are shaped by the relationship with the technological others. Yet this relationship has different consequences in the two aforementioned concepts of PC: in the former the hybridization between our life as shaped by us and technology becomes the new ground for an ontology of the present human condition; in the latter the technology-driven transformation of the human identity has such a big impact to cause the overcoming of the human as such and the birth of a posthuman form of life. Finally the former is a posthumanist description of the human condition, while the latter is a still humanist technophilic and anthropocentric prophecy regarding the end of the human.

Rather than signifying the end of the present human condition we think the PC can be more usefully assumed as a new theoretical tool to call into question some assumptions about current human condition. It is a matter of fact that the contemporary development of technoscience is increasingly changing our view of human body and human identity, but it is not necessary to imagine a chronological overcoming of the present human being: we think that we have to deal not with a new species after humans, but with a new even still human form of life, not totally understandable with the humanistic categories.

In this perspective the PC expresses a hybrid being, whose hybridization is both the result and the condition for *plasticity*, which is emerging as the new formal paradigm of human. This implies that the relationship between human and posthuman cannot be simply assumed as a chronological or semantic sequence (posthuman = enhanced human, or posthuman = human without its "natural defects"), but they meet and clash in contemporary *Weltanschauung*, that is in contemporary view of life.

The plasticity of human being can be the starting point for avoiding the absolutization of the becoming which is the main risk of the first concept of PC, which, in the end, risks to have a nihilistic outcome: a subject of the becoming is always necessary, because a changing without a substance is aporetic. Exactly this "becoming

being" is the paradox of human identity, naturally artificial, but also in need of an ethical reflection and management of its artificialization.

The second concept of PC is based on a dualistic assessment of nature/technology relationship, particularly of human nature/technology. Actually, if the former is defined as only a result of the creation or of the evolution that dichotomy is real, but if we think human nature also as a creating force not only that dichotomy seems difficult to be sustained, but the same human/artificial distinction becomes problematic.

The so-called *technogenesis argument* (Clark 2003) has been elaborated against the aforementioned dualistic view: according to this argument, technology has always been a constitutive part of the human identity, which is at the same time expressed and shaped by it.

Against the rhetoric of an overcoming of the human condition, particularly of the human body and the matter as such, the so-called *materiality argument* has been proposed: human intelligence is related to an embodied mind, so that a disembodied subjectivity is at least implausible and grounded on a dualistic anthropology.

Another possible argument against the second concept of PC is the so-called *anti-essentialist argument*: if the human essence is previously denied, it is no possible to overcome it with a supposed posthuman subjectivity.

In conclusion, the first meaning of PC reveals its post-structuralist and biopolitical nature criticizing what could be defined as the "dialectical identification strategy" of the human, which is explained through polar oppositions (Nature/Nurture, Nature/Technology, etc.). Particularly, the first opposition is localized in the human itself between the life assumed as materiality and the life assumed as the form we give to our materiality. Differently than the first concept of PC, the second is focused on the separation/subjugation of our materiality (i.e., our body) which must be transformed and even overcame through the form given to it by human technology.

The main aim of the theories about the PC is to free the human identity from every metaphysical artifact built to explain the human essence. Yet the conceptual premises of both concepts of PC

are not post-metaphysical nor post-essentialist: they can be assumed as essentialist view on human nature, particularly as a commitment to transformation and hybridization grounded on the metaphysical premise of Newtonian mechanicism and Darwinian evolutionism.

In the end, both the concepts of PC are undoubtedly potential new theoretical possibilities in order to think the human nature, especially in its relationship with contemporary technoscience, but they also need to be balanced with a more appropriated concept of human nature. It is necessary to go over the dualistic approach to nature/culture, and this is possible thinking the human nature as a "plastic substance," that is as intrinsically dynamic: the human condition is a transitional condition, so that both the meanings of PC (hybridization and transformation) can be included within the human condition (Farisco 2011).

Cross-References

▶ Artificial Intelligence, General
▶ Body
▶ Cyborgs
▶ Philosophical Anthropology
▶ Philosophy of Mind
▶ Technonature and Theology
▶ Theological Anthropology

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Posthumanism

▶ Posthuman Condition

Postliberal Theology

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Related Terms

Post-secular theology

P

Description

Postliberal theology has become (1) the standard *designation of an influential North American academic theological movement – or "school" – which developed during the 1970s mainly at Yale Divinity School, mainly in the fields of historical, systematic, and ecumenical theology, and earned its reputation as a distinct program for theological reflection in the mid-1980s.*

The notion is also used more broadly as (2) *a designation of various anti-secularist, mainly neo-Barthian and postmodern theological programs or movements in the contemporary debate (especially from the early 1990s until the present).*

These two understandings are clearly interrelated, although the first is undoubtedly more established than the second. Not the least because the "Yale school" is somewhat indeterminate and vague, it is important to recognize the *interrelations* between the two forms at the same time as one keeps them apart as two *distinct stages* in the development of a certain form of unapologetic Christian postmodern theology.

In the wake of recent debates on theological postmodernism and post-secular thought, it is pretty obvious that the label "▶ postliberal theology" has become somewhat detached from its original context, which means that many postliberal theologians of the latter kind find the original postliberal proposals related to Yale theology partly outdated. The reason to maintain the concept of theological postliberalism is mainly that the literature tends to use the label in various extended senses but also because there are clear affinities between the original Yale program and later developments in systematic theology.

The central figure of the international debate of postliberal theology is George A. Lindbeck (b. 1923), but his colleague Hans Frei (1922–1988) was at least as important for the construction of the narrative perspective on theological practice that permeates the postliberal program. Very generally, Lindbeck's and Frei's ideas can be seen as a reaction against secular modernity and more precisely, a reaction to the way theology responded to this modernity. Lindbeck criticizes both the conservative theological focus on doctrinal truth as propositional truth and the liberal idea that doctrinal discourse is noncognitive and secondary to a primary form of human religiosity. As such, postliberal theology becomes a renewal of some of the tenets of neoorthodoxy, especially as it had been developed by Karl Barth and Richard Niebuhr, although this renewed "conversation" with neoorthodoxy took place in a methodological manner, very much shaped by the so-called linguistic turn (Richard Rorty) in philosophy and theory, which took place in the 1960s. This last fact is one of the main reasons that postliberal theology also has been understood as emblematic of postmodern theology (e.g., in Murphy & McClendon 1989).

This entry is organized as follows: First the attention is paid to Lindbeck and Yale theology (sections Postliberal Theology in Its Relation to George Lindbeck and The Yale School and the Debates). After this survey, something more is said about the later debate in this specific heritage from Yale (section Transition). This leads over to the second and broader meaning of the notion (section Postliberal Theology and Neo-Barthian Anti-secularism). Lastly, a further reflection and critical assessment of the notion of theological postliberalism is offered (section Ecclesiological Reduction of Theology?).

Postliberal Theology in Its Relation to George Lindbeck

In its most programmatic sense, postliberal theology dates back to the release of the Lutheran Yale theologian George Lindbeck's much debated piece *The Nature of Doctrine. Religion and Theology in a Postliberal Age* (1984) (from now on *ND*). This rather unambitious, and to some extent even preliminary, book was to become one of the few real classics of North American theology in the 1980s.

It is best known for its emphasis on a "cultural-linguistic" and "intratextual" perspective on doctrinal discourse and the consequences of this perspective for systematic theological reflection. Drawing on thinkers such as the later Wittgenstein, Clifford Geertz, and Peter Winch, Lindbeck challenges a more traditional propositional and cognitive approach to doctrinal truth on the one hand and an "experiential-expressive" approach on the other (the latter is characterized by a noncognitivist and symbolic understanding of doctrines). The experiential-expressive approach was associated with the liberal and revisionist theologies in the tradition from Schleiermacher. Furthermore, although without ignoring their attempt to offer a third way, Lindbeck locates similar problems in the thought of neo-Thomistic Catholic thinkers such as Karl Rahner and Bernard Lonergan.

Postliberal theology, in contrast, was characterized by a "cultural-linguistic" model, and presented as a more successful "third way"

between the conservative and the liberal proposals. More specifically, Lindbeck approached Christianity as a distinct cultural form, bound to its fundamental relationship to the biblical narrative, which functions as its primary system of signs. Doctrines should be understood not as first-order propositions of truth, nor as symbolic expressions of some evasive religious feeling, but rather as second-order truths, a kind of grammatical rules that are "communally authoritative rules of discourse, attitude and action" (*ND*, p. 18). Intratextuality, then, is a method of doctrinal validation that understands meaning as immanent, "constituted by the uses of a specific language rather than being distinguishable from it" (*ND*, p. 114).

It is important to notice that Lindbeck's programmatic call for a postliberal theological approach first and foremost was guided by a thorough *ecumenical* interest. One can argue that the basic questions of the book are related to the "pre-theological" problem of *doctrinal change* in the context of ecumenical debate. Already on the first page of *ND*, Lindbeck states that it is difficult to really believe any report about genuine ecumenical agreement given the propositional and the experiential-expressivist alternatives. Yet, since such agreements are successfully made, Lindbeck opts for a more precise and accurate way to describe the logic of doctrinal dynamics.

However, it is equally important to notice on that this ecumenical problem, which was very much alive at the outset, soon were to be eclipsed by questions concerning general theological methodology. This might explain how and why Lindbeck's rather modest claims were taken up as a wholly new approach in theology. The displacement in the conception of *ND* and its objectives has been so thorough that even Lindbeck has confessed that he has difficulties reading the book as it was originally intended (see, e.g., Lindbeck's preface to the German translation of *ND*).

The Yale School and the Debates

Lindbeck's emblematic work is closely connected to the narrative theology of Hans

Frei, whose major work, *The Eclipse of Biblical Narrative. A Study in Eighteenth and Nineteenth Century Hermeneutics* (1974), can be viewed as the critical foundation for Lindbeck's attack on the liberal theological enterprise. Frei's Barthian focus on biblical narrative is the other leg of postliberal theology, and it is immensely important to acknowledge that Lindbeck's program was grounded in the idea of modern hermeneutics as a kind of forgetfulness of the importance of biblical narrative for any meaningful conception of Christian identity. Yet, since Frei was less active during the 1980s and less involved in the actual debate on postliberalism, his name tends to be connected with the earlier stage of the movement, usually called the Yale school of "narrative theology."

Most standard surveys of the postliberal theology have come include scholars such as David Kelsey, William Placher, Ronald Thiemann, Stanley Hauerwas, William Willimon, Bruce Marshall, and George Hunsinger, etc. However, as George Hunsinger rightly has remarked, the idea of a consistent Yale school of thought is rather exaggerated and the names included vary considerably between different accounts (Hunsinger 2003). Undoubtedly, a series of British theologians can be associated with the camp of postliberals, though at the time of Lindbeck's book, many of them had already developed their own variants of his critique. One can mention names such as David Ford, Rowan Williams, Janet Martin Soskice, Nicholas Lash, Andrew Louth, Oliver O'Donovan, and Colin Gunton.

Besides Lindbeck and Frei, it was perhaps William Placher that was most important for the formation of the idea of a "Yale school" of postliberal theology. Placher was one of the leading voices in the first public debates between the Yale camp and distinguished critics scholars mainly from Chicago (among these, we find James Gustafson and David Tracy, who were to be associated with the most articulated suspicion against the postliberals). Placher also wrote the text on the postliberal theology in David Ford's influential two-volume edition *The Modern Theologians* (1989, which reappeared in the

Second Edition 1997). This contributed further to the image of a coherent movement.

The renowned debate between Yale and Chicago can be understood as a discussion on the very task of theology, its rationale and purpose in and for the world. If for David Tracy, theology was all about correlation between religious tradition and the contemporary situation in order to reach an adequate theological response to the actual human situation in the postmodern situation, the postliberal position came to be recognized as the search for a distinct Christian self-understanding based on a postmodern understanding of knowledge and truth. Lindbeck's pointed formulation of the theological task as "absorbing the universe into the biblical world" (ND, p. 135) has been very critically received and often understood as an outright sectarian aspect of the idea of postliberalism. This charge is not wholly wrong, and we will return to it in the last section. However, one must also keep in mind that the two camps – best represented by Lindbeck and Tracy – in various ways shared a critique of enlightenment thought and secular optimism. This similarity and common ground has been obscured by the polemical tenor of the debate and their radically different approaches to the problem of the postmodern. A more nuanced evaluation of the impact of Lindbeck's book and the postliberal program, at least in the first phase, would be to understand it as new form of theological reception of recent developments in philosophy of language and critical theory.

A charge that Lindbeck and the postliberals had to face already from the beginning was the accusation of relativism and carelessness concerning the question of truth. Some layers of the debate about ND are obsessed with this problem. Lindbeck's choice to view the cultural-linguistic model as a formal structure for legitimating doctrines opens for this criticism. However, as long as one really reads Lindbeck's book in its entirety (as well as his defenders), it is hard to take this charge seriously. Lindbeck is very clear that his program is to be understood as an attempt to make doctrinal reflection possible as a positive and progressive discourse related to the general claims of the Christian worldview.

Therefore, he also adds a somewhat puzzling excursus on truth based on the idea that the ecumenical usefulness of the postliberal program depends on how well it can be settled in a wider context of belief in propositional truth (ND, p. 69). Thus, Lindbeck's program contains ideas that John Milbank later has understood as "metanarrative realism," which means that truth as reference has to do less with single propositions and more with "the entire Christian performance" (Milbank 1990).

Transition

If the problem of relativism was quite exaggerated in the original debate, one can perhaps say that it returns in a more acute way later on. If one dare to speak of phases or strands in the original debate on theological postliberalism, then Stanley Hauerwas has to be associated with the second phase or strand in the sense that his own association with the postliberal camp brought in a new dimension of the problematic; one that was merely hinted at by Lindbeck through his idea of "absorbing the universe." In his reception of postliberalism, Hauerwas, who originally was no Yale scholar, added a flavor of cultural crisis to the discourse on postliberal theology, implying that intratextuality could be taken more ontologically as a way to propose an alternative social vision for theology (compared to the liberal and secular vision that permeated liberal theology).

If Lindbeck and others had understood the problem mainly as a problem of how to approach Christian theology in way that is relevant for the believers in the community, Hauerwas extended the vision and red into the program a more fundamental perspective of a clash between the Christian community and the liberal world. Thus, postliberalism took on an additional political flavor, which implied that the program of postliberalism had become more distinct in terms of theological and ethical content. Compared to Lindbeck's understanding of his own work, as more or less pre-theological, Hauerwas' more epic interpretation of the Christian community as a counterculture twisted the postliberal

agenda into a full-fledged theological vision. This transition made the problem of universal truth much more acute.

A very different continuation of the original postliberal program was proposed by Kathryn Tanner who more or less accepted the cultural-linguistic basis of Lindbeck's argument but questioned the idea of the homogeneity of the Christian identity and the possibility for a single Christian position. In both Lindbeck and Hauerwas, the idea of a distinctive Christian cultural perspective is fundamental for their respective proposals. But is there really a common Christian position? Tanner argues that "[p]ostliberals try to get around the absence of Christian consensus on so many matters at any one time and place by claiming that at least well trained Christians will so agree, and that not all, perhaps not even the majority of Christians are well trained" (Tanner 1997, p. 142). By this, she exposes a dogmatic and even authoritarian trait in the postliberal program that can be countered only by leaving behind the idea that theology ought to reflect an unambiguous Christian self-understanding. Theological creativity, she argues, is still by large shaped by culture. The problem is that cultural frameworks, especially the Christian, are vague and diverse to the degree that any postliberal and cultural-linguistic position must be receptive of this diversity rather than its identity.

Postliberal Theology and Neo-Barthian Anti-secularism

These transitions within the camp of postliberal theologians shed some preliminary light at the second use of the notion postliberal theology, understood as "a designation of various anti-secularist and postmodern theological programs or movements in the contemporary debate."

It is possible to argue that Tanner's subtle continuation of postliberalism takes leave of some characteristic traits in order to reach for a more ambiguous and inclusive notion of the Christian identity, while Hauerwas' change of postliberal emphasis, from method to cultural

critique, was to become typical for the dominant forms of postliberalism in the 1990s. However, the most prominent postliberals in this sense, besides Hauerwas, were soon to develop more autonomous projects.

One of the most influential postliberals in this more autonomous sense is John Milbank, whose work *Theology and Social Theory* (1990) became formative for a British scholarly movement that later came to be labeled Radical Orthodoxy. Milbank is arguing for a postmodern theology in the radical sense of an upheaval from the normative influence of modernity, enlightenment, and secularity. One of the new perspectives he offers is to understand the secular, and especially the modern secular society, as founded on an exclusion of the theological that ultimately presupposes a theology of its own. From the Christian point of view, Milbank claims that this theology can be viewed both as heretic and pagan, depending on which aspect one approaches. The whole book is an attempt to show how theology can be understood as the social theory of the Christian vision of society, while the social theory of secular Western thought is a nihilistic theology of secular society. The strategy here is to argue that everything is embedded in theological discourse and that Christian theology is the theology that makes best sense in that perspective. The other major task that Milbank sets out to accomplish is to show that the "ontology" of the Christian view of society is based on a principle of love and justice, while the secular society relies on a principle of violence.

In all this, we recognize the element of cultural conflict that was present in Hauerwas. This reflects a continued development of Lindbeck's undeveloped idea of a wholly Christian worldview separated from the secular alternative. Milbank's heavy attack on the secular has been so influential that it is possible to think of the 1990s as the decade where the theological postmodernism of the original postliberal attempts (here mainly exemplified by Lindbeck) came to a more full expression in terms of a full-fledged Christian ontology. This theological postmodernism has resulted in various dialogues with "postliberal" thinkers in other fields, especially

radical philosophers, such as Gilles Deleuze, Slavoj Zizek, Giorgio Agamben, Jean-Luc Marion, Michel De Certeau, etc.

Compared to earlier forms of theological post-modernism, such as Mark C. Taylor's and Charles Winquist's, (but also David Tracy's) proposals in the 1980s, this new reception of radical philosophy is very clear about its robust Christian identity, which means that it is not primarily interested in a self-critique of the Christian discourse. If Mark C Taylor's postmodern theology, especially as presented in his book *Erring*, represented a kind of deconstruction of the Christian standpoint by means of its precarious position in the secular situation, the postliberal form theological post-modernism deconstructs the secular by means of its theological advantage over the secular *qua* theology (Taylor 1984). This also explains why the label "post-secular" has come to the fore in recent years, as an alternative to "postliberal" and "postmodern."

To this form of post-secular continuation of postliberalism we can associate a large number of influential contemporary scholars from various traditions, such as Graham Ward, Sarah Coakley, Catherine Pickstock, Gerhard Loughlin, Paul J. Griffiths, Douglas Harink, Barry Harvey, Phillip Blond, and Merold Westphal, just to mention a few.

Ecclesiological Reduction of Theology?

The North American Scholar Gary Dorrien has entitled one of his books *The Barthian Revolt in Modern Theology* (Dorrien 2000). A quite suitable title for a survey of the progressive theology of the early twentieth century. In a certain sense, it would not be wholly wrong to name the postliberal change in focus that took place in the wake of Frei and Lindbeck as a "Barthian revolt of postmodern theology." If there is one name that stands forth as some kind of common inspiration for many of the radical programs within our broad notion of theological postliberalism, it is Karl Barth, whose theological attack on cultural Christianity shares many traits with contemporary postliberal attacks

on the theological liberalisms of our time, not to mention the critique of secular liberal society at large.

The most striking similarity, apart from the numeral references to Barth himself, is the idea of theology as an autonomous discourse, not in need of any apologetic dialogue or correlation between the secular and the sacred. This means, furthermore, that the notion of the Church and the Christian community comes into the fore as the primary locus of theology. Compared to David Tracy, who singled out three public realms for theology, the Church, the academy, and society at large, postliberals such as Lindbeck and Hauerwas cannot but take the Church to be the primary realm as the only place for any true theological discourse.

To some extent, this is a bit paradoxical since another fundamental trait in postliberal theology has been to pinpoint the social and cultural character of all discourses, which means that there must be many potential theological realms. This trait is most obvious in Milbank's reading of the secular society as imbued with a theology of its own. However, the paradox is resolved as soon as we understand that postliberals, in a typical Barthian manner, argue from the presupposition that there is no neutral ground to evaluate and compare these theologies. There is a necessary conflict between the realm of the Church and other cultural realms. Christian theology is therefore obliged to reflect from within the Christian social sphere.

No doubt, this retrieval of Barthian themes in a postmodern context has been very invigorating for the theological debate at large. The problem, which becomes especially obvious in the context of a dialogue between religion and science, is that this radicalized Christian conception of theology supports a doubtful Christian identity of postmodern academic theology. Theological postliberalism has talked much about the Church as its primary context, but it has very often done so from the academic point of view. In terms of sociology of knowledge, the broad influence of various branches of postliberalism has exercised a pressure toward a renewed identification not only between Christian theology and the

Christian community but also between academic theology and Christian interests.

More polemically put, this means that various postliberal critics of Christendom have used the old structures of Christendom to reinforce the old confessional position of academic theology. This works wholly against the original postliberal intention, according to which the cultural-linguistic perspective opened up for a thorough distinction between the idea of a neutral ground and a meaningful theology. Instead of using this insight in order to make the academy more pluralistic, however, postliberalism has not developed the necessary tools for discriminating sufficiently between its own operations as Church theology and its possible role as academic theology in a pluralist academy.

Thus, it is still mainly the proponents of "liberal" theological perspectives that actively try to engage in dialogues with other religions and with science. In its more fashionable postliberal mode, contemporary academic theology seems to have forgotten various aspects of the task of being related to the academy at large. Not in the sense that postliberal theologians are isolated or hesitant to engage in any dialogue with philosophy and theory, on the contrary. But – with some exceptions, such as Nancey Murphy (Murphy 1997) – theologians with postliberal inclinations are not usually that interested in the religion-science dialogue. One reason is of course that science in their eyes still represents a naïve idea of the preponderance of secular reason. But it might perhaps also be understood as a consequence of the premodern nostalgia that lurks beneath several postliberal visions.

This tendency – this ecclesiological reduction of theology through postliberal influence – has also sharpened the conflict between theology and religious studies. Barthian aspirations has always been difficult to relate to a general scientific study of religion, and it largely remains for postliberal theologians to show how their important perspectivist criticism of the secular can open itself for a more thorough and self-changing dialogue with other perspectives.

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Postmetaphysical Theology

▶ After-Metaphysical Theology

Postmodern A/theology

▶ Religion, Theory of

Postmodern Religious Theory

▶ Religion, Theory of

Postmodern Theology

▶ Religion, Theory of

Postmodernity

▶ After-Metaphysical Theology

Post-Post-Modern Pragmatism

▶ Pragmatism on Religion and Science

Post-Secular Theology

▶ Postliberal Theology

Potential Energy

▶ Energy in Physics

Practical Logic

▶ Logic, Informal

Practical Reasoning

▶ Logic, Informal

Practical Theology

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Related Terms

Academic theology; Religious education; Religious practice

Description

The theological discipline *Practical Theology* deals with the theological research of the field of theory-practice relations within Modernity's religion. Practical theology is a field of various studies, and at the moment there is no shared or undisputed consensus about the internal relationship of the two concepts "theory" and "practice" in this discipline. Practice may be viewed (1) as an expression of theory *or* (2) theory may be looked upon as a superstructure upon practice or (3) both may be interrelated in complex ways.

The subjects of practical theological research may include organized forms of practice within congregational churches and more individualistic expressions of religiosity as well. In concrete, practical theology will cover a broad field of disparate disciplines: Liturgy, homiletics, pastoral care, hymnology, ▶ religious education, catechesis, ▶ sociology of religion, and congregational leadership. These studies may include further subdivisions often determined by the adequate methodologies: cultural studies, medial studies, ritual studies, semiotics, rhetoric, theories of the sociology of religion and general theories of religion. The list is not final but subject to current changes.

Historically, the discipline of practical theology presupposes the rather general theory-practice distinction within academic theology

that came up during the German Enlightenment in the eighteenth century. In earlier times, the notion of "theologia practica" had epitomized the experiential theology of faithful interpretation of the bible contrasted by the "speculative" scholastic theology which, however, sixteenth century Reformers accused for failing the true interests of faith. As an example, Martin Luther says in a famous statement: *Vera theologia est practica et fundamentus eius est Christum* ("True theology is practical, and its fundament is Christ"). This rather indeterminate definition of practical theology was left behind during the development of Protestant tradition in seventeenth, eighteenth, and nineteenth century where new distinctions came up generated by the oscillating theory-practice relations between church leadership, the individualized experiences of faith and theological studies. These upcoming distinctions between an academic interest and the concrete practices of ▶ Christian faith enforced the development of a specific theological discipline, practical theology. In premodern society both religious practice and theological reflection had been part of society's religion although in differing ways. During the period of so-called Orthodoxy "theoretical" theology, i.e., church teaching and doctrine had the undisputable and normative prevalence compared to the role of individual religious experience that was considered secondary and applicative to the doctrinaire teaching. Later on, in the period of *Pietism* this relationship generally was turned upside down: Not *teaching*, (*Lehre*, German) but "Life," (*das Leben*, German) had the dominating primacy. In the early Modernity during *Enlightenment* the first steps were taken to define a sober distinction between the actual religious practice and the academic, critical task of intellectual inquiry. Such a distinction does not generally imply any oppositional separation between "science" and "religion," science being "rational" and religion (and theology) being irrational. At the contrary, Modernity's ▶ academic theology seeks to bridge over this gap trying to synthesize the interests of the faith and the interests of critical inquiry. These two perspectives should not be regarded as exclusive toward each other. So modern theology in its self-critical stand, on the one hand, will develop religion's emancipating potentialities and criticize religion's mythological and suppressing worldviews and – concurrently – on the other hand, theology may acknowledge the complexity end valuable contributions of science. From the days of Enlightenment an onward Protestant religious tradition generally has denied any final division between faith and science. Faith and science may represent certain functionally differentiations of modern culture and society (Luhmann), but they are not exclusive to each other. From now on theology seen as "the theory of religion" will establish its position researching the practice of faith in an academic attitude. The practice of the "enlightened" faith and the academic task finally shares the concern of the realization of human freedom.

Reflecting these conditions the German theologian *Friedrich Schleiermacher* at the beginning of the nineteenth century played a unique historical role in his structuring and clarification of the relations between theology and religious practice. Challenged by modernity's idealistic philosophy and concurrently criticizing religion's inherent "barbaric" tendencies Friedrich Schleiermacher insists that theology as a theoretical endeavor studying the expressions of faith shares the spirit of liberation with modern culture. So, theology still has to take place at the university being part of the academic universe. Concurrently, Schleiermacher in his insisting on the concept of religious freedom finds that religion has to be dealt with in terms of personal and congregational autonomy. The state should neither organize the practical issues of church guidance nor should the state dominate the individual's religiosity. Nonetheless the church needs academic support for the leadership in actual practice. The Christian religious communication circles at differing levels of individual and communal exchange inside church seen as a concrete, positively given religious

community. Therefore the church's leadership needs integrative and academic perspectives in order to clarify and correct its guidance and teaching. Only through theological research and critical reflection at an academic level the church may avoid bare traditionalism and arbitrary decisions in its enhancement of the autonomous life of faith. Consequently, Schleiermacher values theology (including practical theology) as a kind of "positive academic task" related to the congregation of faith. The task is to equip church leaders in their guidance of the church in order to evoke the emancipating experience of autonomous self-consciousness; in so doing theology is a "positive" academic affair compared to the "clean" exclusively "theoretical" sciences like, e.g., philosophy.

To serve this "positive" goal Schleiermacher differentiates the academic theology in three distinct groups of disciplines, which he describes in the famous "tree metaphor." As "root" of the tree serves *the philosophical dimensions* of theology that have to clarify the religious "idea." Thus philosophical theology defends the faith against unjustified assaults and corrects the faith against misuse and unclean conceptualizations. The "trunk" of the theological tree consists of *the historical disciplines* (exegesis of the Hebrew Scriptures and of the New Testament's scriptures; church history and dogmatic, which is a discipline that later on has found its place within the philosophical disciplines), and finally *practical theology* is the "crown of the tree." There is no valuation inherent in the conceptualization of practical theology as the "crown." Practical theology comprehensively deals with the "teaching of the art" (*Kunstlehre*, German) of church leadership. In Schleiermacher's perspective such a correlation between theology and religious practice includes radical academic freedom, the freedom to inquiry, and critique *and* the recognition of the actual church leaders' autonomy at the same time. Through differentiated, complex, and weighted exchange both the academic task and the religious autonomy should meet in a balanced relationship.

Since the days of Schleiermacher in the early nineteenth century the discipline of practical theology in its connection to religious practice has undergone huge methodological and partly also substantial refinements. But still the basic distinction between the academic task of critical research and the commitment to concrete religious practice seems to sustain. Among the most important new perspectives may count that the relationship between the institutional church of early Modernity in Schleiermacher's time and modern culture has changed dramatically. Whereas religion used to be embedded as part of a firm church institution dominating the field of religious expressions nowadays religiosity often exists with just casual and loose formal connections to specific religious congregations and institutions. In such case practical theology cannot keep up a consciousness of being the "teaching of the art" of church leadership directed toward a specific congregation. Rather, practical theology nowadays has to reconsider its general task of studying theory-practice relations in a way that connects to a much broader field of modernity's recent religious movements. Such may include the study of religion in the new medial situation with internet and mobile phone.

Self-identification and Characteristics

(a) Practical Theology (at least in the European context) generally identifies itself as partaking of the academic universe. Hereby it is not excluded but rather included that there may be very differing opinions of the specific goals of concrete fields of research.

1. Part of the research will be empirical, e.g., practical studies may research the sociology of the actual life and faith practice of a concrete parish or a religious community. Practical theology in this case seems quite "secular" and "scientific" offering a theoretical reconstruction of the practice of faith in liturgy, worship, and congregational life. However, most practical theologians will not find their end goal in a mere statistical or empirical research.

2. Rather theologians will insist on the integrative and hermeneutical dimensions of their work. Empirical data, liturgy, and other practices of faith may express culturally given symbolic representations. Such representations will call for further and more substantial interpretation. Practical theologians will often insist that the specific issue at stake in a concrete research has not yet been subject to any adequate description unless a comprehensive interpretation respecting the material's own complexity has been undertaken. In opposition to mere statistical, analytical, or empirical research and in opposition to reductive methods practical theology generally wants to insist on the theological dimensions of practice by emphasizing such a comprehensive, interpretational task.

3. In a final step spokesmen of practical theology may want to bring their research into an *active response* to concrete practices of faith that are actually taking place. By theology's transgressing a mere *researching* stand in its relation to practice and in its turning to an actively *responding* to and *restructuring* of practice, however, practical theology may get close to being itself part of religious practice. Actually, practical theology may take the position of an advisor's role in making suggestions for adequate solutions to concrete issues concerning the practice of church and practices of faith. These may for example touch the concrete organization of the religious community, liturgical changes, and methods for pastoral care.

Despite such interactions between theory, research, and practice, generally the practitioners of the discipline of practical theology will deny any direct "religious" dimension of their work. Referring to their methodological and systematic framework they will insist on the academic, nonreligious standing of their endeavour.

Conclusively, in the sense of an ordinary science only a small part of practical theology strictly may be named "science"; so it is at least if by "science" is meant empirical or physical research. Nonetheless, in a broader, hermeneutical, social, and interpretational sense practical theology like other philosophical, social, and humanistic disciplines will share the stand of a hermeneutical method of research being itself systematically and methodologically disciplined in its dealing with complex and irreducible themes of symbolic representation. In this point practical theology takes a position not unlike other hermeneutical methods and disciplines, e.g., literary critics, psychology, and theatricality. Further, certain levels of *interaction* between actual practices of faith and theological research may evolve. However, the interaction between theological research and actual practices of faith will not imply that practical theology itself should be recognized as "religious."

Relevance to Science and Religion

Practical theology deals with actual religious practices which are social, ritualistic, and interpretative and do not present perspectives of its own concerning specific issues, e.g., the "Science and Religion" theme.

Sources of Authority

The methodological clarification made by Friedrich Schleiermacher in his *Kurze Darstellung des theologischen Studiums* from 1811, [1830[2]] might be said to be a main text. Nowadays, we may find a very broad and differentiated field books and articles; cf. Christian Gretlein and Michael Meyer-Blanck (Eds.). (1999). *Geschichte der Praktischen Theologie. Dargestellt anhand ihrer Klassiker*. Leipzig.

Ethical Principles

Practical theology is undertaken in responsibility to the highest general academic standards for research and publication.

Key Values

Practical theology does not represent any other specific values than the general values of academic research and publication.

Conceptualization

As a field of research concerning concrete inter-relations of theory and ▶ religious practice, the discipline itself does not represent specific theological or academic points of view besides the general academic standards. So the discipline does not represent specific valuations or inclinations concerning disputed metaphysical or scientific issues, e.g., about nature, human being, life and death, reality, knowledge, truth, perception, time, consciousness, rationality, and mystery.

Cross-References

- ▶ Freedom
- ▶ Secularization
- ▶ Systematic Theology
- ▶ Theological Anthropology

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Pragmatism (Theological Interpretations)

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Description

Pragmatism is originally an American philosophical movement with vague boundaries rather than a tradition. The movement emerged in the late nineteenth century, flourished at the beginning of the twentieth, and has reappeared strongly at the end of the twentieth and the beginning of the twenty-first century as current pragmatism. Academic theologians have been inspired and challenged to respond to the thrust of pragmatism and develop theological interpretations of pragmatic thought especially since the 1960s. This has mainly been an American movement with its impact on Protestant theology during the last roughly 50 years when the dominance has changed from German to American. Today much of what is named constructive theology, in the Protestant world, is informed by pragmatic reasoning although this identification is rarely used.

Self-Identification

Theological pragmatism is neither a religion nor a science but a movement and methodical perspective in the history of ideas. It proceeds from the liberal tradition of thought, emphasizing the liberation from anything that dictates or constrains an independent inquiry. In religion and science-discussions, theological pragmatism has promoted ways of thinking that does not strictly follow the authority of a religious tradition or the rationality of any single scientific discipline. Instead conceptions have been developed of what is meaningful and true in terms of what provides orientation for human life and promotes coherence between religious practice and common intellectual principles.

Characteristics

It discards any foundationalist attempt to attain indubitable knowledge as well as it rejects a reduction of what can be regarded as true only to empirical test in positivist terms. A leading idea is that what is true is what is meaningful. From the perspective of theological pragmatism this can be spelled out in terms of what leads to human flourishing and advances humane values. Theology should, from a pragmatic point of view, serve the cause of religion for an orientation in life. And religion should be sensitive to results from scientific investigation and theological reflection and recognize the limits of religious claims.

Relevance to Science and Religion

Theological pragmatism does not give any superiority to religious claims, but rights to them as significant perspectives of the world, with the possibility and demand to be judged by their fruits and not their roots. Because it stands critical against both religious assertions on the basis of belief as well as scientific positions grounded in restricted disciplinary investigations, theological pragmatism has a distinctive voice trying to bridge between religion and science. And at the same time it serves as a two-ways critique of both religion and science.

Sources of Authority

There is no given authority from a set beginning, but the authorization comes in the end, with the result and effect for human life and a humane world. The means for this is a rational analysis of the circumstances in which we live and the creative efforts to improve these by the critical and constructive potential of religion and theology. Building on leading insights from philosophical pragmatism, current theological pragmatism has learned and benefited from feminist influences and contextual and political theologies, delivering important, although not authoritative, methodical perspectives.

Ethical Principles

To honor the independent inquiry of the states of affairs in the human world from a perspective of theological reflection, using the resources of religious tradition without subscribing to any given authority except what advances the fulfillment of humane values.

Key Values

To provide adequate orientation for human life and promote instrumental values for a social context which serves human flourishing.

Conceptualization

Nature/World
Theological pragmatism learns from naturalism to focus on the world we know without reducing reality to the empirical world. What is the natural and what is the social world cannot be clearly divided because what is regarded as natural givens and social constructs are interwoven.

Human Being
Humans have a unique capacity and responsibility and need to focus on the results of her behavior. Instead of being led by dogmatic assumptions or a restricted perspective, the objective should be to cultivate what is distinctive human and promote humane values.

Life and Death
At the core of theological pragmatism there is an ambition to argue for and encourage all that enhances life, particularly human life. There is very little occupation with the notion of everlasting life since the focus is on this very life in the world and how we live it. Death is the limit beyond which we cannot tell.

Reality
Theological pragmatism focuses on the empirical world without reducing reality only to what can

be empirically tested. There is openness for what can be regarded as mystery and hence not explainable.

Knowledge

Knowledge has a great instrumental value in building a more humane world. Theological pragmatism proceeds from a principle which says we will never be sure about what is the final truth or absolute knowledge.

Truth

Truth is conceived as the result of a rational inquiry judged by instrumental values, and not the property of things "out there." Truth is replaced by meaning as the decisive arbiter in theological pragmatism. But truth is not rejected as a valid concept, rather reconsidered in light of instrumental values and regarded as always in the making rather than contained in any set of conceptions.

Perception

In theological pragmatism, there is a focus on the empirical world, i.e. what can be perceived. But there is also generally openness for the possibility to conceive, and sometimes also perceive, dimensions of reality which go beyond the strictly empirical sensations.

Time

With time follows experience, and with experience learning that adds to human views. Not always in good directions, but in total to a development in many respects for humanity. This main view is in the background of the positive approach of theological pragmatism in general to the ordinary flow of time and the evolution that follows. This is to be said without claiming any blind optimism about a linear development.

Consciousness

The human consciousness, bound to bodily existence, is unique as far is known. This leads theological pragmatists to concentrate on human capacities without ruling out, or affirming, any other kind of consciousness in reality.

Rationality/Reason

An underlying aim of theological pragmatism is to build, critically and constructively, on religious tradition, and to present religion in a secular world so it can be understood, and argued for, in rational and reasonable ways. By this procedure, religion and theology can also contribute to a contemporary rationality and reason that runs the danger of being reductive.

Mystery

That which is enigmatic lies in the domain of sciences to explore and eventually explain by means of disciplinary investigations. But what goes beyond the explainable and is regarded as mystery is often the point of departure as well as the point of arrival for religious speculations and theological reflections. And theological pragmatism defends the rationale in dealing with mystery, but tries also to build bridges between these issues and everyday life.

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Pragmatism on Religion and Science

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Related Terms

New pragmatism; Post-post-modern pragmatism

Pragmatism's Philosophical Outlook

Pragmatism emerged as a distinct philosophical movement during the second half of the nineteenth century, and its "classical" era stretches well into the twentieth century, when it gradually blended with, and was superseded by, analytical and positivistic approaches. Its leading exponents were Charles Sanders Peirce (1839–1914), William James (1842–1910), and John Dewey (1859–1952). Other notable figures include George Herbert Mead (1864–1931), Clarence Irving Lewis (1883–1964), F. C. S. Schiller (1864–1937), and Sidney Hook (1902–1989). During the 1970s and 1980s, pragmatism reemerged as a distinct philosophical movement, mainly through the work of Richard Rorty (1931–2007) and Hilary Putnam (b. 1926). This entry concentrates entirely on what can reasonably be considered the founding figures of classical pragmatism, namely, Peirce, James, and Dewey (for more on contemporary pragmatism, see the entry on ▶ Neopragmatism).

Pragmatism's philosophical outlook is thoroughly naturalistic and transactional in the sense that human life and human practices are understood to have emerged and developed through an immense number of transactions with the environment. Although there are significant differences between everyday routine actions and abstract scientific reasoning, there is still continuity in all human behavior in the sense that it has evolved in response to problems in our interaction with the environment. Accordingly, pragmatists vigorously oppose dualistic analyses of human mind and

thought, such as René Descartes' (1596–1650) division between thinking and extended substance (*res cogitans* and *res extensa*). They also oppose mental analyses of belief solely in terms of inner states. In the spirit of Alexander Bain (1818–1903), beliefs are defined as habits of action – as that upon which we are prepared to act. Accordingly, genuine doubt – as opposed to Cartesian "paper doubt" – is a highly practical affair, an irritating uncertainty about how to act under specific circumstances.

Pragmatists understand human interaction with the environment to move along the axis equilibrium, loss of equilibrium, doubt, inquiry, resolution of doubt, and restoration of equilibrium. When there is equilibrium between organism (for instance, a human being) and environment, life is mainly directed by instincts and habit. However, problems frequently arise when established habits and patterns of action have unexpected and frustrating results. This gives rise to doubt, which is both frustrating and threatening. The human response to doubt is *inquiry*, where the elements of the situation are examined with the purpose of formulating a problem that directs inquiry. Once a problem is specified, we can develop hypotheses about how to resolve the problem and then put the different hypotheses to the test. As soon as we find a satisfactory solution, doubt is laid to rest, and the process of inquiry comes to an end. The new equilibrium contains a wider repertoire of habits and ways of responding and is, in that sense, richer than the previously upset equilibrium.

The overall pragmatic understanding of both science and religion is in line with its general naturalistic approach. In this context, it deserves mention that the views of classical pragmatists are clearly influenced by rather liberal versions of Protestant Christianity, which dominated the educated classes of the American northeast, where Peirce, James, and Dewey spent most of their lives. Hence, they lay much emphasis on the moral and existential functions of faith and downplay the role of dogma and religious authorities.

Science and religion can both be understood and analyzed as elements of the repertoire we draw on in interaction with the environment

to find satisfactory solutions to problematic situations. To use a terminology that the classical pragmatists did not use themselves, we can initially say that science and religion are different human *practices* (or rather different sets of practices) that enable us to interact more smoothly and fruitfully with the environment. Furthermore, adequate understanding of human practices requires an adequate general understanding of human practices, a pragmatic ▶ *philosophical anthropology*, which functions as a kind of interpretative scheme in the examination of different human phenomena.

Despite some differences in the classical pragmatists' approaches to both science and religion, we can say that, in general, pragmatism conceives of the relation between science and religion in terms of a division of labor, where religion is concerned with the existential and moral elements of life, while science is the systematic examination of the nature of the forces which govern the physical universe. Considered as *ideal types*, the two practices complement one another and can coexist without conflict, provided that we have an adequate understanding of both.

Peirce: Scientific Reasoning and the Reality of God

Peirce was a brilliant logician, scientist, and mathematician, but he never succeeded in obtaining any stable academic position and, thus, spent much of his life in relative poverty. His writings only gained a larger audience when seven volumes were compiled and edited by Harvard University Press between 1931 and 1958.

Peirce himself claims that the fundamental ideas of pragmatism took form in a discussion club in Cambridge, Massachusetts, during the 1870s, "The Metaphysical Club" with Peirce and James among the organizers. He developed some of these ideas in two articles named "How to Make Our Ideas Clear" (1877) and "The Fixation of Belief" (1878). Here, Peirce suggests the pragmatic method as a method to clarify the meaning of statements such as "diamonds are

hard." According to Peirce, such statements can be clarified by specifying what we (empirically or experientially) expect would happen in different situations involving diamonds, for instance, that we can use diamonds to scratch surfaces made of other materials, that a diamond would not be crushed if we hit it with a hammer, and so on. The conjunction of all these expectations constitutes the meaning of the statement "diamonds are hard." Peirce sums up his thought in what later came to be called "the pragmatic maxim":

> Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object. (Peirce 1935, § 402)

The pragmatic method is not only useful to clarify meaning; it can also help us resolve certain pointless disputes in philosophy and theology. When confronted with a controversy like that between the doctrine of transubstantiation and symbolic understandings of the Eucharist, we can ask the question: Are there any experiential effects that one side predicts and the other denies? If yes, we have a method to resolve the dispute. If no, the controversy turns out to be a pseudodebate, a mere play with words, because the alternatives actually *mean* the same.

Peirce's view of the relation between religion and science differs depending on whether religion is seen mainly as a practical affair, where sentiment and instinct are more reliable than reason, or a theoretical affair, where it becomes much closer related to scientific inquiry. In practical matters, conservatism is the first rule since we should trust the vast fund of human experience through the ages to be basically right. There is, accordingly, a stark contrast between the different attitudes appropriate in practical and theoretical affairs. In science, which is the paradigm of theoretical reasoning, a scientist should be prepared to "drop the whole cartload of his beliefs, the moment experience is against them" (Peirce 1931, § 55). Such tentative commitments are, according to Peirce, utterly inappropriate in practical affairs. We should not, for instance, only tentatively accept the universal ban on incest, because we should expect that social

habits that have developed over a long period of time have survival value and contain important lessons. Nonetheless, as the example shows, both science and religion are *communal* practices, where well-founded views can only be attained within a community large enough to root out "the vagaries of me and you."

For Peirce, scientific inquiry – like any inquiry – is triggered by doubt and driven by a desire to replace doubt with belief. He famously distinguished three phases of scientific inquiry: (1) *abduction* (the tentative formulation of a theory which, if true, would explain the problem), (2) *deduction* (the deduction of some prediction which the hypothesis makes that is possible to verify or falsify experimentally), and (3) *induction* (the process where we gather data to determine whether the predictions hold true or not). Each phase contains different kinds of challenges and modes of reasoning.

Science is never the root of religion: religious commitment is born out of man's "religious sensibility," a sensibility which is not primarily rooted in theoretical reasoning (Peirce 1936, § 433). However, theoretical reasoning can serve to give a religious sensibility more definite shape. Here, the first phase of inquiry is the most relevant. Abduction involves giving imagination free play, a process that eventually results in the formulation of hypotheses. Applied to the cosmos as a whole, Peirce holds that free play of the imagination leads any sane man to the hypothesis of God, but not so much in terms of a teleological argument for God's existence based on traces of benevolent design (like in teleological arguments for God's existence), but rather in terms of the existence of that correlation between thought/reasoning and reality that makes inquiry meaningful. It is the very possibility of science, rather than any specific scientific results, which leads any sane man towards the hypothesis of God, and the reassurance to be had from this theoretical insight is mainly optimism regarding the future prospects of inquiry. This, Peirce claims, is an often neglected argument for the reality of God, and he adds that given its independence of specific scientific results, a community of religious believers can fully

resolve that "any change that (scientific) knowledge can work in (its) faith can only affect its expression, but not the deep mystery expressed" (Peirce 1936, § 432). Even when religion and science draw on the same type of reasoning, adequate understanding of both types of practices indicates that they are not in conflict.

James: The Scientific Study of Religion and Its Limits

If Peirce stresses the importance of community in most aspects of life, James' approach to religion is much more individualistic. James was convinced that religion plays its most important role in the experiences of subjects struggling to find existential meaning in a universe that often seems indifferent to their endeavors. As such, religious beliefs differ significantly from scientific hypotheses, and the criteria for how to make choices in science and religion must look rather different.

James spent most of his life at Harvard University and played a crucial role in the development of psychology as a scientific discipline with the publication of *The Principles of Psychology* in 1890. Here, James advocates a naturalistic or, as he calls it, "positivistic" approach to psychological phenomena. He writes in the preface:

> This book, assuming that thoughts and feelings exist and are vehicles of knowledge, thereupon contends that psychology, when it has ascertained the empirical correlation of the various sorts of thought or feeling with definite conditions of the brain, can go no farther – can go no farther, that is, as a natural science. (James 1890 p. 6)

If it does, it becomes metaphysics. This theme is echoed in his Gifford lectures of 1901–1902, *The Varieties of Religious Experience*. Here, James distinguishes between *existential* and *spiritual judgments*. Psychology can make existential judgments about religious experiences, that is, study their origins in terms of psychological or somatic causes. However, psychology can never determine the *value* of a religious experience in terms of a spiritual judgment. Consequently, he attacks "medical materialism," the reductionist view according to which science proves that

religious experiences are nothing but somatic or psychological states of the experiencing subject, as metaphysical rather than scientific. Science can never pass spiritual judgments on religion or religious experience, not even in extreme cases such as that of the founder of the Quaker movement, George Fox (1624–1691), whom James himself characterizes as "a psychopath or *dé traqué* of the deepest dye" (James 1902, p. 7).

Spiritual judgments have nothing to do with the causes of experiences, but are "based on our own immediate feeling primarily; and secondarily on what we can ascertain of their experiential relations to our moral needs and to the rest of what we hold true" (James 1902, p. 18).

Here, we encounter a distinctly Jamesian theme: there is a territory of "overbeliefs," different philosophical, existential, and religious standpoints which shape our outlook on life and which science can neither verify nor falsify. We are, according to James, rationally entitled to choose overbeliefs on pragmatic grounds, hence preferring those we find satisfactory because they appeal to our emotional and existential experiences. Most well known is probably James' defense of "the will to believe doctrine": "Our passionate nature not only lawfully may, but must, decide an option between propositions whenever it is a genuine option that cannot by its nature be decided on intellectual grounds" (James 1897, p. 11). The right to believe that James refers to applies only to the choices that are *live* (more than one alternative appeals to us), *momentous* (choice is significant and definitive), and *forced* (refraining from choice is practically indistinguishable from choosing one side, like in the case of Christianity versus agnosticism). With this doctrine, he attacks thinkers such as W. K. Clifford (1845–1879) who claimed that "[i]t is wrong always, everywhere, and for anyone, to believe anything upon insufficient evidence" (Clifford 2001, p. 85). That attitude is completely inappropriate in the spheres of life where conclusive evidence is never forthcoming, and a refusal to make up one's mind actually means choosing disbelief over belief.

In *Pragmatism* (1907), the defense of the right to believe on pragmatic grounds is restated; however, here the difference between the scientific and the religious setting is downplayed. Scientific theories are (just as much as overbeliefs) beliefs with definite consequences, and as such, their truth value is determined by whether or not they work well when put to use in prediction and application. Pragmatic criteria are thus not limited to the realm of overbeliefs but in use everywhere, although they look different depending on context. However, James qualifies his account by adding that for a belief to be true, it must function well in the long run and harmonize with other beliefs we hold true: "the greatest enemy of any one of our truths may be the rest of our truths" (James 1907, p. 31).

The so-called pragmatic theory of truth is one of the most controversial and debated elements of James' philosophy. Most philosophers agree that there is a logical difference between what is true and what has good consequences and that even if belief in the existence of God has good consequences, even in the long run, it may turn out to be false. Still, it seems that this is exactly what James denies when he claims that a satisfactory belief is thereby rendered true. There is not enough space to cover the extensive general discussion on the relation between pragmatic criteria and truth here. As regards religion, whether this objection is devastating or not depends – as critics such as Bertrand Russell (1872–1970) are well aware – on what you mean by the concept "God" (e.g., Russell 1945). Near the end of *The Varieties of Religious Experience*, James supplies a pragmatic analysis of "God" which he opposes to more traditional philosophical definitions. Speaking of "the unseen region" beyond our own consciousness, he writes the following:

> Yet the unseen region in question is not merely ideal. For it produces effects in this world. When we commune with it, work is actually done upon our finite personality, for we are turned into new men, and consequences in the way of conduct follow in the natural world upon our regenerative change. But that which produces effects within another reality must be termed a reality itself, so I feel as if we had no philosophic excuse for calling the unseen or mystical world unreal. ... I only translate into schematic language what I may call

the instinctive belief of mankind: God is real since he produces real effects. (James 1902, 516f)

A real, as opposed to illusory, God is thus a God which performs a transforming function in believers' inner lives rather than the *ens realissimum* of classical theology. It is the former rather than the latter kind of God towards which pragmatic arguments point, and this also means that although religion can be studied scientifically to a limit, the two practices are not in conflict.

Dewey: Religion, Science, and the Quest for Certainty

Dewey, too, was attracted to the idea of a division of labor between science and religion, but he was convinced that such a division of labor could only be effected if we reconstruct our understanding of both science and religion. We need to break the hold of what he called the "spectator theory of knowledge," a view which construes knowledge acquisition as a passive process, where the object of knowledge remains unaffected throughout, and the paradigm metaphor for knowledge acquisition is that of seeing. A supreme intellectual challenge is that the spectator theory of knowledge fails to give any coherent account of the most successful forms of knowledge acquisition that we know of – mainly scientific inquiry. As a consequence, Dewey holds, "[c]onditions and forces that dominate in actual fact the modern world have not attained any coherent intellectual expression of themselves" (Dewey 1984, p. 62).

Dewey was immensely productive throughout his long career, and apart from philosophy, he also published extensively on psychology and pedagogy. In his philosophy, which he often labels "instrumentalist" rather than "pragmatic," he attempts to spell out the intellectual consequences of an adequate understanding of scientific inquiry. Here, I will only go into these ideas to the extent that they are relevant for understanding the relation between science and religion.

Dewey suggests that rather than distrusting scientific inquiry, we should dismiss the metaphysical presuppositions of the spectator theory of knowledge and develop new accounts of knowledge acquisition that offer a more coherent articulation of the transactional nature of scientific inquiry. Such an account should acknowledge that knowledge acquisition is an active process and that the objects of knowledge are constituted *as* objects of knowledge through the processes by which they become known. Scientific theories extend our capacities of prediction and control, but are not to be conceived of as a corrective of our ordinary conception of the environment.

Religion is of special importance here since it has become so closely allied to the spectator theory of knowledge, primarily in its conception of God. In *A Common Faith* (1934), Dewey argues that the alliance is in fact contingent and historical and, hence, possible to dissolve.

Dewey refuses to see religious experiences as set apart by the object which is experienced. Instead, he holds that religious experiences are set apart by a particular quality involving the relation between ideal and actual states of human life. Dewey here distinguishes between "religion" and "the religious." Religion is the doctrinal and institutional elements of religion. The religious is a quality of experience which is present whenever current states of affairs are improved and brought closer to what we consider *ideal* states of affairs. Such experiences as religious experiences are possible because human beings are capable of forming ideals *and* pursuing them intelligently. The religious thus exists prior to religion, and often enough, religion hampers the religious, for instance, by linking the religious to intellectually and morally dubious claims. Dewey's proposed solution is to liberate the religious by reshaping religion:

> It is admitted that the objects of religion are ideal in contrast with our present state. What would be lost if it were also admitted that they have authoritative claim upon conduct just because they are ideal? The assumption that these objects of religion exist already in some realm of Being seems to add

nothing to their force, while it weakens their claim over us as ideals, in so far as it bases that claim upon matters that are intellectually dubious. (Dewey 1934, p. 41)

Dewey hence rejects the traditional theistic understanding of God as "a particular Being" and claims that to liberate the religious impulse, we should rather understand God as "the ideal ends that one acknowledges as having authority over … volition and emotion, the values to which one is supremely devoted" (Dewey 1934, p. 42).

A shift in our modes of thinking about both science and religion makes possible a reconciliation of the two practices along the lines of a division of labor. It is tempting to understand this division along the lines of the fact-value distinction, between what is the case and what we think should be the case. This is correct as far as it goes, but it is important to remember that Dewey rejects the classical fact-value distinction because of its dependence on a spectator theory of knowledge. Inquiries are instituted where there is a frustrating absence of equilibrium with the environment, so any "factual" inquiry actually presupposes certain value judgments (such as that something is problematic about present conditions). Furthermore, values are not merely subjective whims, but are accountable both to what is possible and what can be shown to function well all things considered. Inquiry into ideals thus requires the operation of intelligence just as much as inquiry into the factual, and there is just as little space for appeals to revealed truths or supernatural sources of knowledge.

Summary

In sum, we can say that although the classical pragmatists have somewhat different views of both science and religion, there is still basic agreement among them on two points of central importance for our view of (the relation of) science and religion: (1) that a pragmatic philosophical anthropology is an important interpretative framework for an adequate understanding of both kinds of practices *as* human practices and (2) that with the help of (1), we can describe the relation between science and religion in terms of a division of labor, which means that they, at least as ideal types, are not in conflict. Neither do they compete with one another.

The idea of a division of labor implies that science and religion perform different functions in human life, and although the function of religion is described in somewhat different terms by Peirce, James, and Dewey, they can still be said to agree that religion is mainly concerned with the ideal and moral aspects of life, both individually and communally. As already mentioned, this view is in line with much liberal Protestant thought at the time, but it can also be considered a serious attempt to show how two of the most significant practices in human life can be reconciled despite a long history of conflict and mutual distrust.

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Pratītya samutpāda (Sanskrit)

▶ Dependent Arising

Predestination

▶ Causality in Physics

Predictability

▶ Causality in Physics

Prediction

▶ Astrology

Prevention Psychotherapy

▶ Counseling Psychology USA/Europe

Primatology

▶ Biology of Religion

Principle of Relativity

▶ Relativity

Prion

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An infectious agent that is composed only of proteins. Prions cause a number of diseases, including "mad cow disease" or bovine spongiform encephalopathy (in cattle – transmissible in some cases to humans), scrapie (in sheep), and Creutzfeldt-Jakob disease (in humans). They are thought to cause infections and multiply by causing similar normal host proteins to convert into their abnormally structured form via refolding.

Prions and Memory

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Prions are proteins that can flip between two different conformations. When they adopt one of the conformations, they can reproduce by converting other proteins into copies of themselves. Such replicating prions are harmful if "offbeat" prion domains attach to one another to clumps. This state causes them to gain a toxic function leading to neurological disorders like "Bovine Spongiform Encephalopathy" (BSE) in cattle and "variant Creutzfeldt-Jakob Disease" (vCJD) in humans.

Searching for the means that stabilize long-term memory in *Aplysia*, Eric Kandel and coworkers focused on replicating prions that lack such "offbeat" domains. They identified beneficial prion-like properties in a neuronal member of the CPEB family (cytoplasmic polyadenylation element binding protein) that

regulates mRNA translation. It is hypothesized that conversion of CPEB to a self-perpetuating prion-like state in stimulated synapses helps to sustain the perpetual protein synthesis necessary to maintain long-term synaptic changes.

Prismatic Clock

▶ Prismatic Theology

Prismatic Language

▶ Prismatic Theology

Prismatic Theology

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Related Terms

Judeo-Christian tradition; Prismatic clock; Prismatic language; Theories of light and color

Description

▶ Prismatic Theology is a theological perspective within the Judeo-Christian tradition based upon a method of study that combines the science of light with the interpretation of Scripture. ▶ Prismatic Theology is therefore defined as the study of sacred text through the science of light, light energy, color, and optics. By applying the science of light to the study of biblical text, ▶ Prismatic Theology creates a bond between science and religion. The following information offers a brief overview of the prismatic method of study and its origins.

▶ Prismatic Theology begins with the understanding that light, color, and image was the oldest and therefore *primary* form of spiritual communication between God and the human soul/spirit/mind/heart. From this viewpoint, it follows that the development of human languages, oral and written, became a *secondary* form of spiritual communication between God and the human soul/spirit/mind/heart during the unfolding of human history. Hence, the sacred texts of the Judeo-Christian tradition are perceived to be *secondary* forms of communication. This perspective does not diminish the importance of biblical text or the sacred quality of the text. It simply asserts that *a primary* form of spiritual communication not only pre-dated the development of sacred text but may have influenced the writing and recording of sacred story.

Thus, the prismatic theologian critically searches biblical text for evidence of the *primary* communication through light, color, and image which may be entwined within or obscured by the *secondary* form of communication through written language. Genesis 1 provides ample evidence of the *primary* form of communication embedded within sacred text because the text itself follows the color order of the visible spectrum of light. Therefore Genesis 1, as recorded in the Hebrew Bible, forms the foundation for the prismatic method of study.

The ancient writers of Genesis 1 did not need to understand the science of light in order to employ the visible spectrum as a framework for the story. The visible spectrum of light was easily observed in the rainbow and other natural prisms. Although the origin of Genesis 1 is arguably dated to either sixth or seventh century B.C.E., (Friedman 2003) employing the visible spectrum as a storytelling method insured that this text would be supported by the *future* of the science of light (Fig. 1).

The prismatic perspective of Genesis 1 features a color wheel depicting six color families in the visible spectrum beginning with violet light in the 400 nm range and ending with red light in the 700 nm range of light energy. When violet light merges with red light, the color purple becomes visible, but this color has no measurable light energy of its own (Mayer). Thus, the Genesis account of Creation employs a total of seven color families as the story unfolds – violet;

Prismatic Theology,
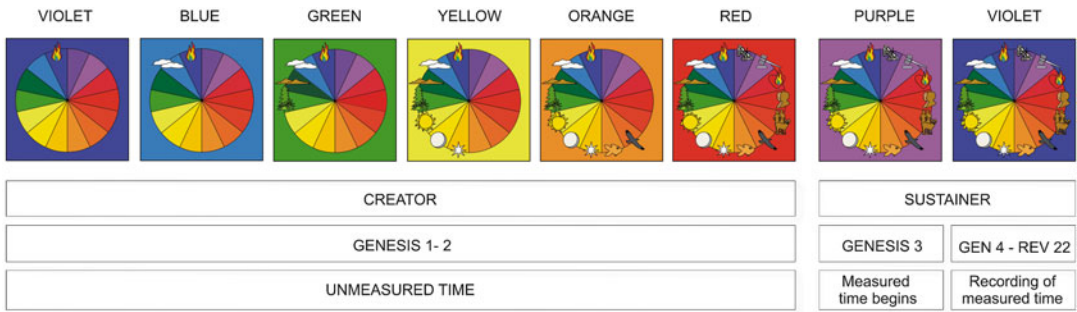**Fig. 1** The prismatic perspective of Genesis 1
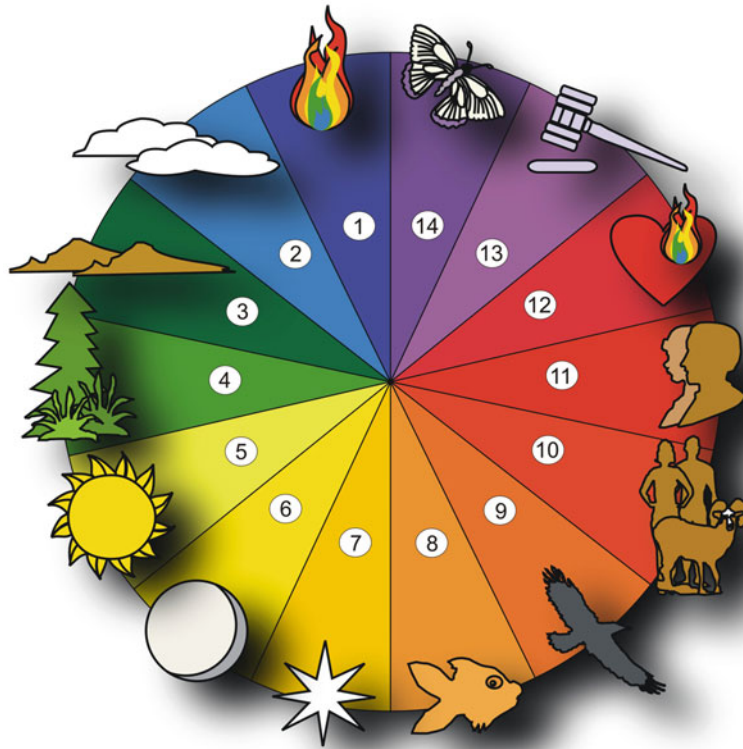
blue; green; yellow; orange; red; and purple (Newton 1952). Moving in a counter clockwise direction, the images around the rim of the color wheel are suggestive of drawings representing 14 aspects of the Genesis account of Creation – light; sky; dry land; vegetation; greater light; lesser light; stars; sea creatures; birds; animal kingdom; image of God; likeness of God; the gift of dominion; and the gift of freewill (Barker 1985a). It is with this foundational tool in hand that ▶ Prismatic Theology is birthed. The resulting method of biblical study offers two subjects for consideration: A ▶ Prismatic Clock which depicts the unfolding of biblical history and a ▶ Prismatic Language that returns the human intellect to its primary language of light, color, and image.

The Prismatic Clock

In addition to a colorful depiction of the Genesis account of Creation, ▶ Prismatic Theology offers

the reader of Scripture a prismatic perspective of time. Beginning with the phrase, "*And there was evening and there was morning*," Gen 1:5b, the passage of time on each Creation "Day" is seen as one symbolic journey around the color wheel rather than one literal 24-h revolution of the earth on its axis (Fig. 2).

The phrase marks the conceptual hours of "Dawn" and "Sundown." The conceptual hours of "Noon" and "Midnight" are then deduced along with four conceptual seasons which correspond to the light energies and colors represented on the wheel. Gen 1: 4-5a indicates that light was separated from darkness. The light was called "Day" and the darkness was called "Night." Thus, it is important to note that the color wheel allowed the storytellers to include nighttime hours that are full of daylight. By employing the visible spectrum of light as a framework for Genesis 1, the storytellers could depict the nighttime as conceptual hours that are separated from the darkness (Fig. 3).

Prismatic Theology, Fig. 2 The passage of conceptual time on each creation day
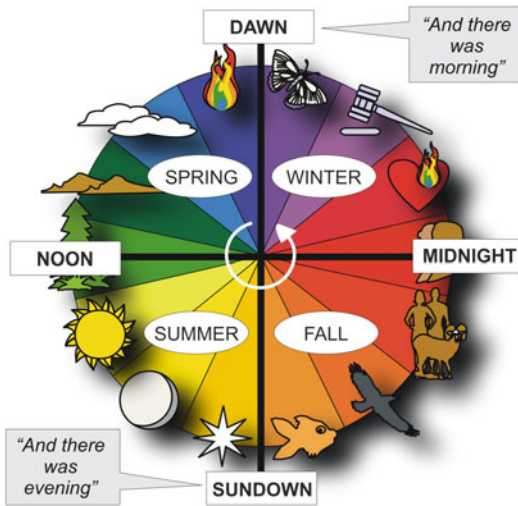
Prismatic Theology, Fig. 3 The eight-day perspective

The prismatic perspective of Genesis 1–3 features an 8-Day perspective of the passage of *time* rather than the traditional 6-Day perspective of the *creation* process. The 8-Day perspective of time acknowledges God as both Creator and Sustainer of all that was, is now, and is to come. Hence, ▶ Prismatic Theology supports a timekeeping purpose for Genesis 1. Beginning with the creation of light on the first "Day," the prismatic perspective transports the reader of Scripture out of *unmeasured* time during the creative process into *measured* time by the end of the seventh or Sabbath "Day." It is a journey through the visible spectrum of light.

It is a well documented fact that the measurement of time began with lunar observations thousands of years before the birth of sacred text. The recording of measured time began during the third millennium, B.C.E (NIST 1995). When viewed in prismatic form, the opening narratives of Genesis provide a time clue, Gen 3: 8, that marks the end of the Sabbath "Day" and the simultaneous dawn of an Eighth "Day" on which 6,000+ years of recorded biblical history unfolds, bringing us to the present time (Fig. 4).

It is impossible to know how the ancient storytellers tried to measure the passage of time on the Eighth Day; however, one mathematical possibility stands out in hindsight as a reasonable calculation. When each division on the Eighth Day Clock is assigned a 600-year measurement of time, 4 seasons of 2,100 years emerge. Each season depicts a *"time, times and half a time"* measurement, Dan 12:7; Rev 12:14 (Barker 1985b). Simultaneously, the 4 seasons of 2,100 years each can also be divided into 700-year increments of time.

How, when, why, or if this timekeeping method was successfully used in ancient history will forever be unknown. One theory suggests that the ▶ Prismatic Clock may have originated within a culture of visual and oral storytellers who chose to adopt the colorful timekeeping method as an alternative to the worship of sun gods, sun disks, and their shadows of darkness during first and second millennium B.C.E (Rohr 1970). Presently, the only way to resurrect this valuable timekeeping method is through a prismatic reading of Genesis 1 (Fig. 5).

Because the whole of biblical history unfolds during the passage of time on the Eighth Day Clock, the clock becomes a tool with which

Prismatic Theology, Fig. 4 The passage of measured time on the eighth day

a prismatic study of Scripture becomes possible. With the aid of the Clock, the prismatic theologian can draw conclusions based on the major aspects of the Hebrew Bible accurately corresponding to the images on the left side of the color wheel. This is either accidental or divinely prescribed.

Likewise, the prismatic theologian can draw conclusions based on the major aspects of the Greek New Testament, the unfolding of biblical prophecy, and the corresponding images on the right side of the wheel. Again, this is either accidental or divinely prescribed. Presently, it could be said that humanity is approaching the conceptual hour of "Midnight" on the Eighth "Day" from the prismatic perspective. With 6,000 years of recorded biblical history and more than 2,000 years of projected prophecy, the ▶ Prismatic Clock fulfills the words written in Isaiah 46:10: *"I make known the end from the beginning, from ancient times what is still to come."* In the literal
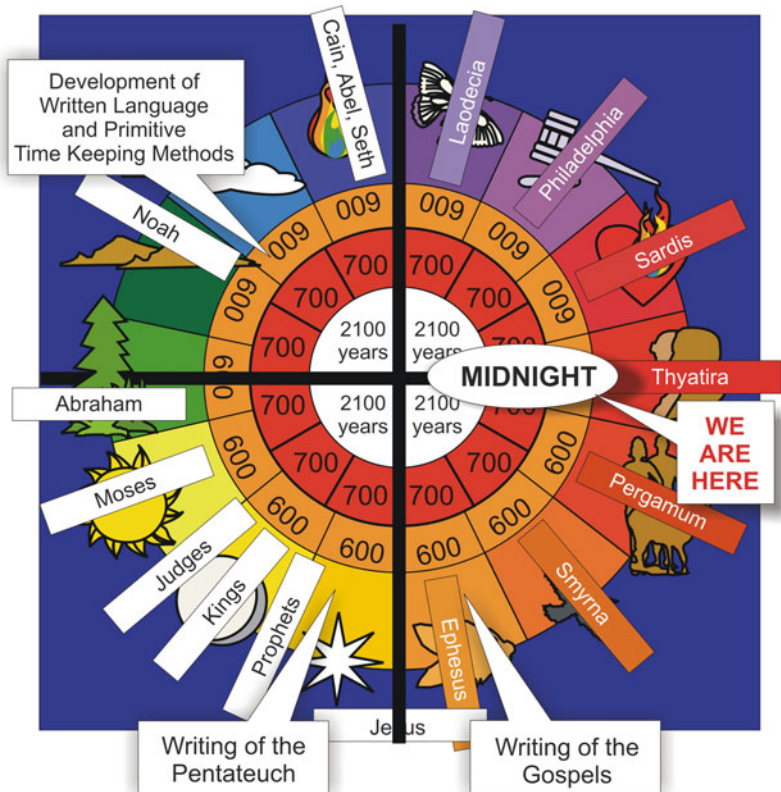
Prismatic Theology, Fig. 5 The unfolding of biblical history on the eighth day
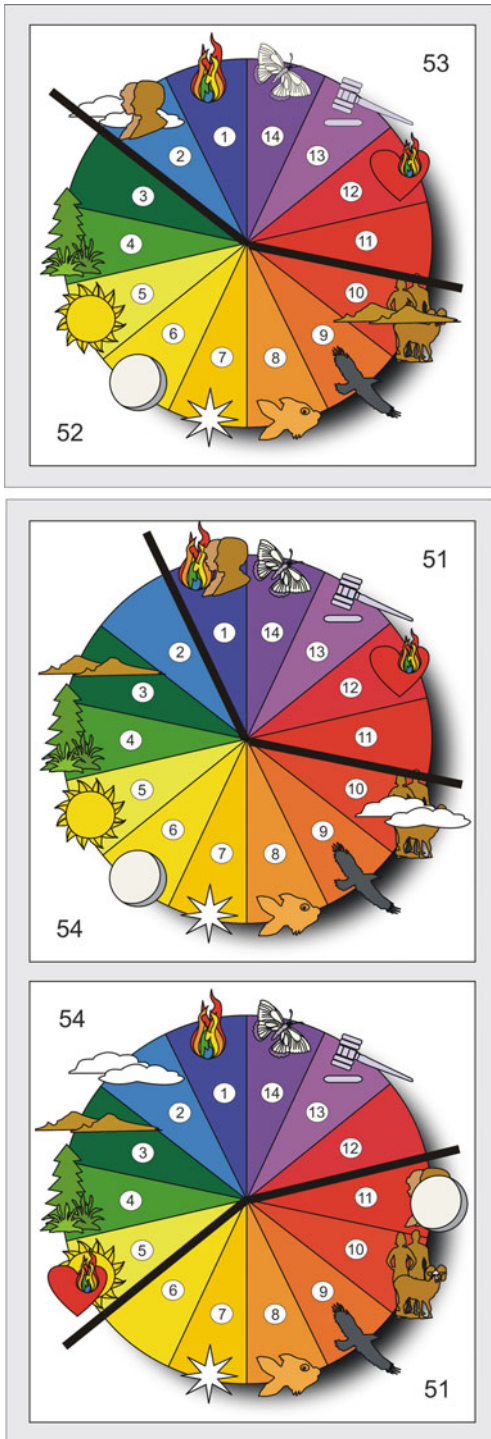
Prismatic Theology,
Fig. 6 The seven voices

24-h sense however *"the day and the hour remain unknowable,"* Matt. 24: 36; 25:13 (Barker 1985c).

The Prismatic Language

In addition to offering a ▶ Prismatic Clock as a tool for biblical study, ▶ Prismatic Theology also offers the reader of Scripture a spiritual language based on the universal images of creation that are common to the whole of humanity. When viewed in prismatic form, the Genesis account of Creation reveals seven complementary relationships, each of which visually communicates spiritual ideas and concepts to the soul/spirit/mind/heart through light, color, and image. Hence, the resulting ▶ Prismatic Language returns the human soul/spirit/mind/heart to its *primary* form of communication through light, color, and images of creation beginning with an understanding of the seven voices on the color wheel (Figs. 6, 7).

The seven voices featured on the rim of the wheel form the root of a universal vocabulary which, in total, consists of 210 spiritual concepts. The concepts invite engagement with a *"common tongue,"* Gen 11:1, (Barker 1985d) which focuses on humanity's relationship *with* the Creation as well as humanity's role *within* Creation. The communication is void of doctrine; ritual; cultural norms; creeds; statements of confession; rules of societal law; etc. The only fixed communication is that which comes from the scientific purpose and natural reasons for each aspect of creation. Thus, the prismatic perspective of Genesis 1 provides humanity with a fresh starting point – a blank slate – with which to create new avenues of spiritual communication in a diverse global society.

Prismatic Theology, Fig. 7 A sampling of the prismatic language

This illustration features 6 of the 210 spiritual concepts found at the center or middle of the vocabulary structure. The six spiritual concepts featured in this sampling include relationships between the following entities: the dry land and the flesh of the animal kingdom; the human mind and the sky; the human mind and the creation of light; the sky and the flesh of the animal kingdom; moonlight and the human mind; the human heart and sunlight. Once the spiritual concepts are pondered and considered, the *primary* form of communication can be applied to a prismatic study of the whole of Scripture for the Judeo-Christian community. In doing so, the ▶ Prismatic Language illuminates the presence of a *primary* form of communication embedded throughout the *secondary* language of biblical text.

How, when, why, or if this visual language was used in ancient history will forever be unknown. The ▶ Prismatic Language may have originated within a culture of visual and oral storytellers who once drew pictures in order to ponder spiritual ideas, converse with one another, and pass their understandings from generation to generation. The only way to resurrect the primary language of light, color, and image is through a prismatic reading of Genesis 1. With this tool in hand, however, the words of the psalmist are illuminated through the science of light, color, and image in their fullest sense: *The heavens declare the glory of God; the skies proclaim the work of his hands. Day after day they pour forth speech; night after night they display knowledge. There is no speech or language where their voice is not heard. Their voice goes out into all the earth, their word to the ends of the world.* Psalm 19:1–4 (Barker 1985e).

Ethical Principles and Values of Prismatic Theology

▶ Prismatic Theology, as a methodology that enhances the interpretation of biblical text, respects the past and present work of biblical scholars and archeologists who continue to

construct a responsible historical/critical methodology for biblical study insuring that the texts are interpreted in their historical/cultural context. Likewise, ▶ Prismatic Theology respects the work of past and present scientists who continue to call for definable; testable; measurable; repeatable; and predictable standards to insure the credibility of scientific information before it is published. Hence, the guiding ethical principles of ▶ Prismatic Theology are rooted in the desire to honor, uphold, and maintain the same high standards practiced in biblical scholarship and scientific research, while adding a new dimension to biblical study and the "Science and Religion" dialogue.

▶ Prismatic Theology values the ongoing investigation of Scripture as well as ongoing research in the science of light, light energy, color, and optics. It also values harmony of purpose; commonality of quest; and acceptance of differing opinions between religious communities and scientific communities. The prismatic method of study upholds these key values by unveiling a prismatic perspective of time and a ▶ Prismatic Language through light, color, and image which can be applied to future conversations between people of all faiths.

By combining the science of light and the study of Scripture, ▶ Prismatic Theology provides an unknown piece in the spiritual puzzle of the Judeo-Christian tradition. ▶ Prismatic Theology is not to be embraced by the faint of heart. It is both spiritually and mentally challenging to combine the science of light with the words of Scripture. Those who employ the prismatic method of study most successfully will be those who come to the method with the mind, heart, and eyes of a child.

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Probability and Statistics

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Related Terms

Statistics and probability

Description

Probability and statistics is a discipline in mathematics and logic. For some proposals, it is better to make a description by separating in two subdisciplines.

Probability is a branch of mathematics that deals with calculating the likelihood of a given event's occurrence, which is expressed as a real number between 0 and 1. An event with a probability of 1 can be considered a certainty. An event with a probability of 0.5 can be considered to have equal odds of occurring or not occurring. An event with a probability of 0 can be considered impossibility. Probability theory applies precise calculations to quantify uncertain measures of random events. Probability expresses how likely it is that an even occurs. The assignment of probabilities to events is not an easy task in which a probability function is used.

The probability is the measure of the frequency with which you get a result (or set of results) regarding to a randomized experiment, in which all possible outcomes are known and conditions are sufficiently stable. Formally, this measure is defined by means of a set of axioms as A. N. Kolmogorov proposed in 1933. The axioms of probability are the minimum conditions to be hold so that a function defined on a set of events returns probability of each event in a consistent way. These axioms are the following:

Ax. 1. The probability of each event, A, is greater or equal to 0: $P(A) \geq 0$.

Ax. 2. The outcome of the experiment is always an element of the sample space, Ω: $P(\Omega) = 1$.

Ax. 3. If A_1, A_2, ... are mutually exclusive events, that is, the intersection of each couple is the empty set, then the probability of the union is equal to the total of the probabilities:

$$P(A_1 \cup A_2 \cup \dots) = P(A_1) + P(A_2) + \dots$$
$$\Leftrightarrow A_i \cap A_j = \emptyset.$$

The probability requires not only the development of basic concepts as axiomatic but also the sample space, the algebra of events, random variables (defined on populations), distributions or models associated with the variables.

The sample space, Ω, could be both a countable or uncountable collection of events. The definition of event is not simple. Some probability models are based on really complicated

space of events (Ω), where some subsets are not consider events. In those cases, it is possible to assign probabilities only to some subsets of Ω. Only the subsets to which probabilities can be assigned are considered events. This family is named the algebra of events. In particular, when Ω is a finite set, the family of all its subsets (the power set) is algebra of events by itself that means any subset of Ω is an event and therefore it has a probability assigned.

A random variable, X, is a function that assigns real numbers to events. It is named random due to the number assigned is unknown; however, the possible values X can take are known: the set of such values is called support set. For example, suppose that we flip two dices. The possible outcomes are $\Omega = \{(1,1), (1,2),\dots, (6,6)\}$. The amount X = "sum of the results" is a random variable whose support set is $Sx = \{2,\dots 12\}$. The probability of event (6, 6) is the same of the probability of getting X = 12. Random variables have a distribution that characterized their behavior. Random variables are very useful in mathematic modeling and industry. Probability also studies the asymptotic behavior of random variables (central limit theorem and law of large numbers).

Statistics is a branch of mathematics dealing with gathering, analyzing, and making inferences from data. Statistics is the science which treats of the collection, classification, and analysis of events described numerically. The data analysis allows the explanation, description, and comparison of the phenomena of real life. Originally associated with government data (e.g., census data), the subject has now applications in all the sciences. Statistical tools not only summarize past data through such indicators as the mean and the standard deviation but can predict future events using frequency distribution functions. Statistics provides ways to design efficient experiments that eliminate time-consuming trial and error. Double-blind test for polls, intelligence and aptitude test, and medical, biological, and industrial experiments all benefit from statistical methods and theories. The results of all of them serve as predictors of future performance, though reliability varies.

Statistics has three key parts: (1) groups of numbers, data collection techniques, and sampling, ways to summarize, analyze, and explain data; (2) the application of probability techniques and tools required in the study of uncertainty; and (3) the comparative study of populations and samples, study of the inherent variability introduced by sampling and development of inferences.

Statistics requires the development of basic concepts such as population, sample, descriptive statistics (collection techniques and exploratory data), and inferential statistics (the study of a sample to draw conclusions about the population using mathematical techniques and theory probabilities).

The relationship between probability and statistics can be displayed from the approach of a problem. On a probability problem, the properties of the study population are assumed known. On a statistic problem, questions about these properties are formulated and then answers are given in relation to a sample of the population. In a statistical problem, the characteristics of a sample are available to the experimenter and this information will enable it to draw conclusions about the population. Recent developments in probability and statistics include topics such as nonparametric regression and density estimation, option pricing, probabilistic methods for multivariate interpolation, robust graphical modeling, and stochastic differential equations.

Self-identification

Science

Probability and statistics study the physical world by means of observation and experiment; in this sense, this discipline is highly considered a science. However, the question about if everything is determined by randomness is open to philosophical debate. What is certain is that every day thousands of people are using tools from probability and statistics and many research studies are based in statistics analysis of data. As any other science, there are a lot of applications in real life of them. An important application of

probability theory is the diagnostic test. The uncertainty is present because there are no perfect tests and questions or decision problems must rely on the behavior or long-term average of diagnostic tests. Probability theory is used to quantify this behavior. Mathematical models are used in the form of distributions to represent the behaivor of the tests.

Statistics plays an important role in the decision-making processes, for example, before launching a new drug to market, the completion of a clinical trial, that is, an experimental study, is required. The data from this study should be compiled and analyzed to determine the viability of the product on the market. The study of statistics involves the collection, organization, analysis, and interpretation of numerical data. The statistical concepts are applied in areas such as psychology, agriculture, medicine, engineering, industry, finance, etc. Sometimes it takes a new statistical nomenclature as in the study of statistics in biology: biostatistics, or the case of bioinformatics, which is the result of applying statistical techniques on large masses of biology data processed by a computer.

The use of probabilistic models and statistical methods for analyzing data has become a common practice in all scientific disciplines.

Religion

The probability theory is an axiomatic system. This system begins with basic truths, similar to a religion, and from them, we construct a logical system. This logical system provides a means of quantifying uncertainty.

As a particular system of beliefs, probability is a degree of knowledge or belief. The degree of knowledge is called the frequency interpretation of probability, while belief is the epistemic of "degree of belief" or Bayesian interpretation. A frequency probability is a property of the world. A Bayesian probability is a mental construct that represents uncertainty. It applies not directly to events, but to our knowledge of them, and can thus be used in determine situations. A Bayesian can speak of the probability of a tossed coin, for example, even if he believes that with precise knowledge of the physical

conditions of the toss, he could predict exactly how it would land.

The difference between the two interpretations is not merely semantic, but reflects different attitudes to what constitutes relevant knowledge. A frequentist would take the probability of throwing a head with a biased coin as some value p (not equal to 0.5). A Bayesian, however, would continue to regard the probability of a head as 0.5 since unless he suspected the direction for the bias, he would have no more reason to expect the next throw to be a head than a tail. The frequentist would estimate the value for p from a number of trial tosses. The Bayesian would revise his initial probability assessment with each successive result. As the number of trials tosses is increased, the values of the two probabilities will tend to converge. But the interpretations of these values remain distinct.

Randomness is an essential component in modeling and analyzing nature.

Characteristics

A distinctive feature of this discipline is their relationship with others. The calculation of probability and statistics applied today in most areas: business, industry, education, marketing, finance, etc.

The probability leads to a deductive reasoning, that is, from the population to the sample, while the statistical reasoning from the sample to the population, that is, inductive reasoning. In both cases, results are basic for the study of other disciplines and sciences.

Relevance to Science and Religion

The probability and statistics have played a role in the development of modern society. General methodological tools have been provided for variability, determine relationships between variables in an optimal design studies and experiments, and improve forecasts and decision-making under uncertainty. In 1961, England introduced the teaching of probability

and statistics to students between 16 and 19 years for their expertise in mathematics. The reasons for premature initiation of these disciplines are as follows: The probability and statistics are a fundamental part of general education for future adult citizens, who need ability to read and interpret statistical tables and graphs, which usually appear in media. Probability and statistics are also an aid to personal development of critical thinking based on objective assessment of evidence and events.

In recent years it has developed the term "statistics literacy" to recognize the role of statistical knowledge in basic training: however, this discipline takes a real interest in other social areas such as governments and societies and institutes which develop numerous conferences looking for statistically literate of society by reasoning, thinking, and statistical literacy. The main objective of these conferences is the reasonable and efficient application of statistics to the solution of statistical problems by experts and practitioners. The agencies responsible for statistics (institutes and government agencies, research centers, and government in general) need the collaboration from all sectors of society in the process of collecting data. The information should be collected by means strictly and reliable techniques so that decisions are sound and they revert in global development.

Sources of Authority

Besides the mathematicians and statisticians, Fermat, Pascal, Bernoulli, Poisson, Fisher, Snedecor, among others, there are some of them more relevant like the following:

Thomas Bayes (1702–1761), a British mathematician, statistician, and religious leader who wrote "Essay towards solving a Problem in the Doctrine of Chances," which was published in 1763 after his death. In this work, the famous Bayes Theorem was included.

Pierre-Simon Laplace (1749–1827), a French mathematician whose work was pivotal in statistics with the publishing of "Théorie analytique des probabilités" in 1812. Laplace

is universally known by the formula of probability given by the number of favorable events divided by the total number of events.

Andrey Nikolaevich Kolmogorov (1903–1987), a Russian mathematician who advanced very significantly in the field of probability theory. In 1933, Kolmogorov published the book, "Foundations of the Theory of Probability," laying the modern axiomatic foundations of probability theory. A bibliography of his works appeared in 1989 in "Publications of A. N. Kolmogorov". *Annals of Probability* (Kolmogórov 1989). E.T. Jaynes realized that probability theory is a generalization of Aristotelian logic which reduces to deductive logic in the case that our hypotheses are either true or false. In Probability Theory: The Logic of Science (1996) Jaynes set a modern thinking about Bayesian probability and statistical inference, developing the notion of probability theory as extended logic, and showing the advantages of Bayesian techniques (Jaynes 1996).

Ethical Principles

The ethical principles of probability and statistics are included in agendas and decalogues of government statistic societies, for instance, the Statistical Institute of Puerto Rico. They list, among others, the following ethical principles: searching of objectivity, prevention of predetermined outcomes, safeguard privileged information, display professional competence, protection of the interests of subjects, maintenance of confidence in the statistics, and exposition of both the independent review results, as the methods used.

Key Values

The General Assembly proclaimed the United Nations on October 20, 2010, as World Statistics Day, to recognize the importance of statistics in our societies. On this day, we celebrate the many accomplishments achieved by official statistics and the key values of service, integrity, and professionalism.

Conceptualization

Nature/World
The nature and the world represent universes of discourse where experiments are performed and events occur.

Human Being
Human beings perceive and interpret reality and events that take place. In probability and statistics, a human being is also the expert who makes decisions based on their perception of reality and facts that take place in it.

Life and Death
Life and death are opposed states in living things. In probability and statistics, life and death also can be understood as the execution time of the experiment (life) and the end of the experiment (death).

Reality
The reality is the universe in which we perform the experiments and in which we observe the events that occur.

Knowledge
The result of any empirical study of universes into the reality. Sample set, all kinds of data and information which come from experiments in real life.

Truth
Truth is only an approximation to reality. Furthermore, the information can change the probability of a future event and its certainty, usually by the collateral effects. We can explain better with some examples: if the news say that a bank has liquidity problems, being false, the bank will probably have problems. On the other hand, if the news are that a road has collapsed, being true, probably the road will be fine.

Perception
Some researchers, in probability and Statistics, think that the human being has a somatic indicator that calculates the probability of occurrence of events. The information is stored from human

experience throughout life, and the somatic indicator feeds from all these data. Researchers believe that this indicator works similar to intuition but that is different, although often these feelings can be confused.

The subjective probability is conditional on the amount of experience and data stored by humans. For example, in front of an unfortunate event like death of a loved one, it is as painful as unexpected (unlikely). That is, the death of an elderly will be less painful than the death of a child, since our perception of the event is conditional on its probability and it seems more likely the death of old and therefore, more acceptable and less painful.

Time

Time is one of the fundamental dimensions of probability. Time is a continuous variable, and it is one basic measure in any experiment. In many of experiments, time is the only variable of interest. The probability distribution of time and its properties are important contributions to the study of probability and to interpretation of statistical data.

Consciousness

Consciousness is the amount of confidence in the probability of an event. This is often related to subjective probability.

Rationality/Reason

The information is always biased per each individual in real life. The amount of information becomes more confidential and poor knowledge become distrustful. A lot of researchers relate the rationality as the amount of knowledge in the following sense: Human beings are as rational as amount of knowledge they have.

Mystery

Knowledge can never be complete. The events that occur in reality may be clear consequences of the facts or may not have an easy explanation. To possible future events, humans also face the uncertainty that probability and statistics do try to solve. However, there is always a degree of uncertainty that cannot be resolved and that we define as mystery, in the sense of lack of knowledge.

Relevant Themes

Four issues are particularly relevant in relation to this discipline: first, the logic from both the mathematical point of view and from the rationality of human beings. The logic is the discipline necessary to achieve properly apply and understand the results. The second is Boolean algebra and the algebra of events, necessary for a mathematical treatment of the whole sample space events. Another important issue is the universe and the universe of discourse specifically associated with each experiment. Finally, chance, it is particularly important to ensure the independence of the experimental evidence.

Cross-References

▶ Formal Logic
▶ Game Theory
▶ Graph Theory
▶ Mathematics and Religion
▶ Mathematics in Human Learning
▶ Mathematics, Formal and Contemporary
▶ Operations Research in Applied Mathematics

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Problem-Solving

▶ Coping, Psychology of

Process of Believing

▶ Credition, the Process of Belief

Process Theology

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Related Terms

Neoclassical theism; Philosophy of organism;
Process-relational theology

Description

The phrase "process theology" refers to a variety
of novel approaches to reconceiving both
the nature of God and the world in light of the
philosophical and metaphysical works of the
twentieth-century philosophers Alfred North
Whitehead (1861–1947) and Charles Hartshorne
(1897–2000). Process theology received its name
because everything – God included – is subjected
to a constant process, which results in change and
novelty within both the world and God. Due to
the centrality of flux, most process theists deny
that either God or any creature within the world is
capable of having the following attributes: immu-
tability, impassibility, omniscience, or omnipo-
tence. Instead, God's nature and vision is forever
growing in response to repeated reciprocal inter-
actions with the world and all of the creatures
therein. Since the God-World relationship is so
important, process theology is alternatively
known as process-relational theology.

For some, but not all process theologians, ulti-
mate reality is understood as consisting of multi-
ple components or elements that are each
coeternal and co-necessary, yet are also mutually
grounding or presupposing. This pluralistic

metaphysics operates as a sort of complex adap-
tive system, providing a new way forward for
dealing with the concerns that arise within the
field of philosophy of religion over the one and
the many, theodicy, and free will. Additionally,
the unique metaphysics inherent within forms of
process thought opens up completely new ave-
nues for successful dialogue between the various
world religions and between religion and science.

Self-Identification

Science
Process theology does not self-identify as
a science. However, many of the core philosoph-
ical concepts within process thought have
exercised influence within the various sciences,
especially physics, ecology, biology, psychology,
and neurotheology. There are process physicists
and psychologists; people who are influenced by
either the cosmology, metaphysics, or epistemol-
ogy espoused by Whitehead and Hartshorne.
These individuals attempt to prove or disprove
various concepts that are found within the philo-
sophical frameworks of Alfred Whitehead or
Charles Hartshorne via the tools and methods of
the different natural and social sciences.

Whitehead in particular had complex ideas
about physics, consciousness, geometry, and sys-
tems theory that can be found within his magnum
opus, *Process and Reality* as well as his earlier
work, *Science and the Modern World*. What is of
particular interest is that contemporary sciences
may be capable of verifying or dismissing some
of Whiteheadian process thought's more contro-
versial claims – the idea of "prehensions" and
"panexperientialism." Prehensions (lit. to seize
or grasp) are the nonsensory form of perception
that all creatures share. A prehension is
a fundamental receptive mode of experience,
whereas sensory perception is a later derivative
mode. Panexperientialism means that all crea-
tures or "actual entities" have some degree of
experience (not necessarily conscious experi-
ence, which is a higher phase of experience
according to Whitehead). This means that even

an atom has some degree of experience or feeling and an extremely rudimentary form of freedom and agency. Advances in neurology, biology, and enhanced measuring technology/instruments should be able to pin down the plausibility or implausibility of prehensive experience and panexperientialism.

Religion

"Whatever suggests a cosmology, suggests a religion" (Whitehead 1926). Interestingly enough, process theology has not branched off as its own unique religion. Instead, its central tenets have been worked into the different preexisting religious frameworks, most notably liberal and progressive forms of Protestant Christianity. For example, it would not be uncommon to hear Whitehead's name mentioned at a Unitarian Universalist sermon. In the mid-twentieth century, Whitehead's philosophy sparked a process Christology and more generally, a process hermeneutics.

In recent years, however, more process theologians are inclined toward religious pluralism, and they find in Whitehead's pluralistic metaphysics a new way of allowing for all of the religions to be genuinely different, yet each equally valid. It is relatively simple to identify at least three (God, a World, and Creativity) if not four (God, a World, Creativity, and the Receptacle) distinct yet related philosophical/religious ultimates in Whitehead's metaphysics.

What process theists, most notably, John Cobb Jr. and David Ray Griffin, have done is to suggest that each religion is geared toward one or more of Whitehead's proposed ultimates. For example, Buddhism and Daoism may be focused on what Whitehead defines as Creativity, whereas Judaism, Christianity, and Islam are concerned primarily with God. The point of this matching up of world religions with Whiteheadian metaphysics is that an argument can be made that if this sort of picture is true, then there is a real reason for a Buddhist to engage in dialogue with a Christian – they can each enrich one another's religious experience and life by bringing in a new religious object with its associated hopes, ways of salvation, and exercises and techniques. If all of the religions are the same deep down on the esoteric level – as the perennial philosophy would suggest – then there is really nothing to be gained through interreligious dialogue. If the religions are all different, then it seems that one should be right and the others wrong. Process theists using Whitehead's metaphysics as a model have presented the religious studies community with a third option.

Characteristics

The God of process thought stands in stark contrast to the view put forth by "classical" or "traditional" theism. In classical theistic accounts, God is understood as being omnipotent, omniscient, immutable, and simple. Process theists reject all of these divine attributes in favor of a divine persuasive lure, maximal knowledge, reciprocal growth, and dipolar theism.

God, through his/her "mental pole," acts within all creatures by providing "initial aims," which serve as lures toward the best possibilities for action given the circumstances of the present moment. Best in this case means actions, which will issue in novel and creative experience within the world with a maximal but balanced degree of intensity. The point is that the creatures have their own degree of self-determination and freedom to either choose or reject this initial aim from God. God literally cannot be omnipotent for process theists because God is not the only religious or philosophical ultimate. There is always God and "a World" not necessarily our particular world with its specific laws of physics, but some world or other, which would consist of simplistic finite "actual entities" (perhaps subatomic "occasions of experience" or something akin to the strings in various forms of string theory or M-theory). This proposition also entails a rejection of *creatio ex nihilo*, which further serves to separate process theists from classical theists.

Process theists would advocate for some form of *creatio ex amore* or *creatio ex materia* instead of out of nothingness.

Almost all of process theology's distinctiveness comes from the affirmation of a pluralistic metaphysics and the reconceived notion of deity. For example, the problem of evil is dissolved because God cannot coerce or determine events due to the sharing of power with all of the finite actual entities, which make up the world. The God-World relationship is understood analogously to the body/soul relationship with God being the soul of the universe, and thus, omnipresence is one of the few "omnis" that are retained by process theology, omnibenevolence being another. All of the actual entities comprise the body of the universe and exist within God (but are not identical with God.) This position is one possible version of the doctrine known as panentheism (literally, all things are within God), but not that all things *are* God or that nature is God (pantheism).

Although process thought is highly original, some of its most basic points like the fundamental role of process/change can be traced back to Heraclitus in the west and Daoism in the east. In more recent times, the work of Hegel and Teilhard de Chardin suggest some parallels. A key difference between Whiteheadian/Hartshornean process thought and Hegelianism is that there is no concept of an Absolute Religion (Christianity in Hegel's case), which represents the pinnacle of human religious experience. The same can be said for Teilhard de Chardin, who posited an omega point for the process of evolution. For process thinkers, there is no mandatory or prophesied end point; instead, there are "cosmic epochs," which may suggest certain limitations on what can and cannot happen in that particular universe. However, there can be an infinite amount of cosmic epochs, so the process of God influencing a world with theoretical possibilities and then weaving back the experiential knowledge gained from that world into the divine nature is ongoing, perhaps ad infinitum.

Relevance to Science and Religion

Process theology – along with the emergent theism of Samuel Alexander – represents two of the more productive areas for dialogue between the scientific community and the religious community. A large portion of the frustration on the part of scientists stems from the fact that most religions are content to discuss the miraculous and the supernatural. Process theology denies any form of supernaturalism or of miraculous activity within the world on the part of God. Process theology is a form of naturalistic theism not supernaturalistic theism.

This means that God is not capable of suspending the laws of physics, which govern our universe. Instead, God must operate within the nomological parameters of the universe and can only persuade the world's creatures to act in one way or another. The universe and everything that is in it work in an organismic fashion, with each part being interrelated to a greater or lesser extent, and thus, there is mutual influence and a mutual immanence. Whitehead called his philosophy not process philosophy per se but the philosophy of organism.

Whitehead and, generally speaking, all process theists accept most of the major scientific theories of the last 150 years. Evolution is frequently cited as being one of the major sources of conflict in the religion and science debate, but it is not problematic for process theologians because they accept the theory of evolution. Of course, with a robust account of a deity, it would be wrong to state that process thinkers hold to the exact same view of evolution as most biologists.

Process theists discuss evolution in terms of creativity as the ultimate of all ultimates. This creativity is conceived as a blind impersonal force, which cannot account for the apparent upward trend and teleological aim that seems evident in the natural world. This is where God would come in as the poet of the world persuasively leading creation toward a more perfected vision of beauty and goodness.

Process theology also is relevant to the contemporary ecological debate. The old Biblical view of dominion that arises in Genesis is set aside in place of the concept of stewardship, but the key difference is that process thought

provides a full-scale worldview that explains why all creatures have intrinsic value. The answer lies again in panexperientialism or the idea that all creatures have some degree of experience although rarely conscious experience. Whiteheadians differ from Deep Ecologists like Arne Naess and George Sessions in pointing to the fact that there is a hierarchy of experiences, and even though all things have an intrinsic value and play a role within the larger ecosystem, it is foolish to propose a complete ecological egalitarianism. A human being has a greater intrinsic value than a mosquito or bacterium, but that does not mean that a human has a greater *inherent* value. The species which have the least *intrinsic* value appear to have the greatest *ecological or inherent* value since they provide the base support for the pyramid of life.

Sources of Authority

The sources of authority for this discipline can be broken into three parts: (1) individual scholars, (2) journals, and (3) organizations/institutions.

1. The most prominent authority is Alfred North Whitehead and specifically his books: *Religion in the Making*, *Process and Reality*, and *Adventures of Ideas*. After Whitehead, the other originator of what will become the process movement is Charles Hartshorne. Out of his numerous works, *Creative Synthesis and Philosophic Method* and *Omnipotence and Other Theological Mistakes* stand out as the most important for process thinkers. The next generation of process theologians consists of John Cobb Jr., Lewis Ford, Stephen T. Franklin, Marjorie Suchocki, Daniel Day Williams, and David Ray Griffin. Cobb and Griffin have collaborated on a number of works including their authoritative introduction entitled *Process Theology: An Introductory Exposition*.
2. Many journals accept work related to process thought, but there is one in particular that is solely dedicated to process philosophy and theology: Process Studies.

3. The single most important repository for all things process theology is the Center for Process Studies (www.ctr4process.org) located on the campus of Claremont School of Theology in Claremont, California. This is the official site for all of Charles Hartshorne's works as well as nearly every article or book published that is in any way related to process studies.

Ethical Principles

Process theology has frequently been criticized for its either lack of a complete ethics or its perceived aesthetically based ethics. In truth, there is no one consistent ethics other than a general framework that one can derive from process philosophy's central metaphysical propositions. For Whitehead, as for most process theists, you cannot separate an ethical system from a cosmology, even though this has been the dominant approach as evidenced in utilitarian and Kantian deontological ethics. The cosmic aim of life is to issue in novelty of ever increasing intensity and complexity of feeling, and thus the social and individual levels are to follow this universal pattern. "Beauty, moral and aesthetic, is the aim of existence" (Whitehead 1938).

The goal in a Whiteheadian-based ethics is to "maximize importance." Importance is defined as follows:

> Importance is a generic notion, which has been obscured by the overwhelming prominence of a few of its innumerable species. The terms morality, logic, religion, art, have each of them been claimed as exhausting the whole meaning of importance...By this false limitation the activity expressing the ultimate aim infused into the process of nature has been trivialized into the guardianship of mores, or of rules of thought, or of mystic sentiment, or of aesthetic enjoyment. No one of these specializations exhausts the final unity of purpose in the world. The generic aim of process is the attainment of importance, in that species and to that extent which in that instance is possible (Whitehead 1938).

In the end, the only thing close to ethical principles would be: follow the divine/initial aim in each moment, maximize importance in

the concrete situation you find yourself in, issue in novelty, and be adventurous.

Key Values

There are at least five key values of process theology. (1) It solves longstanding problems within the field of philosophy of religion. For example, it provides a compelling answer to the problem of evil. (2) It gives people a new option for understanding the nature and function of God, which is distinct from the previous three options: classical theism, pantheism, and deism. (3) It provides a paradigm for mediating successful interreligious dialogue through its acceptance of a pluralistic metaphysics. (4) It provides a novel account of experience, feeling, and consciousness, which hinges upon the ideas of prehensions and panexperientialism. (5) It allows for a more productive ecological discussion by creating a middle ground between deep ecologists who focus on the importance of lower organisms in the ecosystem and humanitarians and animal rights activists, who focus on the importance and value of higher organisms.

Conceptualization

Nature/World
Nature is understood as consisting of all of the "actual entities" (spatiotemporal experiential events with both physical and mental phases of experience) and societies (spatiotemporal groupings of actual entities also called occasions of experience) that make up the world. There are two types of things: aggregational societies and compound individuals. An aggregational society would be a rock or tree, which contains no higher-order entity, which coordinates the activities of the other members within the society. This means that a rock is no more than the atoms or molecules that make up the rock; there is no higher-order agency. However, a compound individual would be any organism that does have a higher-order entity akin to a mind or soul, which can direct the activities of its constituent parts. Your cells in

your body have a degree of self-determination, but at the same time they also fall under the control of your mind. In general, it should be stated that nature and the world are alive and that experience is taking place all around us on all levels, all the way down to atomic occasions of experience.

Human Being
A human being is understood as a compound or enduring individual. Once again, a compound individual is a living organism that has a dominant or regnal member, which coordinates the subordinate members within the society (e.g., a mind influencing cells in the case of humans). It should be noted that a human is not one numerically identical substance or soul that is unchanged over time. Due to the centrality of process, every human is constantly undergoing change from one occasion of experience to the next and, thus, is always somewhat different from one moment to the next. This is a similar ontology and epistemology to many later forms of Buddhism.

Life and Death
Something is alive when it reaches a complexity threshold where novelty and creativity outweigh the power of the law of averages imposed by the laws of physics. It is about the degree of freedom and mentality within a given creature. All entities are dipolar with a physical pole that merely receives data from the past and a mental pole, which creatively alters or uses the data from the physical pole. Living entities are those entities, which have a significantly larger mental pole, so nothing lower than cellular occasions of experience. In one sense, a lesser death occurs all the time with the ending of one occasion of experience, but in a more profound sense, death occurs with the breakdown of the various necessary functions of the coordinate members making up the spatiotemporal society that is a particular human being.

Reality
Reality for most humans consists of whatever physical (other actual entities) and conceptual

data (other entities and/or eternal objects/Platonic Forms) that makes up the actual world of the surrounding environment of a specific person, in a specific place, at a specific time. This data need not be limited to the five senses because most prehensions are a presensory or nonsensory activity.

In a broader conception, ultimate reality would consist of the following: all of the actual entities in the universe or multiverse, a dipolar God understood as one actual entity or a serially ordered society of occasions of experience; a large number of forms in a quasi-Platonic sense, Creativity understood as a sort of metaphysical force and perhaps, a "Storehouse" or Platonic-like Receptacle which stores information and allows for an experience of personal identity over time between one occasion of experience and the next.

Knowledge

Knowledge is information that is either (1) already available to be physically or hybridly prehended or (2) information that is gleaned from a creative process of playing with past information in a highly conscious and novel way. Thus, there is both an objective and a subjective dimension to knowledge, its acquisition, and its creation in the form of information.

Truth

Truth is understood as conformity to fact or correspondence with reality. Most process theists ascribe to a correspondence theory of truth because it is the theory by which most people appear to actually live their lives.

Perception

The most thorough account of perception can be found in Part III of *Process and Reality*. Put simply, it is a nonsensationist version of perception where a nonsensory or presensory grasping or prehending takes place where some aspect of the object or entity being perceived is actually brought into the constitution of the prehending subject. Sensory perception in its more classical form is actually a derivative mode of perception from the more fundamental positive physical prehensions (Fig. 1).

Time

The common understanding of time suggests that time is asymmetrical in the sense that the present is related to the past in a wholly different way than the present is related to the future. It is also commonly believed that time is in constant motion or flux; things are always becoming and then perishing. Lastly, there is a belief that time is flowing in one direction, from the past through the present and into the future, and hence, the past is irreversible.

According to David Griffin's version of process theology, panexperientialism implies pantemporalism. The idea is that all actual entities are spatiotemporal events and are also related to other events, and therefore, the concept of time has always existed, even in the subatomic realm. There is no version of nontemporalism where time is an illusion, or temporal/nontemporal dualism with some actual entities being temporal and others not. Instead, all actual entities are temporal, and our common sense notions of time listed above are also affirmed.

Consciousness

Consciousness refers to a later and higher phase of experience during the process of concrescence. What this means is that each actual occasion of experience goes through various stages: receptive, preconscious prehensions, a supplemental phase, and a satisfaction. As the vast data within each moment comes together within an organism that has a structural makeup that is complex enough, it will likely have some small portion of the overall information taken in from its prehensions, highlighted and valued up. This is known as the process of adversion. The items which have been valued up and/or later, derivative data frequently rise to the level of consciousness. It should be reiterated that although all creatures have some degree or form of experience, not all creatures have conscious experience, which is reserved for a select group that likely have a central nervous system.

Rationality/Reason

Rationality is the pursuit of a unifying, coherent theory that takes into account all that we

The Process of a Concrescing Actual Occasion

Process Theology,
Fig. 1 The process of a concrescing actual occasion
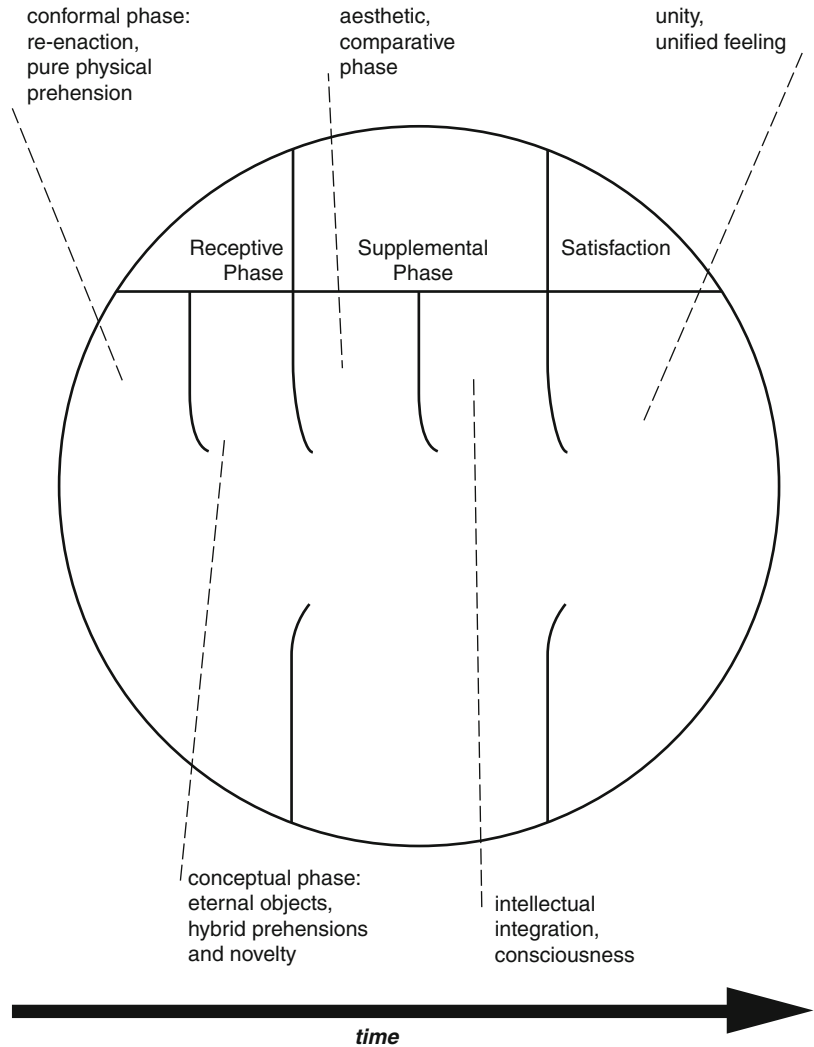
presuppose in both practice and experience. For most process theists, there are certain universal human experiences, but there are also major regional variations. In the end, rationality is going to consist of both a situational and an objective, perennial dimension.

Mystery

It would seem that the precise nature and function of the constituent components of the pluralistic metaphysics inherent within process theology will always remain somewhat mysterious. Also, any piece of information or data that is taken up by a person, but never brought to the higher-phase experience of consciousness may seem to be mysterious. The possibility of life after bodily death is another area that Whitehead, Hartshorne, and others have relegated to the mysterious.

Relevant Themes

One additional issue concerns supernaturalism and scientific reductionism. For most process

theists, both of these notions are antiquated and do not do justice to the best available evidence. Some process theists like David Ray Griffin have pursued the panexperientialist route instead of scientific reductionism. Reductionism results in materialism or physicalism, where physics is the sole arbiter of truth, a physics, which in the end, deals with vacuous entities devoid of any intrinsic value or experience.

Other more recent attempts, like those of Philip Clayton, Paul Davies, Arthur Peacocke, Stuart Kaufman, and Terrence Deacon have tried to wed process thought with the new discoveries in emergence theory. Put simply, process theists are unhappy with the old religious/theological models but they are equally concerned about the prevailing mode of scientific understanding. Therefore, they have sought out or latched on to burgeoning scientific disciplines and constructive religious models.

The relationship of process theology to an even smaller constructive theology based on the philosophy of Samuel Alexander – emergent theism – is one final point of interest going forward into the future. Both of these theologies are capable of incorporating most, if not all, of the major scientific theories of our time, but exactly how they can enrich one another or which one may be of more use in the future remains to be seen. The merger of these two systems could be critical for the creation of a new way of conceptualizing the science and religion debate. This is, hopefully, fertile ground for additional research.

Cross-References

▶ Concept of God in Contemporary Philosophy of Religion
▶ Constructive Theology
▶ Dependent Arising
▶ Evil, Problem of
▶ Interreligious Dialogue
▶ Panentheism

▶ Philosophy of Religion
▶ Science and Religion Dialogue and the Interreligious Dialogue

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Process-Relational Theology

▶ Process Theology

Production and Distribution of Goods and Finances

▶ Globalization, Sociology of

Production of Sounds

▶ Speech

Program Complexity

▶ Computational Complexity

Progressive Judaism

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Related Terms

Liberal Judaism; Reconstructionist Judaism;
Reform Judaism

Description

Progressive Judaism is a term given to describe a variety of Jewish religious groups and movements which, since the nineteenth century, have sought to reconcile their faith with modernity in a deliberate, programmatic way, usually in explicit contradistinction to traditional understandings of Judaism. They include, among others, Reform Jews, Liberal Jews, and Reconstructionist Jews, who, having disassociated themselves from the authority of Jewish tradition to a lesser or greater extent, have come to represent a wide spectrum of views with regard to theology and practice. It is worth noting that the labels can have different meanings in different places; for example, Liberal Judaism in Britain roughly corresponds to Reform in the USA, while Anglo-Reform is closer to US Conservative Judaism. Today, according to the statistics reported by the World Union of Progressive Judaism, there are more than 45 countries with Progressive congregations, around 1,200 Progressive, Liberal, Reform, and Reconstructionist congregations around the world, and approximately 1.8 m people affiliated with the World Union's constituent movements globally.

The Reform movement had its origin in the eighteenth century European Enlightenment, with its emphasis upon rationality and humanism. The Jewish Enlightenment, the *Haskalah*, was characterized by an interest in secular studies, such as philosophy, literature, and languages, and an obsession with raising the intellectual

mores of Jews in order to justify the hopes for political and social emancipation. One towering figure stood out on this stage, the Orthodox Jewish philosopher Moses Mendelssohn (1729–1786), who redefined Judaism in its tribal particularities as "revealed legislation" but who emphasized that Judaism's essential teachings, including its belief in a creator-God, its ethics, and its hope of eternal life, were universal truths available to all mankind through the proper application of reason. In a Romantic-era reaction to the Enlightenment in the nineteenth century, a number of Jewish scholars, including Leopold Zunz (1794–1886) and Heinrich Graetz (1817–1991), established a more historically orientated approach to Judaism known as the *Wissenschaft des Judentums* (or scientific study of Judaism), which came to regard Jewish identity as the sum of Jewish history. Such an approach dispensed with the ideas of divine legislation and a chosen people, and effectively adopted a materialist methodology that refrained from bringing in a supernatural dimension for explaining historical developments.

From these intellectual beginnings emerged the Reform movement, which had taken institutional form in Germany, the USA, England, and France by the 1840s, although the earliest stirrings occurred in Germany in the 1810s. By the 1880s, Reform would dominate North American synagogal life, while it would only ever be a denominational minority elsewhere. There is a debate among scholars as to the precise motivations and driving forces behind these progressive developments in each country, with greater or lesser weight being given to the political ambitions of assimilationist lay Jews, the influence of religious leaders and intellectual pioneers of Reform, and the critique and emulation of the surrounding Christian societies. In any case, with few exceptions the reforms adopted tended to be a mixture of theological and ritual innovations that divided wider Jewish opinion. By deliberately contrasting themselves with the traditionalists, the reformers provoked the rise of what would now be described as ultra-orthodoxy and neo-Orthodox Judaism, the first of which seeks to turn inward and away from the profane

world and its secular knowledge, and the second of which seeks to engage cautiously with it, adopting and adapting those aspects of modernity that, it is believed, can be reconciled with Jewish tradition without causing violence to it.

What were the reforms? At first, the changes were focused on manners and decorum in synagogue services, and on conforming to wider societal (i.e., Christian) norms of behavior. The use of the vernacular in the liturgy was encouraged at the expense of Hebrew, the services themselves were shortened, music was frequently included, and it became possible in some places for men and women to sit together. Reform "ministers" dressed like Christian clergy and the balance of their role shifted away from Talmudic learning and *halakhic* (legal) expertise toward sermonizing and pastoral care. Many reformers became ideologically relaxed when it came to observing *kashrut* (food laws) or the festivals and Sabbath in accordance with rabbinic tradition. Some adopted the practice of bringing newborn babies to synagogue for a blessing (like a christening), and of praying bare-headed (as was the Christian practice), and many replaced the *bar mitzvah* ceremony, that is, the rite of passage at which a boy reads publically from the Torah scroll for the first time, with the confirmation service at which a boy's knowledge of the religious teachings and duties of Judaism were tested (like a catechism). In the USA, in particular, the idea of celebrating the Sabbath on a Sunday was actively advocated. Of course, many of these reforms in behavior implied subtle (and not so subtle) shifts in thought, and it was not long before these were made explicit, leading to more abstract theological innovations being introduced and debated, such as challenging the divine origins of the ▶ *Torah* or Law, or transforming the future hope of a Messiah into that of a messianic age, or propounding the universalist message of Judaism ("the Mission of Israel") in contrast to its commonly perceived particularity, or emphasizing the idea of Judaism as a religion against the view of the Jews as a nation in reluctant exile, with the dangerous implication that they could not be trusted as patriotic citizens of England, France, or Germany.

It would be these theological developments, and the sense of intellectual and religious freedom, that would prove so important in the long run, since many of the new practices, especially those relating to decorum, would be adopted by the traditionalists.

In Germany, which took the lead in the movement, two distinctive positions emerged in the classic Reform period, usually associated with the *Wissenschaft* scholar-rabbis, Abraham Geiger (1810–1974) and Samuel Holdheim (1806–1860), both of whom understood Judaism primarily in terms of moral law and monotheism. Whereas Geiger viewed Reform Judaism as the latest expression of an evolutionary development, Holdheim was more revolutionary in his justification for change. For Geiger, history revealed how each generation of Jews had given fresh meaning to the traditional liturgy and practices that had sought to express the core ethical-monotheistic aspects of Judaism, leading to a perpetual state of organic change as the Jewish religion adapted itself to local circumstances and cultures. In this account of "progressive revelation," modern Jews, who had evolved from a tribal nation to become the proponents of a religious system, had engaged with and developed the rabbinic traditions of medieval Jewry, just as their ancestors had engaged with and developed the traditions of Biblical Judaism. Thus Geiger reinterpreted the traditional expectation of a Messiah to liberate the Jews as a future messianic age of spiritual enlightenment. For Holdheim, history suggested that the destruction of the Second Temple and of Jerusalem in antiquity had brought to an end the need for the civil and ritual laws of Biblical Judaism. It followed that Rabbinic or Talmudic Judaism, which had remained mired in the ceremonial laws originating with the Temple and the Jewish State, had lost its way. What was called for now was a radical break with the past, and a recognition that only the moral teachings of the *Torah* were worth preserving. Holdheim felt he could justify the abolition of the ceremonial laws with the coming of the messianic age, which had been made manifest in modern Jewish political emancipation.

Sources of Authority

Arguably, the Reform movement organized itself according to two principles that define all modernizing variants of Judaism: progress and autonomy. From the *Haskalah* came the prioritization of human reason and autonomy, and from the *Wissenschaft* came the historicist view of the Jewish past, including its traditions and its sacred texts, as developments brought about by mundane historical-cultural forces. The recognition that the human intellect and its conception of religion had progressed over time persuaded reforming Jews, as individuals and as congregations, that they possessed all the authority they needed to define Judaism for themselves in their own day. Thus, reformers came to view the traditional sources of Jewish authority, that is, the *Torah* or the Bible, in a very different way from traditionalists. It came to be seen as encapsulating a variety of distinct, often contradictory, stages in Jewish history, thought and ethics, rather than as an integrated, unified body of religious revelation that was the foundation of Orthodox thought. Many modernists adopted the findings of biblical-criticism with relish, delighting in their newfound freedom to dismiss the morally and scientifically challenging aspects of the scriptures as manifestations of the unenlightened chauvinism and ignorance of earlier ages. The divine Law revealed at Sinai might be said to have originated in Heaven (*Torah min Ha-Shamayim*), but this should not be interpreted in a simplistic or naive fashion; even if inspired by God, the Law had been mediated by flawed human agents. Modern biblical scholarship with its concerns for the identification of multiple authors, contextual history, and linguistic mastery of the sources was a tool by which one might uncover the ethical principles that represented the authentic understanding or essence of Judaism. Such an approach would free it from the biases and errors that had, in the past, necessitated extensive theological gymnastics by traditional defenders of the truth and moral authority of God's divinely revealed *Torah*. With regard to their attitude toward the enormous body of rabbinic laws and traditions, including the Mishnah and the Babylonian and Jerusalem Talmuds, the reformers adopted a range of different views, from those following Geiger, who regarded such literature as historically, culturally, and religious significant feature of Jewish tradition, still of value for Jews today, to those more in sympathy with Holdheim, who was impatient and dismissive of what he saw as a primitive, misguided conception of Jewish religion, best forgotten. Generally speaking, the *Halakhah*, that is, the religious law, has not possessed the binding force or authoritative status for progressive Jews that it has for the Orthodox. At the same time, progressive Jews have tended to display an active interest in non-Jewish thought as (potentially, at least) authoritative sources of knowledge that can be synthesized with or understood to complement Jewish thought, especially in the realms of morality, ethics and science.

Key Values

Here, as elsewhere, the autonomy and commitment to change so prized by reformers has led to a range of views. In the US, Reform was split between moderate leaders such as Isaac Mayer Wise (1819–1900) and the followers of Holdheim's radicalism, such as David Einhorn (1809–1879). Over the course of the nineteenth and twentieth centuries there were a series of rabbinic conferences or platforms which codified in an authoritative way the key values of the reformers. The Pittsburgh Platform of 1885, convened under Kaufmann Kohler (1843–1926), showed the radicals to be in the ascendant at that time, declaring that "we accept as binding only its moral laws, and maintain only such ceremonies as elevate and sanctify our lives, but reject all such as are not adapted to the views and habits of modern civilization." Mosaic and rabbinic laws had "originated in ages and under the influence of ideas entirely foreign to our present mental and spiritual state" and these were denounced in that "their observance in our days is apt rather to obstruct than to further modern spiritual elevation." They declared themselves to be a religion, rather than a nation, and thus distanced themselves from Zionism and the political hope

for a Jewish State. Judaism was presented as "a progressive religion, ever striving to be in accord with the postulates of reason," and, along with Christianity and Islam, was concerned to promote "monotheistic and moral truth." By 1937 and the Columbus Platform, however, there had been a retreat from some of these positions, such that the land of Israel was now embraced as a profound expression of Jewish identity ("Judaism is the soul of which Israel is the body... a center of Jewish culture and spiritual life"). The text, drafted by Samuel S. Cohen (1888–1959), also willingly admitted that many traditions had been too easily set aside in the past:

> Judaism as a way of life requires *in addition to its moral and spiritual demands*, the preservation of the Sabbath, festivals and Holy Days, the retention and development of such customs, symbols and ceremonies as possess inspirational value, the cultivation of distinctive forms of religious art and music and the use of Hebrew, together with the vernacular, in our worship and instruction.

This trend can continue to be traced in the 1976 statement "Reform Judaism: A Centenary Perspective," in which the authors, led by Eugene Borowitz (1924-), identified a number of historical experiences (including threats to political freedom, the explosion of new knowledge and technologies, and the spiritual emptiness of much of Western culture) that "taught us to be less dependent on the values of our society and to reassert what remains perennially valid in Judaism's teaching." At the same time, the Holocaust was seen to have "shattered our easy optimism about humanity and its inevitable progress" so that even while Jews remain committed to the hope for the messianic fulfillment of humanity yet "we have learned that the survival of the Jewish people is of highest priority." The emphasis on the universalist values enshrined in the "mission of Israel" to humanity was also tempered somewhat by the realization that Jews continued to be regarded as a people apart and viewed with hostility by so many.

> Early Reform Jews, newly admitted to general society and seeing in this the evidence of a growing universalism, regularly spoke of Jewish purpose in terms of Jewry's service to humanity...

Until the recent past our obligations to the Jewish people and to all humanity seemed congruent. At times now these two imperatives appear to conflict. We know of no simple way to resolve such tensions. We must, however, confront them without abandoning either of our commitments. A universal concern for humanity unaccompanied by a devotion to our particular people is self-destructive; a passion for our people without involvement in humankind contradicts what the prophets have meant to us... Previous generations of Reform Jews had unbound confidence in humanity's potential for good. We have lived through terrible tragedy and been compelled to reappropriate our tradition's realism about the human capacity for evil.

And while there was frustration that, in the face of Orthodox opposition, Reform Judaism had not yet been recognized as a legitimate expression of Judaism within Israel, such political frustrations could not weaken the loyalty Reform Jews felt towards the "newly reborn" Jewish State to which they were bound "by innumerable religious and ethnic ties," nor would it prevent them from encouraging individual Jews to make *aliyah* (that is, to emigrate to the land of Israel). Likewise, the 1999 "Statement of Principles of Reform Judaism" (drafted by Richard Levy) with its tri-part focus on God, the *Torah* and the land of Israel, sought to reassert traditional and Zionist values alongside the classic reformist ones. In contrast to official declarations before it, no mention is made of modern biblical-critical understandings of the *Torah*, preferring to highlight its role as the foundation of Jewish life; to "cherish the truths revealed in Torah" about God's ongoing revelation to the Jews and the record of their ongoing relationship with God; and to view it rather as a manifestation of *ahavat olam*, God's eternal love for the Jewish people and for humanity. With regard to traditional ritual, the Statement noted that while "some of these *mitzvot*, sacred obligations, have long been observed by Reform Jews, others, both ancient and modern, demand renewed attention as the result of the unique context of our own times."

In Britain, the Reform movement developed in a quite different direction. David Wolf-Marks (1811–1909), the first minister of the first Anglo-Reform synagogue, had internalized the

criticism of traditional Judaism voiced by many evangelical Christians. He sought to bring Judaism back to what he saw as its core beliefs of the Bible, and dismissed the rabbinic traditions as a kind of corruption. Unlike in the US and Germany, Anglo-Reform Judaism's emphasis upon reason did not result in the adoption of biblical criticism, which would have undermined the authority of the Word of God, and it was left to Claude Montefiore (1858–1938), co-founder with Lily Montagu (1873–1963) of Anglo-Liberal Judaism, to reform Reform around the turn of the century by injecting it with a more historical-critical character. Montefiore was also one of the pioneers of interfaith dialogue, an activity that has enthused progressive Jews much more than it has Orthodox Jews. As Montefiore saw it, not all the light has shone through Jewish windows, and this led him not only to dialogue with religious thinkers of other faiths, but also to become one of the first critically-acclaimed Jewish experts in New Testament studies and one of the earliest proponents of the Jewish reclamation of Jesus as a good Jew. Britain was also important in terms of drawing together from across the world those who shared a common set of progressive values, for it was Montagu who established the World Union of Progressive Judaism in 1926. Both Anglo-Liberal Judaism and the WUPJ continue to this day to champion the progressive Jewish interest in those truths that can be found in teachings outside of Jewish tradition, together with a profound commitment to the development of Jewish-Christian relations. Ironically, when it comes to official institutional interfaith representation, progressive Judaism is often sidelined by Christian partners in dialogue in an attempt to avoid offending the sensibilities of Orthodox Judaism, with whom the majority of British Jews are affiliated.

It is also worth noting Reconstructionism, a denomination that emerged in the US in the early twentieth-century and which is often viewed as a kind of compromise between Jewish religion and Jewish secularism. Its founding figure, Mordechai Kaplan (1881–1983), a Conservative-trained rabbi, came to believe that, as a result of modern developments in philosophy, science and history, the theology of Jewish tradition was largely redundant. He established the Society for the Advancement of Judaism in 1922 and published *Judaism as a Civilization* in 1934. Essentially, Kaplan's vision of Judaism rejected supernaturalism while remaining committed to the Jewish community, such that Jewish religious life was to be maintained without any belief in a personal, supernatural deity or in His revealed Law. "God" was to be understood to be a metaphor, the sum of all natural processes that allow man to become self-fulfilled. Other reconstructionist teachings included the ideas that Judaism should be regarded as a continuously evolving religious civilization, an all-embracing way of life incorporating languages, literature, customs, civil and criminal law, art, music, and food; that the authority of religious observance comes from its status as the historical manifestation of the will of the Jewish people; and that the synagogue is regarded as a centre for communal activity. While it has not been successful in terms of affiliated numbers, in terms of its teachings it has undoubtedly influenced many other progressive Jews.

There has always existed a tension within progressive Jewish communities between the competing values of traditional religious authority and what might be described as the humanistic, liberalizing agenda. It seems fair to say that the Reform platforms considered above record a return to tradition that would have left some of the more radical founding fathers dismayed. In particular, there has been an acceptance of the significance of the Land to Judaism and an acknowledgement of the State of Israel as a legitimate element of modern Jewish identity, an increasing use of Hebrew in the liturgy, and renewal movements that emphasize traditional approaches to religious observance and Talmudic study. But as has been made clear by the principal organization of Reform in the US and Canada, the Central Conference of American Rabbis, personal autonomy still has precedence over authority of these platforms. And this principle holds true of other progressive groups, too.

Ethical Principles

From the beginning, Reform-minded Jews saw themselves as the guardians of ethical monotheism, a belief in one God who cares for humans and who expects them to care about each other, in contrast with the ceremonial law which was understood to lie at the heart of traditional Judaism. While none of the progressive Jewish denominations have been comfortable with creeds or mandatory lists of principles from which they can be said to derive their ethical worldview, a number of common beliefs do appear in their writings and statements of purpose. There is the idea of the "Mission of Israel," that is, the responsibility to promulgate to the nations of the world the teaching of the unity of God as described in the *Shema* ("Hear O Israel, the Lord is our God, the Lord is one"). Along with a view of the *Torah* as the co-product of divine inspiration and human agency in the distant past, there is an optimism in the rationality of humanity that makes it an obligation to interpret and re-interpret this source of moral guidance appropriately for each generation. And there is a commitment to the social justice taught by the Hebrew prophets and embodied in the concept of *Tikkun Olam* (that is, mending or rebuilding the world), which is itself closely associated to the ancient hope for a future messianic age of peace for all humankind. It is worth remembering that Kaplan, the father of Reconstructionist Judaism, defined God as "the power that makes for human salvation" and by this he meant, among other things, that "to believe in God means to take for granted that it is man's destiny to rise above the brute and to eliminate all forms of violence and exploitation from human society." (*Judaism without Supernaturalism*, 1958).

Historically, progressive Jews have celebrated the Bible and rabbinic literature as enshrining the basic ethical framework for the Jew, although they have always reserved the right to censor the moralistic teachings of the Jewish traditions and to modify them in the light of modern ethical sensibilities. The Pittsburgh Platform (1885) focused on the disparity of wealth, deeming it

"our duty to participate in the great task of modern times, to solve, on the basis of justice and righteousness, the problems presented by the contrasts and evils of the present organization of society." The Columbus Platform (1937) gave an even higher priority to defining Reform's ethical worldview. Judaism was described as blending religion and morality into "an indissoluble unity," with the love of God defined in terms of one's love of fellow men. Social justice was sought by applying the teachings of Judaism to economic order, industry, and to national and international affairs. Jewish religion was presented as working towards a social order which protects men from material disabilities of old age, sickness, and unemployment and, and it cited the prophets' ideal of universal peace, as committed to the moral education, love and sympathy necessary "to secure human progress." The 1976 statement "Reform Judaism: A Centenary Perspective" reflected upon the successes of the Reform movement in the century since the establishment of the Union of American Hebrew Congregations and the rabbinical training centre Hebrew Union College-Jewish Institute of Religion. According to this account, one of its proudest achievements was that its teaching "that the ethics of universalism implicit in traditional Judaism must be an explicit part of our Jewish duty, [and] that women have full rights to practice Judaism" now appeared "self-evident to most Jews."

In relation to wider cultural debates, progressive Jews have tended to adopt a socially liberal approach towards gender-equality (women Reform rabbis were ordained in the US in 1972 and in Britain in 1976), to abortion, to civil divorce, and to homosexuality (with many groups fully supportive of gay marriage and accepting of gay rabbis and cantors). Large numbers were involved in the US civil rights movement and the peace movement, and many have approached the Israeli-Palestinian problem by asserting their commitment to justice for what they see as the wrongs perpetrated against Palestinians as an expression of their commitment to prophetic and religious Zionist ideals.

Characteristics

While the idea of "the Judeo-Christian tradition" is often exaggerated, in many ways Judaism and Christianity are the most similar of the world religions, in large part because they emerged from a common ancestor in the first century. They share much of their scriptures (although they read the Hebrew Bible very differently, and they have each generated the later sacred writings of the Talmuds and the New Testament respectively) and they also share much of their ethical codes (despite the fact that many critics of Judaism contrast the so-called New Testament God of Love with the Old Testament God of Judgment). Of course they do differ on core issues such what is meant by the unity of God, who or what is the Messiah, who are the true people of Israel, and whether the *Torah* or Law has been abrogated. Other important differences include the complicated reality that Judaism tends to be defined as both a religion *and* in relation to the Jews as a people, rather than as a religion per se, and the importance of *Eretz Yisrael*, that is, the Land of Israel, to the majority of Jews, which strikes many Christians as an unspiritual obsession. When it comes to traditional teachings such as the role of women, the belief in the afterlife, or the divine nature of scripture, progressive forms of Judaism can often appear to share more in common with progressive forms of Christianity than with their more conservative co-religionists.

Progressive Jews differ amongst themselves regarding their professed beliefs, but this is rarely regarded as a problem since diversity is understood to be the inevitable result of the long-held commitment to personal autonomy. God can be viewed anywhere along a continuum from the biblical deity who intervenes in history to the power-that-makes-for-human-salvation. The *Torah* might be God's revelation refracted though human culture or it might be simply a collection of ancient wisdom writings. The *halakhah* or religious law issued by rabbis might be regarded as binding or, more often, as general guidance. *Kashrut* or food laws may be observed, or encouraged, or ignored.

Intermarriage with non-Jews might be frowned upon or accepted. A Jew might be defined according to matrilineal descent (that is, of the mother), or it may be acceptable to have one Jewish parent and to have been raised as a Jew.

Science and Religion

A defining characteristic of the project of Reform was the claim to reconcile Judaism with the best scientific and philosophic knowledge of the day. Its proponents saw themselves as the rightful heirs of the *Haskalah* and embraced the positivist scientific worldview of the Enlightenment. Just as Jews had been doing for hundreds of years, progressive Jews stressed the rationality of Judaism in contrast to the allegedly irrational teachings of Christianity, such as the incarnation or the trinity, and also, as we have seen, they denigrated many of the teachings of Orthodox Judaism. The Pittsburgh Platform (1885) declared

> We hold that the modern discoveries of scientific researches in the domain of nature and history are not antagonistic to the doctrines of Judaism, the Bible reflecting the primitive ideas of its own age, and at times clothing its conception of divine Providence and Justice dealing with men in miraculous narratives.

Likewise, the Columbus Platform (1937) affirmed that

> Judaism welcomes all truth, whether written in the pages of scripture or deciphered from the records of nature. The new discoveries of science, while replacing the older scientific views underlying our sacred literature, do not conflict with the essential spirit of religion as manifested in the consecration of man's will, heart and mind to the service of God and of humanity... God reveals Himself not only in the majesty, beauty and orderliness of nature.

At least until after the second world war, the story was very much one of a positive "response to modernity," as the title of Michael Meyer's (1988) seminal history of the Reform movement has it. The emphasis upon humanistic rationalism led to the adoption of biblical criticism, with all the implications that this had for a demythologized understanding of the history

and nature of Judaism. And many progressives were at pains to stress their acceptance of the findings of contemporary scientific thought, especially social sciences like sociology and psychology, a preeminent example being Kaplan's *Judaism as Civilization*. But later official pronouncements did not enthuse about science to quite the same degree. The Centenary Perspective (1976) was somewhat ambivalent about "the explosion of new knowledge and of ever more powerful technologies," and the Statement of Principles (1999) did not mention scientific progress at all. Arguably, the impact of science has been somewhat superficial and has never really gone much further than a rejection of crude supernatural beliefs and an integration of philosophical and historical analysis with Jewish theology. It did not result in a particularly strong interest in the natural sciences, for example. Exceptions to this rule included geological estimates of the age of the earth and biological evolutionary theory, which, among US progressive Jews, came to take on an iconic status in the science-religion controversy.

The theory of evolution possessed certain obvious attractions to Jewish reformers, not least as a parallel to the idea that the religious understanding of humankind in general, and of Jews in particular, had evolved over time and would continue to do so. But Darwinism, with its core tenets of competition, cruelty, and chance proved problematic. At first, Reform Jews such as David Einhorn and Isaac Mayer Wise rejected Darwinism because, like so many other religious thinkers in their day, they could not accept the idea of humans as descendents of lower animals. Wise denounced such view as "homo brutalism," and went on:

> In a moral point of view the Darwinian hypothesis on the descent of man is the most pernicious that could be possibly advanced, not only because it robs man of his dignity and the consciousness of his pre-eminence, which is the coffin of all virtue, but chiefly because it presents all nature as a battleground, a perpetual warfare of each against all in the combat for existence, and represents the victors as those praiseworthy of existence, and the vanquished ripe for destruction... (*The Cosmic God*, 1876, 51).

But Wise did not reject the idea of evolution per se, only the Darwinian version. And in fact a theistic, teleological conception of evolution, which viewed organic evolution as a natural law and the means by which God achieved His purposes, became commonly accepted among progressives. Emil Hirsch (1851–1923) was probably typical in arguing in *The Doctrine of Evolution and Judaism* (1906) that evolutionary theory was not yet scientifically proven as an adequate account of life for it failed to account for life's origins, had not yet overcome the gaps in the fossil record, and could not explain the shift from the unconscious to conscious. Yet, he suggested, in its assumptions about the order and lawful nature of the universe, and in its recognition of the interdependence of human and non-human forms of life, a non-atheistic version could be easily reconciled with Judaism, which provided the meaning and purpose that were lacking. Kaplan would later go further by stating "We may accept without reservation the Darwinian conception of evolution, so long as we consider the divine impulsion or initiative as the origin of the process." (*Judaism as Civilization*, 1934, 98). In the 1950s and 1960s, there was less interest in attempting to reconcile Judaism with scientific theories, although Gunther Plaut (1912–2012) wrote about a divine goal of greater awareness corresponding with increasing complexity in *Judaism and the Scientific Spirit* (1962). By the 1980s Reform Judaism could be found opposing (Christian) Scientific Creationism, albeit this public activism was motivated primarily by the potential violation of the boundaries between Church and State in general, and science and Judaism in particular. Without espousing the pre-War confidence that evolutionary theory and Judaism could be readily integrated, and without making any comments on the type of evolution envisaged (whether Darwinism or theistic), the Central Conference of American Rabbis had no difficulty taking a stance and asserting that "the principles and concepts of biological evolution are basic to understanding science" (*On Creationism in School Textbooks*, 1984). The case of evolution, then, demonstrates the historically

strong desire among progressives to align with the scientific worldview whenever possible, even while privileging, ultimately, a theological or political perspective.

Cross-References

▶ Bible as Literature
▶ Biblical Studies
▶ Creation in Judaism
▶ Creationism
▶ Evolution
▶ Feminism in Judaism
▶ Judaic Studies
▶ Language and Literature, Hebrew
▶ Messiah
▶ Monotheism
▶ Natural Selection
▶ Philosophy in Judaism
▶ Redemption in Judaism
▶ Revelation in Judaism
▶ Science and Religion
▶ Theology in Judaism

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Protestant Education

▶ Religious Education, Protestant

Protestant Epistemology

▶ Epistemology, Reformed

Protestant Reformation

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The general terminology conventionally employed to characterize a complex and far-reaching series of events in Europe during much of the sixteenth century that had significant long-term effects on religion, politics, and even forms of commerce and economic organization. The original "Protestants," led by the German monk Martin Luther, challenged the absolute authority of the Pope over both spiritual and secular matters and sought a return to the simplicity of the Christian churches of the first centuries. They also focused on the right and obligation of individual Christian believers to read the Bible and to interpret its meaning for themselves as well as to organize congregations without central control from Rome.

Providence

► Divine Action

Proximate Causes

► Biology of Religion

Psyche

► Soul

Psychiatry

► Clinical Psychology

Psychiatry in America

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Description

Psychiatry is generally described as that branch of medicine that addresses both the diagnosis and treatment of mental, emotional, and behavioral disorders. Disorders include, among other things, depression, anxiety, and schizophrenia.

People early on recognized how emotions played an important role in mental disorders. In medieval times, it was believed that it was demonic influence that caused such disorders. From the Middle Ages up until the eighteenth century, there was no attempt to address those mental abnormalities which might have provided help for those that were mentally ill.

It was only in the twentieth century that some reformers looked for improved conditions for the mentally ill. This was sometimes useful insofar as there were improved conditions in some asylums. But there were many asylums in which patients with certain forms of mental disease had little help. However, by the nineteenth century, there were reformers, among them, Dorothea Dix, who fought for improved conditions for people in asylums.

By the twentieth century, one could first begin to see a systematic approach that provided for those who were mentally ill. Scientists and psychiatrists began to investigate what caused mental and behavioral disorders. The German psychiatrist Emil Kraepelin was the first who divided psychosis into two different classifications: manic depressive psychosis, on the one hand, and schizophrenia on the other. Another very important intervention was provided by Sigmund Freud. He was the first person to relate the patient's problem to their behavioral and emotional history. He observed that individual histories were apt to give some clues or interpretation to whether the patient suffered from neurosis or psychosis.

Self-identification

Psychiatry is essentially a science because it looks for and discovers the sources of one or another psychological dysfunction. As previously noted, it was the German psychiatrist Emil Kraepelin who first divided psychosis into two different classifications: manic depression and schizophrenia. But it was Sigmund Freud who turned to the behavioral and emotional history of the patient as providing clues as to the cause of a specific psychoneurosis.

Psychiatry encompasses a discussion between the doctor and the patient and an interpretation of the patient's problem. But the examination must also encompass the differences between psychological problems and medical problems, a distinction necessary to deciding what treatment is best for the patient.

Characteristics

The major difference is that psychiatry does not address a physical problem alone, but is on the lookout for psychological distortions. In other words, it is not just about the failure of body parts; it is about the distortion in the way the mind may process things or sometimes misunderstand them, especially in hard times, such as the loss of a beloved, a crisis at home, experiencing a sense of failure, or some other form of discomfort.

Psychotherapy is distinctive among other specialities and traditions insofar as it has put together a wide variety of treatment strategies that can be applied to different psychological disorders. Psychiatry encompasses both psychological and physiological problems. What appears to be psychological is generally addressed through a discussion that transpires between patient and psychiatrist. What appears to by physiological is generally treated through the use of drugs that are known to influence neurotransmitter functions in the brain. Other times, electroconvulsive treatment may be useful.

Depending on the nature of a patient's problem, a psychiatrist may use interpretation in some situations, or prescribe medicine. Psychotherapy addresses a broad range of disorders. For example, depression is understood as a mood disorder characterized by intense feelings of loss, sadness, hopelessness, failure, and rejection. Neurasthenia is a condition caused by irritability, lack of concentration, worry, and hypochondriasis. It was G.M. Beard who first introduced this latter term into psychiatry in 1869.

Of course, at its beginning, psychotherapy did not have the access to many of the strategies that are available today. Over time, a number of different treatment strategies have been discovered that combat different psychological disorders. It should be understood that physicians are licensed: They have been thoroughly trained to treat patients with mental disorders, using interpretation of the patient's plight and/or medication, and sometimes uncovering a condition that is not altogether "psychological."

Relevance to Science and Religion

Science is extremely pertinent to psychiatry. Among other things, psychiatrists must be competent in knowing how to treat a patient not only with words and interpretation but also with medication. The psychiatrist needs to understand the psychological source of problems but also takes note of whether the problem is predominately psychological or physiological, and to act accordingly.

Sources of Authority

The sources for this speciality tradition encompass medical training which can take place only after the individual has received a college degree. The traditional route is a 4-year training in college followed by additional training in psychiatry. This usually encompasses 3–4 years of training in a department of psychiatry.

Ethical Principles

The ethical principles encompass not only the achievement of the knowledge one must learn about patients, diseases, and treatments, but also something about the interpersonal interaction between doctor and patient. Among the ethical principles, one must consider the privacy of the patient. That is, while the patient's problems may be discussed with other professionals whose specific knowledge may be essential to treating the patient, there are no other kinds of discussion about the patient without the patient's consent.

Key Values

The key value of this speciality/tradition is to help patients address their problems. Doctors must abide by confidentiality and not disclose the patient's problems with others except with consent from the patient.

Other key values include being well trained and keeping abreast of new knowledge as it

emerges in the field. In the medical world, there are ongoing findings both as to the cause of one or another disease and its potential cure. Therefore, doctors must stay abreast of journal articles, particularly those that are specific to their field.

Conceptualization

Nature/World
Each of us is defined by our innate nature as well as by our connection to the external world.

Human Being
As someone who is deserving of a good life.

Life and Death
While death is inevitable, the focus of all physicians, including psychiatrists, is to preserve life insofar as is possible.

Reality
For psychiatrists, the goal must sometimes be to help establish reality for a patient. This is particularly true for patients who disclaim their current reality.

Knowledge
A psychiatrist must have both medical and psychological knowledge in order to help a patient.

Truth
Psychiatrists are interested in knowing about their patient's ability to discriminate between truth and fictitious beliefs. A psychiatrist's training is important, but so is their ability to "get" a patient's feel, both in terms of affect, interest, and willingness to open up.

Perception
The best doctors observe not only a patient's physical condition but are also able to reach their hopes, dreams, and fears.

Time
Psychiatrists are very keyed into the meaning of past, present, and future as experienced or hoped for by their patients.

Consciousness
Consciousness (awareness) is a prerequisite for patients who can be treated by psychological insight.

Rationality/Reason
Rationality is important, but so is reasoning. The ability to reason is essential to rationality.

Mystery
All psychiatrists know that there are some unknown mysteries that impact each of us: These may or may not be established in the psychotherapeutic process. It depends on a patient's willingness to explore true meaning of some of their fears, angers, depression, etc.

Relevant Themes

This is a difficult question to answer. Psychiatrists must be well trained, but the best of them have the ability to notice not just a patient's words but also his or her affect, ability to interact, and the scope of the patient's insight into their dreams, hopes, and fears. Psychiatrists must have compassion for the patients, but must also intervene when the patient appears to be making perilous or un-thought through decisions.

Psychiatry in Europe

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Description

Psychiatry is a medical specialty that is concerned with the diagnosis, treatment, and prevention of mental disorders including research into these topics. Mental disorders are diagnosable illnesses that affect brain functions and that lead to cognitive, affective, motivational, perceptual, and behavioral symptoms. The term

"Psychiatry" was first coined in 1808 by the German physician Johann Christian Reil and it is composed of the ancient Greek word "psyche" (soul) and the word "iatros" (medical doctor) (Berrios and Porter 1999). Due to the high prevalence of mental disorders in the general population, Psychiatry plays an important role for public health and health economics in general (Schneider et al. 2011). In the last about 60 years, many successful treatments have been developed, and Psychiatry has become a therapeutic discipline. Moreover, psychiatric research in many neurobiological subdisciplines has advanced our understanding of mental disorders as disorders of brain functions (Gelder 2009). Therefore, it can be expected that translation of these basic research findings may also improve diagnosis, treatment, and prevention of mental disorders in the future.

Self-Identification

Science

Psychiatry is a very interdisciplinary science with strong relationship to natural and life sciences, but also to social sciences and the humanities. Modern psychiatric research combines biological, psychological, and social perspectives to investigate causal factors and disturbances of brain functions in mental disorders. Scientific methods range from genetics, molecular neurobiological methods to investigate the functioning of nerve cells including protein, neurotransmitter, and neuroreceptor functions, analogous investigations in animal models of mental disorders, research on the level of interacting cell populations in different parts of the central nervous system including neuroimaging techniques and electromagnetic approaches, to behavioral and particularly neuropsychological approaches as well as health services research and research into social factors and social treatments of mental disorders. The ultimate aim of these various research efforts is to improve the understanding of mental disorders mostly in terms of so-called bio-psycho-social disease models, and to develop better treatments and preventions for these mental disorders. In general, current treatment approaches are multimodal in nature which means that biological, in particular psychopharmacological, psychotherapeutic, and social therapeutic approaches are combined. In the last two decades, evidence-based guidelines for the diagnosis and treatment of different mental disorders have been established, mostly on basis of well-conceptualized randomized double-blinded clinical studies.

Religion

Psychiatry does not self-identify as a religion. Before Psychiatry developed as a medical discipline, in the ancient Greece and Rome, mental disorders (particularly those with psychotic symptoms) were considered supernatural in origin by many people – although already Hippocrates hypothesized that physiological disturbances may be the cause of mental disorders. In particular by religious people, exorcism was often used to treat mental disorders. Also in the Middle Ages, particularly women with mental disorders were considered to be possessed by the devil or to be witches, were persecuted and killed. It is one of the important merits of the psychiatrist Wilhelm Griesinger (1817–1868) that he conceptualized mental disorders as brain disorders and that, in line with this view, he established Psychiatry as an empirical science.

Characteristics

Psychiatry as a scientific discipline is concerned with brain dysfunctions underlying mental disorders. Other specialties of medicine that in some way share this interest in disorders of brain functions are Neurology and related disciplines like Neurosurgery and Neuroradiology, as well as Psychosomatic Medicine and, as a nonmedical discipline, Psychology. Psychiatry is distinguishable from Neurology in that it focuses on disorders of brain function whose pathological substrates in the brain have not yet been fully discovered by current diagnostic techniques. Exemptions are so-called organic mental disorders like delirium, dementias, or amnestic disorders, which are diagnosed and treated by both medical specialties. Psychiatry differs from Psychosomatic Medicine in that it

focuses on disorders whose symptoms are directly related to brain dysfunctions, whereas Psychosomatic Medicine focuses on disturbed interactions between brain and mind on one hand, and other organs like heart, lung, or stomach on the other. Psychiatry differs from Psychology being a medical specialty which is devoted to the treatment of patients with mental disorders, although nowadays, psychologists specialized in Psychotherapy are also entitled to treat such patients.

Relevance to Science and Religion

Because of its interdisciplinary orientation, Psychiatry may also be interested in the scholarly area called "Science and Religion." First, the self-conception of Psychiatry as a discipline is closely linked to theoretical presuppositions with regard to the idea of man. In particular, during the recent years, Neurophilosophy has been developed as a subdiscipline between the empirical neurosciences (among them Psychiatry) and the so-called Analytical Philosophy of Mind. One of the central questions of this subdiscipline is the so-called problem of free will and of personal responsibility. Second, religious delusions are among the classical psychopathological symptoms in mental disorders. This symptom represents only one example of a general problem in Psychiatry which is the proper differentiation between healthy experiences, thoughts, emotions, and behaviors on the one hand, and psychopathological symptoms on the other. Third, using functional neuroimaging techniques, psychiatrists akin to other neuroscientists have attempted to study the neural correlates of religiosity.

Sources of Authority

Sources of authority in Psychiatry are influential psychiatrists whose work represents milestones in the development of the scientific and therapeutic discipline. Wilhelm Griesinger (1817–1868) not only conceptualized mental disorders as disorders of the brain, but also can be regarded as one of the protagonists of community-based care in Psychiatry. He also closely linked the principles of psychiatric nosology (regarding the description of diagnostic entities) to the clinical course of mental disorders, an aspect that was later on followed up in more detail by Emil Kraepelin (1856–1926). One of the milestones that Kraepelin contributed to Psychiatry has been the concept of "natural disease entities." Like somatic disorders, this concept also considers mental disorders as biological, natural phenomena resulting from disorders of brain functions. Another influential proposition made by Kraepelin was the dichotomy of endogenous psychoses into dementia praecox and manic-depressive illness, which is still maintained in current operational diagnostic manuals (World Health Organization 1992). By focusing on the symptomatological, but possibly also pathogenetic heterogeneity of dementia praecox, Eugen Bleuler (1857–1939) coined the diagnostic term "schizophrenia" as a group of mental disorders resulting from disturbances of brain connectivity. The development of psychotherapy as one important therapeutic approach in Psychiatry is mainly connected to Sigmund Freud (1856–1939) who developed the theory of psychoanalytic treatment, and to J. Watson and B. F. Skinner who are considered to be founders of the behaviorism and behavioral therapy. In modern Psychiatry, many psychotherapeutic approaches integrate different aspects both from psychoanalysis and from behavioral therapy. Another important milestone in the development of modern Psychiatry is the development of a methodologically reflected psychopathology that mainly goes back to Karl Jaspers (1883–1969), and to Kurt Schneider (1887–1967) who developed the influential triadic system of diagnoses in Psychiatry. Up to the present, psychopathological symptoms are the main criteria on which current psychiatric diagnoses and therapeutic decisions are based. The current authoritative source for diagnostics in Psychiatry is the International Classification of Diseases (ICD) (World Health Organization 1992) that is edited and used by the World Health Organization, and that is currently revised for version ICD-11. A milestone in the development of current psychopharmacological therapies was

the discovery of therapeutic psychotropic actions of substances like chlorpromazine (by Henri Laborit, Pierre Deniker, and Jean Delay) in 1952 and of lithium (by John F. Cade) in 1949. As authoritative sources for current treatment regimes in Psychiatry, a number of evidence-based guidelines for the treatment of different mental disorders have been developed and edited by different national and international psychiatric societies (World Psychiatric Association).

Ethical Principles

National as well as international societies of psychiatric have also developed ethical codes to govern the conduct of psychiatrists. For example, the World Psychiatric Association has set a psychiatric code of ethics in 1977 (and revised it in 1999). This code includes issues such as confidentiality, human dignity of incapacitated patients, patient assessment, up-to-date knowledge, research ethics, genetics, discrimination, torture, euthanasia, and death penalty. The ethical principles are closely related to the key values of Psychiatry (see below).

Key Values

The key values of Psychiatry mainly relate to the treatment of humans with mental disorders. An important basis for the successful treatment of mental disorders is a good relationship and contact between physician and patient that is characterized by confidence, empathy, and humanity. The responsibility of the psychiatrist for the patients with mental disorders has been complemented in recent years by the important aspect of empowerment of patients, which aims to strengthen the patients' autonomy and own responsibility for their treatment as far as possible.

Conceptualization

To most of the following terms, Psychiatry does not provide an explicit and formal conceptualization. Therefore, the following passages will give examples of how Psychiatry is related to these terms and topics.

Nature/World

Nature may be considered to be the sum of physical, biological, and biochemical factors in the environment of an organism, for instance, of a patient. The term "world" appears to have a broader definition that additionally includes social (sociobiological) aspects of the environment. In Psychiatry, it is well known that environmental factors may strongly influence the occurrence and maintenance of mental disorders.

Human Being

Like in other natural sciences, the human being is regarded as a highly developed biological organism equipped with a complex brain, which enables many higher functions like language, executive functions, and social cognitive functions. Some of these higher brain functions may be considered to be evolutionary new acquisitions that are specific to the human species.

Life and Death

Like in all medical specialties, life is defined as the presence of physiological functions in biological organisms. Death is regarded as the cessation of these physiological functions. The so-called brain death is a special case that raises ethical questions in medicine. In this state, other bodily functions are maintained, whereas no brain activity is observable.

Reality

In Psychiatry, external reality that is represented by the physical world around biological organisms, especially humans, is distinguished from an internal reality, which is the subjectively experienced reality in humans (and possibly in other animals).

Knowledge

Knowledge can be subdivided into an objective type of knowledge, which, for example, is represented in textbooks and libraries, and into

a subjective type of knowledge, which corresponds to information maintained in long-term memory in the brain.

Truth

In contrast to reality, which in Psychiatry may be subdivided into an objective (external) and a subjective (internal) part, truth is more narrowly conceptualized as only the objective reality that is represented by the physical, biological, biochemical, and social environment. Because the environment is too complex and only in part accessible with the human sensory organs, truth in its strongest definition may not be approachable for humans or other living beings.

Perception

Perception is considered to be the way in which humans and other living beings obtain information about the extern physical world via the different sensory organs which they are equipped with. Perception includes both conscious and unconscious information flow. In Psychiatry, perceptual disturbances like hallucinations are major psychopathological symptoms, in particular in schizophrenia.

Time

Time can be objectively measured in relation to environmental changes. Human subjective perception of time may differ from these objective measurements. For human beings, time is also an important category as regards the development of personal schemes of life and life perspectives. In some mental disorders like dementia, the orientation in time may be severely disturbed as a classical psychopathological symptom.

Consciousness

Consciousness is defined in many different ways in the literature. In Psychiatry, quantitative and qualitative disturbances of consciousness are a further important psychopathological symptom that is especially characteristic for organic mental disorders.

Rationality/Reason

Rationality may be defined as a proper and healthy way of thinking that is guided by understandable reasons. Rationality is disturbed in several mental disorders that present themselves with formal thought disorders and/or baseless fears, obsessions, compulsions, or delusions.

Mystery

In the Ancient as well as in the Middle Ages, mental disorders have often been considered to be mysteries, and the same is true for the very complex and astonishing functions (and sometimes dysfunctions) of the human brain. Nowadays, in Psychiatry, many specialists share the view that both the complex functions of the human brain and the complex psychopathological symptoms observed in mental disorders may at least in principle be fully explainable using current and future scientific approaches.

Relevant Themes

An additional topical issue in Psychiatry as regards "Science and Religion" is the challenge to overcome the stigma of mental disorders. The stigma has significantly reduced in the public during the last decades, but is still present. It dates back to the Ancient and Middle Ages, in which mental disorders were misconceptualized as being supernatural in origin and in which patients suffering from mental (brain) disorders were redlined as being criminals or asocial people. It is another very important aim of contemporary Psychiatry to combat the current stigma of these patients by clarifying the biological nature of mental disorders.

Cross-References

▶ Empathy
▶ Evolution
▶ Free Will
▶ Gene
▶ Neuroimaging
▶ Neurology in Europe
▶ Neuropsychology
▶ Neuroradiology
▶ Neurosurgery
▶ Perception

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World Psychiatric Association at www.wpanet.org

Psychoanalysis of Religion

▶ Psychology of Religion

Psychoanalysis/Depth Psychology

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Related Terms

Psychoanalytic psychology; Psychodynamic psychology

Description

Sigmund Freud (1923), the founding father of psychoanalysis, defined psychoanalysis as a triptych that is (a) a method to gain knowledge about psychic processes, (b) a psychological treatment, and (c) a theory of psychological development and functioning. Its basic assumptions include an emphasis on the role of unconscious processes and psychological conflict, the influence of the past on the present through complex developmental pathways, the importance of psychosexual desires from early childhood on, and the role of psychological causality.

Since its inception, psychoanalysis has met with fierce criticism from different fields, including psychiatry, philosophy, and religion. In particular, early biological psychiatry opposed Freud's valuing inner life and individual life history and instead emphasized that psychiatry had to concern itself only with biological factors in psychiatric disorders. Philosophers have mainly criticized the empirical status of psychoanalysis, and particularly its views on the nature of science and the validation of scientific theories. From the field of religion, Freud has been criticized for his view that religion is based on a psychological illusion. More generally, psychoanalysis' openness about sexuality, its promoting of atheism, and its emphasis on the autonomy of the individual thus liberating the person from the oppressive forces of the "Victorian" epoch have always been of concern to various religious traditions.

Yet, psychoanalysis has received much credence, first and foremost because it was the first systematic form of psychotherapy. Because of this, its theories and therapeutic techniques were rapidly embraced in countries all over the world, and particularly in the United States, where at the beginning of the twentieth century there was not yet a strong tradition in the field of medical psychiatry, as there was in Europe. This led to a strong dominance of psychoanalysis in psychiatry in the 1950s and 1960s until the arrival of systematic alternative psychological treatments based on either the humanistic movement in psychotherapy or behavioral and cognitive psychology.

Simultaneously, the hegemony of psychoanalysis was further decreased by the rise of biological psychiatry.

Psychoanalytic ideas have also left their mark in the world of art. Writers such as Arthur Schnitzler, Elfride Jelinek, Philip Roth, Erica Jong, Virginia Woolf, Italo Svevo, and Jean-Paul Sartre, to name only a few, embraced psychoanalytic ideas and used them in their work. Likewise, movie directors became increasingly intrigued by psychoanalytic ideas, using concepts such as trauma, repression, and the unconscious and early childhood memories in their plots. Well-known examples include *Citizen Kane* by Orson Welles (1941), *Spellbound* by Alfred Hitchcock (1945), and *Another Woman* by Woody Allen (1988). Others, such as the famous movie director Ingmar Bergman (Sweden), used psychoanalytic ideas more indirectly, as is expressed in movies like *The Silence* (1963), *Persona* (1966), *Cries and Whispers* (1973), and *Autumn Sonata* (1978). All this artistic attention has contributed a great deal to the popularization of psychoanalytic ideas, as is also expressed in the fact that psychoanalytic concepts have permeated our daily language. Who does not use from time to time terms like "repression," "lost memories," or speaks of a "Freudian slip?" Psychoanalysis has, so to speak, become part of our self-understanding, at least in the Western world.

Today, psychoanalysis or psychodynamic psychology encompasses a variety of theoretical and therapeutic approaches that have developed as a result of confrontation with different types of patients and problems, and a constant dialogue with neighboring fields and sciences. Hence, contrary to what is often believed, there is no such thing as "psychoanalysis" as a monolithic school or a dogmatic set of assumptions. This diversity of "psychoanalytic psychologies" within psychoanalysis demonstrates its liveliness and its potential for growth in the future.

Historically, four such "psychologies" within psychoanalysis can be distinguished (Pine 1988):

Drive psychology is the oldest approach in psychoanalysis and was first developed by Freud. The emphasis in this approach is on trying to understand human development and behavior in terms of a continuous conflict between internal drives – or

wishes in more experiential terms – and the moral standards of the individual. The main focus in drive psychology is on psychosexuality and aggression and their role in normal and pathological development. Apart from Freud, Jacques Lacan, a famous French psychoanalyst, has played a central role in developing the drive perspective. Influenced by the French structuralistic approach that dominated the human sciences during the 1950s until the 1970s, he argued for the importance of language and of social structures as symbolic systems that always precede and determine psychological development. The work of Lacan still is very influential in the areas of philosophy, literary criticism, and qualitative sociological research. Within psychoanalysis, he has caused a refreshing "retour" to Freud and remains influential particularly in France, Belgium, and various Latin-American countries.

Within *ego psychology*, the focus is less on the drive aspect in human functioning, but rather on how the person's ego develops defense and coping mechanisms in an attempt to deal with drives as well as with the demands of the social environment. The central focus is on how the individual can adapt to the "average expectable environment." Therefore ego psychology does not ignore the role of drives and inner conflicts, but focuses on the adaptive possibilities of the individual. Not surprisingly, therefore, ego psychology has been influential in the fields of diagnostic assessment, educational theory, child psychotherapy, and developmental psychology (e.g., David Rapaport, Erik Erikson, Anna Freud) and has played an important role in the popularity of psychoanalysis in the USA (Heinz Hartmann, Ernst Kris, Rudolf Loewenstein, Charles Brenner, Ralph Greenson). Margareth Mahler extended ego psychology into a global theory of normal and abnormal characteristics of ego development.

Object relations theory originated in the UK through the works of psychoanalysts such as Melanie Klein, Ronald Fairbairn, Harry Guntrip, Donald Winnicott, and Wilfred Bion. This branch of the psychoanalytic family mainly focuses on the development of relationships to others (i.e., "objects") and how these relationships are increasingly being internalized as representations of self and others or cognitive-affective schema that

influence perception and behavior throughout life in increasingly complex ways. As Winnicott noted, in the first months of human life, the basic unit is not the individual, but the individual in its relational environment (Winnicott 1952). Object relations theory played a vital role in fostering more integrative trends in current psychoanalytic thought and research, as is expressed, for instance, in the work of Otto Kernberg (1980), John Clarkin et al. (1998), and Sidney Blatt (Auerbach et al. 2005). Finally, object relations theory also paved the way for John Bowlby's (1969/1973/1980) approach to early relationships with caregivers, the well-known attachment theory.

Self-psychology focuses on the subjective experience of the self and identity and how disruptions in the development of the self may give rise to so-called pathology of the self, which includes, but is not limited to, narcissistic and borderline personality disordered features. Heinz Kohut, for instance, noted the importance of age-appropriate mirroring by primary caregivers of the child's narcissistic needs and how disruptions in this process may give rise to a vulnerable and insecure self. His emphasis on the need of empathic support by the therapist made him the author of preference for psychotherapeutic authors of the school of client-centered psychotherapy (founded by Carl Rogers).

Currently, there is a growing dialogue and integration among these "four psychologies" and with neighboring fields such as cognitive psychology, developmental psychology, and developmental psychopathology, including attachment research, social psychology, and the neurosciences (Fonagy and Target 2003; Kandel 1999; Luyten et al. 2006). This has also led to a growing body of empirical research documenting the validity of psychoanalytic hypotheses and the efficacy and effectiveness of various treatments based on psychodynamic principles (Leichsenring and Rabung 2008).

Self-identification

Science

Psychoanalysis has considered itself a scientific enterprise from its beginnings in the works of Freud until today, although, like any other psychological treatment, it is also in part an "art."

In contrast to the psychologists of his time, Freud's approach to psychological phenomena (psychopathological symptoms in hysteria and other neuroses) was very empirical. Trained in the natural sciences as a medical doctor (mainly in neurology), he adopted what can be called a hypothetico-deductive style of research. Confronted with inexplicable psychological symptoms in his patients, as well as in disturbances in everyday life (the Freudian slips) and in everybody's dream life – the so-called "normal" pathologies – he refused to merely speculate about the likely causes, but instead tried to arrive at theoretical assumptions about the psychological mechanisms behind these symptoms in order to make these phenomena understandable from a rational point of view. This was done by careful clinical observation and particularly by a technique that he slowly developed, partly instigated by his patients, called free association. In a back-and-forth way, he checked these constructs with further observations. Eventually, this brought him to an abstract theoretical model of the mind, with different systems (unconscious vs. conscious), later replaced by a more complex model (ego, id, superego). But these constructs were only *Hilfsvorstellungen*, that is, theoretical models which could be replaced at any time by alternative models in view of new data and insights. Freud did his empirical research in the style of his time (end of nineteenth century and first decades of the twentieth): he did not possess the methodological and statistical knowledge and possibilities that only became available later. Yet, unfortunately, psychoanalysis for a long time continued to rely almost exclusively on methods that became clearly outdated and showed many methodological flaws. It was only in the second half of the 1980s that more mainstream methods were adopted by psychoanalytic researchers.

In addition to the criticisms of Freud and psychoanalysis summarized above, there were many critiques of his scientific approach. The philosophical (epistemological) opposition to psychoanalysis was most precisely phrased by Karl Popper. For him, real science is characterized by a falsifying approach, that is, science is not

an accumulation of an endless series of observations leading to a general law (inductivism), but is the continuous process of challenging theoretical (i.e., general) assertions with well-selected empirical observations. Basically, one can say that Freud originally worked along these lines. But, because psychoanalysis became such a vast theoretical enterprise without unity and definite structure and because psychoanalysts always have shifting and different possible interpretations of their empirical facts (i.e., their observations during psychoanalytic sessions), psychoanalysis positioned itself as irrefutable and, thus, is not a science in Popper's opinion. This criticism has been and is a real challenge for psychoanalysis.

About the current status of scientific research in psychoanalysis, we highlight two points. (1) We must say a word about the tension within the psychoanalytic community between those who promote the new alliance with mainstream research in psychology and medicine versus those who nostalgically defend the case study method in Freud's style. In this controversy, we argue for a strategic scientific choice between methods (see Luyten et al. 2006): that is, depending on the nature of the research question and the accessibility of the phenomenon under scrutiny, either a nomothetic or a qualitative in-depth approach (via case study, interview, text analysis) can be chosen, or if possible, both approaches complementing each other should be used. (2) We draw the attention to the growing body of mainstream empirical research that challenges many aspects of psychoanalytic theorizing and that makes obvious the evidence-basedness of psychoanalytic psychotherapy (see Leichsenring and Rabung 2008; Piper et al. 2002).

Finally, we must highlight that psychoanalysis has been very influential in many different human sciences, as well as in the realms of art, literature, cultural criticism, and philosophy.

Characteristics

Compared with other branches of ▶ psychology, the following characteristics of psychoanalysis

must be made clear. Psychoanalysis, by the nature of its original observational basis (i.e., the psychoanalytic cure, which is a very intimate interpersonal dialogue), stresses much more than mainstream psychology, the importance of inner life, mental processes, and the representational world of the person. Thus, in psychoanalytic research, the attention goes primarily to the experience of the person and to his/her narratives about this experience and not to externally observable behavior. As a theory, psychoanalysis is humanistic and holistic.

In relation to ▶ psychiatry, the following should be emphasized. Until the 1960s, psychoanalysis was very influential in the world of psychiatry. It was the only accepted general theory for understanding psychopathology, and it formed the basis of nearly all descriptions of mental diseases. This hegemony is illustrated by the dominance of psychoanalysis in the first internationally available handbooks of psychiatry, like the *American Handbook of Psychiatry*, edited in 1960 by the psychiatrist-psychoanalyst Silvano Arieti. This is also illustrated by the earliest versions (until the end of the 1970s) of the worldwide-accepted *Diagnostic and Statistical Manual of Mental Disorders*, a major tool in research in medical psychiatry. There has been much criticism of this dominance. Also, this criticism, which was in the beginning mostly ideology driven and not research based, became increasingly research based, and thus the decision was made to make this manual as theory-neutral as possible in using only diagnostic categories that can be defined by objectively observable behavior characteristics. Today, the psychoanalytic framework is almost absent from the mainstream terminology in psychiatric research, although it can play a substantial role in this research. The psychoanalytic approach is valued in the study of the latent personality structures underlying psychiatric illnesses, and it plays an important role in the study of the inner world of meaning and subjective experience of the patients that are studied in medico-psychiatric investigations of the interplay of psychiatric symptoms and biomedical markers.

Relevance to Science and Religion

Psychoanalysis is not fundamentally linked to the actual debate that is known under the title "Science and Religion." Nevertheless, it must be underlined that there is a constant flow of psychoanalytic publications about topics related to religion, (personal) religiosity, and spirituality. In that sense, the topic remains a constant issue of discussion throughout the history of psychoanalysis.

It must be remembered that the "depth psychologies" (i.e., Freudian psychoanalysis, Jungian analytic psychology, and Adlerian individual psychology) played, in the first half of the twentieth century, an important role in what one can call the secularization movement in the Western world. Freud, born in a more or less orthodox Jewish family, considered himself an atheist. As a rationalistic enlightenment thinker, he believed that religion would automatically disappear in the course of the further evolution of mankind toward societies governed by reason. Similarly, he thought that individual religious belief was the neurotic remnant of infantile desires for protection by an almighty father. However, he did not impose his vision on his patients. In his psychotherapeutic work, he was absolutely respectful of the personal values and beliefs of his patients.

Freud's application of elements of his psychoanalytic theory to cultural phenomena such as religion has been very influential in the emancipation and liberation movements in different Christian denominations. It is important that religious scholars are well informed about this historical context.

The psychoanalytic approach remains important in the practical field of psychotherapy. Psychoanalytic teachings prescribe a very strict neutrality for the therapist vis-à-vis the religious and moral values of the patients. This is in line with Freud's absolute respect for the personal values and religious choices of the patient as fundamental in the attitude of the therapist. In the ongoing discussions of today in the world of other psychotherapeutic schools and in religious institutes about the possible integration of religion into psychotherapy, this prescription is

a clear statement. Although religion is proven to be, in some circumstances, salutary for (mental) health, this does not permit the merging of these two worlds: the world of religious belief, conviction, and prayer on the one hand and the human science–based and more technical world of psychotherapy on the other.

Finally, psychoanalytic theory and psychodynamic psychology can be of great theoretical and clinical help in conceiving and designing research in the psychology of religion. Recent examples are investigations about the psychological basis of the human relationship with God that can be found in object relations theory and more precisely in attachment theory. Also, religious and mystical experiences can be understood in reference to psychoanalytic theory.

Sources of Authority

For the discipline of psychoanalysis, we must refer to the foundational works of several great researchers and clinicians. First, the 20 volumes of Freud's complete works must be mentioned. Second, the studies of leading scholars in the "four" schools of psychoanalytic psychology. In drive psychology, besides Sigmund Freud, the main authors are the French psychoanalysts Jacques Lacan, Jean Laplanche, and Jean-Bertrand Pontalis (see Laplanche and Pontalis 1985). In ego psychology, first, there is the work of Anna Freud and then of the founding trio, Ernst Kris, Heinz Hartmann, and Rudolf Loewenstein. Later authors in this line are Erik Erikson, Margareth Mahler, Charles Brenner, and Ralph Greenson. In self-psychology, the main author is Heinz Kohut, and later contributors are Paul Ornstein and Ernest Wolf. In object relation psychology, many names must be mentioned from this school. First, there are the founding authors: Melanie Klein, Ronald Fairbairn, Donald Winnicott, Harry Guntrip, and Winfred Bion. Later very important authors are John Bowlby (attachment theory), Otto Kernberg, John Clarkin, James Grotstein, Thomas Ogden, Sidney Blatt (research on mood disorders and

psychotherapy outcome), Peter Fonagy (attachment and therapy research) Glen Gabbard (psychiatry), and Ivan Boszormenyi-Nagy (founder of a trend in family therapy). Robert Wallerstein and Fred Pine are American psychoanalysts that have underlined the "common ground" in the different psychoanalytic psychologies.

Ethical Principles

As a therapeutic undertaking, it puts the freedom of the individual and an absolute respect for the values, the moral and religious views, and the life choices of the person in the center of the therapist's attitude toward the patient. Psychoanalysis is not interventionist; it is centered on the self-discovery of the person and on his personal growth (see section Key Values).

Key Values

Various values are at stake in the large field of psychoanalysis. The entire enterprise is based upon fundamental values that are inspired by enlightenment thinking (Freud): freedom of the individual, personal value of the individual, society as a community that organizes the "commerce" between free individuals and gives him/her protection and respect, critical respect for laws and regulations (critical means possibility is open for proposals of negotiated amendments), and the value of rational thinking and reasoning amid individual and social irrationality. Consequently, psychotherapy is not based on the knowledge or preconceived thoughts of the therapist, but on the ethics that follow from the respect for these values: psychotherapy is not "learning" or transmitting of knowledge, but self-discovery and recovery of personal freedom; it stimulates personal thinking and freeing of the person of imposed values and "truths", it aims at greater personal freedom and self-esteem, in full respect of the personal history of the person.

Conceptualization

Nature/World

For psychoanalysis, there are two major challenges for the human being in its confrontation with "the world": (1) uncultivated outside nature (the dangerous and threatening natural forces) against which the unprotected human being has to seek protection and (2) the innocent individual facing the social world. In civilized societies, this world is well ordered, but due to basic aspects of human nature this order and regulation are only superficial. Beneath this organization, there is human aggressiveness, irrationality, and self-centeredness.

In explaining individual psychological life, psychoanalysis is not one-sided. Although not its core business, psychoanalysis takes into account the biological nature of the human being. From a causality perspective, the psychoanalytic approach should be characterized as interactionistic. The psyche is always in interaction with the biological and with the social environment. In current psychodynamic research, increasing attention is given to this complex interplay. Therefore, this research is becoming more interdisciplinary. Intensive collaboration is needed between psychodynamic personality theory, social psychological attention to environmental details such as current life events, social support, and biogenetic approaches. The psychic life is more than an epi-phenomenon of biological life and biology is more than the passive substrate of psychological mechanisms.

Human Being

Psychoanalysis does not speculate about the origin of mankind. The human being is there as an observable given and many perspectives are possible for observing and studying it. Therefore, the training program of the psychoanalyst is always multidisciplinary: it deserves a biopsychosocial basis and makes use of the contributions of the different branches of human sciences. Although psychoanalysis mainly focuses the inner life of the individual, it always approaches this interiority in its dialectical relationship with "the other." The individual is not on its own; it only becomes

a personal interiority as the result of a permanent interaction process with the environment: the family, the broader society, and the culture that structures family life and social order. Being human is *becoming* human by integrating the relational structures and models of the family and the basic representations and mental models of the culture (and language) that structures his familial group in his/her own inner history.

Another point that must be stressed is that psychoanalysis illuminates both sides of being human: its *grandeur* as well as its vulnerability. It is not fortuitous that Freud studied mental illness in order to find a cure for human psychological weaknesses and that he also tried to understand the greatness of cultural achievements: works of art, religion, philosophy, science, and (world) politics. Fundamentally, psychoanalysis considers culture as a victory over the ever threatening natural forces and the threatening chaos of living in a group, and it considers being human as a continuous fight against the inner threatening chaos of unconscious desires and drives by participating in the work of culture (sublimation).

Life and Death

In psychoanalysis, there is no theory about the origins of life. There is no reference to the belief in creation or to another explanation of the beginning of life. For Freud, as for a biologist, life is a bare given. It can be studied on the basis of observation, but it cannot be explained in terms of its origins. The same has to be said about death: it is a tragic given that must simply be accepted. Freud himself was very stoical in the face of his death. As a psychological theory, psychoanalysis does not claim any belief in an afterlife. For Freud, this was linked to his atheism; for the psychoanalyst in general, this is a matter of correct epistemological use of psychoanalysis as a psychological (and not spiritual or religious) theory.

Reality

Although one could say that from a ontological point of view, psychoanalysis adopts a (Kantian) critical realistic standpoint (there is a real world there outside, although I cannot know it directly and without the mediation of my perception and cognitive processes), in its practice (the psychotherapy) and in its theorizing, it is essentially interested in the permanent intrapsychic, that is, subjective construction of "the" world: "my" world. Freud therefore introduced the term "psychic reality." This psychic reality is subjective and does not necessarily correspond to the so-called "objective" (socially sanctioned) reality or the historical "truth." The human being is essentially a meaning-making creature (see, e.g., Crystal Park). Memory research concerning testimonies about earlier events (e.g., Elisabeth Loftus) has shown that there are great divergences between subjective and so-called objective reality and truth. But from an individual standpoint, at least in the context of psychotherapy, this makes the "psychic reality" not less real. It has a traceable "objective" quality for the person; it determines the way in which a person is experiencing him- or herself, his/her family "reality," and the social environment.

Knowledge

Consistent with the (Kantian) critical realistic standpoint, knowledge is the result of the interaction between critical thinking, cognitive capacities, and empirical observation. In a probabilistic way, we can progressively approach a "better" knowledge of our world. Nevertheless, there are tendencies in the big psychoanalytic family that are more inclined to adopt constructivist and deconstructionist approaches (see Lacan and Derrida).

Truth

Consistent with our comments under "reality" and "knowledge," it is clear that concerning "truth," a distinction must be made between the psychoanalytic concept of truth in the context of its scientific research task and the concept of truth in the context of its psychotherapeutic task. There is no speculative nor dogmatic truth from which psychoanalysis starts its endeavor. Scientifically, psychoanalysis is hypothetico-deductive: starting from a curious fact, a continuous back-and-forth process is started between empirical (the patient's discourse in therapy, or the data from (quasi-)experimental research) observation and theory

building. The building of "truth" is a permanently provisory pathway. The findings are hypothetical truths. And each next step in research is done in the service of falsification of existing "truths" and in the expectation of finding a better approach to the "truth."

In the context of psychotherapy (psychoanalytic cure), the term "truth" refers not to preexisting knowledge or dogma, nor to a so-called objective historical truth, but to the process of finding personal truth through the narrative process of psychoanalytic treatment.

Perception

Perception is conceived in psychoanalysis in a direct link with consciousness (being conscious). "The theory of psychoanalysis emerged from a refusal to define the psychical field in terms of consciousness." But, of course, consciousness is an essential phenomenon, although it represents only a small part of the entire psychic activity, which is mainly unconscious. Perception can be called the sense organ of our consciousness. It is the antenna to the outside world through the function of all our (physical) sensory organs, as well as to the inside world. It is the internal "perception" of thought processes (reasoning as well as revival of memories) that makes possible the consciousness of psychical phenomena. In this becoming conscious of inner psychic data, the function of language plays a crucial role. "The bringing of thought-processes to consciousness depends on the association of these processes with 'verbal residues'" (Laplanche and Pontalis 1985).

Time

Time and temporality are important topics in psychoanalysis. Actual behavior (acts, feelings, motivations, ideation) can only be understood if one takes into account the past and the future. The past refers to "my" personal history and the history of my family. These form the background and the building blocks of my current state of mind and of my way of behaving. They remain largely unconscious and can only be approached by the narrative effort that characterizes the therapy – the therapy as a continuously digging out of personal and familial memories. They form, so to speak, my personal psychic archive. This archive is to be considered the basis of psychic causality: it "causes" my basic mood as well as the disturbances in my behavior. These disturbances are the consequence of personal or familial conflicts that have not been well digested or elaborated (worked through). It is this narrative conception of man's conflictual past, that is, the background of Jacques Lacan's (French psychoanalyst, 1901–1981) conception of the unconscious as a constantly flowing series of "signifiers," a concatenation of affectively laden "words" or narratives.

Not only the past but also the future time dimension is of great importance. Although technically, most therapy effort is devoted to revealing forgotten and repressed memories, the therapeutic progress requires also unraveling the person's intentions and plans for the future.

For both reasons (reworking past conflicts and fighting for a new future), psychoanalysis is called a dynamic psychology: a psychology that takes into account the conflicting forces in the human mind. Therefore, the term "psychodynamic psychology" is frequently used.

Consciousness

For psychoanalysis, it is fundamental to consider consciousness side by side with the unconscious. The most important (in terms of quantity and of influence on human behavior) domain in human mental life is unconscious. Quantitatively, most of the psychological processes are descriptively unconscious. They influence fundamentally, more than one likes to admit, the conscious psychic life. In many cases, the unconscious dynamics are the causal background of psychopathology (the so-called structural unconscious and the repressed unconscious). It is in this sense that psychoanalysis as a therapy is directed toward making conscious what hinders normal functioning from inside the unconscious (elements that were not well registered or that have not been consciously accepted).

Rationality/Reason

To put it in terms of the historical periods of Western culture, one could say that

psychoanalysis is the paradoxical combination of the enlightenment and of Romanticism: the enlightenment because of the central role of reason in psychoanalysis and Romanticism because of the central role of irrationality, emotion, and affectivity in its scrutiny of the human psyche. In opposition to the beginning rationalistic psychology of the end of the nineteenth century, Freud did not accept the idea that the seemingly irrational aspects of human behavior were not open to rational, scientific investigation. This was for him "the" challenge for psychology: to find the "ratio" in the irrationality. This characterizes Freud as a rational and rationalistic scientist. At the same time, just like the romantics, he believed that the "deeper truth" of the human soul is to be found in its irrational undergrounds.

Mystery

This term is not explicitly defined in psychoanalysis. Indirectly, the term is relevant in that psychoanalysis considers itself and is considered by other scholars as a "demystifying" enterprise. In therapy, it helps the person unravel the mysteries of his or her disturbing past. As a theory, psychoanalysis aims at finding rational explanations for all aspects of human behavior, even the most perplexing, surprising, and hidden ones.

Relevant Themes

- *Jungian analytic psychology*: Carl Gustav Jung was an early disciple of Freud, later a "dissident," partly because of his mystical tendencies. Has had great influence in Christian religious circles of his time; this continues today.
- *Cultural anthropology*: As in other matters, Freud, the medical doctor and psychologist, made use of "helping" human sciences to understand certain phenomena; for his study of religion, he relied on the then existing ethnographic anthropology; more recent psychoanalytic authors rely on structuralist cultural anthropology, like that of Claude Lévi-Strauss.

- *Psychology of religion*: Besides other types of psychological study of religious behavior, the psychoanalytic or psychodynamic approach to religious phenomena has a long tradition inside psychology of religion. Main authors are Paul Pruyser, Ana Maria Rizzuto, James W. Jones, William W. Meissner and, in Europe, Julia Kristeva, Denis Vasse, Jacques Lemaître, Michel de Certeau, Louis Beirnaert, and Antoine Vergote.

Cross-References

- ▶ Clinical Psychology
- ▶ Cognitive Science of Religion
- ▶ Consciousness, the Problem of
- ▶ Developmental Psychology
- ▶ Emotion
- ▶ Judaic Studies
- ▶ Psychiatry in America
- ▶ Psychiatry in Europe

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Psychoanalytic Psychology

▶ Psychoanalysis/Depth Psychology

Psychobiography

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Description

Psychobiography is the largest and best-known subfield of psychohistory, which is oftentimes even confused with psychohistory as a whole. It can be defined as the systematic use of contemporary scientific psychology in research on the biography of a (usually deceased) individual. As insights produced by scientific psychology is usually not universally valid, the bulk of psychobiographical research has been conducted on persons from a not too remote past, although daring efforts have been made to go back even as far as to the times of Jesus Christ (Capps 2000). The type of psychology most commonly employed in psychobiographical research has been psychoanalysis, although the number of studies in which an attempt is made to use also other kinds of psychology is growing (Belzen 2004; Belzen and Geels 2008; Bucher 2004; Schultz 2005). Often misunderstood as being reductionistic (i.e., explaining "everything" from a psychological perspective or bringing only a psychological perspective to bear on the data available), psychobiography, correctly performed, is the careful attempt to recognize the individual intertwinement of an instinct-driven body and the symbolic order. A good psychobiography requires triple-entry bookkeeping. The individual under study needs to be understood on three complementary levels: (1) the body and all that constitutionally comes with it; (2) the ego as idiosyncratic synthesis of experience; and (3) the social structures within which the individual life history is realized and whose ethos and mythos shape the subject and, in the case of exceptional individuals, is shaped by the subject.

Self-identification

Science
Psychobiography self-identifies as a scientific enterprise, in which psychology is applied in biographical research of historical individuals.

Characteristics

Psychohistory is distinct in its employment of contemporary scientific psychology in research on individuals from the past.

Relevance to Science and Religion

Psychobiography has no specific interest in or contribution to make to any "science and religion" dialogue, which is usually seen as

a branch of systematic theology or of religious studies. Psychobiography may and has been quite often performed on religiously significant historical persons, however (Erikson 1958; Meissner 1992). Articulation and elaboration of the consequences of such research for any "science and religion" area is left to others.

Sources of Authority

The same sources as in psychological and historical research are authoritative for psychobiography.

Ethical Principles

The same ethical principle as with psychology and history guide psychobiography.

Key Values

Psychobiography endorses the same values as the disciplines of psychology and history.

Conceptualization

Nature and world, human being, life and death, reality, knowledge, truth, time, rationality/reason, and mystery are no concepts specific to psychology or biographical research; therefore, psychobiography does not define them in any way of its own. Perception and consciousness being concepts specific to psychology, psychobiographers follow contemporary psychological theories in their conceptualization of these; they do not offer new or specific definitions.

Cross-References

▶ Religiosity
▶ Religious Experience
▶ Self

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Psychobiology

▶ Biological Psychology

Psychodynamic Psychology

▶ Psychoanalysis/Depth Psychology

Psychogerontology

▶ Aging, Psychology of

Psychohistory

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Description

As signaled already by the very designation, psychohistory is a field constituted by an overlap of the

academic disciplines of psychology and history (each of which is heterogeneous itself). It is a field plagued by misperceptions. Psychohistory is not to be confused with other overlaps between psychology and history: it is not "history of psychology," which is part of the history of science, dealing with psychologies from the past and their fate; psychohistory is not "historical psychology," which focuses on the way how psychic functions – e.g., memory (Danziger 2008) – and processes developed, manifested themselves and functioned in the past; psychohistory is not "psychological history," which refers to historical scholarship focusing on aspects of the daily private life of ordinary people in former days (e.g., on smell, anxiety, hate), instigated by the French *Annales* school in the 1920s (this branch of historical scholarship is also often referred to as "history of mentalities"). Neither is psychohistory a "psychology of history," attempting to provide psychological explanations for historical processes at large (although there have been authors offering "explanations" of the "behavior" of entire states or continents; usually such "explanations" present quite speculative reasoning, employing poorly understood psychoanalytic concepts, something Freud condemned as "wild analysis"); nor does psychohistory start from the assumption that much of culture is shaped by the psychodynamics of the individual psyche.

Very generally formulated, then, psychohistory is an interdisciplinary field of research in which aspects of conduct and experiences of individuals, groups, and/or other cultural entities are investigated by means of modern psychological instruments (like theories, concepts, and skills).

Although the lion's share of psychohistorical production is still made up of biographical and psychoanalytical studies, psychohistory in no way needs to limit itself to the genre of biography and to the utilization of psychoanalysis (cf., e.g., Runyan 1982). These are additional misunderstandings which need to be rejected. It does have to be recognized, however, that psychoanalysis in its reflection on the interpretive process in therapy offers a valuable tool for helping in the analysis of the interpretive work of the historian (Röckelein 1993).

In two ways, heuristically as well as hermeneutically, one can also employ, e.g., personality theory, social or developmental psychology, in historical investigation. The views developed in these branches of psychology can draw the attention of historians to certain themes, which would probably otherwise remain un- or underexposed; psychology in this case urges to search for further sources. In the second place, psychological theories or viewpoints may furnish additional possibilities for the interpretation of sources. Although the results of psychological research are hardly ever universally valid, such research nevertheless has produced some knowledge of, e.g., motivation and emotion, social interaction, decision behavior, human development, and personal life stories, which, for all their limitations, exceeds the level of common sense. These and many other psychologically namable processes have played a role in the lives of past individuals, groups, organizations, and institutions (Belzen 2001). Pursued as the systematic and reflected use of scientific psychology in historical investigation, the psychohistorical *modus operandi* offers important advantages: for one who turns to the past always uses one or another psychology and certainly when doing research on themes relevant to this field. Instead of doing this altogether uncritically, and instead of naively applying the homegrown common sense one happens to have become acquainted with, psychohistory attempts to follow a carefully thought-out procedure. Though not a guarantee of infallibility, such a considered attempt is nevertheless preferable over unreasoned psychological dilettantism. In the same way that disciplines such as sociology or economics can be integrated with historiography and yield an additional perspective, this can likewise be done with psychology (Belzen 2004).

Self-identification

Science

Being a combination of psychology and history, psychohistory is a branch of science or of scholarship in the same way as these two mother disciplines are sciences. Stronger than is the case with

history, psychology belongs to several different types of sciences, to both the natural sciences and to the humanities or the cultural sciences ("Geisteswissenschaften" as classically defined by a.o. Dilthey). Psychohistory typically ranges on the cultural side of psychology, as it acknowledges that psychic phenomena are different at different times and places and that they are culturally constituted (Belzen 2010). Inevitably drawing on modern scientific knowledge, psychohistorians try to employ contemporary psychological instruments to explore past state of affairs, which puts them in tension with historical psychologists who stress the different character of past psychic phenomena, and who sometimes go so far as to deny that any contemporary psychology can be employed in researching the past.

Religion

Numerous religious states of affairs may and have been investigated from psychological, historical, and psychohistorical perspectives however.

Characteristics

It is the typical combination of psychological and historical scholarship (empirical historical research guided and interpreted by psychological insights) that makes psychohistory distinctive.

Relevance to Science and Religion

Just like psychology and history, psychohistory may be relevant on a theoretical level to any dialogue between science and religion, but like its mother disciplines, it is more likely to be applied to religious phenomena and states of affairs rather than to contribute to a dialogue with any religion (in what way ever understood). Psychohistory does research on religious phenomena; in fact, quite a number of classic studies in psychohistory also count as classics in the psychology of religion (e.g., Carroll 1986;

Freud 1923/1961; Erikson 1958; Festinger et al. 1956). But again (see section "Description"), not all combinations of psychology and history in the psychology of religion can count as psychohistory: Acknowledging that psychological phenomena are developing products of historico-cultural constitution is something else and something more than combining psychology with an interest in religious phenomena from other times and places (as, e.g., with Jung who – quite the opposite of cultural psychology – searched for the same psychological archetypes in various places). It is also different from carrying an anthropological interest into the study of the history of religions, as with great authors such as Otto, Van der Leeuw, or Eliade.

Sources of Authority

The same sources as for psychology and history are authoritative for psychohistory.

Ethical Principles

The same ethical principle as with psychology and history guide psychohistory.

Key Values

Psychohistory endorses the same values as the disciplines of psychology and history.

Conceptualization

Nature and world, human being, life and death, reality, knowledge, truth, time, rationality/reason, and mystery are no concepts specific to psychology or history; therefore, psychohistory does not define them in any way of its own. Perception and consciousness being concepts specific to psychology, psychohistorians follow contemporary psychological theories in their conceptualization of these; they do not offer new or specific definitions.

Relevant Themes

An important issue that psychologists have largely lost sight of is the origin and development of culture including religions. Whether psychology has anything to offer with respect to these issues to historical research is a question still to be settled. (At present, so-called cognitive scientists of religion, usually trained in "religious studies," seem to be more optimistic in this regard than both psychologists and historians.) Yet in the light of the many new developments in fields like biology, neurology, and evolutionary theory, psychologists need to address anew the nature of the knowledge they produce and reflect whether new forms of psychohistory, as interdisciplinary area between psychology and history, might be developed.

Cross-References

▶ Psychobiography
▶ Psychology of Religion
▶ Religiosity
▶ Religious Experience
▶ Self

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Psycholinguistics

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Related Terms

Language; Psycholinguistics; Psychology of language

Description

Psycholinguistics is the scientific study of the psychological processes involved in language. Psycholinguistics investigates how humans produce, understand, and store language, and is therefore concerned with processes such as speaking, listening, writing, and reading. Therefore, of necessity the representation and storage of language and meaning are of fundamental interest to researchers in the area. Psycholinguists also investigate how children acquire language and how aging changes language skills. The subject is also concerned with the relation between language and the brain, and some researchers construct models of how different types of brain damage affect language. The scope of the subject also includes language in exceptional circumstances, such as the effects of linguistic deprivation, developmental disorders of language, and language in other modalities (particularly sign language).

In addition to progressing our understanding of these processes using experimental techniques standard in much of cognitive psychology, over

the last decade or so, psycholinguistics has made notable advances along four new fronts.

First, recent developments in brain imaging, particularly ▶ fMRI (functional magnetic resonance imaging), have enabled us to map how has enabled us the brain processes language in real time. Although there is still some way to go in terms of the quality of resolution of the data generated by these techniques, we now have an advanced understanding of which part of the brain does what, how the parts are functionally related together, and how the parts interact in real time. In addition to aiding our understanding of normal processing, these advances have enhanced our understanding of how the brain can go wrong, both in terms of developmental and acquired disorders.

Second, advances in genetic mapping have led to the very beginning of an understanding of the genetic basis of language. Specific language impairment (▶ SLI) is a deficit of producing sounds and grammar that runs in families. Genes have been identified that might be related to the language disorders playing a central role in ▶ SLI, although the precise way in which they manifest themselves is controversial. The FOXP2 gene, which has been called the "speech and language" gene, has been suggested to play a central role in language acquisition and evolution.

Third, anthropological evidence has been related to the mutation of the FOXP2 gene to give greater understanding of the evolution of language. Language and speech must have been present at the start of the cultural flowering of 50,000 BC, although it might have been present some time earlier. Archaeological finds that suggest that Neanderthals played musical instruments, along with genetic evidence, suggest that the Neanderthal branch of the hominid tree was also capable of language. One plausible idea is that spoken language evolved out of manual gestures, with the mutation in the FOXP2 gene allowing greater control over the tongue and lips, so that the symbol system could be transferred to the mouth, freeing the hands for the use of tools simultaneous with communicating.

Fourth, computational modeling over the last couple of decades has greatly increased our understanding of the microprocesses involved in language. Connectionist modeling shows how complex processes can emerge from the interaction of many simple "▶ neuron-like" units. Another advantage of this type of model is that it emphasizes the role of learning in behavior. The models have been most successfully applied to word recognition, particularly reading, and word production.

Connectionist models emphasize the importance of statistical regularities in the linguistic input rather than the operation of formal linguistic rules, and this has led to a general acknowledgment of the role of statistical processes in language. For example, in reading, many argue that a word's pronunciation is influenced by the sum of the total influences of similar words; in language acquisition, infants may learn to segment language by detecting statistical regularities in the input. The extent to which language processing is statistical or based in rules and the extent to which we are born with innate language-specific knowledge rather than acquire language using general-purpose cognitive mechanisms are two of the great current controversies in psycholinguistics.

Self-identification

Psycholinguistics is most definitely a science. It uses the scientific method, using experiments and other data to formulate and test hypotheses and distinguish between competing theories. The discipline does not self-identify as a religion in any way.

Characteristics

Psycholinguistics is distinguished by the scope of its material: It is concerned with the intersection of language and psychology and asks the question: What are the processes involved in doing language? In this respect, it needs to be distinguished most from linguistics, the study of language in itself. The distinction originally made by

Noam Chomsky between linguistic competence (idealized linguistic knowledge) and performance (language as it is actually produced and understood, subject to our many cognitive limitations, such as limited memory resources) is still relevant. Psycholinguistics is best conceptualized as an arm of cognitive psychology. Nevertheless, although it has a distinct identity, it is an interdisciplinary subject, and knowledge of linguistics, anthropology, cognitive psychology, social psychology, artificial intelligence, philosophy, and now genetics and evolution stands researchers in good stead.

Relevance to Science and Religion

Although psycholinguistics is not directly interested in "science and religion," it does have some implications for the topic. First, language is uniquely human. Although some animals have rich communication systems, they all lack the creativity of human language that enables us to express any thought. And although there have been several attempts to teach language to animals, particularly chimpanzees, none has been equivocally successful. Language sets us apart. Second, it casts light on the relation between language and thought and the origins of culture, cognition, and thought. Indeed, it is likely that origin of religious beliefs dates to soon after the origin of language. It is impossible to conceive of religions without language.

Sources of Authority

Although we can discern a few early attempts at understanding language with an approach that is undeniably modern, the history of psycholinguistics is a relatively modern one. Psycholinguistics emerged from a postwar synthesis of psychology, information theory, and linguistics. Many trace its origin to a conference held in the summer of 1951 in Cornell, USA; its first printed use was in the title of the book by Osgood and Sebeok (1954) reporting that conference.

The first great authority in the subject, and still one of the most cited authorities in the area, was the American linguist, Noam Chomsky, whose review of Skinner's book Verbal Behavior created the landscape of the early subject. Chomsky's early work on transformational grammar was seized upon by psychologists, particularly George Miller, as a model of how the mind might process knowledge, in addition to a representation of our knowledge of language. The early experiments that showed some relation between psycholinguistic processing and linguistic theory were followed by disillusion, and since the late 1960s, psycholinguistics and linguistics have gone separate ways, in a way that mirrors Chomsky's performance-competence distinction.

Psycholinguistics is a broad and fast-changing area, and there has been no single authority since its earliest days. Now authority is defined by accomplishment, as measured by publication in a peer-reviewed journal. It might be added that like much of cognitive psychology, it is a subject area riven by disagreement over the fundamentals: Is processing interactive or modular? Do we use rules or statistical knowledge? Do we have innate language-specific knowledge, or do we learn language using general-purpose learning mechanisms? The answer you get will depend on which authority you are speaking on which authority to whom you are speaking.

There are two recent handbooks that cover the area, Gaskell's *Oxford Handbook of Psycholinguistics* (Gaskell 2007) and Traxler and Gernsbacher's *Handbook of Psycholinguistics*, now in its second edition (Traxler and Gernsbacher 2006). There are also a number of texts, including Harley (2008, 2010) and well-known popular books (Pinker 1994, 1999).

Ethical Principles

Psycholinguistic research is guided by the same ethical principles that govern other sorts of psychological research. The primary rule is that the participant must normally give informed consent, unless there are very good reasons for doing so

(e.g., the person is unable through age or illness), in which case other appropriate consent should be sought. Researchers typically abide by the ethical guidelines of institutions such as the American or British Psychological Associations. However, because of the nature of the subject matter and experimental techniques used, ethically controversial studies are rare. Participants are not subjected to pain, humiliation, or danger. Occasionally, participants may be deceived to a small degree of deception about the purpose of the experiment (e.g., they might be told that the experiment is about memory when in fact it is about word recognition), but this deception is typically very minor and usually considered trivial.

Key Values

The key value is adherence to the scientific method: experimental rigor. Psycholinguistics is a subdiscipline of cognitive psychology and depends for its integrity upon the rigorous application of the scientific method: the collection of experimental and observational data, statistical analysis, and the formation and rejection of hypotheses on the basis of those data.

Conceptualization

Nature/World
Humans are part of nature and use language to describe and study their world. In addition, studies of semantics suggest that all languages share a number of universal features, at the levels of the types of grammatical rules used and, perhaps even more revealing, in the types of semantic representations used, suggesting that all languages reflect a similar "deep" cognitive structure that derives from the way human brains interact with the world, mediated by our senses.

Human Being
Psycholinguistic research investigates topics central to the question of what does it mean to be human. Language is one of the most important cognitive achievements that separates us from animals: It is probably the single most important distinguishing cognitive difference. Animals communicate; humans talk or sign. It also seems that there is a human drive to develop a language, even in the most difficult of circumstances. Even when situations deprive children of language, they develop some version of it. For example, for some time, deaf children in Nicaragua were kept in isolation; nevertheless, the children developed their own sign language to communicate with each other, with the language having its own grammar. Children who grow up exposed to pidgins (mixed languages used to communicate readily in mixed linguistic communications) effortlessly convert pidgins to creoles, which are rich languages with their own full grammars.

Life and Death
Psycholinguistics does not really have anything directly to say about the origins of life and death. Different cultures express their attitudes to life and death in different ways, but this topic is more strictly in the domain of anthropology and linguistics rather than psycholinguistics.

Reality
One of the key issues in psycholinguistics is the relation between language and thought. One influential idea has been the Sapir-Whorf hypothesis, the idea that the way in which we perceive and categorize the world is determined by the form of our language. Although this hypothesis is almost certainly incorrect, elements of it are supported by data: To some extent, the way in which we conceptualize the world is facilitated or affected by aspects of our language, and differences between languages might lead to differences in how we conceptualize aspects of reality. However, most psycholinguists think that the way in which we perceive the world is mostly determined by a combination of our biology and pressure from the environment; that is, reality constrains the way in which we think about reality.

Knowledge
Again, the relation between language and thought is important here. We describe our knowledge linguistically and use language to devise and

report studies to analyze knowledge. Knowledge is transmitted horizontally (from person to person) and vertically (from generation to generation) by language.

Truth

Yet again, the relation between language and thought is important here. Certainly, we are constrained by our language to some extent about how we can describe the external world and therefore what we believe to be "true" and "false." Psycholinguists will adopt different individual viewpoints on the philosophical aspects of science. And of course, some things are a matter of faith alone.

Perception

As mentioned above, although language might influence aspects of perception (it is easier to remember something if we have a name for it), perception is mainly determined in the first instance by our biology. There are two caveats to this conclusion: First, we tend to perceive auditory stimuli in discrete categories (a phenomenon known as categorical perception); second, many argue that there are top-down influences on perception, so, for example, we find it easier to identify a sound in a word context than a nonword context.

Time

Once more, the relation between language and thought is important here.

Consciousness

We describe the contents of our consciousness linguistically. Introspection shows that language plays an important role in human consciousness; our "stream of consciousness" is made up out of inner speech. It is unlikely that language is essential for consciousness (it would take a very brave person to say that a chimpanzee has no consciousness of any sort), but it clearly plays an important role in shaping its contents.

Rationality/Reason

We use language to describe reasoning. Indeed, formal logic is a form of language, but having language does not mean that we necessarily always – or even usually – reason logically. We are subject to several types of bias. Language can even lead our reasoning astray, leading us to irrational conclusions. In particular, it has been shown many times that the way in which we phrase a problem can affect the conclusions we draw. People are also reluctant to move away from the meaning conferred by a verbal label to think of novel uses for objects (an effect known as functional fixedness).

Mystery

There are plenty of mysteries left in psycholinguistics! And as Nabokov said, "the deeper one's science, the deeper one's sense of mystery."

Relevant Themes

There are no critical concepts, but:

1. Language is what makes us human and is responsible for what defines us as apart from other higher primates (Diamond 1992).
2. It is inconceivable that sophisticated culture and any form of religion could have developed without language.
3. Complex thought and symbolic representation are intimately involved with language.

Cross-References

▶ Psycholinguistics

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Psychology

Psychology in Buddhism

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Related Terms

Dharma/dhamma psychology; NeoZen; New Buddhist Psychology; Psychology of Relational Buddhism; Relational Buddhism; Relational Dharma

Description

Born a prince some 100 generations ago in the clan of the Shakyas (kindness), the Buddha (awakened one), named Siddhartha (having all worldly wishes fulfilled) Gautama (most victorious on earth) before his awakening, was a fallible human being who lived at the foothills of the Himalayas in the Iron Age. Living comfortably, like many urban citizens nowadays, Siddhartha was eager to uncover life's meaning after observing *duhkha*: suffering due the predicament of birth, illness, aging, and death. Historically, his teaching (Dharma, Sanskrit) countered Brahmanism by contending "neither theism nor atheism." The Buddha's way was explained down the ages as a religious quest, metaphysics, ethics, and recently as a psychology. This is possible due to the principle of *upaya*, the "skillful method" enabling the Dharma to adjust to various cultures and times.

The term "Buddhist psychology" (BP) was coined by C. Rhys Davids in her 1900 *Buddhist Manual of Psychological Ethics*. She dealt with the Theravada (Elders') three baskets transmitted orally during four centuries and subsequently written down in Pali on palm leaves in the first century before Common Era (BCE). The first basket is about rules for *bhikkhus*, Buddhist scholars; the second is about the Buddha's discourses; and the third contains abstractions of the discourses, made until the fifth century BCE. The size of these scriptures is about ten times the bible. The size of the Mahayana (Great Vehicle) Sanskrit scriptures, written during the first century BCE until the twelfth/thirteenth century, is about 50 times the bible. BP reflects a confluence of Buddhist scriptures and western psychological science. While psychology refers to the study of mind and behavior marked by the start of Wundt's laboratory (1879), the term "psychology" did not exist in the languages through which Dharma is rendered. In BP, the mind is not located in the head but in-between people's hearts. In first instance, BP aims at experiencing "emptiness," comparable to the universe's black hole dissolving everything and nothing. Emptiness is not a goal in itself but a reset point for prosocial behavior. Meditation awakens to Dependent Origination-arising-peaking-subsiding-ceasing of experience, the Buddhist insight *par excellence*.

The Buddhist quest is to end *duhkha* by improving interpersonal conduct. Based on the enlightening view that "to be means to inter-be," a meaningful life is pursued through the Immeasurables, social meditations of loving-kindness, empathic compassion, and shared joy, filling in the emptiness. These are serene actions to antidote the Poisons of greed

(causing economic crises), hatred (causing global terrorism), and ignorance (causing daily misery). The most recent development is that BP concurs in many respects with social construction, a psychology emphasizing human interconnectedness by proposing "relational being" (Gergen 2009), by contending that "transcendental truths" are nonfoundational (empty), and by asserting that psychological processes are not so much under the skin as they are in-between people. Do individuals come together to form relationships or is it out of relational process that the idea of "independent agency" is derived? (This chapter is largely based on Kwee, 2010)

Self-identification

Science

BP identifies itself as a human science. C. Rhys Davids' (1857–1942) pioneering endeavors might be considered as the first generation of BP studies founding a basis for two subsequent generations after WWII. Building on this "old" BP, a second generation is endowed by Padmasiri de Silva's *An Introduction to Buddhist Psychology* (1979, 4th revision: 2005) and David Kalupahana's *The Principles of Buddhist Psychology* (1987). The second generation was also landmarked by Mahayana authors like Daisetz Teitaru Suzuki (1870–1966), Chögyam Trungpa (1939–1987), and Alan Watts (1915–1973). Psychology's "grand old men" who embraced the Dharma were William James (1842–1910), Carl Jung (1875–1961), Abraham Maslow (1908–1970), and Erich Fromm (1900–1980). The "psychobiologist" Francisco Varela (1946–2001) may be added to this list.

The third generation is primarily gathered since 1987 in the Dalai Lama's "Mind & Life Institute" <www.mindandlife.org> which promotes a science of mind. To its inner core belongs Allan Wallace, Daniel Goleman, Richard Davidson, Paul Ekman, and Jon Kabat-Zinn. The latter devised an outpatient training "Mindfulness-Based Stress Reduction" which sparked "mindfulness-based cognitive therapy" and a number of kindred programs

<http://marc.ucla.edu>. Other cognitive-behavioral approaches have also included mindfulness, e.g., Dialectical Behavior Therapy and Acceptance and Commitment Therapy. Whether these mindfulness meditation-inspired approaches deserve the predicate Buddhist is questionable because they conceive mindfulness as a universal method and conceal its Buddhist origins for their patients (Shapiro and Carlson 2009). A less known group, the Transcultural Society for Clinical Meditation, founded by Yutaka Haruki, is particularly committed to advance BP http://transcultural.meditation.googlepages.com. Promoting a "new" BP, this society integrates evidence-based data connecting the Dharma with psychology in order to arrive at a "social-constructionist-clinical-neuro-Buddhist psychology" (Kwee et al. 2006; Kwee 2010).

The *psychology of social construction* offers a metaperspective asserting that truth, reality, knowledge, and facts are community-based; that meaning, values, morality, and ethics are a cultural consensus; that objectivity is a relational achievement – *verstehen* is more important than *erklaeren* – and that language is a pragmatic tool to constitute nonfoundational "truths." *Clinical psychology* prescribes an evidence-based approach of outcome research. Belonging to the most effective and efficient, the cognitive-behavioral approach gets on well with most of the Pan-Buddhist tenets. This accordance was explored by pioneers in the 1970s and 1980s, particularly by William Mikulas, Padmal de Silva, and Maurits Kwee (Kwee 1990). As a *neuropsychology*, BP is on the lookout for neuroscientific correlates of Buddhist concepts and practices. Initiated in the 1950s by neurophysiologists A. Kasamatsu, T. Hirai, and Y. Akishige, BP seeks, among others, for brain-based evidence of the Buddha's 6th sense (mind's eye) capable to perceive *dharmas* (the smallest units of experience) during meditation (Austin 2009).

Religion

Buddhist classical thought evolved from the Buddha's pristine discourses as extant in the

Theravada *suttas*' onto the Mahayana *sutras* which criticize the early traditions as not prosocial enough. All scriptures were written from the first century BCE until the seventh century by anonymous authors. The *sutras* can be subdivided in the *Perfection of Wisdom sutras* and the *Buddha-womb sutras* which include loose texts called *tantras*. Nagarjuna, also known as the second Buddha, commented on the wisdom *sutras* through his Madhyamaka school (second century) and expounded "emptiness only" to attain by a "via negativa." This school alludes to an intermediate phase in an evolution that moved from the Buddha to the last innovation of Yogacara "meditation only" school (fourth century) championed by Asanga and Vasubandhu who commented on the Buddha-womb *sutras* and complemented Nagarjuna's "emptiness of emptiness" which they regard as a *horror vacuum*. Their "via positiva" containing metaphysical flirtations, deemed to be merely cognitive representations against the backdrop of emptiness, eventually grew exponentially. A Mahayana subcurrent, called Vajrayana (Adamantine Vehicle), foremost practiced in the Himalayas, evolved from Yogacara's metaphor of deified Buddha-natures. Thus, an extensive cosmology developed; see Table 1 for a sample of categories. By having the teachings resemble a theistic religion, the *upaya* campaign succeeded in luring the meek into a declining Dharma.

Characteristics

BP is to be distinguished from Dharma interpreted as a religion. As a clinical and neuropsychology, it bears strong resemblance with the stimulus-organism-response paradigm widely used in cognitive-behavioral psychology. Dharma as social construction applies a family of redefined terms. This is in accord with Wittgenstein's observation that meanings of words are constructed, while they are actively used by a community in service of its particular needs. Thus, a Dharma qua religion applies a "language game" of religion, while a Dharma qua psychology applies a "language game" of psychology. A social constructionist idiom of ten keywords is submitted in the following vocabulary:

1. Instead of Buddhism: *Dharma*. Translated as Buddh-"ism" which came to denote religion, philosophy, metaphysics, or ethics, Dharma refers to a way of life for which there is no western equivalent. Nonetheless, Buddhism can be used as a container term like in "Relational Buddhism." With a capital D, it is differentiated from *dharma* with a simple *d*: perceivables, conceivables, imaginables, knowables, memorables, dreams, illusions, and delusions; manifesting in protean versatility, they all continuously change qua form and content.

2. Instead of the four Noble Truths: 4-Ennobling Realities. Truth smells of transcendence, while *sacca* from which truth is derived might also mean real. Ennobling is preferred because one will not become a nobleman by walking the Buddhist talk. A similar rationale applies to the 8-Fold Balancing Practice.

3. Instead of "right": *balancing* (for *samma*) to denote eight factors entwined in a transforming practice: view-understanding, intention-thought, speech-communication, action-behavior, living-habitude, effort-commitment, attention-concentration, and awareness-introspection. Obviously, right means not wrong. Because these are dualistic terms, nondual balancing reflects the process of the "Middle Way." BP offers a practical guide toward awakening to *Dependent Origination*, emptiness/▶ Not-self, and interbeing while balancing in life's journey. Balancing implies a spirit of equanimity/serenity. NB: dogma and sin are anathema in the Buddhist Dharma.

4. Instead of suffering: *duhkha* which refers to life's nonsatisfactoriness, hence the adjective "existential" is applicable. Due to existential impermanence, imperfection, and gnawing imbalances, *duhkha* is not a punishment or sacrifice but a disquieting "dis-ease" to be endured with regard to what the next moment will bring. This gives rise to agony due to

Psychology in Buddhism, Table 1 Vajrayana divine cosmology against a backdrop of emptiness$^{\copyright}$: a sample

Buddha-nature	Vairocana	Akshobhya	Ratnasambhava	Amitabha	Amoghasiddhi
Meaning:	Illuminating	Imperturbable	Jewel-born	Infinite light	Invincible
Color:	White	Blue	Yellow	Red	Green
Location:	Center	East	South	West	North
Element:	Void	Water	Earth	Fire	Wind
Consciousness (cs):	Buddha cs	Memory cs	Self cs	6th sense cs	5 Senses cs
Awareness:	Emptying	Mirroring	Harmonizing	Discriminating	Accomplishing
Affliction:	Ignorance	Hatred	Pride	Greed	Envy
Interbeing:	Loving-kindness	Joy	Equanimity	Compassion	Friendliness

angst, anguish, aversion, despair, discomfort, frustration, lamentation, misery, pain, sorrow, and stress. Enduring *duhkha* becomes cyclical through "rebirths" of emotional episodes.

5. Instead of a paradise in the beyond, Nirvana as a state/trait of mental coolness, i.e., the result of extinction of ignorance-craving and its affective-behavioral ramifications (greed-grasping/hatred-clinging). While greed hides anxiety (fear of shortage) and sadness (grief of loss), hatred hides anger (other-blame) and depression (self-blame). It may also refer to happiness amidst adversity, smiling contentment, and silent emptiness.

6. Instead of reward/punishment or fate, ▶ Karma as self-chosen intentional interaction (*Kamma Sutta*). The Buddhist *Karma* is not a "bank account" of demeanor like in the following mind-boggling teaching anecdote (*koan*). Once in 521, Bodhidharma visited the Emperor Wu, a great patron of the Dharma. Having built many priories, he asked what merit his generosity had earned. "No merit" was the answer. Flabbergasted, he asked what the supreme essence of Dharma is. "Vast emptiness, nothing holy," was the reply. Finally, he asked, "Who are you?" "Don't know," said Bodhidharma alluding to "*Not-self.*"

7. *Skandhas*: behavior, affect, sensation, imagery/cognition, and awareness, these BASIC modalities, move in a flux, are anchored in biological processes and in social interactions. Constituting the "provisional self," they are subject to habits of clinging/

attachment. Ultimately, this self is empty which is obvious if its reified and abstract nature is understood. BASIC's emptiness implies that there is no ghost in the machine or a soul to identify with, a notion discarding reincarnation. The *Skandhas* are the Buddhist down-to-earth-all-and-everything dismissing metaphysics and a psychological cornerstone of interbeing.

8. Instead of the Eurocentric term "enlightenment," "awakening" which is the pristine meaning of *bodhi*. The root *budh* means "to be wakeful and aware of," i.e., not to be illusioned by a self/soul or delusioned by a god. As from the Age of Enlightenment (eighteenth century), scientists believe in "timeless truths" and declared the supremacy of rational-empirical/logical-positivistic science. Dharma illuminates by means of heartfelt interpersonal understanding rather than through the calculating mind.

9. *Mara*: a projection of inner states. The seducing demon Mara symbolizes inner foes, i.e., fears of death, illusions of self/soul, delusions of celestial beings, and the six realms. The realms are bliss-pride (gods), envy-struggle (demigods), greed-ignorance (animals), hate-anger (hell fires), craving-grasping (hungry ghosts), and doubting-clinging on the one hand and awakening-*Nirvana* on the other hand (humans).

10. Because the Dharma does not acknowledge sinners and saints, the *arahant* is not a saint but someone who has overcome her/his proverbial inner enemies.

Relevance to Science and Religion

BP moves away from Dharma viewed as a religion toward becoming a psychology of transformational dialogue. Although *upaya* permits presenting a "sky-god religion," Dharma is not a religion as commonly viewed. BP will not satisfy seekers of eternalism or annihilationism. Instead, a "neither all nor nothing" is proposed which cancels out the existence of a god as well as the nonexistence of god, leaving us behind with "nontheistic emptiness." Nontheistic means neither gnostic/theistic nor agnostic/atheistic and even not something in the middle: god is a nonissue. Instead, BP promotes mind's emptiness as a reset point from where to cultivate prosocial feeling-thinking-interacting. Its sole aim is to end *duhkha* by an experiential/experimental understanding how the mind works. Not conducive to inner freedom, metaphysics, dogma, creed, belief, omniscience, and miracles are viewed as impossible to confirm or deny nonsense. Never claiming to be a godly authority, the Buddha never assigned people to worship him. Notwithstanding, he is usually listed alongside Moses, Jesus, and Mohammed. The Buddha does not belong to this Abrahamic company because at bottom his Dharma considers godheads as delusional. Rather than god created man, the adage "first man created god and then god created man" is endorsed. Later adherents of the Chan/Zen denomination even admonished to kill the Buddha and advised to urinate on Buddha statues or to clean ass with scriptures, thus clarifying that concepts are empty. Phenotypical similarities mask genotypical differences: vodka and water taste differently.

Sources of Authority

James, founding father of American psychology, embraced Dharma as a psychology. He not only recognized its psychology, he also agreed on the notion of *Karma* (the interplay of intentional meaning and relational action), acknowledged that we "normally" are only half awake, drew on Dharma when framing concepts, e.g., the "stream of consciousness" and "pure" experience, and addressed the value of mindfulness on the wandering mind.

Ethical Principles

Robin Hood's morality is different from the sheriff's. By the same token, BP is a morality without ethics which concurs with the social constructionist "nonfoundational morality of collaborative practice" (Gergen 2009). Ethics are rooted in differing interpersonal values and variegated communal conduct. Because absolutisms are anathema, BP's morality is based on relational motives. The focus is on the relational process itself in reflective negotiation and transformational dialogue as exemplified in the *Jataka* allegories wherein the Buddha lied and killed. Thus, Dharma is not a theory of ethics but a psychology of *Not-self* and interbeing. Avoiding karmic nonvirtues of *body* (killing, stealing, misconduct), *speech* (lying, divisive, harsh, idle talk), and *mind* (envy, harmful intent, erroneous views), BP cultivates responsibility in relationships through generosity, virtue, renunciation, insight, effort, forbearance, honesty, resolution, kindness, and equanimity.

BP and social construction view morality as a collaborative practice that goes beyond moral absolutism and relativism. It offers a morality continuum ranging from a rigid to a tolerant sense of "right." Meaning on what one cares about in life is generated in togetherness and provides value in relationships. However, there are multiple voices within one community. What is acceptable in one relationship is not necessarily acceptable in another relationship. Various relationships generate various moralities. On the other hand, congealing moralities create a space of "them" and "badness." If one group considers itself as morally just, others are bound to be wrong. The Buddhist stand is practical and submits that a morality that claims to be "transcendental truth" is inimical to human well-being. Because BP is not a set of rules, the

moralistic terms evil and good are avoided in favor of un/wholesomeness.

Key Values

Although BP is not an ethical system, this does not imply that the Buddhist roadmap does not advance values. The Buddhist way of life embodies wholesomeness by cultivating virtue versus greed-hatred and savvy-wisdom versus ignorance. Known as the root *Poisons*, greed, hatred, and ignorance are to be eradicated for the sake of relational harmony; ignorance refers to unawareness of the mind's functioning. Continuously lured by illusions and delusions, the mind, once awakened from enticing dreams, is ready to cultivate the core virtues of the *Immeasurables*. These are relational stances to be multiplied through contemplation, visualization, and walking the talk. Teaching social meditations to as many people as possible is the Buddhist practice to make love go round in the world.

Conceptualization

Nature/World

BP deals with the world out there as well as with the internal world which comes about by personal history in a cultural context and through a multitude of other social influences. Dealing with a relationally generated mind, the *4-Ennobling Realities* is an interpersonal psychology, there is *duhkha* which originates and ceases in codependence, and the remedy is an *8-Fold Balancing Practice*. The nature of existence is determined by relational processes, implying a view that the individual is an exponent of relationship and of the 3-Empirical Marks of Existence. Due to the world's impermanence-imperfection, *duhkha* comes about: craving for permanence, grasping to perfection, and clinging on an abiding self. BP deconstructs erroneous views on self/I-me-mine. Although we need provisional tools in daily life, quasi self-identifications like a name, ultimately, there is

no self. Whatever one says about self, it cannot be the same in the next moment of the flux.

Human Being

Human being as "biochemical-sensing-moving-thinking-emoting-relational being" is accountable for intentional interaction. In *Karma* lies the opportunity for a turnaround despite an unfortunate past. According to a review, intentional activity determines sustainable happiness for 40%, circumstances account for 10%, and genetic endowment explains 50% (Lyubomirsky 2008). We are relational beings because we "inter-be" (*Avatamsaka Sutra*), as (1) bodies conceived in sexual interaction, (2) interactive speech from the cradle to the grave, and (3) mind viewed as extended in between people rather than as self-contained. Change comes about as effect in body/speech/mind. The body subsumes movements (B) and feelings (A, S), the mind subsumes visualizing (I) and conceptualizing (C), and speech subsumes *i*nterrelationships. Thus, the *BASIC-I* of interbeing is constructed. Body/speech/mind concurs with the bio-psycho-social paradigm of self-organizing living systems operating through feedback and feedforward loops in self-perpetuating cyclical processes (Kwee 2010). Body/speech/mind is thus a subsystem of an interpersonal metasystem called interbeing (*Heart Sutra*), which is equivalent to relational being that exists in interaction rather than behind the eyeballs (Gergen 2009). Relational being implies the emptiness of solitary selves, the Buddhist proposition *par excellence*. Focusing on interactions, "you-me" binaries crumble; viewing persons as manifestations of relationships, individuals are empty of the private. Even thoughts cannot be solipsistic as they emerge from a history of language and relations. "Relational Interbeing" does not discard psychobiology but completes our humane nature.

Life and Death

BP's *raison d'être* is to end *duhkha*; thus, metaphysical questions remain unanswered (*Cula-Malunkyovada Sutta*). Instead of questioning – e.g., "Is the world eternal or not, or

both, or neither?" – a simile is told on a man shot by a poison arrow to emphasize action. The man would die if rather than treating him, one quizzes the archer's name, caste, appearance, home, the arrow's type, etc. Awakening does not require being a scientist or knowledge on the origin of life.

Once, the Buddha explained that he is a peerless *arahant* who had conquered his inner enemies, i.e., quenched his inner fires. Having attained *Nirvana*, he was going to beat the drum of "deathlessness" in a blind world (*Ariyapariyesana Sutta*). Deathless refers to liberation due to nonattachment – noncraving/nongrasping/nonclinging – to what is born and dies. Deathlessness is attained by uncovering the unborn, like in the Zen question: how does my face look like before I was born? Such is not a task of reconstruction; nothing can be done but to detach and "dissolve" the question. *Nirvana* is featureless, colorless, tasteless, and formless and has been around like space, before realizing it is here. Deathless is a state/trait free from conditioning/conditionality from the concepts of birth and death by terminating the habit of attachment.

Notions of life after death and reincarnation are atavisms, indigenous cultural beliefs, which have become part of a local Dharma. There is nothing to transmigrate across lives without a soul. BP's rebirth is a cyclical emotional episode recurring as relational scenarios of depression, fear, anger, sadness, joy, love, or serenity. Other worldly vagaries on rebirth are to be eschewed.

Reality

Reality of the unawakened is determined by the *sensorium* of the visible, hearable, smellable, tastable, and touchable. Reality of the meditator is determined by the mind's eye able to perceive *dharmas*. BP hypothesizes that the neuroplastic brain functions as a sixth sense organ with the capacity to perceive the mind, its activities, and its contents. Meditation enables to see "things as they really become" and to discover that *dharmas* move in *Dependent Origination* (codependence, interdependence, or nonindependence). Reality may be "true" in one community but "false" in

another one. Beyond community, there is thundering silence. Like the self, reality is provisional, linguistically coconstructed, and arranged in a dance of meanings. Even if unveiled by science, data are man-made, intersubjective, relative, and inextricably space-time-culture bound. Conceived as narratives, they are amenable to amendment and to be replaced by more functional social constructions going forward. Actually, this is happening in the present transition of the Dharma from a religion toward a "Psychology of Relational Buddhism".

Knowledge

The Buddhist community is studious. BP appreciates qualitative and quantitative research as provisional knowledge on three levels of inquiry: objective (third person neuropsychology), intersubjective (second person social psychology), and subjective (first person clinical psychology and meditation). Although objectivity is fictitious, it would be unwise to neglect statistical indexes, e.g., of the weather. BP endeavors to gain insight in the genesis of experience and in the nature of knowledge. Sensory data, even if neutrally observed, are biased by inference conditioned by cultural beliefs. Even objective validation of subjective experience by sophisticated brain imaging machines is guesswork and communal construction. Resorting to neuroscience seems to be another cultural conviction rather than a final revelation of mental states. Real for those who work within the tradition, it is questionable whether such mapping is *the* reflection of the world that should be privileged or is just another site of speculation. If no reality claim is privileged, there is no need to eradicate anything but to listen instead to the different voices of strange bedfellows which intersecting could spawn creative outcomes. Recognizing the pragmatics of knowledge in realizing awakening, BP advises not to carry a raft around once arrived at the other shore.

Truth

The concept of "transcendental truth" is anathema in BP which aims at experiencing emptiness

Psychology in Buddhism, Table 2 Quadrant of mindfulness meditation[©]

Mindfulness: remember to keep a balanced mind in order to be able to dissolve *existential suffering*	Bare attention: perception of *dharmas* via the six senses (knowledge by description), in *verbal speech*	Choiceless awareness: 6th sense *dharmas'* apperception (wisdom by acquaintance): non-verbal/no speech, in *clear comprehension*
Relaxed/gentle/focused concentration on object or process with zeal and diligence (*dhyana*)	1. Samatha (body/mind) calm/ composure/tranquility/equanimity: *Quiescence*	2. Samadhi (body/mind) receptive absorption/flow-stabilization through flame extinction: *Nirvana*
Vigilant deep introspection/ reflection discerning un/ wholesome Karma (*watchfulness*)	3. Vipassana (mind/body) insight in the psychological causation of feel/think/do in *Dependent Origination*	4. Sunyata (mind/body), the highest wisdom of emptiness, suchness, or zeroness as a reset point: *Not-self*

via a dialectics of negation ("neither this nor that"). We live in a provisional reality of meaning and values emerging from culture and history constructed in relationships and concatenated to action. Relationships create meaning which motivates action abandoning the invaluable while participating in new relational endeavors ever making new realities and ways of life possible. This understanding of truth and reality does not constitute a belief as it is not conclusive. Dharmic "truth," if any, is nondual: neither true nor false.

Perception

Perception is relevant in the unwholesomeness uprooting Buddhist meditations alluded to in the *8-Fold Balancing Practice*. The first step is to tame the restless mind by *dhyana* which is the cultivation of concentration by using the breath as an anchor. It works at one pointedness, contentment, equanimity, and stillness (see Table 2).

Mindfulness aims at illuminating consciousness and consists of attention-concentration/ awareness-introspection. *Dhyana* is a run-up to mindfulness, encompassing Samatha meditation leading to Samadhi (stabilization) and Vipassana meditation leading to Sunyata (emptiness). While Samatha-Samadhi, comprising means and goals, operates like a metonym (there is no way to mindfulness, mindfulness is the way), Vipassana-Sunyata is purposeful by intending to further wise reflection. The quadrant clarifies that mindfulness starts by cultivating composure, tranquility, and equanimity of body/mind

(including inner speech) due to relaxed concentration and bare attention by neutrally observing perceptual stimuli. Practice shifts this quiescence into a nonsuppressing state of stable flow in absorption due to gentle concentration on occurring *dharmas* in full presence and clear comprehension resulting in the extinction of emotional arousal (*Nirvana*). Having thus healed afflictions, one progresses onto cultivating mind/body (including inner speech) by cleansing the doors of perception in order to be able to see in a "special way," i.e., perceive "things as they really become" (in *Dependent Origination*). This insight comes about by remembering attentiveness and by being vigilantly watchful in discerning un/wholesome *Karma*. By staying heedful in wise introspection and in unclouded luminosity of clear comprehension and discernment, the mind gradually shifts and/or suddenly drops toward a bottomless emptiness/selflessness, also called luminous "suchness" or liberating "zeroness."

The slightly overlapping categories track a process of *social deconstruction* in order to start a process of *social reconstruction* through the *Immeasurables*. *Sabbasava Sutta* advises to implement mindfulness "rightly" by introspecting karmic intentions/actions wisely, i.e., with a beginner's mind. Note that "choiceless awareness" implies that there is no prejudice, sympathy, or antipathy for what occurs in the spaces of body/speech/mind while observing *dharmas*. "Apperception" is a preconceptual perception in the absence of preconceived ideas.

Thus, telescoping our inner galaxies and using body/speech/mind as a laboratory, we encounter *dharmas* which are empty on the ultimate level but full of affect on the provisional level. Inner speech, self-dialogue, or self-talk occurs during the entire process up to the point of emptiness. The mindfulness-based approaches mentioned in section "Self-Identification", i.e., the awareness arising by "paying nonjudgmental attention on purpose and in the present moment," are limited to the first two quadrants and are not the pristine mindfulness by excluding BP (Davidson and Kabat-Zinn 2004) and its notions indispensible for understanding Dharma, like *Dependent Origination*, emptiness/*Not-self*, and *Karma*.

Time

Time is socially constructed, thus an illusion. Although based on consensus, time is within us rather than out there. It is on agreement that we live in 2012 because most people follow the Christian calendar. Based on the year of the Buddha's death (in 483 BCE), Buddhists contend that we live in 2495 (i.e., 2012 + 483).

Consciousness

Consciousness is like life itself enigmatic. Comparable to electricity, we cannot see consciousness, but nonetheless we know it exists through its working like by our capacity to respond. Awareness is a function of consciousness which ranges from deep sleep to full alertness. Clarity of mind can be enhanced by cultivating mindfulness. *Mahasatipatthana Sutta* refers to cultivating mindful awareness within four frames of reference: the body and its activities (feelings: sensations and emotions) and the mind and its activities (thoughts: visualizations and conceptions). Mindfulness is the general factor of subsequent practices comprising *12-Meditations*, i.e., (on the body's breathing, behaviors, organs, elements, decomposing, and feelings, and on the mind's hindrances, modalities, senses, awakening factors), the *4-Ennobling Realities*, and the *8-Fold Balancing Practice*.

Rationality/Reason

Mind usually functions at the prerational, irrational, and rational levels, seldom at the postrational or wisdom level. Rationality renders the view that freedom of choice prevails in determining *Karma* or psychological fate. BP concurs with cognitive-behavior therapy, particularly rational emotive behavior therapy (Kwee and Ellis 1998) and cognitive therapy (Kwee et al. 2006; Kwee 2010). Both endorse the view that though we cannot control birds flying over our heads, we can prevent them from building nests in our minds. *Sallatha Sutta* points at rationality as an outcome of meditation: hit by an arrow the unskilled mind grieves and laments, while the skilled mind is not distraught; it grieves and laments not. While the trained mind only feels bodily pain, the untrained mind feels bodily and mental pain as if hit by two arrows.

Mystery

Based on *suttas* (Rahula 1997), BP demystifies by emphasizing meditation and interpreting *sutras* in a nonmetaphysical way. Although Mahayana with its more than 12 denominations including Zen is mysteriously exotic, the Vajrayana schools of Tibet with its many magical rituals are conspicuously secretive. Wisdom is hermeneutically locked in puzzling teachings; unlocking requires guru worship.

Relevant Themes

The concept of *Karma* carries religious and secular meanings causing a plethora of misunderstandings. In Brahmanism, it is a law of cause and effect stretching across reincarnated lifetimes toward rejoining Brahman. A judicial account of retribution, this *Karma* determines fate, like one's caste. The Buddhist *Karma* renders a completely different meaning. The Buddhist pristine interpretation is psychological, not metaphysical. Action is a function of intention (seed) and conducive to its fruit: feeling/affect/emotion. In BP, bad things happen to good people and

good things happen to bad people. "Evil" can be done without any purposeful intention. Without a god banking merit or demerit, BP is a psychological system of *Karma* transformation and collaborative practice. Commemorating that the Buddha was a "karmavadin," a craftsman who dealt with *Karma* and who analyzed (vibhajjavada) the motivating cause (hetuvada) of un/wholesomeness (*Hetu Sutta*), the twenty-first century clinician/coach/activist might want to walk in his footsteps to alleviate *duhkha* and promote contentment for all. Hopefully, the present psychology of Relational Buddhism is helpful to this end.

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Psychology in Judaism

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Related Terms

Jewish science and psychology; Psychology in Jewish religion

The Ancient Near Eastern picture of what it means to be a human being in relationship to God and the rest of the world underwent significant change as a result of the impact of Platonic and Aristotelian conceptions of psychology after the Judean state was conquered first by Greeks and then by Romans. What these changes most impacted in terms of rabbinic systems of core beliefs was the doctrine of the nature of humanity in relationship to God and the world. Once absorbed, the new rabbinic understanding of humanity was further, possibly more radically, modified by the influence of medieval Jewish philosophers into what in modern times would be recognized as the traditional or Orthodox doctrine of human nature. At the core of what emerges as Jewish dogma in this area is a synthesis of Platonic and Aristotelian psychology in the light of medieval commentaries, both philosophical and kabbalistic. However, no sooner formalized as foundational doctrine, modern scientific conceptions of the human radically undercut and thereby challenged contemporary belief in human nature in particular, but other traditional rabbinic so-called dogmas as well.

The most serious challenges have arisen from two quite different approaches to modern psychology – Freudian and Darwinian. The biblical identification of the life force in a living thing with breath is transformed by the medieval philosophers and Kabbalists into a platonic conception of a soul. Souls are nonphysical, distinct

entities that have an identity of their own, independent from their related physical bodies. These souls are the immediate causal agents of all animal (including human) volitional behavior. Hence, they are the ultimate component in human identity that has moral responsibility and the source of the moral responsibility is God, the creator. Freud reversed this connection between body, soul, and creator. Rather than God creating the soul that orders morally the physical human, it is the mind of the physical human who is the real creator of both God and morality. For Freud, mind is a function of the body and both God and morality are mentally created fictions. In the case of Darwinianism, the separation from traditional rabbinic psychology is even more extreme. In this instance, not only are God and morality human creations, but the mind that creates them is itself ultimately something physical, viz., a brain, where the category "mental" is to be understood as a fiction that somehow enhances physical human beings' opportunities to survive in their natural environment.

More challenging than either Freudian or Darwinian interpretations of the role and identity of the human in the universe are the doctrines of contemporary historians of both the Ancient Near East and the Hellenistic Asia Minor for whom the focus becomes studies of the anthropological origins of the Jewish people. Presupposed in the central notion of divine authority for the commandments that define what human beings are and how they are to be judged is a story of how those commandments were given to a prophet named Moses as an eternal covenant between God and the Jewish people. However, based on more than a century of archeology in the land of Israel, the strongest evidence suggests that the professed event is a fiction. Now how much of a fiction is a matter of speculation, but, on most interpretations, it is unlikely that the events reported in the opening historical narratives ever actually occurred in the explicit way the texts say they occurred, from the creation of the world through the theophany at Sinai through even the dynasty of David as King of Judea. Of course, answers can and have been given by Jewish theologians to all of these questions, and different

thinkers will make different evaluations of the different answers. What all of them do is force in some significant sense a rethinking of what it means to be a human and, more specifically, to be a Jew. The issues can be classified under two headings, psychology and ethics.

Jewish theology affirms that the human body belongs to God, that its moral worth is that it reflects the image of God, that a human being is an integrated whole that is created morally neutral but potentially good, and the major duty by which a human life is to be valued is by fulfilling the duty of sanctifying God's name. At least six scientific claims call into question each of these four affirmations about human nature.

First, cosmogony teaches us that our universe is too old and human existence too brief for humanity to provide the reason for the existence of the universe, for the universe is a little more than 13 billion years old and humans (or, more specifically, hominids) have dwelt in it a mere 2 million plus years. Given these dates, it is almost totally unfathomable to think that God created the universe as the place in which human beings can fulfill the commandments that define human value. However, if we give up this humanist assumption, viz., that the human species provides the raison d'être for the existence of the universe, how can we understand why God created the universe? If humanity is not central to its purpose for being, what is its purpose? Critical to Jewish faith is at least the assumption that there is one, and different theologians offer a variety of different answers.

Second, the term in biblical Hebrew (*nefesh*) that came to mean "soul" need not be understood in a Platonic sense. Whatever the authority of the biblical text itself for fashioning the details of biblical faith, the pagan Greek Plato as such has no authority. Rather, the term was given a platonic interpretation because the medieval Jewish natural philosophers believed that the platonic description of the soul was true. Hence, since the source of our interpretation is itself not authoritative, modern scientifically informed, religiously traditional Jewish thinkers are relatively free to reinterpret what a "nefesh" is. And many different interpretations have been given,

ranging from an account of the human soul as some form of energy that is not a substantial entity but is to be understood strictly as a function, to arguing that a soul is something like DNA, viz., information for the body minimally analogous to (and maximally identical with) the information that a computer program transmits through the physical computer. As the information of the computer is a distinct kind of entity from both computer hardware and computer software, so this human information is ontologically distinct from both mind and matter.

In general, there is a need in Jewish thinking about science to move beyond mere physicalist accounts of human nature in general (and not just the soul in particular) to something compatible with contemporary dominant trends in psychology and the other human sciences that can provide a basis for affirming that in this material world, there is an objective basis for moral judgment, and that beyond the present, there is something to be interpreted as "redemption" in the distant future.

Third, the process of rethinking what it means to be a human requires rethinking just what there is about the human life-form that is distinctive, if anything. In general, what does it mean to be human when becoming a living thing is reducible to purely chemical reactions? In physicalist terms, there is very little difference in every respect between chimpanzees and humans and very little difference between human beings and all other life-forms with respect to the DNA that informs all of us. The human cell is composed of 23 pairs of chromosomes and each chromosome consists of a single DNA molecule that forms part of a sequence with other molecules that are wrapped around a core of protein. It is these sequences that do the work of the souls of medieval philosophy (Jewish as well a Christian) to order both human nature and human responses to nature, and there is relatively little difference between the molecules of one species and another. In this context, the question of what it means to be human is reduced to two related questions: When do chemical reactions become living things and when do living things become human beings?

This analysis of humanity's physical bases has in itself a number of consequences for a Jewish understanding of what it means to be human. First, chimpanzees no less than humans exhibit moral behavior, which would suggest that being a moral agent is itself not a distinguishing human trait. Second, if it is not, divine moral codes ought not to be restricted to humans. Third, as moral beings, humans are morally obligated to other animal species no less than to humanity.

Finally, the above distinctively physical questions about being human raise a number of distinctive moral questions. One, when does life begin and end? Two, when does a human being become human if we no longer affirm a distinct, non-physicalist element like a soul? Three, the fuzziness of life and death suggests that they can no longer be treated as absolutes. The purpose of life cannot be just to live or to avoid death. Life must have some end beyond itself that makes it a virtue and death a vice. Of course, the traditional Jewish answer is that life is progress toward, and death is regression from, the service of worshipping God, and the end of divine worship is of value no matter what is the life-form.

Cross-References

▶ Astronomy in Judaism
▶ Creation in Judaism
▶ Kabbalah in Judaism
▶ Historical Theology
▶ Judaism: An Overview
▶ Philosophy in Judaism
▶ Redemption in Judaism
▶ Theology in Judaism

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Psychology and Law

▶ Forensic Psychology

Psychology in Jewish Religion

▶ Psychology in Judaism

Psychology of Language

▶ Psycholinguistics

Psychology of Positive Human Functioning

▶ Positive Psychology

Psychology of Relational Buddhism

▶ Psychology in Buddhism

Psychology of Religion

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Related Terms

Cognitive science of religion; Cultural psychology of religion; Neuroscience of religion and spirituality; Psychoanalysis of religion; Psychology of spirituality; Scientific study of religion; Social scientific study of religion

Description

The psychology of religion is that area within general scientific psychology whose goal is the understanding of the processes that mediate human religiousness in all its variations. The topics within its orbit range from the micro (e.g., the brain processes involved in experiences that a person may deem religious, spiritual, or sacred) to the macro (e.g., the psychological factors involved in complicated individual and group religious social behaviors), with all of the standard areas of psychology that reflect multiple levels of analysis in between – e.g., learning, developmental, personality, cognitive, perceptual, motivational, emotional, and social psychological processes must all be taken into account. It tries to understand both why people are religious and what effect their religion has on other aspects of life.

Some psychologists see the psychology of religion as an area of research that focuses on the religious instance of behavior in general, and others see it as an area of research on more or less unique aspects of human functioning, that is, aspects found in religiousness, but not found elsewhere. The question of the uniqueness of religiousness as a human psychological phenomenon undergoes examination and debate from time to time (Baumeister 2002). Like its parent discipline of psychology, the psychology of religion is a subdiscipline under

theoretical and methodological development. There is little doubt that psychology comes from a fragmented past methodologically and theoretically. Scholars disagree over the degree to which the field is fragmented or is instead moving toward gradual integration or synthesis in its ideas, approaches, and knowledge base (Belzen 2010; Paloutzian and Park 2005a, 2013; Pargament et al. 2013a,b). As is often the case in the development of a science, the truth is probably somewhere in the middle.

There is no doubt, however, about the richness and vast scope of the phenomena within the orbit of the psychology of religion. The scope of topics within this subdiscipline is as expansive as it is in general psychology. Topics include but are not limited to issues of religious development; cognition; motivations for religions and motivations that derive from them; religions and mental and physical health and illness; emotional expressions of one's religion and emotions that foster them; experiences deemed religious, supernatural, or sacred; social influence processes mediating religiousness; attribution of religious or sacred meanings; religions and cultures; religiousness and coping; change within, toward, and away from religions; and spiritual transformation, conversion, and deconversion. The reader is referred to the above-cited handbooks and to other recent comprehensive books that summarize the many lines of research in this area (Miller 2012; Hood et al. 2009; Wulff 1997; Beit-Hallahmi and Argyle 1997).

Recent developments during the past quarter century have occurred at an amazing pace (Emmons and Paloutzian 2003). Since 1980, the field has gone from having no textbooks to having several of them, including those now in third and fourth editions. The field saw its first research handbook in 2005 and now has three of them. Its international journal was first published in 1991, and its American Psychological Association counterpart appeared in 2009, in addition to the longer presence of other journals that include psychological research on religiousness and the increase in publications on psychology of religion topics in other standard psychology journals. Briefly said, as assessed by the number of research publications, books, and conference presentations devoted to topics in the psychology of religion and spirituality, the field has grown on a steep curve in the past quarter century.

Science

The discipline of psychology including psychology of religion defines itself as a science (i.e., a crossover field that is a blend of both social science and natural science aspects) and does not define itself as a religion. The same rules of logic and evidence apply to psychology as to any other science. Most researchers in the American Psychological Association Division 36 (Society for the Psychology of Religion and Spirituality) and the International Association for the Psychology of Religion (both nonsectarian with membership and presidents across the board religiously) apply accepted rules of logic and evidence to how they answer their research questions. And although this topic is potent with great bias potential, the researchers' policy, due to their own integrity, commitment to the scientific process, wanting of honest knowledge, and procedures like blind peer review of journal publications, open competition for research grants, and public evaluation of one's research – all foster research conduct in accord with benign neutrality toward religion in general or any specific religion in the conduct of research and interpretation of data. Psychologists normally receive extensive training in experimental design, measurement, data analysis and interpretation, and principles based on evidence and argument that connects and sustains them.

Religion

Just as psychology is not a religion, neither is the psychology of religion a religion. As a field of scholarly inquiry, it takes no position on the truth claims of any particular religion, but instead treats human religiousness as an aspect of human functioning to understand, just as we aim to understand all other human functioning.

Characteristics

The psychology of religion is that subfield within psychology that focuses on the processes that

mediate human religiousness in all its forms, process that reflect the religious instances of general psychological processes but also those that reflect processes that may be unique to religion – a point about which scholars in the field disagree (Baumeister 2002; Paloutzian and Park 2005b). No other discipline or subdiscipline does this.

Relevance to Science and Religion

The psychology of religion can be seen as the centerpiece of the so-called science-religion discourse. This is because the core issues, when repeatedly examined and as the dialogue evolves, eventually become matters of meaning to humans. These are manifested through psychological constructive and meaning appraisal processes, and because in all sciences, when questions are posed upon questions, they eventually feed and arrive at the same central issues, those having to do with what it means for and to humans.

Sources of Authority

In the psychology of religion, there are two kinds of legitimate sources of authority and one kind of pseudosource, from a psychology research point of view.

The two kinds of legitimate sources of authority are interconnected and interdependent. They are (1) the highly esteemed, peer-reviewed, and well-edited research and scholarly books and journals in the field. They are the depository or archives that document the progress in research in the field, and the handbooks and research-based textbooks summarize this research in authoritative ways. None of these constitutes absolute authority due to the nature of scientific research, evidence, argument, and inquiry. But all are authoritative in the sense that they contain well-examined presentations of the research in the psychology of religion as of the time they were written (2). The evidence and argument founded on data well collected, properly analyzed, and keenly interpreted. There is no single authority

in the sense of it being one person, one book, or one idea. But there is a general authoritative body of material made up of the above-mentioned sources and based on the correctly applied rules of scientific procedure and deriving from conclusions based on evidence.

The pseudosource of authority comes from so-called religious psychology, not scientific psychology of religion. Religious psychology is not psychology of religion. There is a smaller subset of scholars who claim that their work falls under the psychology of religion umbrella whose final authority for whether to accept a research conclusion differs from the standards noted above. Such persons do religious psychology, not psychology of religion. There are Christian, Islamic, and other expressions of this approach, but at bottom, those who do scholarship of this type place their preheld belief above the findings from their research, if the two appear to conflict. Within such scholarship, research findings must support the preheld beliefs. There is great possibility of disagreement between those who endorse scientific psychology of religion (an open system) and those who endorse a particular religious psychology (a closed system). As an example of how these two approaches differ, see a dialogue published on the first anniversary of 9/11 between a psychologist who presupposes a secular Western epistemology and another who presupposes a Muslim religion-based epistemology (See dialogue between Professors Murken and Shah in the following two articles: Kahlili et al. 2002; Murken and Shah 2002). The epistemological assumptions differ in the extreme: they are incompatible. In the secular mind, religion is an aspect of culture similar to other aspects. In the strict religious mind, religion defines the culture so that all other aspects of it, including the knowledge from and conduct of science, are subsumed within the religion. Similar examples can be found that reflect particular Christian and other religious points of view. So-called creation science is an example of this in a nonpsychology field. In general, in this approach, a conclusion is held logically prior to and independent of an examination of publicly accessible scientific data. Thus, when data are examined, they are attributed to a process that

conforms to the preheld view. No other conclusion is acceptable. The religious psychology approach is not consistent with the normally understood science of psychology of religion as part of general psychology. In scientific psychology of religion, truth claims are subject to test based on evidence and are not self-authenticating.

Ethical Principles

The American Psychological Association and the Department of Health and Human Services, National Institutes of Health, and National Institute of Mental Health (USA) have published ethical guidelines for research with human and animal subjects, and these apply to research on human religiousness. The standard rules of research (e.g., a participant in a research project should leave the laboratory in the same condition that he or she came to the laboratory, or subject anonymity is protected) apply straightforwardly to studies on psychology of religion. But there are some unique instances in which, in order to test a psychology of religion hypothesis, the researcher may need to bump up closely to the ethical standard, and in such cases, the researcher is obligated to protect the welfare of the subject. For example, a researcher may wish to test a hypothesis about how a person responds when confronted with information contrary to deeply held beliefs. To do this, the researcher may recruit and screen subjects who have the requisite degree of belief and then, using deception, expose them to contrary but fictitious information. Such procedures are controversial and not often used. If or when they are used, the subject is debriefed and given education about the research with the intent that he or she leaves the laboratory enriched by having participated. Similarly, if an investigator needs to use interview methods, sometimes it may be necessary to ask the research participant questions that might make the person feel uncomfortable. In all cases, the researcher is responsible to protect the person's confidentiality and to take delicate care to use procedures that insure, first and foremost, the well-being of the research participant.

Key Values

In addition to the general values that guide good quality scientific research and the application psychological knowledge, the psychologists of religion must pay special attention to being neutral with respect to religion in general or the truth claims of any particular religion. Thus, the emphasis must be on free, open, and objective inquiry to religiousness as one domain of human mental processes and behavior and has nothing to do with any particular belief about, commitment to or against, or favor or disfavor with respect to, things in general or in particular that are deemed religious, spiritual, or sacred.

Conceptualization

Nature/World
Psychology of religion studies human religiousness as a natural process in the same sense that any science studies its phenomena. The methodology of the field assumes that principles of nature actually work and that these are either knowable or at least that we can create theories as attempts to summarize what we think they might be.

Human Being
A member of the species *Homo sapiens*.

Life and Death
The object of study in psychology is the mental and behavioral processes in living human beings. We generally leave precise scientific definitions of life and death to biology and medicine. So in psychology of religion, we study human mental and behavioral processes with unique attention to those through which religiousness in all its manifestations – belief, knowledge, practice, feeling, effects, to use a common summary of its dimensions – is regulated. Psychology of religion *is* concerned with people's beliefs about life and death, but what actually happens to a human after he or she dies is not known and not accessible to the research methods we have. But the beliefs, behaviors, practices, purported

experiences, etc., of living people with respect to it are so accessible and are researched.

Biologists and clinicians debate scientific definitions of life and death just as scholars of religion debate definitions of religion. That should not bother those who do psychology of religion research, however, because, for example, physicists cannot define light very well, but they can do a lot with it. The "essential" nature of light, like the "essential" nature of religion and life and death, is a mystery. The open-endedness of the scientific process with its insistence that a proposition be testable and falsifiable based on evidence leads us to enjoy doing our research with that mystery. Trying to solve new mysteries on the horizon is what keeps science going. In the end, psychologically speaking, truth may be in the meaning system of the beholder.

Reality

As is the case with the rest of psychology, the psychology of religion does one of two things with respect to the concept of reality. Either (1) it assumes that there is one and we proceed to study it or our perception of it, or (2) it assumes nothing either way about its ontological existence and instead takes mental reality as the only reality to be concerned with. Psychology of religion makes no formal pronouncements about metaphysical concerns. It instead attempts to study its part of the real world that we live in.

Knowledge

The area of knowledge about which the psychology of religion is concerned focuses on the processes that mediate human religiousness in its myriad variations. Such knowledge is not regarded as absolute or binding for all peoples in all religions at all times, but is instead, as is the case with all scientific knowledge, tentative, probabilistic, and subject to modification based on new evidence. Some things that are known may stand the test of time and culture, and some may not; this reflects the nature of scientific understandings of the world and is expected in a topic of seemingly infinite variation such as human religiousness. Thus, it can be said that research in the psychology of religion strives for

the hypothetical ideal of universal knowledge while being aware that this is an ideal goal and not an actuality.

The kind of knowledge at issue is that which is based on evidence and is subject to tests that can lead to confirmation or falsification of the knowledge claim. Thus, empirical evidence subject to public examination, whether derived from quantitative or qualitative methods, is a necessary part of the process. The data may come in emic or etic points of view. The data that can be accumulated can range from those that assess subjective states to those that assess objectively observable events, and they are subject to analysis and interpretation by standard psychological methods.

Truth

Psychology of religion takes no position on whether or not there is an absolute "truth." Truths in psychology of religion are scientific truths, therefore always tentative, probabilistic, and subject to change based upon further evidence.

Perception

Psychology of religion is to a great extent concerned with human perception, in particular with the emphasis on "religious experience" such as claims of having heard God's voice; apparitions of Jesus, Mary, of other religious figures; to have seen Satan; and other nonnormal purported experiences and perceptions (Taves 2009). Although we cannot "see" someone else's purported experience, we can record and measure people's accounts of them and can use standard psychological methods to learn about the processes that mediate them and the contexts in which they occur.

Time

Because human religiousness, like other aspects of human functioning, occurs across time, time perception and accounting for variation across time is inherent in the conduct of work in the field. In addition to studying religiousness in real time in vivo, all other ways of studying it automatically involve a time dimension, whether implicit or explicit. This includes but is not limited to studying commitments made in the past and their effects on present and future decision

making or functioning, reports of past mental and other experiences, and memories of one's childhood religious upbringing – all such questions and methods available to address them inherently assume operations and continuity over time. One can hardly imagine "religion" or any particular religion as existing without it.

Consciousness

Consciousness as an area of psychological study is important because with the reintroduction of the study of consciousness to psychology came the reintroduction of the study of religious consciousness, mysticism, experiences deemed religious or spiritual, and such things as religious or spiritual manifestations of seeing visions, hearing voices, and having dreams. Some have proposed that the study of "religious experience," especially from a phenomenological perspective, is the central core and task of the psychology of religion (James 1902/1958).

Rationality/Reason

The psychology of religion sees rationality and reason as human capabilities that are more or less invoked as means of regulating other aspects of human functioning such as decision making. These processes can be applied to greater or lesser degrees to one's religiousness in a manner similar to any other aspect of one's functioning. The limits of rationality or reason as a guide and regulator of behavior is examined, however; thus, it is well known that other a-rational or non-rational factors also influence how someone feels, thinks, and acts in major ways. The holding or not holding of explicitly religious beliefs may not be based upon rationality alone.

Mystery

One could say that part of the core of the psychology of religion concerns mystery. This is because of its topic of study – religion or religiousness. Religions seem to be among the things that humans have and do as a way of dealing with, and living within, the big and unanswered (and perhaps unanswerable) questions about life, death, and why we are here. These are, among other things, some of the most timeless and endless psychological questions that people have asked, within and across disciplinary boundaries. The psychological way of dealing with them is to treat them as the mysteries that they are and try to learn how and why humans think about, understand, process, and respond to them.

Cross-References

▶ Biology of Religion
▶ Cognitive Science of Religion
▶ Conversion
▶ Islamic Religious Psychology
▶ Methodology in Psychology
▶ Philosophy of Religion
▶ Religion, Sociology of
▶ Religion, Theory of
▶ Religious Experience
▶ Religious Studies

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Psychology of Religion China/Asia

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Related Terms

Chinese psychology of religion

Description

In mainland China, psychology of religion is a branch of the science of religion and a special field in applied psychology. As an interdisciplinary field of study exploring the mental activity in the religious affairs of humans, it tries to reveal the characteristics and laws of the formation and development of religious mentality and serves the building of harmonious society by making use of research results in psychology of religion. Before the reform and open policy, there were few scholars who did research in the psychology of religion in mainland China because of historical reasons. However, since the 1980s, the achievements of Chinese psychology of religion have increased gradually. First, some famous works on psychology of religion from abroad have been translated and introduced to mainland China in quick succession. These include A. M. Ugrinovic's *Psychology of Religion* translated by Shen Jipeng in 1989, M. J. Meadow and R. D. Kahoe's *Psychology of Religion: Religion in Individual Lives* translated by Linshu Chen et al. in 1990 (Meadow and Kahoe 1990), L. B. Bulang's *Psychology of Religion* translated by Dingyuan Jin and Xigu Wang in 1992 (Bulang 1992), K. M. Loewenthal's *The Psychology of Religion: A Short Introduction* translated by Yuejun Luo in 2002 (Loewenthal 2002), M. Argyle's *Psychology of Religion: An Introduction* translated by Biao Chen in 2005 (Argyle 2005), and others. Second, the discussions of theory are concentrated on the origins, characters, and functions of human religious mentality (e.g., explore works by Boyue Li 1996; Yinchuan Yuan 1996; Guangwen Song 1996; Yiyin Yang 1996; Shuqin Yang 2004; and Yingguang Luo 2004). Third, the ideas of representative writers in western psychology of religion are researched systematically (e.g., see Biao Chen 2003, 2007; Yongsheng Chen and Yang Shen 2007). Fourth, questionnaires are used to reveal the features of Chinese religious mentality and the relations between Chinese religious mentality and mental health (Sheng et al. 1996; Hong et al. 1998; Liang 2004; Li et al. 2004) (also see examples by Liqing Lu 2006 and by Henghao Liang 2006). Fifth, research on making scales to assess ▶ religiosity and ▶ spirituality with Chinese samples has gotten attention (Shen 2007; Liu 2007).

In September 2007 and March 2008, small international seminars on the psychology of religion were held in Zhejiang Normal University, Jinhua, Zhejiang Province, and in Beijing. The conveners were Prof. Alvin Dueck from Graduate School of Psychology, Fuller Theological Seminary, in America, and Prof. Han Buxin from Institute of Psychology, Chinese Academy

of Sciences. These two seminars have exerted positive effects on promoting exchange and cooperation between mainland China and USA in psychology of religion research.

Self-identification

Science
Multidisciplinary and diverse approaches to research are maintained in psychology of religion, but defining the right question, putting forward the correct hypothesis, and testing that hypothesis with objective data are at the basis of research in psychology of religion. So psychology of religion is a science, according to its research methods.

Religion
Psychology of religion explores the mental activity in human religious affairs. To psychology of religion, theoretical research or practical application cannot be done apart from the concrete religious practice of human beings. So psychology of religion, as a science, related to religion in the sense that religion is its object of study.

Characteristics

The most distinct characteristic of psychology of religion is that it not only focuses on systematic research into religious believers' special mental processes and personality characteristics (belief in divinity, experience of mystery, pursuit of value, and institutional participation or open participation) but also attaches great importance to principles of psychology being applied concretely in special ways to religious life. This distinguishes psychology of religion from other subjects in the science of religion (philosophy of religion, anthropology of religion, sociology of religion) as well as other subjects in psychology.

Relevance to Science and Religion

Psychology of religion has achieved independent status in many interlaced research fields because of its interests in science and religion. Psychology of religion stresses revealing the laws of psychology in religious life through scientific methods and stands for guiding the religious believers' daily life with knowledge gained from scientific methods. Thus, it can help integrate scientific findings with religious beliefs and practices and helps psychology of religion to be an interdisciplinary subject which not only has the strict attributes of science but also has a special relationship to religious life.

Sources of Authority

Chinese psychologists of religion hold that in more than 100 years, a wealth of literature accumulated by western psychology of religion is the foundation for promoting the development of psychology of religion in mainland China. So Chinese psychologists of religion are favorably disposed toward some classic works like W. James's *The Varieties of Religious Experience*, 1902; W. Wundt's *Mythus und Religion*, Vols. 4–6 of *Völkerpsychologie*, 1905–1909; S. Freud's *Totem and Taboo*, 1913, *The Future of an Illusion*, 1927, and *Moses and Monotheism*, 1939; C. G. Jung's *Psychology and Religion*, 1938, *The Psychology of Eastern Meditation*, 1943, and *Psychology and Alchemy*, 1944, 1952; E. Fromm's *Psychoanalysis and Religion*, 1950; E. H. Erikson's *Gandhi's Truth: On the Origins of Militant Nonviolence*, 1969; V. Frankl's *Man's Search for Meaning: An Introduction to Logotherapy*, 1962, and *The Unconscious God: Psychotherapy and Theology*, 1975; G. W. Allport's *The Individual and His Religion*, 1950; A. H. Maslow's *Religion, Values, and Peak-Experiences*, 1964; and A. W. Watts's *The Way of Zen*, 1957, *The Two Hands of God*, 1969, and *Tao: The Watercourse Way*, 1975.

For thousands of years, thoughts relevant to psychology of religion contained in western and eastern works of philosophy, as well as the classic doctrines in Christianity, Catholicism, Buddhism, Mohammedanism, Taoism, the minority religions, and newly flourished religions, have also attracted attention from Chinese psychologists of religion. In mainland China, *Studies In World Religions* and

Acta Psychologica Sinica are authority academic journals that publish psychology of religion research results. Chinese research results in psychology of religion that are published in related international journals in psychology of religion are becoming the target of endeavor for Chinese scholars. *Psychology of Religion in China*, written by Yongsheng Chen, Henghao Liang and Liqing Lu from Zhejiang Normal University, published in *The International Journal for the Psychology of Religion* in 2006, is not only a positive result subsidized by the Chinese Social Science Fund but also a sign of the above endeavors of Chinese scholars.

Ethical Principles

In research in psychology of religion, Chinese scholars have followed strictly the international popular moral principles when using persons as subjects for scientific research, in order to fully respect and effectively protect the legal rights of religious believers. For example, when religious believers are invited to take part in research in psychology of religion, the voluntary principle must be adhered to; the subjects from different religious background should be treated equally; the personal privacy matters of subjects with religious belief should be kept strictly confidential.

Key Values

Chinese scholars' values embodied in psychology of religion are reflected in two ways. First, there is value in exploring the characteristics and laws of religious mental phenomena in the religious activities of human beings by various methods and techniques in order to offer scientific explanations and illustrations from a psychological point of view. Second, there is value in serving religious believers by using the existing achievements of psychology of religion (principles, methods, techniques, etc.) in order to improve religious believers' level of mental health and overall quality of life and to help religious believers show positive effects in efficiently building a harmonious society.

Conceptualization

Nature/World

There are two understandings of the concept of nature. In a narrow sense, nature means the inorganic and organic sphere as understood in the research of natural science. However, in a general sense, nature means the objective material world, which is independent of human consciousness. "World" is the totality of all things involved in nature and human society, which not only includes the objective material world but also includes the subjective spirit world. Obviously, "world" is a term which has more fertile connotations and broader extensions than "nature."

Human Being

A human being is a kind of higher animal that can make and use tools. Human beings include not only the primitive peoples who are in the developmental process but also the more developed peoples who live in modern civilization societies. The special meaning of this concept should be grasped in accord with the unique purposes for which it is being used.

Life and Death

Life is regarded as the active capacity inherent in organisms and a mode of being of proteins. The origin of life is a process of changes about substance from simple to complex, which means originally formed from inorganic substance to organic substance. For a person, life is embodied in the whole process from birth to death. When a person's life processes are over (death), the mental activities that are part of the life process stop as well. From the angle of psychology of religion, the individual life is over, but the spiritual wealth created in the life can still be transmitted and carried on in the life of the next generation, so it can contribute to the gradual improvement of human civilization. This principle can be used to help explain the positive effect that religious activities may have on future human civilization.

Reality

Reality is everything that exists objectively.

Knowledge

Cognitive achievements are acquired in practice, including empirical knowledge and theoretical knowledge. The former is the elementary stage of knowledge, and the latter is the higher stage of knowledge.

Truth

Truth refers to the correct reflection of objective reality and its laws. It is the opposite of "falsehood." The goal of reflection on truth is to know something objectively and concretely; the sum total of innumerable relative truths approximates the so-called absolute truth.

Perception

Perception is the cognitive process which reflects an overall image in external reality and the first sensation of a stimulus from objective reality. Perception depends on sensation and is more complex and complete than sensation. Perception is a key link between sensation and thinking. The material from sensation can be processed through perceptual process in order to provide some preparation for thinking activities.

Time

Time generally refers to a kind of measure for the duration through which the motion of matter goes, as well as an instant in time during the motion of matter. Time and space constitute two basic existing forms of substance in which motion occurs. In the field of psychology of religion, the experience of time for "afterlife" and "eternity" becomes the part of experience of mystery.

Consciousness

Consciousness is the function of the human brain and the reflective ability peculiarly owned by a human being in the world. During the exploration of conscious activities by psychologists of religion, unconsciousness or subconsciousness may be regarded as the conscious activities inhibited or undetected.

Rationality/Reason

Rationality is equivalent to "rationalness"; it refers to a form of thinking, such as conception, judgment, reasoning, etc., or thinking activities that have some evidence of reason. The psychologists of religion always maintain that the irrational matters in religious activities should be understood by a rational approach. One use of "reason" is equivalent to "result" or "conclusion"; it refers to the condition that causes some result or arouses some processes that produce whatever occurs. Reasons and results constitute important forms of thought involved in understanding general connections and interactions in objective reality, sometimes also called causal connections. Causal connections are complex and varied. For instance, one result may occur as a consequence of many reasons, or one reason may lead to many results. In psychology of religion, "karma" may be understood as a type of rationale for outcomes; i.e., in Buddhism, it embodies sayings such as "good results come from good acts, bad results come from bad acts."

Mystery

Mystery generally refers to matters that cannot be firmly understood and are enigmatic. Religious activities sometimes are covered with the mysterious veil, and the religious believers always claim that they have an "experience of mystery." However, psychologists of religion hold that the so-called "indescribable" experience of mystery can be explained by some psychological means, such as analysis of dreaming, conjecture of metaphor and symbolization, or use of technology like brain imaging. Of course, the explanations and illustrations from psychology of religion are still limited at present. With the advance of science and technology, especially for the development of psychology of religion, the level of explanation and illustration in the psychology of religion for "experience of mystery" will gradually improve.

Relevant Themes

In the eyes of Chinese psychologists of religion, some terms like belief in divinity, experience of mystery, pursuit of value, and institutional participation or open institutional are core elements

for people to comprehend in order to understand basic concepts in psychology of religion like ► religiosity, ► spirituality, or folk belief. Whether for the development of the tools of psychological measurement or for the exploration of possible consequences of one of these variables on another is all interconnected and understood to be psychologically closely related. These terms and basic concepts erect a bridge for communication between scientific methods and the mental life of religious believers and provide academic support for in-depth discussion of the topics of science and religion.

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Psychology of Spirituality

▶ Psychology of Religion

Psychopathology

▶ Clinical Psychology

Psychotherapy

▶ Clinical Psychology

Psychotherapy in Africa

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Psychotherapy in Africa is an umbrella term which points to the existence and evolution of a variety of psychological therapies in the modern African context: some indigenous to Africa, others influenced by our professional contact with the modern West (Madu et al. 1996; Nwoye 2010). The above observation means that while all therapeutic practices in modern Africa come under the umbrella term, psychotherapy in Africa, not all therapeutic practices in

modern Africa are informed by the principles and worldview of African psychotherapy.

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Pueblo Indian Religions

▶ Hopi Religion and Anthropology

Pulmonary

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Related Terms

Respiratory medicine; Respirology

Description

Pulmonary is a subspecialty of internal medicine focused on the diagnosis, treatment, and prevention of diseases involving the airways and lung. Commonly treated diseases include asthma, chronic obstructive pulmonary disease, interstitial lung diseases, occupational lung diseases, infectious diseases of the lung, and acute or chronic respiratory failure. In North America, pulmonary became a subdiscipline in the middle of the twentieth century. The polio epidemics of this era underscored the need to further our

knowledge of respiratory physiology and served as a catalyst to train specialists who could better understand the pathogenesis and treatment of respiratory failure. Recently, diseases characterized by sleep-disordered breathing such as sleep apnea have become areas of interest. The most recent advances in clinical pulmonary medicine center on a renewed interest in the pathogenesis and treatment of chronic obstructive pulmonary disease and asthma. The most recent advances in pulmonary related to basic science include a better understanding of the molecular and genetic bases of diseases affecting the airways and lung parenchyma and a better understanding of mechanisms of cellular injury and of mediators involved in inflammatory, interstitial, and granulomatous lung diseases.

Self-identification

Science

Pulmonary identifies itself as a science focused on investigating all aspects of airway and lung function. As science is an intellectual activity designed to discover information about the natural world, pulmonary is an intellectual discipline, committed to the discovery of new information regarding breathing and disorders affecting breathing. In the pulmonary discipline, this discovery of new information is based on observation and the development of testable hypotheses. Observations on breathing date back to the ancient Greeks when they recognized the importance of the diaphragm in breathing and with Hippocrates description of periodic breathing. Major progress in understanding the physiology of breathing, however, did not occur until the beginning of the twentieth century. At that time, Bohr and others such as Krogh furthered our understanding of gas exchange by demonstrating that diffusion of oxygen and carbon dioxide across the alveolar-capillary membrane accounted for the transfer of carbon dioxide out of and oxygen into the pulmonary capillaries. During this era, Haldane and Priestley described the chemical regulation of respiration. Insight into the mechanical properties of the respiratory

system (forces that promote inspiration and expiration) was achieved by Rohr in the early 1900s. He characterized the elastic properties of the lungs and chest wall by providing descriptions of their static pressure-volume characteristics. He and others applied principles of physics to the respiratory system to calculate airway resistance and the work of breathing. In the 1940s, Fenn, Rahn, and Otis refined our understanding of respiratory mechanics and applied this knowledge to the advancement of aviation medicine and to diseases affecting the respiratory system. The polio epidemics of the 1940s and 1950s highlighted the need for coupling our emerging understanding of respiratory mechanics and gas exchange with the treatment of thousands of individuals who were dying from respiratory failure. Subsequently, methods were developed to provide artificial ventilation, first with negative pressure (iron lung) and then with positive pressure. With the advent of microelectrode technology in the 1960s, the measurement of partial pressures of oxygen and carbon dioxide in arterial blood became a powerful tool to assess lung function. This advance allowed clinicians to identify the presence of acute and chronic respiratory failure involving a host of pulmonary disorders unrelated to polio. Along with advances in respiratory physiology came remarkable progress in the treatment of tuberculosis in the latter half of the twentieth century. The use of isoniazid in the early 1950s revolutionized the treatment of TB and heralded the transition of treatment from sanitariums and surgery to effective chemotherapy. With the development of clinical pulmonary function testing in the mid-1960s, the advent of fiber-optic bronchoscopy, refinement in radiologic techniques, and a better understanding of the pathology of lung disease, the need to train physicians with expertise in applying this new knowledge and technology to the diagnosis and management of lung disease emerged. Training programs in pulmonary disease evolved to meet the growing demand for respiratory physicians. The first board exams for pulmonary and cardiology were administered in 1941 and those for critical care medicine in 1987. Commonly, physicians will combine

training in pulmonary and critical care medicine as the treatment and diagnosis of respiratory failure is common ground for the two subspecialties.

Presently, there are a number of tools employed by pulmonologists to diagnosis and treat diseases of airways, lung, and chest wall. These include the analysis of arterial blood gases and the measurement of respiratory mechanics with spirometry and body plethysmography. Radiologic techniques such as chest radiographs, CT scanning, MRI, and positron emission tomography (PET scan) are employed to evaluate malignant and inflammatory pulmonary parenchymal processes. Fiber-optic bronchoscopy is performed to directly visualize the airways and obtain tissue biopsies in the diagnosis of malignancies, infectious diseases, and interstitial parenchymal diseases. The use of interventional bronchoscopy is in its infancy with studies ongoing accessing the utility of placement of one-way valves in the airways for emphysema surgery as well as the placement of stents to alleviate obstruction due to endobronchial lesions.

Characteristics

Pulmonary requires a sound knowledge of respiratory physiology and of diseases that affect the respiratory system. It is distinctive from other medical subdisciplines as the pulmonologist must have expertise in other organ systems which are indirectly involved with respiration. Systems which intersect with the respiratory system include the central nervous system, musculoskeletal system, and cardiovascular system. For example, the "pacemaker" for breathing is located in the medulla and generates the drive to breathe. This neural traffic is transmitted to the respiratory muscles via the spinal cord and peripheral nerves. The diaphragm, the major inspiratory muscle, is then activated and provides the requisite force to expand the chest wall. Mechanical factors determine how the inhaled volume is distributed in the lung, and gases diffuse across the alveolar-capillary membrane. Cardiovascular determinants of blood flow

within the lung importantly influence the effectiveness of gas exchange. Acid-base homeostasis, in turn, is a function of alveolar ventilation and CO_2 removal. Disorders of any of these disparate organ systems can negatively impact breathing. Examples include neurologic and musculoskeletal disorders such as spinal cord injury, muscular dystrophy, kyphoscoliosis and obesity which limit the ability of the respiratory muscles to deliver air to the alveolus. Diseases of the pulmonary parenchyma, such as occupational exposures or infectious or inflammatory disorders involving the lung or airway can profoundly affect gas exchange. Similarly, pulmonary vascular diseases can negatively affect gas exchange. Finally, sleep can affect the regulation of breathing and several pulmonary problems may be exacerbated during sleep. In treating and diagnosing patients with lung disease, the pulmonologist needs to have an understanding of infectious diseases that affects the lung and the ability to interpret chest radiographs, CT scans, and PET scans of the chest. Thus, the discipline of pulmonary medicine overlaps with the disciplines of neurology, cardiology, renal, rheumatology, infectious disease, oncology, and radiology (see Fig. 1).

Relevance to Science and Religion

Generally, there is very little overlap between pulmonary medicine and religion. However, when patients are critically ill or have a very poor prognosis, end-of-life issues are often discussed. In this instance, families and patients often have questions with religious overtones which are addressed to the pulmonologist. In addition, the pulmonologist may have interactions with clergy or representatives from different religious sects when the end of life is near.

Sources of Authority

There are a number of professional organizations that are dedicated to fostering clinical and research careers in pulmonary medicine.

Pulmonary, Fig. 1
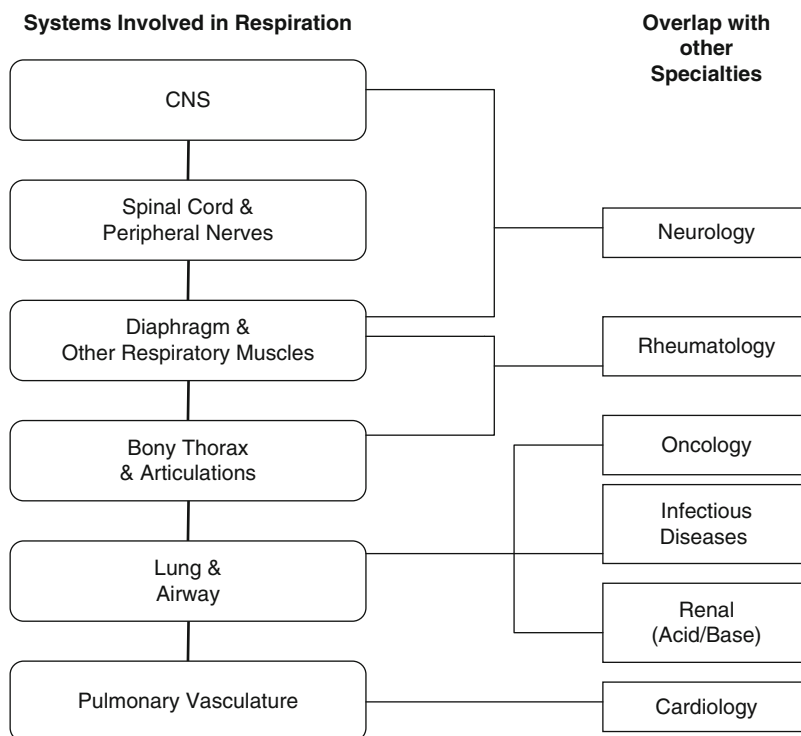
The American Thoracic Society, European Thoracic Society, and American College of Chest Physicians often develop consensus statements regarding the management and diagnoses of varied respiratory diseases. In addition, each one of these organizations supports innovative research in a range of lung diseases. The National Institute of Health, Heart, Lung, and Blood Division is also an extremely important source of funding for investigators. Major textbooks in respiratory medicine include Murray and Nadel's Textbook of Pulmonary Medicine (1) and Fishman's Pulmonary Diseases and Disorders textbook (2). Finally, there are a number of journals which are considered authoritative and include the *American Journal of Respiratory and Critical Care Medicine* which is published by the American Thoracic Society; *Chest*, which is published by the American College of Chest Physicians; *Thorax*, which is published by the British Medical Association; and *European Respiratory Journal*, which is published by the European Respiratory Society, as well as a number of independent journals without society affiliations such as *LUNG*.

Ethical Principles

In general, pulmonary is guided by the oath and law of the ancient Greek physician Hippocrates and an ethical imperative to deliver pulmonary care to those in need regardless of socioeconomic factors. In addition, the ethical rules incorporated in the Declaration of Helsinki of 1971 serve to guide those involved with research.

Key Values

The key values are to improve quality of life and alleviate human suffering. The pulmonologist achieves these goals through a better understanding of the pathogenesis and mechanisms leading to diseases of the respiratory system and implementation of appropriate therapies.

Conceptualization

Nature/World?
Nature consists of all that can be experienced by all our senses in our environment.

Human Being
The human being is the most highly developed form of life that is found in nature. The human being has the greatest intellect and a superior ability to communicate using speech. The ability to think abstractly, exhibit creativity, and adapt to environmental and social change contributes to the unique capacities of humans.

Life and Death
Life in humans can be defined by the composite function of different organ systems. Humans have the ability to support metabolism by delivering oxygen to tissues and by removing the waste products of metabolism. The interruption of this process leads to hypoxia, anoxia, and death, that is, the cessation of metabolism.

Reality
Reality consists of comprehensible and incomprehensible observations or the physical world around us.

Knowledge
Knowledge consists of a combination of information, experiences, and insights which can be transferred from one human to another.

Truth
Truth is knowledge that is in agreement with reality.

Perception
Perception is the act of utilizing the senses to become aware of objects in nature or utilizing our intellect to become aware of concepts.

Time
Time is a fundamental concept of measurement used to distinguish among events or describe a sequence of events.

Consciousness
Consciousness is a process in which one is aware of their surroundings.

Rationality/Reason
Rationality is a process of responsible human behavior employing reasoning and characterized by a systematic application of the intellect.

Mystery
Mystery is a phenomenon that science has yet to explain either due to the lack of tools needed to assess the phenomenon or to a lack of the proper theoretical construct.

Relevant Themes

Pulmonologists encounter patients with a myriad of religious backgrounds. Greater knowledge of religion, and varied religious beliefs, would prove to be an asset in caring for patients and their families in times of crisis, especially with regard to end-of-life decisions.

References

Fishman, A. P. (2008). *Pulmonary diseases and disorders* (4th ed., Vol. 2). New York: McGraw-Hill.

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Punishment

▶ Sin (Vice, Human Limits, Negativity)

Purpose

▶ Divine Action