D

Daltonism

Daltonism is also known as *deuteranopia, deutan colour blindness, and deutan colour deficiency. All four terms are used to denote a *colour vision deficiency of the green–red type. The eponym Daltonism refers to the British chemist and physicist John Dalton (1766–1844), who in 1794 published an account of his own *colour vision deficiency. As Dalton remarks in this paper, "My yellow comprehends the *red, orange, yellow*, and *green* of others; and my *blue* and *purple* coincide with theirs. That part of the image which others call *red* appears to me little more than a shade, or defect of light; after that the orange, yellow and green seem *one* colour, which descends pretty uniformly from an intense to a rare yellow, making what I should call different shades of yellow." In addition to his own colour vision deficiency, Dalton also described those of his brother and 28 other males. He initially referred to his own condition as 'red-blindness'. However, a genetic analysis of the tissue preserved from his eyes, carried out some 150 years after his death, indicates that it was actually of the green–red type. Dalton was not the first to publish on this type of colour vision deficiency. As early as 1777 it was described by the British hydrographer and engineer Joseph Huddart (1741–1816). Today Daltonism is the most prevalent form of colour vision deficiency. Attributed to an X-linked autosomal condition, it affects 6% of all men, but very few women. The fact that the prevalence of the condition is higher in men than in women was already noted by Dalton. Daltonism can be subdivided into a dichromatic form, called 'green' for short, in which the retina's medium-wavelength cones (M-cones) are missing, and an anomalous trichromatic form, referred to as 'green weak', in which the M-cones are present, but in which the peak of the sensitivity for light is displaced towards the red-sensitive cones. Daltonism is commonly classified as an *entoptic phenomenon. In the past the term Daltonism has also been used as a synonym for the (now obsolete) term *colour blindness.

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Dancing Mania and Hallucinations

Dancing mania is also known as dancing plague, epidemic of dancing, epidemic chorea, and choreomania. According to historical sources, the

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latter term was introduced by Theophrastus Bombastus von Hohenheim, better known as Paracelsus (1493–1541). All the above terms are used to denote a complex motor phenomenon that occurred throughout Western Europe from the 14th through the 17th century. In dancing mania, groups of people would dance in the streets, displaying hallucinatory behaviour, epileptiform fits, and transient paralyses, until they collapsed from exhaustion. According to the French alienist Louis-Florentin Calmeil (1798–1895), the dancers often reported religious and/or terrifying *visions. The first major outbreak of dancing mania is thought to have taken place in Aachen, Germany, on June 24, 1374, after which it spread quickly through France, Italy, Belgium, Luxemburg, the Netherlands, and even Madagascar. It appears to have reached its peak in 1418 in Strasbourg. Because the religious treatment of the condition involved praying to St. Vitus (amongst many other things), the condition has been erroneously referred to as St. Vitus Dance (a term that actually refers to Sydenham's chorea). Paradoxically, dancing mania was also treated by means of music. As to the condition's etiology, no real consensus exists. Post hoc hypotheses range from mass hysteria to encephalitis, epilepsy, the bite of a Tarantula, murine typhus, and ergot poisoning. A well-known case of dancing mania in Aix-la-Chapelle, France, has been attributed to ergot poisoning (known in the Middle Ages as St. Anthony's Fire) due to the ingestion of rye infected with ergot (*Claviceps purpura*), a fungus that produces alkaloids with a hallucinogenic potential. The reason that the occurrence of dancing mania was restricted to this specific geographical area and time frame is unknown.

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Dancing Plague

see Dancing mania.

Dark Light

see *Eigengrau*.

Dark Side of Oz

see Dark Side of the Rainbow.

Dark Side of the Rainbow

Also referred to as *Dark Side of Oz* and *Wizard of Floyd*. The name *Dark Side of the Rainbow* is a contraction of the 1973 album title *The Dark Side of the Moon* by the British rock band Pink Floyd, and the song title *Over the Rainbow* from the sound track of the 1939 film *The Wizard of Oz*. In addition, it has been suggested that it refers to the colours of the rainbow featured on the cover of the Pink Floyd album. The term *Dark Side of the Rainbow* denotes a peculiar pattern of thematic similarities that can be discerned while one is watching *The Wizard of Oz* while simultaneously listening to *The Dark Side of the Moon*. With the aid of this somewhat unusual procedure, over a hundred instances of perceived interplay have been reported by fans. It is not known who first established this pattern of thematic similarities, but from 1994 onwards it was widely discussed on internet sites such as the Usenet message board *alt.music.pink-floyd* and in the popular media. As the Pink Floyd band members (save Roger Waters) have always denied deliberate attempts to synchronize their album with the movie, the *Dark Side of the Rainbow* is commonly designated as a *cognitive illusion and attributed to a process called *apophenia, i.e. an excess of perceptual or heuristic sensitivity leading to the discernment of patterns or connections in random or meaningless data. Similar thematic coincidences have been described between other movies and rock albums, but none of these are as elaborate or as well aligned as the *Dark Side of the Rainbow*.

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Datura Hallucination

Datura is known under many names, including apple-Peru, angel's trumpet, devil's trumpet, devil's weed, devil's cucumber, hell's bells, jimsonweed, pricklyburr, toloache, and thornapple. Etymologically, the Latin name *datura* is thought to stem from the Hindi or Old Indian name *dhattūra*, which means thornapple. It covers a genus of some 11 species of vespertine flowering plants belonging to the family *Solanaceae*. The term datura hallucination is used to denote a variety of hallucinatory phenomena mediated by the use of preparates from species such as *Datura stramonium*, *Datura discolor*, and *Datura wrightii*. These species contain the powerful tropane alkaloids atropine, hyoscine (i.e. scopolamine), and hyoscyamine. They have been used since ancient times as an *entheogen, an aphrodisiac, a therapeutic, an anaesthetic, and a poison. Today a person intentionally employing datura for the purpose of exploring the psyche may be called a *psychonaut. Using the criterion of psychoactive potential as a guiding principle, datura is usually classified as a *deliriant. As to its effects, the German anthropologist and ethnopharmacologist Christian Rätsch (b. 1957) maintains that "The Indian division into three stages has particular relevance here: A mild dosage produces medicinal and healing effects, a moderate dosage produces aphrodisiac effects, and high dosages are used for shamanic purposes." The symptoms of datura intoxication are quite similar to those of atropine intoxication. They include mydriasis, blurred vision, tachycardia, vertigo, a sense of suffocation, an extremely dry throat, constipation, urinary retention, *illusions, hallucinations, *delirium, sopor, and ultimately respiratory failure, coma, and death. Pathophysiologically, these symptoms are attributed to the inhibition of the action of acetylcholine at the acetylcholine receptor in the nerve synapse, thereby blocking the physiological function of the parasympathetic nervous system. Today datura is occasionally used for recreational purposes, at considerable risk of accidental overdosing. It is either smoked, ingested raw or consumed in the form of a tea. In all cases, datura is reputed to mediate vivid *visual or *compound hallucinations. The content of these hallucinations is described as either metaphysical, or quite banal. The Canadian anthropologist and ethnobotanist Edmund Wade Davis (b. 1953) lists datura as one of the possible ingredients of a potion believed to evoke an extreme form of *twilight state, called zombification.

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David's Definition of Hallucinations

In 2004 the British neurologist and psychiatrist Anthony S. David (b. 1958) defined hallucinations as follows. "A sensory experience which occurs in the absence of corresponding external stimulation of the relevant sensory organ, has a sufficient sense of reality to resemble a veridical perception, over which the subject does not feel s/he has direct and voluntary control, and which occurs in the awake state."

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Day Blindness

see Hemeralopia.

Daydream

Also referred to as waking fantasy, *oneirism, and reverie. The term daydream tends to be used

quite loosely to denote a fantasy or memory played out in the imagination. Daydreams generally consist of imagined or remembered scenes or conversations. As noted by the American psychologist Mary Maria Watkins (b. 1950), "In daydreaming, the ego's attention becomes attached to to the imaginal contents in the same way it does to our daily concerns. There is no awareness during it or memory afterward of what was going on. One could say that daydreams are a form of sleeping wakefulness, as opposed to the state of wakefulness even while sleeping that characterizes a waking dream." By definition, daydreams lack the perceptual quality of *dreams and *hallucinations. Nevertheless, they can be so lively and distracting that they drown out the regular stream of sensory input. Or, alternatively, they can arise as a consequence of diminished or depatterned sensory input. As the Scottish physician Robert MacNish (1802–1837) wrote in 1830, "Reverie proceeds from an unusual quiescence of the brain, and inability of the mind to direct itself strongly to any one point; it is often the prelude of sleep. There is a defect in the *attention*, which, instead of being fixed on one subject, wanders over a thousand, and even on these is feebly and ineffectively directed." Daydreams can occur either spontaneously or intentionally. They tend to be experienced as purposeless in nature, but they can also be used in a goal-directed manner. In psychology, daydreaming styles are labelled as either positive-constructive, or as guilty and fearful. Daydreams may occasionally develop into a *daymare, especially in subjects plagued by recurring *nightmares. More often, however, they constitute a prelude to a *microsleep, *hypnagogic state, or sleep state. The term daydream is used in opposition to the terms dream, sleep dream, and nocturnal dream. It should not be confused with the terms *dreamy state, absence, absence seizure, or *hypnagogic hallucination.

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Daymare

Also known as *ephialtes vigilantium. The term daymare is indebted to the Old English noun *mare*, which means hag or goblin. It is used to denote an episode of acute anxiety, distress, or terror occurring during a period of wakefulness, which is often precipitated by a *daydream or a fantasy. Conceptually and phenomenologically, the daymare is considered the daytime equivalent of the *nightmare. The American psychiatrist and sleep researcher Ernest Hartmann (b. 1934) characterizes the daymare as "A daydream which becomes increasingly frightening and 'nightmarish' so that it frightens the daydreamer much as a nightmare awakens the dreamer at night. A rare phenomenon, but described by many persons with frequent nightmares." In the past, the phenomenological similarity between the daymare and the classical nightmare has brought some authors to designate the daymare as an *incubus experience taking place during wakefulness, characterized by the same peculiar pressure on the chest that is characteristic of the nocturnal variant. In 1830 the Scottish physician Robert MacNish (1802–1837) gave the following colourful autodescription of a daymare. "During the intensely hot summer of 1825, I experienced an attack of daymare. Immediately after dining, I threw myself on my back upon a sofa, and, before I was aware, was seized with difficult respiration, extreme dread, and utter incapability of motion or speech. I could neither move nor cry, while the breath came from my chest in broken and suffocating paroxysms. During all this time, I was perfectly awake: I saw the light glaring in at the windows in broad sultry streams; I felt the intense heat of the day pervading my frame; and heard distinctly the different noises in the street, and even the ticking of my own watch, which I had placed on the cushion beside me. I had, at the same time, the consciousness of flies buzzing around, and settling with annoying pertinacity upon my face. During the whole fit, judgment was never for a moment suspended. I felt assured that I laboured under a species of incubus. I even endeavoured to reason myself out of the feeling of dread which filled my mind, and longed with insufferable ardour for some one to open the door, and dissolve the spell which bound me in its fetters. The fit did not continue above 5 min: by degrees I recov-

ered the use of speech and motion: and as soon as they were so far restored as to enable me to call out and move my limbs, it wore insensibly away. Upon the whole, I consider daymare and nightmare identical. They proceed from the same causes, and must be treated in a similar manner." Elsewhere MacNish states, however, that "The only difference which [would] seem to exist between the two states is, that in daymare, the reason is always unclouded – whereas in incubus it is *generally* more or less disturbed." Although MacNish was apparently convinced that his judgment had remained unaffected throughout the entire episode, it is not unthinkable (in retrospect) that he had actually experienced an episode of *microsleep.

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De Clérambault Syndrome

The eponym de Clérambault syndrome refers to the French psychiatrist Gaëtan Georges Gatian de Clérambault (1852–1934). It was introduced in 1936 by the Swiss neurologist Georges de Morsier (1894–1982) to denote a hallucinatory state or syndrome characterized by *auditory and *visual hallucinations occurring in the context of chronic *psychosis, which had previously been described by de Clérambault in the context of his work on mental *automatisms. It should be noted that the eponym de Clérambault syndrome is also used to denote a delusional syndrome characterized by erotomania.

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De Maupassant, Guy (1850–1893)

A French writer – considered one of the fathers of the short story – who described various types of hallucination in his literary works. It is known that de Maupassant used *hallucinogens throughout his adult life, that he suffered from visual loss, migraine, and neurosyphilis (possibly complicated by stroke), and that he spent the last months of his life in a state of *delirium. It has been suggested that throughout his working life he drew on his own hallucinatory experiences for his fantastical stories. Careful analyses of his biography and literary works indicate that until the early 1880s de Maupassant experienced *hypnagogic hallucinations, *hypnopompic hallucinations, and *drug-induced hallucinations, while during his later years he also experienced *visual hallucinations, *autoscopic phenomena, and *metamorphopsias (including *prosopometamorphopsia and *macropsia). It has been suggested that the latter symptoms fulfilled the criteria of the *Alice in Wonderland syndrome. During the delirious state in which he spent the final months of his life, de Maupassant may also have experienced other types of hallucination. The import of his work for hallucinations research lies in the combination of a first-hand acquaintance with hallucinatory phenomena, and an exceptional talent for verbalizing and analyzing them. This combination places him in a league with other hallucinating intellectuals, such as Victor Kandinsky (1849–1889), Daniel Paul Schreber (1842–1911), John Thomas Perceval (1803–1876), Christoph Friedrich Nicolai (1733–1811), Vaslav Nijinsky (1889–1950), Fjodor Dostoevsky (1821–1881), and Ludwig Staudenmaier (1865–1933).

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Dead-Weight Hallucination

A term introduced in or shortly before 1951 by the American neurologist Caro W. Lippman

(1886–1954) to denote a *kinaesthetic hallucination characterized by a subjective sensation of being pulled down to the ground. As noted by one of Lippman's patients, "While walking I have a feeling as if a rope were attached between my legs, pulling me down into the ground. At other times I have a feeling of being near to the ground, squashed down, my whole body mashed." Lippman classifies dead-weight hallucinations as variants of the *space-motion hallucination. Because of their association with migraine, they may also be classified as *aural phenomena.

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Deafferentiation Hypothesis of Hallucinatory Activity

The term deafferentiation is indebted to the Latin words *de* (away from, 'negation'), and *affere* (to take somewhere, to bring somewhere). The deafferentiation hypothesis of hallucinatory activity is a hypothetical model that seeks to explain the mediation of some types of hallucination by reference to an endogenous type of *sensory deprivation attributed to disruptions in neural connectivity. It postulates that spontaneous hallucinatory activity can be mediated by sensory cortical areas when these are deafferentiated, i.e. when they are cut off from the neurons and/or axons conducting afferent sensory impulses. This hallucinatory activity is attributed to massive degeneration and subsequent reorganization taking place in the cortical termination zones, as well as in the primary non-affected subfields of the sensory cortex. It is generally held that deafferentiation of primary sensory cortical areas may entail the spontaneous mediation of relatively *simple hallucinations, whereas deafferentiation of cortical association areas may entail the spontaneous mediation of *complex hallucinations. The deafferentiation hypothesis has been employed as an explanatory model for various types of hallucinations, including the *visual hallucinations occurring in the context of *Charles Bonnet syndrome, *hemianopic hallucinations, *verbal auditory hallucinations, *musical hallucinations, *olfactory hallucinations, *deafferentiation pain, *anaesthesia dolorosa, and *phantom limb illusion. Conceptually, the deafferentiation hypothesis of hallucinatory activity is indebted to early 19th-century deafferentiation models of sleep, such as those of the Italian anatomist Luigi Rolando (1773–1831).

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Deafferentiation Pain

Also known as neural injury pain. The term deafferentiation pain is indebted to the Latin words *de* (away from, 'negation'), and *affere* (to take somewhere, to bring somewhere). It is used, especially in the older literature, to denote a type of pain attributed to a disruption of neural connectivity, due to the severance of afferent axons and/or neurons (i.e. deafferentiation). Phenomenologically, deafferentiation pain can present in the form of *hyperaesthesia, *hyperpathia, *allodynia, *phantom pain, *causalgia, and spontaneous pain. Although deafferentiation pain has sometimes been lumped together with *central pain on the basis of 'common clinical features', the two syndromes are distinctly different. It has been suggested that the terms deafferentiation pain and neural injury pain are confusing, and that they should perhaps be discarded altogether for clinical purposes. The question of whether pain can also be experienced in a hallucinated form is a knotty philosophical issue.

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Deafness

see Hearing loss and hallucinations.

Deathbed Apparition

see Take-away apparition.

Deathbed Escort

see Take-away apparition.

Deathbed Vision

A term used to denote a *visual or *compound hallucination occurring shortly before dying. Deathbed visions have been known and described since ancient times. The first systematic study of these phenomena was carried out between 1924 and 1926 by the founder of the Society for Psychical Research, the British physicist William Fletcher Barrett (1844–1925). It was also Barrett who introduced the term deathbed vision in 1926. In a study conducted between 1959 and 1973 by the *American Society for Psychical Research, represented by the parapsychologists Karlis Osis (1917–1997) and Erlendur Haraldsson (b. 1931) among tens of thousands of individuals in the United States and India, deathbed visions were found to occur in 50% of the population under study. Reportedly, these visions tend to involve either deceased loved ones, other individuals, or mythical or religious figures. In the literature, visions depicting an otherworldly messenger are addressed as *afterlife-related hallucinations and as hallucinatory near-death experiences. Because of their alleged role in summoning or escorting the individual from this world to the afterlife, such figures are also designated as deathbed escorts, deathbed apparitions, or *take-away apparitions. They are sometimes described by the dying person as an unusual light or energy. Deathbed visions may also depict scenes associated with an afterworld. Such scenes typically involve radiant lines, luminous gardens, buildings of great architectural beauty, and symbolic transitional structures such as doors, gates, bridges, death-coaches, rivers, and boats. The afterworld scenes may be populated with angels or humanoid figures. They tend to be reported as being executed in glowing, bright colours. Sometimes celestial music is reported as well. When visions of such scenes replace the whole sensory environment, they are referred to as *total hallucinations. When they are accompanied by a compelling sense of objectivity, they are said to have a high degree of *xenopathy. Deathbed visions may resemble *ecstatic experiences (i.e. 'the psycho-physical condition that accompanies the apprehension of what one experiences as the ultimate reality') in that they may summon up feelings of great peace, and/or a feeling of unity with God or with Creation. The duration of such deathbed visions varies. About half of those reported by Osis and Haraldsson lasted 5 min or less. Some 17% lasted between 6 and 15 min. Three quarters of the individuals under study died within 10 min after their vision, and almost all of them died within hours afterwards. Pathophysiologically, deathbed visions tend to be conceptualized either as *release phenomena, or as *reperceptions. To suspend judgement on the issue of whether the perceived otherworldly figures exist or not, it has been proposed to use the neutral term *idionecrophany to denote any sensory experience that involves an alleged contact with the dead. It has also been suggested that the experience of a 'clear light of death' may be associated with the massive release of the neurotransmitter dimethyltryptamine (DMT).

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Defective Corollary Discharge Model for Verbal Auditory Hallucinations

This is a term used to denote a variant of the *inner speech model for *verbal auditory hallucinations (VAH) that seeks to explain the misattribution of inner speech – which is deemed to underlie the mediation of (some types of) VAH or 'voices' – by reference to a default in corollary discharge. In this context the term corollary discharge refers to an early-warning signal (also known as feedforward signal or efference copy) purportedly sent by the speech production areas to the speech perception areas via the fronto-cingulo-temporal (FCT) circuit. The function attributed to this corollary discharge consists in 'preparing' the speech perception areas and/or the auditory cortex for an endogenous signal to come, thus allowing these structures to distinguish between self-mediated and externally mediated signals. As postulated by the British psychologist and neuroscientist Christopher Frith (b. 1942) and others, a failure in this type of corollary discharge can lead to the misattribution of inner speech to an external source. Conceptually, the defective corollary discharge model for hallucinations is a derivative of the CODAM model developed by the British mathematician John Gerald Taylor (b. 1931), which in turn constitutes an elaboration of the work of the American philosopher Sydney Shoemaker (b. 1931) on self-reference and self-awareness. CODAM is an acronym for COrollary Discharge of Attention Movement. The CODAM model postulates that the general deployment of attention, as well as the creation of consciousness, depend primarily on the ability of the brain (or mind) to predict its own future state, and that this ability is created by an efference copy or corollary discharge of the attention control signal.

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Defective Revisualization

see Charcot–Wilbrand syndrome (CWS).

Deformation Phosphene

Also known as pressure phosphene. The two terms are used interchangeably to denote a type of *phosphene (i.e. 'seeing stars') that can be provoked under physiological conditions by the exertion of gentle pressure on the eyeball. Deformation phosphenes are classified as *entoptic phenomena. They may present as a darkening of the visual field, as diffuse colour patches, as changing, scintillating, and deforming light-grids with occasional dark spots, or as a field that is sparsely covered with intense blue points of light. The earliest known description of the deformation phosphene was recorded by the Greek philosopher and medical theorist Alcmaeon of Croton, who lived in the mid-fifth century BC. Under the influence of *hallucinogens such as mescaline and LSD, the induction of deformation phosphenes can trigger a kaleidoscopic series of *visual hallucinations.

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Déjà Experience

The French-English neologism *déjà* experience translates loosely as 'already experience'.

It is used as a generic term for the group of false memory phenomena exemplified by **déjà vu*. Although to the affected individual these phenomena may be suggestive of a perceptual aberration, they are generally conceptualized as mnestic events. According to the South African *déjà vu* expert Vernon M. Neppe, over 20 different *déjà* experiences can be distinguished. These include *déjà arrivé* (already happened), *déjà connu* (already personally known), *déjà dit* (already said or spoken (i.e. speech content)), *déjà entendu* (already heard), *déjà éprouvé* (already experienced), *déjà fait* (already done), *déjà gouté* (already tasted), *déjà lu* (already read), *déjà parlé* (already spoken (i.e. speech act)), *déjà pensé* (already thought), *déjà pressenti* (already sensed), *déjà raconté* (already recounted), *déjà rencontré* (already met), *déjà rêvé* (already dreamt), *déjà senti* (already felt or smelt), *déjà su* (already known), *déjà trouvé* (already found), *déjà vécu* (already lived), *déjà visité* (already visited), *déjà voulu* (already desired), and *déjà vu* (already seen, as used in the restricted sense of having perceived in the visual modality). Conceptually, the *déjà* experiences are considered the opposite pole of **jamais vu* (never seen). A third variant is known as **presque vu* (almost seen).

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Déjà Vu

Also known as false memory. The term *déjà vu* is French for 'already seen'. As pointed out by the South African *déjà vu* expert Vernon M. Neppe, the term is used in a broad sense to denote "any subjectively inappropriate impression of familiarity of a present experience with an undefined past" (i.e. as a synonym of the generic term **déjà* experience), and in a narrow sense to denote a **déjà* experience occurring in the visual modality. As used in the latter sense, the term *déjà vu* is used in opposition to more than 20 related terms, such as *déjà arrivé* (already happened), *déjà connu* (already personally known), and *déjà entendu* (already heard). As used in the broad as well as the narrow sense, *déjà vu* is considered the obverse of **jamais vu*. The origin of the term *déjà vu* is unclear, but it is sometimes attributed to the French philosopher and psychologist Émile Boirac (1851–1917), who reportedly mentioned it in 1876 in a letter to the French journal *Revue Philosophique de la France et de l'Étranger*. The concomitant concept, however, would seem to be much older. It has been suggested that the Church Father St. Augustine (354–430) referred to this phenomenon when he used the term *falsae memoriae* in his work *De Trinitate*. Although the term *déjà vu* may seem to suggest otherwise, this symptom is not conceptualized as a perceptual phenomenon but as a false, but compelling sense of familiarity or recognition (i.e. a mnestic event) that may accompany a regular perceptual experience or event. For example, one may walk into a restaurant, and observe the other guests sitting at their dinner tables, and have the feeling that one has witnessed that exact scene before. Pseudo-presentiments like these would seem to be fairly common in healthy individuals of all ages. They typically last for various seconds to minutes, without affecting the subjects' judgment of their present situation. The subject's feeling is rather characterized by the cognitive dissonance between the feeling of re-experiencing a given situation, and the simultaneous awareness of its impossibility. Epidemiological surveys indicate that the lifetime prevalence of *déjà vu* experiences in the non-institutionalized population lies between 30 and 96%. This broad range of prevalence figures is probably due to differences in the operational criteria of *déjà vu*, and to population biases. The literature also suggests that the incidence of *déjà vu* may be higher in young and imaginative individuals, and that its incidence tends to increase in the context of conditions such as fatigue and heightened perceptual sensitivity. Some studies also suggest that *déjà vu* may be more prevalent among individuals with a psychiatric disorder, such as anxiety disorder, dissociative identity disorder, mood disorder, personality disorder, or *schizophrenia. In addition, a heightened incidence of *déjà vu* is associated with the organic brain syndrome, temporal lobe epilepsy, Alzheimer's disease, and other types of dementia. When *déjà vu* is attributed to an organic cause, it is referred to as endogenous *déjà vu.* In the case of a specific association with epilepsy, the phenomenon is sometimes referred to as epileptic *aura or epileptic

déjà vu. Epileptic *déjà vu* typically presents as a *déjà vu* phenomenon with a prolonged or recurrent course. It can be complicated by hallucinatory phenomena such as *abdominal aura and olfactory hallucinations, and by subjective phenomena such as derealization, depersonalization, and strong affective states. As to the pathophysiology of *déjà vu*, various competing models exist. Most of these revolve around the notion of a dissociated activation of the familiarity/remembercentres of the brain, as may occur in dysfunctional activation of the mesial temporal lobe. In the literature this dysfunctional activity is conceptualized as epileptic in origin or not. Alternatively, the dual pathway hypothesis suggests that perceptual information from the senses does not always converge on sensory cortical areas in a coordinated fashion, thereby luring the cortex into labelling a single percept as a duplicated (i.e. re-experienced) one. As the alleged delay in neurotransmission is thought to originate from the optic nerve, the concomitant model is referred to as the optical pathway delay hypothesis. A third hypothesis suggests that *déjà vu* may arise from an instance of unattended perception, followed by an instance of attended perception. In parapsychology, *déjà vu* and other *déjà* experiences are sometimes regarded as telepathic phenomena, or as veridical memories of an alleged past life.

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Deliriant

Also known as true hallucinogen and anticholinergic hallucinogen. The term deliriant comes from the Latin verb *delirare*, which means to go off the furrow, to derail. It is used to denote a subclass of the *hallucinogens characterized by the ability to induce a state of acute *delirium. Such acute states can be accompanied by a variety of symptoms, including hallucinations, restlessness, agitation, and fugue states. Some examples of deliriants are alkaloids such as belladonna, mandrake, henbane, datura, atropine, and scopolamine, and antihistaminics such as diphenhydramine and dimenhydrinate. The mode of action of the deliriants is thought to be through inhibition of the action of acetylcholine in the CNS. The term deliriant is used in opposition to the terms *psychedelic and *dissociative. In some classifications, the deliriants are considered a subgroup of the dissociatives. A person intentionally employing deliriants for the purpose of exploring the psyche may be called a *psychonaut.

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Delirious Hallucination

A term used – and possibly also introduced – in 1973 by the French psychiatrist Henri Ey (1900–1977) to denote a hallucination occurring in the context of disease. Conceptually, Ey's notion of *hallucination délirante* would seem to resemble the *pathological hallucination of his compatriot Alexandre Jacques François Brierre de Boismont (1797–1881). Ey uses the term *hallucination délirante* – or hallucination, for short – in opposition to the term **éidolie hallucinosique*.

Reference

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Delirium

Also known as acute confusional state, acute organic reaction, acute brain syndrome, confusoneiric state, and toxic-metabolic encephalopathy. The term delirium comes from the Latin verb *delirare*, which means to go off the furrow, to derail. The term was used in the Hippocratic Corpus and other ancient medical texts with a variety of connotations, mostly revolving around the notion of a disturbance in the train of thinking. The various contexts in which the term was used are often epistemologically discontinuous with current medical thinking. During the first part of the 19th century (and especially in the French

medical literature) the term delirium (*délire*) was used for a variety of mental states, including those characterized by disorders of intellectual function, errors of judgment (i.e. delusions), and perceptual disturbances (such as hallucinations). For a long time, delirium was distinguished from mental illness by the presence of fever. It was the French alienist Alexandre Jacques François Brierre de Boismont (1797–1881) who in 1845 made an important contribution to the syndromatic approach which is in use today by suggesting that delirium should be conceptualized as an acute, prototypical type of insanity. Today the term delirium is used to denote a heterogeneous mental and neurobehavioural syndrome which is by definition associated with organic disease, although not necessarily with fever. As to its symptomatology, delirium is characterized primarily by alterations in the level of consciousness (i.e. 'clouding'), and by a disorientation in time and space. Additional symptoms may include attention deficits, impairments of cognitive functioning, delusions, hallucinations, *illusions, speech disorders, an altered sleep-wake cycle, and behavioural symptoms such as restlessness, agitation, disrobing, plucking, physical aggression, and wandering. The hallucinations and illusions occurring in the context of delirium are primarily of a *visual nature, although the other sensory modalities may be involved as well. *Zoopsia and *formicative hallucinations are considered classical symptoms. The term *delirium tremens is reserved for delirious states occurring in the context of alcohol withdrawal.

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Delirium of Judgment

The German term *Urtheilsdelirien* (i.e. delirium of judgment) was introduced in or shortly before 1885 by the Russian psychiatrist Victor Kandinsky (1849–1889) to denote a type of *illusion in which perceptual stimuli or objects are misinterpreted rather than misperceived. Some examples of delirium of judgment are cases in which pebbles are held for gems, or pieces of simple metal for silver or gold. The notion of delirium of judgment is conceptually compatible with the notion of *ganglionic illusion as defined by the French alienist Jean-Etienne Dominique Esquirol (1772–1840). Although illusions are generally conceptualized as perceptual phenomena, the term delirium of judgment would seem to refer to a delusional rather than an illusory phenomenon. As Kandinsky points out, this is a common, but not a proper usage of the term illusion, the origin of which can be traced back to Esquirol. Kandinsky uses the notion of delirium of judgment in opposition to the notions of *sensory misperception (*Sinnestäuschung*) and *delirium of the senses (*Sinnesdelirien*).

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Delirium of the Senses

The German term *Sinnesdelirien* (i.e. delirium of the senses) was introduced in or shortly before 1885 by the Russian psychiatrist Victor Kandinsky (1849–1889) to denote a type of *illusion commonly designated as *intermetamorphosis (i.e. *Personenverwechselung* in German). This type of illusion typically involves a situation in which an individual is regularly and consistently misidentified, and taken for a different person. This consistent misidentification is explained by Kandinsky in terms of a *pareidolia based on the distinctive facial features that two (or more) persons may have in common. In Kandinsky's own words, "Delirium of the senses is an external state of affairs, and mostly a singular, highly specific one, that calls forth the percept at hand. Should we not assume that the images of the individual persons that call forth these cases of mistaken identity correspond in various characteristic ways with the images of the true persons? And

that that is why the complete, objective image and the schematic, subjective image fall into the same place, and why the mistake is thus called forth by an event that belongs to the process of sense perception?" Kandinsky uses the term delirium of the senses in opposition to the terms *sensory misperception (*Sinnestäuschung*), and *delirium of judgment (*Urtheilsdelirien*). Conceptually and in a classificatory sense, the delirium of the senses occupies a sort of middle ground – or perhaps one should say a common ground – between hallucination and illusion. As Kandinsky explains, "This type of illusion, the perceptual interchange delirium, as distinct from the cognitive interchange delirium, is therefore basically also a hallucination, distinguishing itself from the more regular hallucination only because the inner impulse, the inner anomaly is not sufficient for its occurrence, and that a certain exterior impulse must be added, so that the hallucination is not a complete one, but only a partial one." In a later passage Kandinsky adds that the term delirium of the senses also has a bearing on objects, and proposes that the term pareidolia be used as a generic term for all the various kinds of 'partial' hallucinations.

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Delirium Tremens

Also known as shaking delirium and Saunders-Sutton syndrome. The term delirium comes from the Latin verb *delirare*, which means to go off the furrow, to derail. The adjective *tremens* is Latin for trembling or shaking. The expression delirium tremens is used to denote a subtype of *delirium that may occur following the cessation of a prolonged and excessive intake of alcohol, benzodiazepines, barbiturates or other tranquillizers. The term was introduced in 1813 by the British physician Thomas Sutton (1767–1835), who used it to demarcate the concomitant cluster of symptoms from other types of delirium, as well as from other alcohol withdrawal syndromes. The eponym Saunders-Sutton syndrome refers to Sutton and to his Scottish colleague Willam Saunders (1743–1817), who had lectured on the subject, and gave Sutton advice while he was preparing his original paper on the subject. According to the historians of psychiatry Gregory Zilboorg (1890–1960) and George W. Henry (1890–1964), the symptoms characteristic of delirium tremens have been known since prehistoric times, as has their association with alcohol withdrawal. The clinical symptoms of delirium tremens include tremor, tachycardia, tachypnea, either hypertension or hypotension, increased perspiration, an alteration of body temperature, gastritis, vomiting, disorientation, hyperkinesis, anxiety, panic attacks, agitation, insomnia, food aversion, confabulations, paranoia, hallucinations, *illusions, *paraesthesias, epileptic seizures, and coma. The hallucinations occurring in the context of delirium tremens are primarily of a *complex visual or *compound nature. They tend to consist of vivid, terrifying images of people, animals (i.e. *zoopsia) or insects that can be felt crawling upon or beneath the skin (i.e. *formication). A special type of visual hallucination described in the context of delirium tremens that can be evoked by the covering of one eye is the *monocular hallucination. As pointed out by the Swiss psychiatrist Ferdinand Morel (1888–1957), many of the *visual illusions (and perhaps also hallucinations) in delirium tremens are associated with the presence of a positive *scotoma, which can be described adequately by the affected individual during sober phases, but which may act as a **point de repère* for their development when consciousness is clouded. The symptoms of delirium tremens typically arise several days to a week after the cessation of a prolonged episode of excessive alcohol intake. Without adequate treatment these symptoms may last for several weeks. As noted by 19th-century authors, untreated delirium tremens is always self-limiting, in the sense that it ends either in spontaneous recovery or death. The mortality rate of untreated delirium tremens is estimated to lie between 15 and 40%. Even with adequate treatment, the mortality rate is between 1 and 15%. The pathophysiology of delirium tremens is largely unknown, but it is attributed mainly to the central effects of alcohol on the benzodiazepine-$GABA_A$-chloride receptor complex for the neurotransmitter gamma amino butyric acid (GABA). The high mortality rate is associated primarily with comorbid conditions such as hyperthermia, dehydration, vitamin depletion, electrolyte disturbances, cardiac arrhythmia, cardiac failure, and hepatic coma.

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Delusional Halitosis

see Hallucinatory halitosis.

Delusional Misidentification Syndrome

see Misidentification syndrome.

Delusional Reduplication Syndrome

see Misidentification syndrome.

Dementia and Hallucinations

The term dementia comes from the Latin words *de* (away from, apart) and *mens* (mind). It is used to denote a generalized, pervasive decline in cognitive functioning to an extent which is beyond what can be expected in normal ageing, and which leads to a significant interference with the affected individual's daily functioning, social functioning, and/or occupational activities. Etiologically, dementia is associated primarily with a variety of CNS diseases, including Alzheimer's disease, cerebrovascular disease (leading to vascular dementia), Pick's disease, Parkinson's disease (i.e. Lewy body dementia), Huntington's disease, *Aids (leading to the Aids-dementia complex), Creutzfeldt-Jakob disease, alcoholism (leading to alcoholic dementia), and substance abuse. Among the hallucinations occurring in the context of dementia, the *visual and *auditory ones are the most prevalent. However, hallucinations in dementia may occur in any of the other sensory modalities as well. Hallucinations and illusions in dementia usually arise after the characteristic process of cognitive impairment has set in, but occasionally they constitute the disease's presenting symptom. For more specific details, see the entry Alzheimer's disease and hallucinations.

Reference
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Dementia Paralytica and Hallucinations

see Syphilitic hallucinosis.

Demon

The term Demon comes from the Greek noun *daimōn*, which means spirit or god. It was introduced into the biomedical jargon during the early 1970s by the American psychopharmacologist Ronald K. Siegel to denote a visually hallucinated black gauzy curtain with a large human eye in the centre, surrounded by a symmetrical arrangement of smaller eyes. The term Demon, suggested to Siegel by a test person referred to as 'Jim', was inspired by a passage from *The Pit and the Pendulum* by the American author and poet Edgar Allan Poe (1809–1849) which runs as follows. "Demon eyes, of a wild and ghastly vivacity, glared upon me in a thousand directions where none had been visible before, and gleamed with the lurid lustre of a fire that I could not force my imagination to regard as unreal." Like the eyes described in Poe's *vision, the hallucinated eyeballs are described as "alive, leering". In Siegel's laboratory they were perceived by various test persons during *cannabis-induced visions,

Fig. 1 Demon. Illustration by JDB

while a more or less similar phenomenon has been described in *hallucinogen-induced visions, and in individuals with a clinical diagnosis of *schizophrenia. Despite Siegel's efforts to fathom the neurophysiological correlate of the Demon (including a trip to a Mexican shaman said to be over a 100 years old) he was unable to find any explanation other than the possibility of a *reperceptive hallucination based on a slide with geometrically arranged eyes that had previously been shown to the test persons. It is unknown whether this mechanism also applies to other manifestations of the Demon phenomenon. The term is also used in religion, demonology, occultism, and parapsychology to denote a supernatural being that is not a deity, i.e. a fallen angel or evil spirit.

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Demoor's Sign

see Charpentier's illusion.

Dendropsia

The term dendropsia comes from the Greek words *dendron* (tree) and *opsis* (seeing). It was coined in or shortly before 1999 by the British neuroscientists Dominic H. ffytche and Robert J. Howard to denote a *geometric hallucination consisting of irregular branching forms reminiscent of trees, branches, or roadmaps. These hallucinated branching forms are executed in one or more colours, and occasionally display adnexes reminiscent of leaves or needles. Dendropsia has been reported in elderly individuals experiencing *visual hallucinations and *illusions (as in *Charles Bonnet syndrome, for example), in degenerative eye disease, and in *hallucinogen-induced hallucinatory states. Pathophysiologically, dendropsia tends to be associated with central rather than peripheral mechanisms. The current 'central' model attributes the perception of branching forms to neuronal discharges affecting the retinocortical map (i.e. the patterns of connection between the retina and striate cortex), and/or neuronal circuits lying within striate cortex. Phenomenologically, dendropsia is distinguished somewhat arbitrarily from *tessellopsia. Moreover, dendropsia should not be confused with the *Purkinje effect, a physiological *entoptic phenomenon consisting of irregular branching forms that can be observed by shining light onto the eyeball.

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Denial of Blindness

see Anton–Babinski syndrome.

Depressive Disorder and Hallucinations

see Mood disorder and hallucinations.

Dermal Vision

see Eyeless vision.

Dermatozoic Hallucination

see Formicative hallucination.

Dermo-Optical Perception

see Eyeless vision.

Dermo-Optics

see Eyeless vision.

Descartes, René (1596–1650)

A French rationalist philosopher who – according to the British physician and alienist Forbes

Fig. 2 René Descartes. Oil painting (1649) by Frans Hals. Source: Musée du Louvre, Paris

Benignus Winslow (1810–1874) – was plagued by the voice of an invisible person after a period of confinement. Reportedly, this voice urged Descartes "to pursue his search for truth". The source of Winslow's allegation is unknown, however, and although it has been repeated by eminent authors such as Edmund Parish (1861–1916), Cesare Lombroso (1836–1909), and Kurt Goldstein (1878–1965), experts on the life and work of Descartes question whether he actually experienced any *verbal auditory hallucinations.

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Winslow, F. (1840). *The anatomy of suicide*. London: H. Renshaw.

Desert Hallucination

A term used to denote a *complex visual or *panoramic hallucination reported by desert dwellers and travellers, which typically occurs during the night, and which may consist of scenes depicting caravans, rows of soldiers, trees, oases, etc. Desert hallucinations can also affect the *auditory modality. Reportedly, they tend to have a high degree of *xenopathy. They are attributed to the hardships of life in the desert, more specifically fatigue, undernourishment, thirst, and the monotonous character of sense impressions. Desert hallucinations may be related in a phenomenological and pathophysiological sense to *hypnagogic and *hypnopompic hallucinations. They should not be confused with the *desert mirage, the *fata morgana or other types of *mirage.

Reference

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Desert Mirage

see Highway mirage.

Deutan Colour Blindness

see the entries Deuteranopia and Daltonism.

Deutan Colour Deficiency

see the entries Deuteranopia and Daltonism.

Deutanomaly

Also known as deuteranomaly and anomalous trichromatic deuteranopia. All three terms are indebted to the Greek words *deuteros* (second), and *anōmalia* (anomaly, irregularity). They translate roughly as 'an irregularity in the ability to perceive the second of the primary colours (i.e. green)'. The introduction of the term has been attributed to the German ophthalmologist and physiologist Willibald A. Nagel (1870–1911), the inventor of the Nagel anomaloscope (used in colour vision testing). Phenomenologically, deutanomaly presents in the form of a reduced sensitivity to greens. Pathophysiologically it is associated with a diminished sensitivity of the retina's green receptor mechanism. Deutanomaly is classified as an *anomalous trichromatism, which itself constitutes one of the *colour vision deficiencies. The term deutanomaly is used in opposition to *protanomaly and *tritanomaly.

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Deuteranomaly

see Deutanomaly.

Deuteranopia

Also known as deutan colour deficiency, deutan colour blindness, *Daltonism, and green–red blindness. The term deuteranopia comes from the Greek words *deuteros* (second), *an* (not) and *opsis* (seeing). It translates roughly to 'not being able to see the second of the primary colours, (i.e. green)'. The term deuteranopia was introduced in or shortly before 1837 by the German physicist August L.F.W. Seebeck (1805–1849) to denote the green–red type of *colour vision deficiency. Deuteranopia can be divided into dichromatic deuteranopia and anomalous trichromatic deuteranopia. In dichromatic deuteranopia the green–red colour blindness is absolute, due to the absence of the medium-wavelength cones or M-cones. In anomalous trichromatic deuteranopia the M-cones are present, but malfunctioning. As a consequence, there is a diminished ability rather than an absolute inability to distinguish between greens and reds. The latter condition is also referred to as *deutanomaly. Deuteranopia is the most common form of the colour vision deficiencies. As it is an X-linked autosomal condition, it affects 6% of all men, but very few women. The term deuteranopia is used in opposition to the terms *protanopia and *tritanopia.

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Deuteroscopic Hallucination

The term deuteroscopic hallucination is indebted to the Greek words *deuteros* (second) and *skopeō* (I am looking at). In 19th-century medicine it was used as a synonym for *autoscopic hallucination. The French physician and psychologist Paul Auguste Sollier (1861–1933) criticized the use of the term deuteroscopic hallucination, and introduced the term *dissimilar autoscopy to replace it. Sollier motivated his proposal as follows: "The individual may see a figure who does not resemble his physical appearance, his sex, or his clothing, but with whom he identifies in a moral sense, and whom he acknowledges as being he himself. Such a form, which one may call dissimilar autoscopy, corresponds with what used to be called a deuteroscopic hallucination." Today dissimilar autoscopy is known as *heautoscopy.

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Deuteroscopy

The term deuteroscopy comes from the Greek words *deuteros* (second) and *skopeō* (I am looking at). The coiner of the term is unknown, but it was used for centuries in demonology and occultism before taking on a biomedical connotation. From 1837 onwards the German psychiatrist Friedrich Wilhelm Hagen (1814–1888) used the term deuteroscopy to denote a phenomenon that is now known as *heautoscopy (i.e. the occurrence of a *visual hallucination depicting an individual identified as oneself, even though it does not have the exact same physical characteristics). It was the French physician and mesmerist Charles Féré (1852–1907) who criticized the use of the term deuteroscopy, suggesting instead the term *autoscopy (denoting the occurrence of a visual hallucination depicting one's self). The term deuteroscopy is now only used in occultism and parapsychology, where it serves as a synonym for second sight or *clairvoyance, i.e.

the ability to evoke hallucinations or other percepts considered to be veritable in nature.

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Hagen, F.W. (1837). *Die Sinnestäuschungen in Bezug auf Psychologie, Heilkunde und Rechtspflege*. Leipzig: Verlag von Otto Wigand.

Deutsch's Illusion

see Musical illusion.

Developmental Synaesthesia

A term introduced in or shortly before 1996 by the British neuroscientist Simon Baron-Cohen as a synonym for the term *idiopathic synaesthesia.

Reference

Baron-Cohen, S., Harrison, J.E., eds. (1996). *Synaesthesia: Classic and contemporary readings*. Cambridge, MA: Blackwell Publishers.

Dichromatism

Also known as dichromatopsia, dyschromatopsia, and parachromatopsia. The term dichromatism comes from the Greek words *dis* (twice) and *chrōma* (colour). It refers to a type of *colour vision deficiency in which one of the three colour receptor mechanisms is missing. Dichromatism is absolute, due to the absence of one type of retinal cone pigment. In trichromatic species such as humans there are three types of dichromatism, called *protanopia, *deuteranopia, and *tritanopia. The term dichromatism is used in opposition to the terms *monochromatism and *anomalous trichromatism.

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Dichromatopsia

see Dichromatism.

Digital Sight

see Eyeless vision.

Dimensions of Visual Imagery

A term introduced during the early 1970s by the American psychopharmacologists Ronald K. Siegel and Murray E. Jarvik to denote a classification of the phenomenological characteristics of *cannabis-induced visual imagery. More specifically, Siegel and Jarvik's classification constitutes an arrangement of regularly recurring forms that can be discerned among the numerous manifestations of cannabis-induced *geometric hallucinations. This arrangement comprises (1) a form dimension (including the categories random, line, curve, web, lattice, tunnel, spiral, kaleidoscopic, and complex), (2) a colour dimension (including the categories black, violet, blue, green, yellow, orange, red, brown, and white), (3) a movement dimension (including the categories aimless, horizontal, oblique, explosive, concentric, rotational, and pulsating), and (4) a dimension of action patterns (including the categories complete image changes, changes within a single image, combining of images, repeating of images, and overlaying of images). Siegel and Jarvik's classification was patterned on that of mescaline-induced *form-constants published in 1928 by the German-American biological psychologist and philosopher Heinrich Klüver (1897–1979). Both classifications may be seen as elaborations of the work of the 19th-century French physician Pierre Dheur on recurrent patterns of movement and disappearance in individuals experiencing *visual hallucinations.

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Dimethyltryptamine (DMT) and Hallucinations

Dimethyltryptamine is also known as dimethyltryptamin, *N,N*-dimethyltryptamine, nigerin, nigerine, and nigerina. All six names are used more or less interchangeably to denote a hallucinogenic tryptamine belonging to the group of indole alkaloids. The substance DMT, or $C_{12}H_{16}N_2$, is a derivative of tryptamine with two additional methyl groups at the amine nitrogen atom. Its chemical structure is related to that of the *hallucinogens psilocin and bufotenine, as well as to that of the neurotransmitter serotonin. Using the criterion of psychoactive potential as a guiding principle, DMT is usually classified as a *deliriant. It is believed to act as a partial agonist of 5-hydroxytryptamine or serotonin receptors. However, it is not clear whether this is also the working mechanism behind its hallucinogenic effect. DMT was first synthesized in 1931 by the German-Canadian organic chemist Richard Helmuth Fred Manske (1901–1977). The Brazilian ethnobotanist and chemist Oswaldo Gonçalves de Lima was responsible for the name nigerine. DMT was first isolated from the seeds of *Anadenanthera peregrine* in 1955, and soon afterwards it became clear that it occurs naturally in many plants and animals, as well as in humans. DMT is usually ingested via smoking, but it can also be taken orally (along with a monoamine oxidase (MAO) inhibitor to prevent early breakdown), as well as intravenously, intranasally, and rectally. Its hallucinogenic effects have a short duration, i.e. on the order of 10 min when smoked or snuffed, and around 45 min when injected. However, due to a *time distortion known as *protracted duration, the subjectively experienced duration of this time span tends to be much longer. The hallucinations evoked by the use of DMT are usually *visual, *compound or *panoramic in nature, typically displaying human and humanoid beings (such as aliens, fairies, and elves). These hallucinatory states are described as having an extraordinarily alien quality sometimes referred to as 'hyperdimensionality'. According to the German anthropologist and ethnopharmacologist Christian Rätsch (b. 1957), DMT is "easily the most powerful psychedelic known". The function of DMT when it occurs naturally within the human nervous system is not fully understood. As Rätsch comments, "Neurobiologists are as yet uncertain about the role DMT might play in the nervous system. Hyperventilating causes the concentration of DMT in the lungs to increase. One physician has reported that the release of endogenous DMT is highest at the moment of death. It is my opinion that this chemical messenger is responsible for the ultimate shamanistic ecstasy, for enlightenment, and for the merging into the 'clear light of death'." A person intentionally employing DMT for the purpose of exploring the psyche may be called a *psychonaut.

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Diminutive Visual Hallucination

see Microptic hallucination.

Dinitrogen Oxide and Hallucinations

see Nitrous oxide hallucination.

Diplacusis

Also known as paracusis duplicata and double hearing. The term diplacusis comes from the Greek words *diploös* (double) and *akouein* (to hear). This translates to double sound or double hearing. The term is used as a generic term for a group of auditory distortions characterized by the hearing of a single tone at a different pitch in each ear. The American otolaryngologist George Elmer Shambaugh, Sr. (1869–1947) has been credited with providing the first case report of diplacusis in 1907, attributing the condition to slight differences in response on the part of the tectorial membranes of the right and left ear. In 1940 Shambaugh's son, George Elmer Shambaugh, Jr. (1903–2008) distinguished three varieties of diplacusis which he called diplacusis binauralis dysharmonica, diplacusis binauralis echotica, and diplacusis monauralis dysharmonica. Diplacusis binauralis dysharmonica, considered the most common variant of diplacusis, is conceptualized as an auditory distortion in which a single sound is heard at a different pitch by the two ears. The ensuing dissonant double clang is attributed to the disordered processing of sounds by a diseased ear, in combination with the normal processing of sounds by the other, healthy ear. In diplacusis binauralis echotica a single sound is heard a fraction of a second later by the diseased ear. In diplacusis monauralis dysharmonica a pure tone is heard as a double tone, due to echoing within the diseased ear itself. A fourth variant, known as diplacusis qualitatis, is conceptualized as a type of diplacusis in which the diseased ear is held responsible for changing the quality of notes without altering their pitch. Diplacusis is commonly classified as a type of *paracusis (i.e. false acoustic perception). Etiologically, diplacusis is associated primarily with Ménière's disease and retrocochlear lesions. Beyond the context of pathology, however, cases of diplacusis on the order of 1 or 2% can be found in many individuals with normal hearing, especially under the influence of fatigue and/or exposure to noise.

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Diplohaptia

see Synchiria.

Diplopia

The term diplopia comes from the Greek words *diploös* (double) and *opsis* (seeing). It translates as double vision. The ensuing coexistence of similar images within the field of vision is called *multiplication. Diplopia can be divided into two broad classes: binocular diplopia, in which both eyes are involved, and *monocular diplopia in which only one eye is involved. When the term diplopia is used, it usually refers to binocular diplopia. For an account of monocular diplopia, see the entry Diplopia monocularis. Binocular diplopia is characterized by the visual perception of two identical images of a single object or stimulus, while looking with both eyes. The perceived image may display a horizontal, vertical, or oblique displacement, depending on the ocular muscles involved. Pathophysiologically, binocular diplopia is associated with a variety of conditions affecting the oculomotor nerve, the abducens nerve, the trochlear nerve, the eye muscles themselves, or the orbit (as in mass lesions). Etiologically, diplopia is associated with a variety of systemic conditions, including diabetes mellitus, hypertension, myasthenia gravis, herpes zoster, and aneurysm of the arteria communicans posterior. The local mechanical causes of diplopia binocularis include thyroid disease, orbit myositis, fracturing of the orbit wall, intraorbital tumour or haematoma, and Brown syndrome. Central causes of diplopia binocularis include mesencephalic lesions, pons lesions, increased intracranial pressure, and acute vitamin B1 defi-

ciency (i.e. Wernicke's syndrome). Diplopia may be transferred to the content of *visual hallucinations, which then take the form of double images (also referred to as *distorted hallucinations). The Scottish physicist David Brewster (1781–1868) is commonly credited with having been the first to demonstrate the mediation of distorted hallucinations experimentally. Whilst seeking to distinguish between sensory and hallucinatory visual images, he applied pressure to the eyeball of a test person, only to find that both types of percepts were doubled in the process. The term *pseudodiplopia is sometimes used to denote cases of *palinopsia, a condition which displays certain phenomenological similarities to diplopia.

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Diplopia Monocularis

Also known as monocular diplopia and hallucinatory diplopia. The term diplopia monocularis is modern Latin for 'double vision with one eye'. The concomitant condition is characterized by the visual perception of two identical images based on a single object or stimulus, even when one eye is covered. The ensuing coexistence of identical images within the field of vision is called *multiplication. The displacement of multiplied images can be in either a horizontal or vertical direction. Moreover, displacement can vary in accordance with the distance to the perceived object, and with the perceived object's orientation in the visual field (i.e. to the right or to the left). The ensuing images can differ in size, in distinctness (one being 'fuzzier' than the other), and in shape (displaying visual distortions, for example). Under physiological circumstances diplopia monocularis can be induced artificially with the aid of a double prism. Within the context of pathology, diplopia monocularis may occur as a consequence of a refractive/optical defect (including irregular astigmatism, keratoconus, an early incipient cataract, a dislocated lens, and retinomacular disease), or as a result of the simultaneous employment of normal and abnormal retinal correspondences. Cortical causes of monocular diplopia include migraine and occipital lobe lesions. During the 19th century, diplopia monocularis also went by the name of diplopia monocularis hysterica. Due to its association with hysteria, as well as to medicine's failure to explain this phenomenon physiologically, it was long considered a purely functional symptom. The German neurologist Heinrich Lissauer (1861–1891) has been credited with introducing the notion that diplopia monocularis may stem from the eye's failure to accommodate properly. He agreed that the symptom was often associated with hysteria, but conjectured that individuals with hysteria might occasionally suffer from nerve disturbances affecting the lens system of the eye, thus causing the retina to receive a dual optical image instead of a single one. Diplopia monocularis may be classified as a visual distortion or *metamorphopsia. When the condition is due to refractive/optical pathology, it can be classified alternatively as an *entoptic phenomenon.

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Direct Voice

Also known as direct voice phenomenon. Both terms are used in parapsychology to denote an isolated voice, perceived by those participating in a spiritualist séance, as coming from a distinct location in extracorporeal space, and allegedly arising independently of the vocal organs of the medium present at such séances. In some cases of the direct voice phenomenon, it is claimed that the perceived sound is accompanied by a visually perceived device called a 'voice box' hovering above the floor, at the medium's shoulder or near the ceiling, purportedly made of a mysterious substance (sometimes designated as *ectoplasm) by a spirit that is trying to make itself heard. In other versions there is either no ref-

erence to such a visible source of agency, or to a (physical) metal trumpet placed on the floor (hence the term 'trumpet séance' used sometimes to address this type of séance). In the latter case, it is claimed that the trumpet can be seen moving about the room autonomously, and that the direct voice is heard as emanating from the trumpet, wherever it positions itself. Reportedly, the direct voice can be preceded or accompanied by simple or geometric visual phenomena designated as 'spirit lights' or by *faces in the dark. Biomedical explanations of the direct voice phenomenon include an illusionist trick called 'near ventriloquism', *collective hallucinations, simple fraud, and *subvocalization. The term subvocalization refers to a process involving subtle instances of motor activity within the larynx and/or vocal cords which may or may not be accompanied by *verbal auditory hallucinations. Early experiments by the Scottish paranormal researcher John B. M'Indoe (also spelled as McIndoe), carried out with the aid of a sensitive telephone transmitter attached to the larynx of the medium, demonstrated that at least some cases of the direct voice phenomenon coincide with subvocalization. Within the context of the biomedical paradigm, the visual phenomena co-occurring with the direct voice phenomenon can perhaps best be explained as *hypnagogic hallucinations.

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Disjunctivism

The term disjunctivism is indebted to the Latin *dis* (apart, away from each other) and *iungere* (to connect). It translates loosely as 'disconnection doctrine'. The term disjunctivism is used to denote a philosophical doctrine based on the disjunctive theory of appearances introduced in 1973 by the British philosopher John Michael Hinton (1924–2000). Hinton's theory denies that genuine sense perceptions and subjectively indistinguishable hallucinations are states of the same fundamental psychological kind. Starting from the premise that the two types of percepts are psychological experiences that may have identical qualities, the disjunctive theory suggests that they are nevertheless fundamentally different, due to the fact that the qualities of perceived objects or stimuli are *instantiated* in cases of genuine sense perception, whereas in cases of hallucinatory phenomena they are merely *represented*. In the words of the British philosopher Tim Crane "What the disjunctivist therefore rejects is what J.M. Hinton calls 'the doctrine of the "experience" as the common element in a given perception' and an indistinguishable hallucination. The most specific common description of both states, then, is a merely *disjunctive* one: the perceptual appearance of a rabbit is *either* a genuine perception of a rabbit *or* a mere hallucination of a rabbit. Hence the theory's name." A theory opposing disjunctivism is known under the name *qualia theory.

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Disorder of Corporeal Awareness

A term introduced in or shortly before 1963 by the British neurologist Macdonald Critchley (1900–1997) as an alternative for the term *body schema illusion.

Reference

Critchley, M. (1965). *Disorders of corporeal awareness in parietal disease*. In: *The body percept*. Edited by Wapner, S., Werner, H. New York, NY: Random House.

Disorder of Perception

see Perceptual disturbance.

Disorder of Time Sense

see Time distortion.

Disposition

see Hallucinatory disposition.

Dissimilar Autoscopy

The term dissimilar autoscopy comes from the Latin words *dis* (not) and *similis* (alike), and from the Greek words *autos* (self) and *skopeō* (I am looking at). The French term *autoscopie dissemblable* (i.e. dissimilar autoscopy) was introduced in or shortly before 1903 by the French physician and psychologist Paul Auguste Sollier (1861–1933) to denote what is known today as *heautoscopy, and formerly as *deuteroscopy. All three terms refer to a *visual hallucination depicting an image of oneself that deviates somewhat from a truthful mirror image. Sollier portrays the concomitant phenomenon as follows. "The individual may see a figure who does not resemble his physical appearance, his sex, or his clothing, but with whom he identifies in a moral sense, and whom he acknowledges as being he himself. Such a form, which one may call dissimilar autoscopy, corresponds with what used to be called a deuteroscopic hallucination." Sollier classifies dissimilar autoscopy as a variant of *positive autoscopy.

Reference

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Dissociation and Hallucinations

The term dissociation comes from the Latin words *dis* (apart, away from each other) and *associare* (to gather, to unite). It was used as early as 1889 by the French philosopher and hypnotist Pierre Marie Félix Janet (1859–1947), and may have been introduced by him. The notion of dissociation is notorious for its wide-ranging meanings and connotations, but many definitions revolve around the notion of an intrapsychic connection that is absent where it should be present, and the ensuing compartmentalization of mental functions. This compartmentalization involves a disconnection and subsequent isolation of mental functions – i.e. memory, personal identity, perception of the environment from the conscious I. In early accounts of dissociation, the ensuing isolation of mental functions used to be conceptualized as rather absolute. From the 1920s onwards, however, the notion of dissociation has also been allowed to apply to cases where a certain degree of interference or 'leakage' between the respective mental domains and the conscious I remains intact. It is generally held that the conceptual basis for the theory of dissociation stems from the work of the American physician Benjamin Rush (1745–1813), and from French pioneers such as Jacques-Joseph Moreau de Tours (1804–1884) and Jean Martin Charcot (1825–1893). In conformity with the work of the Swiss psychiatrist Carl Gustav Jung (1875–1961), dissociation tends to be explained in terms of a subconscious defense mechanism that either keeps conflicting strivings or impulses apart, or separates threatening ideas and feelings from conscious awareness. Conceptually as well as pathophysiologically, dissociation is associated primarily with states of altered consciousness such as *ecstasy, *trance, rapture, hypnotic states, *twilight states, and somnambulism. During such states, elaborate hallucinations may either occur spontaneously, or be induced by a third party (such as a hypnotist). The ensuing hallucinations are referred to as *dissociative hallucinations. A somewhat different use of the term dissociation can be found in the work of the German hallucinations researcher Edmund Parish (1861–1916). For an account of this usage, see the entry Dissociation model of hallucinatory experience.

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Van der Hart, O., Horst, R. (1989). The dissociation theory of Pierre Janet. *Journal of Traumatic Stress*, 2, 397–412.

Dissociation Model of Hallucinatory Experience

The term dissociation model is indebted to the Latin words *dis* (apart, away from each other) and *associare* (to gather, to unite). It refers to a hypothetical model introduced in or shortly before 1894 by the German hallucinations researcher Edmund Parish (1861–1916), which seeks to explain hallucinations in terms of perceptual input signals misdirected towards aberrant sensory cortical areas. The term dissociation is notorious for the wide range of meanings and connotations attached to it. The manner in which it is used in the context of the dissociation model of hallucinatory experience is based on the conventions of association psychology, which state that all mental activity is based on associations, and that regular paths of association can become disrupted or diverted under the influence of certain pathological conditions. When applied to the subject matter of hallucinatory experience, the dissociation model suggests that sensory input signals are sometimes diverted in the direction of aberrant loci within the sensory cortex, thus initiating perceptual processes that do not match with the input stimuli involved. Parish seeks to explain hallucinations by a virtually exclusive appeal to this type of dissociation. To account for all types of *sensory deception, he divides dissociation into total and partial dissociation, with a further division of the latter subclass into systematic partial dissociation, localised partial dissociation, and diffused partial dissociation. In all of these cases, however, he attributes the mediation of hallucinations to a blocking of the regular course of sensory input signals by what he calls "a state of intracerebral tension". This intracerebral tension is conceptualized by Parish in terms of psychological preoccupations that lend the concomitant brain area an 'attractor' function, thus causing the affected individual to hallucinate in accordance with his or her idiosyncratic, affect-laden themes. In Parish's own words, "A false perception occurs when for some reason or other the cerebral elements are in such a state of tension that the incoming stimuli stream towards element-groups which normally would be discharged only by stimuli of another kind." Modern variants of the dissociation model of hallucinatory experience are known under names such as *biased competition, *top-down attentional factor, and cross-activation. The literature on *bereavement hallucinations, for example, refers to biased competition as an important candidate mechanism for the perception of a deceased loved one (rather than some random image) by widowed individuals, whereas the literature on *coloured hearing and other types of *synaesthesia designates cross-activation between different sensory domains as one of its major explanatory models. Some important virtues of the dissociation model of hallucinatory experience are its close connection with the biomedical model of sense perception, and its capacity to link the specific contents of hallucinations to the realm of personal, qualitative experience. Thus it is well suited to explain the mediation of hallucinations charged with idiosyncratic and symbolic meaning, as is the case in many instances of *reflex hallucination. Whether it is suited to explain all, or even a large number of hallucinatory experiences, is food for discussion.

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Dissociative

The term dissociative comes from the Latin words *dis* (apart, away from each other) and *associare* (to gather, to unite). It translates loosely as 'a substance capable of evoking a loosening of associations'. The term dissociative is used to denote a class of the *hallucinogens characterized by the ability to reduce or block afferent signals to the conscious mind, especially those derivative of

the sense organs. Some examples of dissociatives are ketamine, dextromorphan, nitrous oxide, and muscimol (derived from the mushroom *Amanita muscaria*). Dissociatives are believed to act via the biochemical pathway of *N*-methyl D-aspartate (NMDA) receptor antagonism, and the inhibition of the action of glutamate within the CNS. It has been suggested that dissociatives evoke a pharmacologically induced state of *sensory deprivation, and a subsequently increased awareness of endogenous activity in the service of self-exploration, dreamlike activity, and hallucinatory activity. The mode of action of the primary dissociatives is thought to be similar to that of *phencyclidine (i.e. angel dust). The term dissociative is used in opposition to the terms *psychedelic and *deliriant, which refer to two additional classes of the group of hallucinogens. A person intentionally using a dissociative for the purpose of exploring the psyche may be called a *psychonaut.

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Dissociative Hallucination

The term dissociative hallucination is indebted to the Latin words *dis* (apart, away from each other) and *associare* (to gather, to unite). In its broadest sense, the term dissociative hallucination is considered more or less synonymous with terms such as *pseudohallucination, *quasi-hallucination, *hysterical hallucination, and *psychotic-like hallucination, which all refer to a perceptual phenomenon that for some reason or other does not fulfil all the formal criteria of a *hallucination proper. In a more restricted sense, the term dissociative hallucination is used to denote a hallucination occurring in the context of *dissociation. As used in the latter sense, dissociative hallucinations are traditionally deemed to occur during episodes of clouded or narrowed consciousness (i.e. during *twilight states), to have a sudden and dramatic onset, and to be precipitated in many cases by an upsetting situation or event. The alleged existence of a phenomenological distinction between dissociative hallucinations and *hallucinations proper is increasingly losing credence. For a discussion of this issue, see the entry Borderline personality disorder (BPD) and hallucinations, as well as the entry Pseudohallucination.

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Dissociative Twilight State

see Twilight state and hallucinations.

Distorted Hallucination

The term distorted hallucination is indebted to the Latin adjective *distortus*, which means twisted. It was used in 1894 by the German hallucinations researcher Edmund Parish (1861–1916) to denote a hallucination, typically visual in nature, which consists of an image with distorted or disfigured features. Parish explains the mediation of distorted hallucinations by reference to manipulation or illness of the peripheral sense organs, in combination with a central origin of the hallucinations at hand. Citing as examples sideways pressure to the eyeballs and strabismus due to atropin poisoning, he contends that "the distorted perception of objective impressions (resulting from failure of co-ordination in the eye-muscles) is transferred to the hallucination." The technique of doubling visual hallucinations with the aid of gentle pressure to the eyeballs was developed by the Scottish physicist David Brewster (1781–1868). Whilst seeking to distinguish between sensory and hallucinatory visual images, Brewster applied pressure to the eyeball of a test person, only to find that both types of percepts were doubled in the process.

Reference

Parish, E. (1897). *Hallucinations and illusions. A study of the fallacies of perception*. London: Walter Scott.

Distortion

see Distortion illusion.

Distortion Illusion

Also known as distortion. Both terms are indebted to the Latin adjective *distortus*, which means twisted. They are used to denote a type of *visual illusion characterized by changes in the perceived size, length or curvature of a given object. Some well-known examples of distortion illusions are *geometric-optical illusions such as the *Café Wall illusion and the *Müller–Lyer illusion. The term distortion illusion is used in opposition to the terms *ambiguous illusion, *paradox illusion, and *fiction illusion.

Reference

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Distortions of Vital Sensations

see Vital sensations, distortions of.

Djinn (also written as *jinn* or *jin*; plural: *djinns*, *jinns*, *jins*, *djnoun*, *jnoun*, *jenoun*, or *jnûn*)

The term *djinn* is Arabic for spirit or ghost. It translates as 'that which is veiled and cannot be seen'. The term 'genius', traditionally used in the Western literature, is incorrect as a translation of the term *djinn*. In accordance with Islamic religious teaching, *djnoun* are classified as 'ghosts from beneath', i.e. as living beings created by Allah out of smokeless fire. They are referred to as one of the four classes of humanoid beings, the other three being humans, angels, and Azazeel or Iblees, who was later to become the chief of all *sheytâns* or devils (i.e. Satan). Out of these four classes, only human beings are normally considered to be visible to the eye. *Djnoun* are, however, deemed capable of making themselves visible if they so wish. They were allegedly created several thousand years before the human species and forced to inhabit islands far away from the continents, because they were found to be perverse and unwilling to reform. Like humans, they are believed to have a life cycle (they are born and die), to form families, communities, and societies, to eat, drink, move, procreate, urinate, defecate, and so on, and to be sensitive to offence. They reportedly carry out most of their activities at night. The presence of *djnoun* is regularly reported by North African and Turkish individuals with a clinical diagnosis of *schizophrenia or *affective disorder, but also by individuals with other clinical diagnoses. It may take some persuasion on behalf of the physician to get these individuals to talk about their *djnoun*, but when they do, they often provide detailed reports of creatures whispering in their ears, touching their shoulders, hitting them in the face or appearing in the form of snakes that climb up their legs or writhe around in their belly. Hallucinations in any of the sensory modalities can be attributed to a *djinn*, especially – although by no means exclusively – when they display human, humanoid, or animal characteristics. Common examples of unimodal hallucinations attributed to a *djinn* are *verbal auditory hallucinations, *haptic hallucinations, *somatic hallucinations, *sexual hallucinations, *cacosmia, *dysgeusia, and visual hallucinations depicting human beings or animals such as a cat, a dog, or a serpent (i.e. *zoopsia). Multimodal or *compound hallucinations – such as *personifications – likewise occur. In the latter case, *djnoun* tend to be depicted as dark-coloured, foul-smelling creatures, who may touch or penetrate the body of the affected individual and may be heard speaking inside or outside one's head. It is believed that *djnoun* exert their influence either from a place outside one's body (by speaking, or producing foul odours, for example), through physical contact with one's body (by touching or striking someone, or by sitting on their face or chest), or by entering the body. Some *djnoun* are believed to dwell in wet places such as a well, a stream, a toilet, or the kitchen sink and others in stones, ruins, cemeteries or garbage dumps. Allegedly, they can be aroused when a person passes by, steps upon them, or literally or figuratively 'crosses a line' (a phenomenon referred to as *tretat*). The person may simply have been 'in the wrong place at the wrong time', but he may also have committed an act considered sinful,

such as torturing or killing an animal, or pouring boiling water into the kitchen sink. A second way in which *djnoun* can be aroused is when a person in the possession of magic powers (referred to as *sHour* or *seHour*) casts a spell over someone. It is believed that this can be done in a multitude of ways, either with or without direct physical contact between the two individuals involved. *Djnoun* are sometimes classified according to gender (male or female), geographic origin (Arabic, Dutch, German, etc.), and religious background (Islamic, Christian, Jewish, etc.). It is said that in Western, biomedical terms, being possessed by a female, Jewish *djinn* is comparable to a clinical diagnosis of chronic, incurable schizophrenia. While *djnoun* may be a nuisance or a threat, they may also be of use, in the sense that they often give good advice or provide agreeable companionship. Islam makes a clear distinction between good and bad *djnoun*. In a psychiatric setting, however, they tend to terrorize their victims by insulting and threatening them, by luring them into dangerous behaviour, or by attacking them. *Djnoun* are often reported as saying that they will intensify their attacks upon their victim if the individual in question dares to speak of them in front of others. A traditional healer (referred to as a *fquih* or *feki*, which translates to 'religious scholar') may attempt to oust *djnoun* by means of Koranic readings, prayer, trance, animal sacrifice, amulets, or magical rituals such as fumigation with herbs (referred to as *b'khour* or *pkhor*). Beating the affected individual, or throwing him or her into a deep well – with the intent of frightening the *djinn* away – is also common practice. When traditional methods fail, the victims of *djnoun* are often handed over to Western doctors employing Western methods, who classify these apparitions as *compound hallucinations, and treat them with antipsychotic and/or antidepressive medication. The Arabic names *Tufah al-jinn* (meaning apples of the djinn) and *Baydal-jinn* (testicles of the djinn) are used to denote the psychoactive plant mandrake or *Mandragora officinarum*.

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D-Nightmare

see Nightmare.

Dodgson, Charles Lutwidge (1832–1898)

Better known as Lewis Carroll. A British mathematician, and member of the Society for Psychical Research (SPR), as well as an author of children's books, who is probably best known for his *Alice's Adventures in Wonderland*. As suggested in 1952 by the American neurologist Caro W. Lippman (1886–1954), Dodgson may have suffered from migraine with aura, and the writer's own experiences as a *migraineur* may have been a source of inspiration for some of Alice's

Fig. 3 Charles Dodgson, a.k.a. Lewis Carroll

adventures. In this vein the British psychiatrist John Todd (1914–1987) introduced the term *Alice in Wonderland syndrome in 1955 to denote a rare group of symptoms comprising subjective feelings such as *hyperschematia, derealization, depersonalization, and somatopsychic duality, as well as perceptual symptoms such as illusory changes in the size, distance, or position of stationary objects within the subject's visual field (i.e. *micropsia, *macropsia, *macroproxiopia, *microtelepsia, *teleopsia, and *plagiopsia), illusory feelings of levitation, and illusory alterations in the passage of time. In a paper published in 2002, the German psychiatrist Klaus Podoll and the curator of migraine art Derek Robinson (1928–2001) drew attention to the split body image of Sylvie in Dodgson's book *Sylvie and Bruno*, and speculated that Dodgson may have used a migraine-associated illusion of his own as a source of inspiration for this image as well. An alternative explanation for Dodgson's references to the above perceptual symptoms stems from the American historian and author Michael Carmichael. According to Carmichael, Dodgson had either read about the hallucinogenic effects of the mushroom *Amanita muscaria*, or experimented with the mushroom himself.

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Donizetti, Domenico Gaetano Maria (1797–1848)

An Italian opera composer who suffered from neurosyphilis, and died in a state of *psychosis or 'general paralysis'. On the basis of a careful reconstruction of Donizetti's medical history, which includes recurrent fevers, severe headaches, convulsions, gastrointestinal problems, formal thought disorders, and delusions, it has been suggested that the composer's musical and lyrical creativity may have been influenced by his brain disease. In particular, the portrayal of the hallucinatory state of the historical Anne Boleyn (1501 or 1507–1536), second wife of King Henry VIII of England, which features prominently in Donizetti's opera *Anna Bolena*, has led historians to believe that Donizetti himself also suffered from hallucinations.

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Donut Vision

see Bagel vision.

Dopamine Hypothesis of Hallucinatory Activity

Dopamine is also referred to as 3-hydroxytyramine, $C_6H_3(OH)_2\text{-}CH_2\text{-}CH_2\text{-}NH_2$, and 4-(2- aminoethyl)benzene-1,2-diol. The name dopamine is a contraction of the terms d(i)o(xy)p(henyl)a(lanine) and amine. The dopamine hypothesis constitutes a biochemical explanatory model for the mediation of hallucinations and other psychotic phenomena that attributes a central – although by no means exclusive – role to the action of dopamine within the CNS. Dopamine is classified chemically as a monoamine of the catecholamine family. It has a physiological function in both vertebrates and invertebrates, as a hormone, and as a neurotransmitter. In humans it is produced by various structures in the CNS, including the substantia nigra, and the ventral tegmental area. As a neurohormone, it is released by the hypothalamus. Dopamine was first synthesized in 1910 by the British chemists George Barger (1878–1939) and James Ewens. Its natural occurrence in the human CNS was demonstrated in 1957 by

the Swedish pharmacologists Arvid Carlsson (b. 1923) and Nils-Åke Hillarp (1916–1965). In 1974 the group headed by the American psychiatrist and pharmacologist Solomon H. Snyder (b. 1938) put forward the hypothesis that excess activity of dopamine may play a crucial role in the mediation of hallucinations and other psychotic phenomena. The group based their hypothesis on the discovery that chlorpromazine and other antipsychotic drugs of the phenothiazine class attach themselves to the postsynaptic dopamine receptor, and in this way appear to reduce the neurotransmitter's excitatory effect upon the mesolimbic pathways and other parts of the CNS. One of the virtues of Snyder's work was that it integrated many of the major historical discoveries in this area of research, including the conceptualization of chemical synaptic transmission by the German physiologist Emil du Bois-Reymond (1818–1896) in 1877, the empirical confirmation of the presence of neurotransmitters in the brain by the American biologist Betty Twarog in 1952, and the identification of dopamine as a neurotransmitter in the CNS by Carlsson et al. An additional, and in a sense complementary strand of research that paved the way for Snyder's work was the study of the effects of pro-dopaminergic substances such as cocaine and the amphetamines upon the CNS. Although the dopamine hypothesis still serves as an attractive explanatory model for the mediation of hallucinations and other psychotic phenomena, the initial hope of a one-on-one relationship between dopamine and psychosis was not confirmed. It is now generally held that other neurotransmitters (notably glutamate and serotonin) may play a role in the mediation of psychosis as well. Moreover, it has long been a mystery why the response rate of individuals with psychotic symptoms to any antipsychotic agent lies no higher than 50–60% on average, and why the blockade of dopamine D2 receptor-mediated transmission (which can be obtained within hours after the administration of antipsychotic agents) is usually followed by a significant reduction in psychotic symptoms after a period of only weeks to months. These empirical findings have prompted a shift in focus from 'fast' receptor blockade towards issues such as intracellular signalling, indirect effects, and neuroplasticity. However, arguably the most intriguing – and as yet unresolved – issue remains the exact influence of neurotransmitters such as dopamine upon perception.

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Doppeldenken

The German term *Doppeldenken* translates literally to double thinking. It was used – and possibly also introduced – in 1889 by the German psychiatrist Emil Kraepelin (1856–1926) to denote *audible thinking, or what the German psychiatrist August Cramer (1860–1912) had previously designated as **Gedankenlautwerden*.

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Doppelgänger

The German term *Doppelgänger* was introduced in 1796 in a collection of short stories colloquially known as *Siebenkäs*, published by the German writer Johann Paul Friedrich Richter, who was also known as Jean Paul (1763–1825). In the Anglo-Saxon literature the term *Doppelgänger* is either used untranslated (in the form of doppelgänger), or translated as *double. In biomedicine both terms are used to denote a *visual hallucination depicting a mirror image of oneself, such as may occur in cases of *autoscopy, *heautoscopy,

Fig. 4 William Wilson and his Doppelgänger, by Harry Clarke. Source: Poe, E.A. (1928). *Tales of mystery and imagination*. Illustrated by Harry Clarke. London: George G. Harrap & Co

and other instances of *reduplicative hallucination. The term doppelgänger is also used in the context of the *syndrome of subjective doubles. The term *somaesthetic doppelgänger is used as a synonym for the term *sensed presence. In parapsychology a doppelgänger is an astral or etheric counterpart of the physical body, which is believed to be capable of temporarily moving about in extracorporeal space. The historical literature is replete with references to doppelgängers allegedly observed by the affected individual as well as by third parties. A well-known example is the story of St. Anthony of Padua (1195–1231), who reportedly preached simultaneously in two different places during the year 1226. Parapsychologists use the term bilocation to refer to this phenomenon. To facilitate the study of the physiological correlates of doppelgängers, the Austrian psychiatrist Erich Menninger-Lerchenthal (d. 1966) proposed the term *eigenen Doppelgänger* (one's own doppelgänger) to denote doubles that are perceived by the affected individual, but not by others. Neuroscientific studies of such *eigenen Doppelgänger* often hint at a biological correlate located in an area at the occipito-temporo-parietal junction.

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Doppler Effect

Also known as Doppler shift. Both eponyms refer to the Austrian mathematician and physicist Christian Andreas Doppler (1803–1853), who first described the effect in or shortly before 1842. In perceptual neuroscience, they are used to denote an *auditory illusion consisting of a change in frequency of a sound, as perceived by an observer moving relative to the source of the sound. In everyday life the Doppler effect is experienced when a motor vehicle approaches an observer, and then passes and recedes. As compared to the emitted frequency of the sound, the perceived frequency is increased during the approach, identical at the instant of passing by, and decreased during the recession. Doppler's original description had a bearing on the light waves emitted by binary stars. The application of his discovery to sound waves was published in 1845 by the Dutch chemist and meteorologist Christophorus Henricus Diedericus Buys Ballot (1817–1890).

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Doppler Shift

see Doppler effect.

Dostoevsky, Fjodor Michajlovitsj (1821–1881)

A Russian author who during his adult life suffered from epileptic seizures. By his own estimate, these occurred every 3 weeks on average. As reconstructed by historians, they were probably due to temporal lobe pathology. In the context of these epileptic seizures Dostoevsky would seem to have experienced *ecstatic aurae and various other types of *aurae. He wrote about the ecstatic aura which preceded what he considered to be his first epileptic seizure: "The air was filled with a big noise and I tried to move. I felt the heaven was going down upon the earth and that it engulfed me. I have really touched God. He came into me myself, yes God exists, I cried, and I don't remember anything else. You all, healthy people... can't imagine the happiness which we epileptics feel during the second before our fit. Mahomet, in his Koran, said he had seen Paradise and had gone into it. All these stupid clever men are quite sure he was a liar and a charlatan. But no, he did not lie, he really had been in Paradise during an attack of epilepsy; he was a victim of this disease like I was. I don't know if this felicity lasts for seconds, hours or months, but believe me, for all the joys that life may bring, I would not exchange this one." In addition, Dostoevsky experienced recurring *verbal and *nonverbal auditory hallucinations of largely unspecified content (the hallucinated sound of someone snoring is mentioned explicitly in the literature). Moreover, it has been speculated that the second Mr. Golyadkin featured in the novel *The Double* may have been inspired by an *autoscopic hallucination experienced by Dostoevski himself. Although historians of medicine tend to differ somewhat as regards their opinion on the exact debut, nature, and course of Dostoevsky's illness (arguably the most extreme variant being the opinion, voiced by the Austrian founder of psychoanalysis Sigmund Freud (1856–1939), that Dostoevsky suffered from neurosis rather than epilepsy), they are unanimous in their view that it had a significant impact upon his literary creativity. The import of Dostoevsky's work for hallucinations research lies in the combination of his first-hand acquaintance with hallucinatory phenomena, and his exceptional talent to verbalize and analyze these. This combination places him in a league with other hallucinating intellectuals, such as Victor Kandinsky (1849–1889), Daniel Paul Schreber (1842–1911), John Thomas Perceval (1803–1876), Christoph Friedrich Nicolai (1733–1811), Vaslav Nijinsky (1889–1950), Guy de Maupassant (1850–1893), and Ludwig Staudenmaier (1865–1933).

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Double

see Doppelgänger.

Double Consciousness

Also referred to as dual consciousness, duplication of consciousness, doubling of awareness, double perceptions, and secondary personality. During the late 19th century these terms, and probably many more, were used to denote a condition in which two distinct mental states

coexist within a single individual. It is not clear who introduced the notion of double consciousness, but a German physician named Jensen is credited with being among the first to draw clinical attention to it. In 1868 Jensen used the German term *Doppelwahrnehmung* to denote what today is known as the *déjà vu* phenomenon. In the field of hallucinations research the term double consciousness is used to denote a mental state in which two streams of perceptual information – consisting, say, of *scenic hallucinations on the one hand, and regular sense perceptions on the other – are experienced simultaneously. The Canadian neurosurgeon Wilder Graves Penfield (1891–1976) used the term to denote the mental state described by individuals experiencing *reperceptive hallucinations due to cortical probing. As Penfield wrote, "Consider the point of view of the patient when the surgeon's electrode, placed on the interpretive cortex, summons the replay of past experience. The stream of consciousness is suddenly doubled for him. He is aware of what is going on in the operating room as well as the 'flashback' from the past. He can discuss with the surgeon the meaning of both streams." An analogous phenomenon was described by the Cypriot philosopher and psychologist Andreas Mavromatis in the context of his work on *hypnagogic hallucinations. As Mavromatis points out, trained – and sometimes untrained – individuals can have "hypnagogic experiences in a state of double-consciousness in which [they] although deeply involved in their imaginal activities are still aware of their physical surroundings." A third example of double consciousness is the mental state accompanying the *lucid dream, characterized by the experience of the dream itself as well as the acute awareness that one is dreaming. When instances of *out-of-body experience (OBE) and *heautoscopy are experienced in rapid alternation, they are also referred to as double consciousness.

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Double Dream

Also referred to as a 'dream within a dream'. Both terms are used rather loosely to denote a *dream during which a *false awakening takes place.

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Double Hearing

see Diplacusis.

Double Mirage

The term double mirage is indebted to the French verb *se mirer*, which means to reflect or to be reflected. It is used to denote a *mirage or *physical illusion consisting of a combined *superior and *inferior mirage. Inferior mirages are believed to result from light waves reflected upward, away from the surface of the earth, while superior mirages are believed to stem from light waves first bent upward, and then downward. The double mirage is a relatively rare *optical illusion attributed to a combination of these two types of light reflection. The term double mirage is used in opposition to the terms inferior mirage, superior mirage, and *lateral mirage.

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Double Perceptions

see Double consciousness.

Double Rainbow

see Rainbow.

Doubling of Awareness

see Double consciousness.

Doughnut Vision

see Bagel vision.

Downward Sensory Impulse

see Reperception.

Dream

Also known as sleep dream, night dream, and nocturnal dream. All four terms are used interchangeably to denote an endogenously mediated perceptual experience occurring physiologically during sleep. Dreaming can be defined as the creation of percepts during sleep, in a format which the dreamer tends to experience as a participant rather than a mere observer. The dream's content tends to be primarily visual in nature (hence the term *sleep dream vision), although the other sensory modalities may be involved as well. Near the end of the 19th century, dreams were divided into associative dreams and *Nervenreizträume* (i.e. 'nerve-impulse dreams'). Both terms were introduced in 1882 by the German philosopher Heinrich Spitta (1849–1929). Spitta uses the term associative dream to denote a dream that borrows its content in an associative manner from intrapsychic data such as wishes, fears, memories, and fantasies. Envisaging associative dreams as *de novo* perceptual experiences, Spitta conceptualizes these as analogous to hallucinations. The term *Nervenreiztraum* is used by him to denote the type of dream prompted by external perceptual stimuli (such as the sound of the rain or a door closing, or the feeling of a cat jumping onto the bed). Therefore, Spitta likens *Nervenreizträume* to *illusions. Dreams are associated primarily, although not exclusively, with periods of rapid eye movement (i.e. the REM state of paradoxical sleep). Their mediation is associated primarily with neurophysiological activity in the pons. The term *lucid dream is used to denote a dream during which the individual is aware that he or she is dreaming while the dream is in progress. Traditionally dreams are distinguished from *hallucinations proper by their occurrence during sleep, as well as by their capacity to replace the whole sensory environment. Except for *panoramic or *scenic hallucinations, hallucinations tend to coincide (and often to blend in) with regular sense perceptions. However, the *continuum hypothesis put forward by the French classical scholar and dream researcher Louis-Ferdinand-Alfred Maury (1817–1892) suggests that dreams and hallucinations are not distinct but continuous phenomena. Moreover, it has been suggested by a small minority of authors that dreams should be granted the status of hallucinations. For example, the American psychiatrist and sleep researcher William Charles Dement (b. 1928) asserts that "there can be little question that dreams qualify as hallucinations." The term night dream is used in opposition to the term *daydream. The global cessation of dreaming following bilateral occipital infarction is known as the *Charcot-Wilbrand syndrome.

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Dream Anxiety Attack

see Nightmare.

Dream Fish

Also known as nightmare fish. Both terms are used to denote a group of ichthyoallyeinotoxic fishes such as *Kyphosus fuseus*, *Kyphosus vaigiensis*, *Sarpa salpa*, *Siganus spinus*, and *Mulloidichthys samoensis*, many of which are indigenous to the Indian and Pacific Oceans, and/or the Mediterranean Sea. Eating the heads or other body parts of these fish may lead to hallucinogenic fish poisoning or *ichthyoallyeinotoxism, a rare condition characterized by the occurrence of vivid *visual and *auditory hallucinations, *nightmares, and sometimes frank *delirium. Reportedly, *S. salpa* was used in the past for ceremonial purposes in Polynesia, and for recreational purposes in countries surrounding the Mediterranean Sea during the era of the Roman Empire. The toxin or toxins responsible for the mediation of ichthyoallyeinotoxism are unknown. As all ichthyoallyeinotoxic fishes are algal grazers, it is has been suggested that they derive their hallucinogenic properties from alkaloids of the indole group, which display similarities in chemical structure to LSD, and which occur naturally in certain types of algae and phytoplankton. It has also been suggested that ichthyoallyeinotoxism is mediated by the presence in the fish of *dimethyltryptamine (DMT), a *hallucinogen even more potent than the indoles.

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Dream Intrusion

see Perceptual release theory of hallucinations.

Dream Pain

see Hypnalgia.

Dream Scintillation

Also known as flickering consciousness. The term dream scintillation is indebted to the Latin noun *scintilla* (spark). It was introduced in or shortly before 1949 by the American neurobiologist Alexander Forbes (1882–1965) to denote a brief, dream-like flash of what seems to be a dream memory occurring to the waking, unclouded mind. In Forbes's original self-report, episodes of dream scintillations sometimes lasted for hours. They consisted of chaotic, kaleidoscopic sequences of *visual hallucinations reminiscent of the type of dream image that one may experience while falling asleep. They came at a rapid-fire sequence, and were accompanied, in Forbes's case, by disorientation in time, as well as a subjective sense of estrangement. Four out of five of these episodes were preceded by strong emotional stimuli plus strenuous physical exertion. According to the American psychiatrists Mardi Jon Horowitz (b. 1934) et al., dream scintillations are phenomenologically different from *hypnagogic hallucinations and dreams, in that they display a non-linear, flickering quality, and defy any attempt at psychoanalytic interpretation. In conformity with the opinion voiced by the Canadian neurosurgeon Wilder Graves Penfield (1891–1976), Horowitz et al. argue that "the phenomenon bears sufficient resemblance to occurrences in persons with temporal-lobe seizures that it might be considered a minor variant or forme fruste of temporal-lobe epilepsy triggered by metabolic fatigue or local circulatory factors." They propose the term 'flickering consciousness' as an alternative to Forbes's expression 'dream scintillation'. Conceptually as well as phenomenologically, dream scintillations would seem to be related to aurae occurring in the context of paroxysmal neurological disorders such as migraine and epilepsy, notably *visual aura, *psychic aura, and *persistent aura without infarction.

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Dream Screen

Also known as matrix of the mind and background object of primary identification. The term dream screen was introduced in or shortly before 1946 by the American psychoanalyst Bertram David Lewin (1896–1971) to denote the hypothetical background upon which a *dream appears to be projected. As Lewin explains, "The dream screen, as I define it, is the surface on which a dream appears to be projected. It is the blank background, present in the dream though not necessarily seen, and the visually perceived action of ordinary manifest dream contents takes place on it or before it. Theoretically it may be part of the latent or the manifest content, but this distinction is academic. The dream screen is not often noted or mentioned by the analytic patient, and in the practical business of dream interpretation, the analyst is not concerned with it." Phenomenologically, the dream screen may be related to the virtual 'screen' upon which *visual hallucinations sometimes appear to be 'projected'. In the literature this phenomenon has been reported in various types of visual hallucination, notably those occurring in the context of substance abuse.

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Dreaming True

see Lucid dream.

Dreamy Mental State

see Dreamy state.

Dreamy State

Also referred to as dreamy mental state and intellectual aura. The term dreamy state was introduced in or shortly before 1879 by the British neurologist John Hughlings Jackson (1835–1911), as a somewhat paradoxical replacement for the term intellectual aura, introduced by him in 1876. Over the years, both notions came to designate a brief state of over-consciousness (i.e. a heightened intellectual state) occurring either in isolation or during the onset of an epileptic seizure. Phenomenologically, this state of over-consciousness is characterized by simple or complex experiential phenomena. Simple phenomena occurring in the context of the dreamy state are conceptualized by Jackson as a false sense of reminiscence, i.e. what today is commonly referred to as **déjà vu*. The complex dreamy states, also referred to as voluminous mental states, are considered to be more diverse in character. For Jackson they included the feeling that one is losing touch with the world or that one is somewhere else (i.e. derealization), as well as a loss of personal identity, deprivation of corporeal substance (i.e. depersonalization), *ecstatic states, states of profound despair, and a state called *double consciousness. The relation between these states on the one hand, and epileptic seizures on the other was summarized by the British neurologist James Crichton-Browne (1840–1938): "The dreamy mental state of one kind or another is not rarely the introduction to an epileptic fit and in that case is designated as an intellectual *aura* or warning." Pathophysiologically, Jackson attributed the dreamy state to a *release phenomenon preceding an actual epileptic seizure affecting the midtemporal region. In 1899 he reported on various additional phenomena occurring at the onset of epileptic seizures, associating these with what he then called the group of uncinate fits or uncinate epilepsies (of which the dreamy state constitutes only one group of clinical varieties). However, both Jackson and Crichton-Browne believed that not all dreamy states should necessarily be attributed to epileptic activity. Today the dreamy state tends to be classified as a partial epileptic seizure or *aura. As such, it may be complicated by associated symptoms such as *gustatory hallucinations, *olfactory hallucinations, *auditory hallucinations, unusual epigastric sensations (i.e. *abdominal aura), and

motor *automatisms (notably repetitive motions of sniffing, smelling, or smacking of the lips). Although Jackson's name is inextricably connected with the notion of the dreamy state, the clinical phenomenon itself had previously been described by authors such as the French psychiatrists Théodore Herpin (1799–1865), and Jean Pierre Falret (1794–1870).

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Jackson, J.H. (1888). On a particular variety of epilepsy ('intellectual aura'), one case with symptoms of organic brain disease. *Brain*, 11, 179–207.

Drug

see Psychoactive substance.

Drug-Induced Hallucination

Also known as psychedelic hallucination. Both terms are used to denote a hallucination occurring after the use of a *psychoactive substance. The British anthropologist Richard Rudgley (b. 1961) defines psychoactive substances as "those that alter the state of consciousness of the user. These effects may range from the mild stimulation caused by a single cup of tea or coffee to the powerful mind-altering effects induced by hallucinogens such as LSD or certain mushrooms, in which profound changes may occur in the perception of time, space and self." Although many substances registered as therapeutics are also capable of producing hallucinations, the terms drug-induced hallucination and psychedelic hallucination tend to be used in the context of substances not intended primarily for therapeutic purposes. The number of known psychoactive substances is vast, and it is very likely that they constitute a mere fraction of the psychoactive substances naturally available and synthetically produceable. They are referred to by a wide variety of generic terms, including *hallucinogen, hallucinogenic drug, hallucinogenic substance, magicum, pseudohallucinogen, illusinogen, mysticomimetic, *psychedelic, psychedelic drug, psychedelic substance, psychotic, *psychotomimetic, *phantasticum, *eideticum, *deliriant, and *dissociative.

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Rudgley, R. (1998). *The encyclopaedia of psychoactive substances*. London: Little, Brown and Company.

Drug-Induced Synaesthesia

A term used to denote a type of *synaesthesia (i.e. a member of the group of perceptual phenomena exemplified by *colour hearing) falling into the class of *non-idiopathic synaesthesias. Etiologically, drug-induced synaesthesias are associated primarily with the use of *psychotomimetic substances such as LSD, mescaline, and peyote.

Reference

Cytowic, R.E. (2002). *Synesthesia. A union of the senses. Second edition.* Cambridge, MA: MIT Press.

Dual Consciousness

see Double consciousness.

Dual-input Model of Hallucinations

A term used to denote a hypothetical model for the mediation of hallucinations that was formulated during the 1960s by the American psychiatrist Louis Jolyon West (1924–1999). Basically, the dual-input model would seem to constitute a variant of the older *perceptual release model. In 1962 West used the metaphor of a man standing at a closed glass window opposite a fireplace,

looking out of the window into the garden while the Sun is setting, watching the garden becoming gradually darker, and the reflection of the fireplace becoming gradually brighter. In West's own words, "In perceptual release, the daylight (sensory input) is reduced while the interior illumination (general level of arousal) remains bright, and images originating within the rooms of our brains may be perceived as though they came from outside the window of our senses. The theory thus holds that a sustained level and variety of sensory input normally is required to inhibit the emergence of percepts or memory traces from within the brain itself." Like the *experiential projector model of hallucinations, the dual-input model emphasizes the role of arousal in the release of endogenous percepts. As West maintains, "The greater the level of arousal, the more vivid the hallucinations."

Reference

West, L.J. (1962). *A general theory of hallucinations and dreams*. In: *Hallucinations*. Edited by West, L.J. New York, NY: Grune & Stratton.

Dual System Experience

A term introduced in or shortly before 1928 by the German-American biological psychologist and philosopher Heinrich Klüver (1897–1979) to denote a visual experience that may arise in mescaline intoxication, involving the radical difference between two groups of phenomena. As Klüver wrote, "The hues, shapes, designs and movements, etc. in one group seem radically different from those of the other group. Thus the observer has the feeling of viewing two 'systems' or even two 'antagonistic' systems as he may refer to them, e.g. as 'solar' or 'polar' systems. Frantic motion may be typical of one system while slow majestic movements are characteristic of the other one. In psychotic states these two systems the differences of which are merely differences in visual properties may gain 'cosmic significance'."

Reference

Klüver, H. (1966). *Mescal and Mechanisms of hallucinations.* Chicago, IL: University of Chicago Press.

Duck-Rabbit

see Jastrow's duck-rabbit.

Dumbbell Phosphene

Also known as dumbbell-shaped phosphene. Both terms are used to denote a type of *phosphene (i.e. 'seeing stars') that may arise after sustained convergence of the eyes, especially with closed eyes against an illuminated background. The name dumbbell phosphene refers to the typical dumbbell shape of these phenomena, extending horizontally from the region of the fovea to the periphery. Dumbbell phosphenes are classified as a variant of the *convergence phosphene, which is in turn classified as an *entoptic phenomenon or a *physiological illusion. The term dumbbell phosphene is used in opposition to the term *fiery rings of Purkinje.

Reference

Tyler, C.W. (1978). Some new entoptic phenomena. *Vision Research*, 18, 1633–1639.

Duplication of Consciousness

see Double consciousness.

Dysacusis

see Hyperacusis.

Dysaesthesia

The term dysaesthesia comes from the Greek words *dus* (bad) and *aisthanesthai* (to notice, to perceive). It translates loosely as 'bad feeling'. The term dysaesthesia is used as a generic term for a number of unpleasant tactile and somatic percepts such as tingling (i.e. *paraesthesia), burning, numbness, a feeling of pins and needles, coldness, wetness (i.e. a hygric sensation or *hygric hallucination), pain (i.e. *hyperalgesia, *allodynia), and the perceived absence of body parts (i.e. *acenesthesia or asomatognosia). Some

types of dysaesthesia are associated with peripheral conditions such as small fibre neuropathies, neuromata, and nerve traumata, whereas others are associated with parietal lobe pathology, due, for example, to multiple sclerosis or to *aurae occurring in the context of paroxysmal neurological disorders such as migraine and epilepsy.

Reference

Critchley, M. (1953). *The parietal lobes*. London: Edward Arnold & Co.

Dysauris

see Hyperacusis.

Dyschromatopsia

The term dyschromatopsia comes from the Greek words *dus* (bad), *chrōmatos* (coloured), and *opsis* (seeing). It tends to be used as a synonym for the term *dichromatism. Although not a true synonym for *colour blindness and *colour-vision deficiency, it is sometimes used as more or less interchangeably with these terms. In addition, the term dyschromatopsia has been used as a synonym for the term colour confusion, and as a term denoting an incomplete variant of *achromatopsia (i.e. the inability or strongly diminished ability to perceive colour).

Reference

Zeki, S. (1990). A century of cerebral achromatopsia. *Brain*, 113, 1721–1777.

Dyschronation

see Time distortion.

Dysgeusia

The term dysgeusia comes from the Greek adjective *dus* (bad) and the Latin noun *gustum* (taste). It refers to an alteration or distortion of the sense of taste in response to normal chemoreceptor stimulation, as in eating or drinking. It typically presents in the form of an excessively sweet, bitter, salty or metallic taste, referred to as sweet dysgeusia, bitter dysgeusia, salt dysgeusia, and metallic dysgeusia, respectively. Dysgeusia is often associated with – and may be confused with – *parosmia. It may also be confused with *parageusia, which refers to a foul or spoiled taste rather than a mere alteration or distortion of the sense of taste. Etiologically, dysgeusia is associated primarily with diseases of the upper respiratory tract, viral influenza, general anaesthesia, iatrogenic damage of the chorda tympani, the use of illicit substances such as alcohol, opium, and amphetamines, and the use of therapeutics. The list of therapeutics associated with dysgeusia includes captopril, acetazolamide, allopurinol, lithium, metronidazole, flurazepam, and at least 70 other substances. In some cases dysgeusia may be attributable to central disorders of the gustatory tract. Dysgeusia is classified as a *gustatory illusion (i.e. a taste illusion) or a *chemosensory disorder.

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Schiffman, S.S., Gatlin, C.A. (1993). Clinical physiology of taste and smell. *Annual Review of Nutrition*, 13, 405–436.

Dysmegalopsia

The term dysmegalopsia comes from the Greek words *dus* (bad), *megas* (big), and *opsis* (seeing). It translates roughly as the diminished ability to appreciate the size of objects. Dysmegalopsia is generally classified as a *sensory distortion or, more specifically, as a variant of *metamorphopsia. Dysmegalopsia may present either as an isolated symptom (i.e. as *macropsia or *micropsia), or as part of a cluster of symptoms called the *Alice in Wonderland syndrome. In or shortly before 1916, the British neurologist Samuel Alexander Kinnier Wilson (1878–1937) proposed the new term *dysmetropsia as a replacement for dysmegalopsia.

Reference

Wilson, S.A.K. (1916). Dysmetropsia and its pathogenesis. *Transactions of the Ophthalmological Society UK*, 36, 412–444.

Dysmetropsia

The term dysmetropsia comes from the Greek words *dus* (bad), *metron* (yardstick), and *opsis* (seeing). It is used to denote a distorted perception of image size. The term dysmetropsia was introduced in or shortly before 1916 by the British neurologist Samuel Alexander Kinnier Wilson (1878–1937) to replace the older term *dysmegalopsia. Wilson defines dysmetropsia as a defect in the visual appreciation of the measure or size of objects, whether by over-estimation or by under-estimation. On phenomenological grounds, dysmetropsia is commonly divided into four categories, comprising *macropsia, *micropsia, *pelopsia, and *teleopsia. However, combinations and intermediate forms (such as *porropsia, *microtelepsia, and *macroproxiopia) have been described as well. Using the alleged locus of origin as a guiding principle, Wilson divides dysmetropsia into a peripheral and a central form, and the latter into a cortical and a transcortical (or psychical) form. As noted by Wilson, dysmetropsia may occur physiologically (i.e. in the case of objects appearing larger through a fog, and in the case of the *Moon illusion), but also in the context of disease (notably tabes dorsalis, syphilitic basal meningitis, epilepsy, hysteria, tic disorder, alcoholism, and retinal conditions such as retinitis, and sarcoma of the choroid). Dysmetropsia is generally classified as a *sensory distortion, more specifically, as a variant of *metamorphopsia. However, in some hierarchical models it constitutes a class of its own, ranking at the same level as the metamorphopsias. Wilson himself motivates this arrangement by pointing out that metamorphopsias are characterized by a *distortion* of the visual image, whereas dysmetropsia involves *a change in estimated size*, without any kind of distortion of the interrelationships between the image's constituent parts.

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Dysmorphopsia

The term dysmorphopsia comes from the Greek words *dus* (bad), *morphè* (form), and *opsis* (seeing). It translates roughly as the inability to perceive the proper form of objects. In a restricted sense, the term dysmorphopsia is used to denote a variant of *metamorphopsia in which lines appear wavy. In this version, dysmorphopsia is associated primarily with bilateral occipital cortical damage, due to carbon monoxide poisoning, for example, or to the use of psychotomimetic substances such as cocaine, LSD, or mescaline. As exemplified by the work of the German psychiatrist Carl Schneider (1891–1945), the term dysmorphopsia used to have a broader connotation during the first decades of the 20th century, denoting something like the present umbrella term metamorphopsia. Conversely, the term metamorphopsia is used by the Danish neuroscientists Villars Lunn, Axel Klee (1933–1982?), and Rolf Willanger to denote a visual distortion in which objects appear to have distorted contours (i.e. what is now called dysmorphopsia).

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Dysosmia

see Parosmia.

Dysplatopsia

The term dysplatopsia comes from the Greek words *dus* (bad), *platus* (flat), and *opsis* (seeing).

It is used to denote a visual distortion in which objects are perceived as flattened and elongated. Dysplatopsia is associated primarily with *aurae occurring in the context of paroxysmal neurological disorders such as migraine and epilepsy, and with the use of *hallucinogenic substances such as LSD and mescaline. It is commonly classified as a *metamorphopsia, which is itself classified as a *sensory distortion.

Reference

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