Chapter 4
The Line and the Circle

> *It is initially assumed that knowledge is achieved by (consists in) check [riscontro] operations, where the knower is modified by the surrounding environment. The existence of a network of interacting material situations is then postulated. The object that can receive knowledge-producing feedback, which we call here the "reader", is one of the many elements that compose this network of changes, being enmeshed in it. To assume the network means: "the starting point is the network" or, more generally, "there is a network, and knowledge is part of it".*
>
> (Prodi 1982: 15)

Abstract This chapter describes Prodi's peculiar strategy to explain life phenomena. This is a model based on the concept of relation or biological meaning that always privileges the relation over the terms of the relation. For Prodi a relation is never a one-way affair, but, on the contrary, it is always a to and fro. This is because the general epistemic model for life phenomena is that of the circle, a figure that has no preferred direction. This method allows Prodi to avoid any kind of determinism, be it genetic or cultural.

Keywords Natural meaning · Nature · History · Material correspondence

At the most general level, to explain something means to look for a fact or principle which would be simpler than that which needs explaining—a fact or principle which would serve as grounds for the *explanandum*. A good explanation would then possess one essential characteristic: if the *explanandum* is located at the ontological level L, the *explanans* should be found at least at level L-1. That is to say, the explanation needs to appeal to simpler and more basic facts and principles than the *explanandum* does. The most important element, then, is the simplicity (at least in principle) of the explanation. Let us make an example. We have to explain why the males of many species of birds have particularly flamboyant plumage—a physical characteristic that could be a lure to predators—as well as being often large and

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cumbersome (as in the case of the peacock's tail). A plausible explanation is that this is meant to attract the attention of females and that such a highly visible plumage helps them find a mate. There is a fact F—the male's flamboyant plumage—and a measurable effect, since it can be demonstrated that a female will gaze more intently at a bird with flamboyant feathers than one which does not have such a plumage (Zahavi, Zahavi 1997). If this counts as a plausible explanation of F, that is because it is simpler than F; the explanation E, in fact, does not presuppose complex principles. At its core, the theory of evolution by natural selection states that animals compete among themselves for survival and that those who—in a given environment—are bearers of the physical and behavioural characteristics most suitable to it manage to survive and therefore to reproduce, thus transmitting their "advantageous" genes to successive generations—while others do not. Some might dislike it, but this is a very simple explanation indeed, and a very powerful one too, since it can explain a multitude of different facts. The most interesting aspect of this kind of explanation, for our purposes here, is that in order to be efficacious, it does not require the intervention of the subject whose behaviour is explained by it. That is, it is not necessary to presuppose that male birds have an explicit intention to attract the females with their flamboyant plumage: whether they want it or not, their body is composed in such a way that it will attract the females' attention. A good explanation, therefore, does not employ notions like will or intention. A good explanation is non-intentional. As a matter of fact, in all those cases where a will or an intention comes to play a role in an explanation, this loses its essential character—simplicity. Nothing is harder to comprehend than the notion of "will" or "intention". An explanation based on "will", that is, is more complex than the fact it purports to explain.

When this explanatory logic is applied to mental phenomena—and in particular to semiosic ones—it seems natural to suppose that it would fail to be adequate. It appears obvious that, for this kind of phenomena, an intentional explanation would be necessary: in the sense that F would be explained by presupposing an explicit intention to give rise to F. For example, we may wonder why newborn babies cry: according to an intentional explanation, their cries are caused by an intention in their mind (albeit a confused and indistinct one), that of attracting their parents' attention. Mental phenomena, and in particular semiosic ones, would then only be defined by—and explainable through—the intention of those who have them (Buyssens 1943). This thesis is buttressed by the idea that the employment of signs (at least in line of principle) is based on an explicit—that is to say voluntary—convention. For example, the fact that, in English, the neighing equine is called "horse" depends on a "convention", that is to say on an explicit decision taken by a group of human beings. In general, according to this explanatory strategy, targeting semiosic phenomena (and in particular human ones), the best explanation would be an intentional one.

However, this strategy has a fundamental defect: it does not respect the principle of explanatory simplicity, since the *explanans* is more complex than the *explanandum*. If F is at level L, E—in this case—is at level L + 1. We have just seen why: we do not have any access to that which occurs inside people's heads, since we do not know anything about their intentions. Indeed, we do not even know if intentions really exist. Thus, the *explanans* is more complex than that which it purports to explain and, properly speaking, it is not an explanation. Prodi's fundamental methodological

choice, coherently with his predilection for biological continuity, is to avoid this kind of explanation altogether. At the same time, however, Prodi wants to avoid the opposite pitfall: those explanations that simply 'eliminate' the fact that should be explained. He therefore follows a two-tiered commitment: he wants to formulate explanations of complex phenomena, but such explanations must not be reduced to the claim that the complex phenomenon to be explained, in fact, does not exist (as we have seen in Chap. 1, vis-à-vis eliminative materialism).

In order to avoid both of these pitfalls, Prodi always looks for the explanation of a phenomenon in its evolutionary history. This strategy is advantageous because evolutionary history is not a one-way phenomenon: on the contrary, it is a paradigmatic process wherein organism and environment are linked together in a relation of *complementarity*. Here, as will often be the case in the course of this book, we come back to the most simple of situations, when an elementary organism categorizes something in its environment as meaningful, bracketing everything else. As we have seen, this, for Prodi, is an instance of knowledge, indeed the very matrix of all forms of knowledge: "there is a profound relation between the knower and the things he or she can know. This is a relation of derivation, that is to say a genetic one […] broadly conceived. Every living being 'knows' the world to which it is adapted and from which it derives. To know, in this radical sense, means to interpret the environment, to move within the environment, and to survive in the environment" (Prodi 1979: 182). Complementarity means that between the organism and the thing, a relationship occurs and indeed that the relationship itself fixes the organism as a "reader"[1] (with respect to the thing) and the thing as a *meaningful object* (for that "reader"). So, "to know a thing means to be changed by it. Knowledge is always, at every level, a process through which things change, and are reciprocally adapted" (Prodi 1979: 185). The crucial claim is at the end of this quote: the organism and the thing are "reciprocally adapted" entities. The "reader" is adapted to the thing, and the thing is adapted to the "reader". This is the model of the circle, applied to the world of living beings. Returning to the sphere of human semiosic phenomena, it is now clear why they cannot be explained with intentional explanations:

> It is necessary to reject an interpretation of the term "subjective" which pits it against "objective". The usual anthropomorphic criteria that assume intentionality and consensus as primordial facts, are inadequate. […] If we assume, as a criterion used to define the field of semiosis, intentionality qua condition of proof (suggesting that semiosis would begin with the "will to communicate", and therefore clearly distinct from other natural functions) we are operating anthropomorphically. The criterion we are using to demarcate the field is "consciousness", with all the ambiguities that burden this term. So, the attitude of the semiologist, rejecting as extra-semiotic all psychological and biological influences (broadly conceived), […] is conditioned from the start by weighty psychological or even introspective presuppositions. Upon examination, the facts of "consciousness" immediately appear as rooted on natural bases, unconscious and automatic, and can only exist if grounded on these: consciousness is the tip of the iceberg, and if we want to explain anything (in the simple sense of connecting it with something else) we need to refer to the submerged part, to that which allows the tip to emerge. (Prodi 1977: 18)

[1] According to Prodi any living entity "reads" the surrounding world, that is, it "selects" the meaningful elements of it in respect to its own interests.

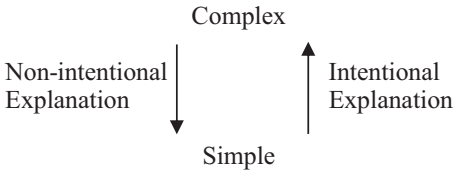

Fig. 4.1 Two kinds of explanation: intentional and non-intentional (This schema, like others that will follow, is not derived from Giorgio Prodi's works. Just as he never explicitly cited his sources, so in his often compressed and dense prose, he never tried to explain too much: "without an effort to deepen knowledge, and its systematic organization into a science, it is impossible to understand the specific character of the times we live in" (Prodi 1974: 7))

Traditionally, semiotics, as we will see in what follows, has attempted to explain semiosic phenomena by means of intentional explanations, that is to say positing at the origin of semiosis a subject that voluntarily choses to use a certain material object—the sign—in order to signify something else. This, has I have argued, is not an explanation since it is based on a more complex notion than the fact it purports to explain: "consciousness is a fact to be explained by means of non-conscious facts, even though it is customary to invert the terms of this problem" (Prodi 1982: 108). Conversely, Prodi tries to explain the whole of natural semiosic phenomena—from the most elementary to the most complex, like human language—by means of non-intentional phenomena, i.e. respecting the constraint that an explanation needs to be simpler than that which it explains. While intentional explanations can be represented as an arrow pointing downwards, from complexity to simplicity, non-intentional explanations can be represented as an upturned arrow, from the simple to the complex (Fig. 4.1).

However, this model is merely a first approximation of Prodi's explanatory style. Here we still see lines and arrows, while we have already detailed how the scientist-philosopher looks for a relation of "complementarity". However, as we will soon see, it takes little effort to transform this model into a circle. It requires the integral adoption of a biological point of view.

Let us go back to semiotics, a discipline that in Prodi's days was mainly concerned with institutionalized systems of signs and of systems, that is, of signs currently in use. It must be remembered that Prodi was working during the final days of the age of structuralism. The core idea of this movement was that what really matters in signs is the *structure* holding them together. The question of the origin of the semiosic link between signifier and signified was considered uninteresting. For the structuralist, the origin is never a scientific problem, as, for example, de Saussure claimed:

> to distinguish between the system and its history, between what it is and what it was, seems very simple at first glance; actually the two things are so closely related that we can scarcely keep them apart. Would we simplify the question by studying the linguistic phenomenon in its earliest stages—if we began, for example, by studying the speech of children? No, for in dealing with speech, it is completely misleading to assume that the problem of early characteristics differs from the problem of permanent characteristics. (de Saussure 2011: 8–9)

However, this approach leaves the fundamental problem of semiosis unexamined: if the sign is essentially a sending to, what guarantees the link between the sign and the object to which it refers? Prodi's answer to this issue—the reply of a scientist-philosopher—is to look for the origins of semiosis not in culture (so in social convention, communicative interaction, and intention to transmit a thought), but in biology, and more precisely in the relations that obtain between different cellular and intracellular entities. The key concept mobilized by Prodi in this venture is that of "reading". Every organism puts itself in a relation with the surrounding environment by selecting the characteristics that, from its point of view, are pertinent, i.e. *meaningful*. Natural meaning is the result of this reading operation. Prodi employs the concept of "reading" or "interpretation" because he wants to highlight the organism's propositive role vis-à-vis the environment. To read means to attribute a meaning; at the same time, the meaning of what which is read cannot be completely arbitrary, because the world affords only some possible readings and not others:

> In nature, meaning arises as a correlation between an organism and a section of the world that can be interpreted thanks to the constitution of adequate structures to interpret them. A thing becomes meaningful when it can be deciphered by someone (that is to say: exploited in a specifically metabolic sense, for survival etc.) Biological objects […] (*the readers of things*) are modelled by environmental conditions, in the sense that things function for them as a reference point, a filter, the reason for their evolution. The organism is therefore shaped by them and modelled onto them. Now, it is natural for them to be meaningful things for an organism, so that their meaning is a phylogenetic product. Meaning, therefore, does not exist: only meaningful things exist. To be more precise, meaningful things do not exist either, but only "things that are meaningful for… (Prodi 1979: 188)

Natural, primordial, meaning is always a "meaning for" a certain form of life. Here, the influence of Jakob von Uexküll is evident. On the one hand, the living organism acts upon the world: "behaviours are not mere movements or tropisms, but they consist of perception (*Merken*) and operation (*Wirken*); they are not mechanically regulated, but meaningfully organized" (von Uexküll 1982: 26). Perception is always already an action, a doing, and a "reading" of the world. On the other hand, the terms of the relation—the organism and the "thing meaningful for" that organism—are linked together by what von Uexküll called the "functional circle" (von Uexküll 1982: 31; see also Brentari 2015: 107–15; Thure von Uexküll 1987; Kull: 1999). The most interesting aspect of Jakob von Uexküll's model is its circularity. The thing means something for the organism, but the organism cannot live without the thing. The "functional circle" (Fig. 4.2) completes the model presented in Fig. 4.1, by adapting it to the biological world. The primary effect of this model is that it effectively supersedes, by making it somewhat useless, the distinction between organism and signified thing. In fact, in a circle—and a "functional circle" is nothing but a circle—there is no beginning nor end. We are so accustomed to think in binary terms that we always conceive of a duality between a "subject" doing something to an "object". But von Uexküll's model overcomes this distinction, and Prodi takes this model very seriously. The distinctive characteristic of "the flux of living beings" (Prodi 1979: 14) is indeed its radical dynamic continuity: "it is necessary […] *to think that mobility is the very 'substance' of nature*" (Prodi 1979: 15).

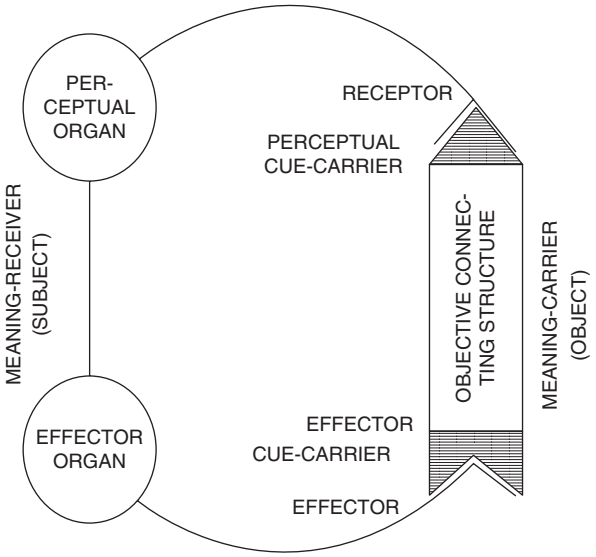

Fig. 4.2 The functional circle of behaviour. (Jakob von Uexküll 1982: 32)

In this scheme the arrows of Fig. 4.1 transform themselves into a (functional) circle; it therefore becomes clear that Prodi's explanatory strategy is not simply non-intentional and reductionist—a strategy that would attempt to dissolve or, more precisely, to reduce complex phenomena to their simple constituents. It is not so because, according to Prodi, while the ground of semiosis and of language is certainly in the world (that is, the material ground of semiosis is the world to whom the signs make reference), such a ground is already intrinsically semiosic: that is, it can be conceived as an infinite chain of translations and transformations of complex assemblages into other complex assemblages. At all levels the world is made of 'meaningful' relations. Single organisms, for example, are "units of behaviour, of reaction, of vital course (from life to death): but they are also modular realities, that is to say, they are composed by many smaller units" (Prodi 1979: 17). As we have seen for Prodi, nature is a "flux", continuity in change. This is the background against which we must understand his concept of the organism's "reading" of the world. When we read a book, for example, we jot down notes about what we are reading, or we talk about it to a friend, or we can simply commit it to memory: in all these cases, "to read" means to transform words into *other* words and thoughts (that in turn will need further words-thoughts and so on). This is what Prodi means with "reading". Just like a summary is a transformation of a text into another text, so every "reading" is the transformation of a "meaningful thing" into another, a new text, and so on. Life is precisely this "and so on".

To move from the line to the circle completely changes the approach to the philosophical and scientific problem of grounding. The ground is not that which should be, in turn, grounded upon something else. Philosophy has long tried to identify an absolute foundation: as we will see in the last chapter, with Prodi we find an unexpected solution to this problem, since human language—the most complex and

articulate form of natural semiosis—will be revealed as being grounded upon another language, intrinsic to nature. Linguistic semiosis is nothing but an extreme complication of natural semiosis. Prodi's explanatory strategy, then, cannot be represented with an arrow, whether this goes from the simple to the complex or vice versa. Rather, it is best exemplified by a circle, a figure without a basic, fundamental element. Prodi is well aware of this, just as he is conscious of the vain hope of attaining an absolutely original knowledge, a definitive foundation:

> in truth, no foundation is possible, because the ultimate operation of thought is a particular operation, like every other one. There is no chapter zero of knowledge, such that its employment would allow a glimpse upon the totality of reality, making the whole of ontology, for a fleeting moment, founded upon an enlightened gnoseology, instantaneous and exalted. Such an operation is completely illusory. (Prodi 1982: 6)

Prodi, then, abandons the idea of an ultimate foundation of knowledge. The relation between knowledge and the world— like that between semiosis and world—is characterized by continuity, as in the circle, where there is no beginning nor end, no before nor after. To hold the primacy of the circle means, once again, to prioritize the relation to the *relata*. Prodi calls this original relation "a tapestry of facts" that is a "tapestry or network of relationships" (1982: 8) accounting for how an organism can attain knowledge about (i.e. to "read") the world:

> A tapestry of facts must exist, of which knowledge is part and without which it could not operate nor could it be produced in the first place. […] We can know things (and objects that can know things can be created in nature) because a) there is a given whole of relations; b) this whole is "traversable" with operations; c) it has produced systems that belong to the "tapestry", that is to say, systems included in the whole of relationships, and exploit factually existing conditions — being their manifestations. (Prodi 1982: 8)

The world is a "tapestry of facts", a whole of relations and not of isolated and individual things. As he writes in *Orizzonti della genetica*, the world is a vital "flux", without interruptions nor gaps. We will see below how Prodi, when tackling aesthetic and religious themes, seems to refer directly to the *Tractatus* (without explicitly quoting from it). In particular, his arguments seem to echo Wittgenstein's opening propositions "1.1 The world is the totality of facts, not of things; 2 What is the case, the fact, is the existence of atomic facts; 2.01 An atomic fact is a combination of objects (entities, things)" (Wittgenstein 1922: 25). But what does Prodi mean when holding that the world is a "tapestry or network of relationships"? He means to say that life is regulated transformation, that is to say "reading" or, which is the same, semiosis. This does not entail that the world is composed by signs (against pansemioticism see Hoffmeyer 2010: 603), but rather that the world *is* relation of relations. Indeed, semiosis means meaningful relation. And since a relation, as we have already seen, is only meaningful *for* an organism, to say that the world is a "tapestry or network of relationships" means that the living world is the whole of all biosemiosic phenomena: of all those "myriad forms of communication and signification observable both within and between living systems […] representation, meaning, sense, and the biological significance of sign processes — from intercellular signalling processes to animal display behaviour to human semiotic artefacts such as language and abstract symbolic thought" (Favareau 2010: V).

According to Prodi this whole of relations—the world—defines the space of "material logic, which can be found in the facts, in the relations and among the elements of the horizon" (Prodi 1977: 43). This means, precisely, that the world itself is intrinsically logical-semiosic:

> we are used to linking logic only to the functioning of our thought capacities: but if those are present in nature, it is because they have differentiated themselves in nature, and since they act upon it their root is the same as those material exchanges that they are capable of interpreting. They are based on a logic of material exchanges, differentiated through a chain of increasingly more complex functions. […] In this sense logic, at its deepest level, is a material tautology. What is, is logical. (Prodi 1977: 43)

Here the reference to *Tractatus* is explicit: a tautology is always true (like p ^ p). World and logic (semiosis) are one and the same. But what Prodi calls "material logic", i.e. the logico-semiosic clay of the world, immediately becomes "categorial logic" (Prodi 1977: 39). Because in the living world, every organism must be able to categorize its living world, that is, discriminate between meaningful and meaningless phenomena. Prodi's "categorial logic" is based upon selection, on the act of discrimination of that with which it is possible to entertain a relationship and that which does not afford such a relation. Such a logic engenders the first implicit categories ("edible" and "inedible", "sexual partner" and "non-sexual partner", "safe" and "dangerous", and so on). This "categorial logic […] can be identified with biological organization in general" (Prodi 1982: 83), that is, with life itself. The world-life is then always and at the same time logico-semiosic.

Let us repeat that the key to the comprehension of Prodi's thought is his insistence on continuity. Prodi wants to offer an account of the possibility that from the world of things (where "material logic", articulating not yet meaningful relations between things, holds sway[2]), it is possible to arrive, through a chain of complications, to human language: the most complex semiosic system that exists. Prodi's crucial move for the resolution of this problem is his identification of the world of life with the world of semiosis. When Prodi talks of a "material logic", he is simply stating this point: the natural world is not a world of isolated things, but a world of relations, of regulated connections between things; for this reason "the event, and not the [isolated] thing, lies at the basis of material logic" (Prodi 1982: 27); indeed

[2] It is important to stress that Prodi did not place a neat separation between organic world (the world of semiosis) and the inorganic world, the world where there is not yet "meaning". Take the case of such a quotation from Thure von Uexküll: "The line drawn between organic and inorganic nature is not determined on the basis of random distinctive features, such as chemical makeup, size, complexity, or the form of the structure in question, but on the basis of a characteristic quality which can first be observed among living things and which is inherent even in the simplest forms of life, the protozoans. This inherent characteristic is the ability of an organism to react to stimuli, not just in a causal-mechanical way, but with its own specific reaction. From this point of view, all living organisms are considered autonomous, while the inorganic, including the tools and machines we use, remain heteronomous" (Thure von Uexküll 1987: 152). I think that Prodi would not agree with such a radical separation between what is "living" and what is "causal-mechanic". In fact, such a separation still seems to imply some form of dualism, and we know that Prodi wanted to get rid off of *any* form of dualism, even such a deeply rooted dualism between the living and the nonliving.

"the concept of a thing is inadequate to function as a starting point. Physics, studying matter in its constitutive parts, does not find entities that are intuitively definable as things" (Prodi 1982: 20). Ultimately "material logic" means nothing but relations and relations of relations. It is on these grounds that other forms of logic are "seamlessly" (Prodi 1982: 15) developed: first the "categorial" logic and lastly "propositional" logic, that of articulated human language.

Let us return to "material logic", the natural logic as a "tapestry of facts, a material tapestry" (Prodi 1982: 9). Since logic-semiosis coincides with the natural world, "the initial operation is therefore a preliminary identification of logic with ontologic" (Prodi 1982: 16). Beyond this tapestry, this "network" is "traversable", that is to say it is knowable by a living organism, being the very same lifeworld that produces "systems" capable of knowing it, systems that are nothing but "manifestations" of this primordial network. The somewhat paradoxical outcome is that this world-life-logic assemblage achieves self-knowledge through its subsystems, through its own manifestations "since the beginning we therefore mean to interpret gnoseology as an internal function of ontology" (Prodi 1982: 9). Knowing becomes a function of being, a *partial* manifestation of being. Once again Prodi surprises us and unveils yet another possible hidden source of his peculiar way of philosophizing—the theological model of Spinoza's *Deus sive Natura*—according to whom the same circularity between knowing (human animal) and nature (God) takes place:

> [h]ence it follows that the human mind is part of the infinite intellect of God; and therefore when we say that the human mind perceives this or that, we are saying nothing else but this: that God-not insofar as he is infinite but insofar as he is explicated through the nature of the human mind, that is, insofar as he constitutes the essence of the human mind-has this or that idea. And when we say that God has this or that idea not only insofar as he constitutes the essence of the human mind but also insofar as he has the idea of another thing simultaneously with the human mind, then we are saying that the human mind perceives a thing partially or inadequately. (Spinoza, *Ethics*, II, XI, Corollary)

Every level of epistemic activity, from that of the virus to that of the scientist, is possible—it manages to reach onto the world—because it is always already within that very world (for this reason knowledge of the human mind, says Spinoza, can never be inadequate, since it is constitutively partial): "it is as if the network", the world itself, "would bend upon itself in certain areas, thus becoming capable of better reading and deciphering the things upon which it bends and comes to surround" (Prodi 1982: 41). Knowledge does not belong to the subject; it is the world that reads itself through the single organism, the single "reader". This is why it is impossible to find an absolute and definitive foundation to knowledge. Such knowledge would be possible only if a given organism could read the whole world from the *outside*. But "no observer […] can see the whole network", i.e. the entire world "nor can it say if the network is a whole. […] The observer is internal. There are no external observers" (Prodi 1982: 36). As we will see in the last chapters of this book, this intrinsic limit of natural epistemic systems implies important consequences of both ethical and religious nature. For now, it will suffice to insist that it is *logically* (and therefore biologically) impossible to escape the biological circle of knowledge:

> [t]he terrain upon which we move — whilst looking for an explanation for this very movement — is a tapestry of existing facts. If a network of facts exists, and we are part of it, then our nature (structure and functions) derives from it and is its own specification. It cannot be neither contradictory nor external. We are never faced with the problem of having to justify the network, but we need to be justified by it. […] This network is therefore continuous with us, and not something extraneous which we could see as wholly external and confronting observers. We hold it within us from the inside, because our epistemic capacities are simply one of its organizational modes. Through the networked facts that compose us, and the facts that connect us to the outside, we are seamlessly immersed in the wider tapestry of facts. (Prodi 1982: 15)

Let us now try to reconstruct Prodi's thought as a whole. We began by ascertaining that the world is a tapestry of relations, what Prodi identifies with the space regulated by the "material logic". But this is not really a beginning, since a relation has always already begun—else it would not be a relation. The model of the circle makes it impossible to identify an absolute beginning. We could say that at the beginning, there was what already was. "Material logic" immediately becomes life ("categorial logic"). But life, as a construction and identification of natural meanings, is coextensive with semiosis: "it is clear that material logic and material semiotic coincide. If a material presence selectively interacts with another [categorial logic]—unveiling it as a referent sign and operative trigger—then this would be a logical condition, connected with the impersonal claim 'every time that…'", (Prodi 1977: 44). What is meaningful for a "reader" triggers a biological operation; such a connection repeats itself every time the "reader" encounters the same "referent sign", that is, the meaningful aspect of the world. Such a repetition transforms the relation into a kind of "logical condition". In this sense it is possible to speak of "material logic".

Life equals semiosis: "biology is natural semiosis" (Prodi 1987b: 147). But then, applying the transitive property to this chain of equations, we reach the identity of semiosis and world (since the world is coextensive with life) and then the final tautology (final but also initial, since in a circle every beginning is also an end and vice versa): semiosis is equal to semiosis. this tautology means that semiosis is at the origin of semiosis, and this simply means that the world (= semiosis = life) exists and that everything that came before it was already world (= semiosis = life). It is impossible to get out of the world.

Is this conclusion not a vicious circle? Since semiosis means relation, Prodi is actually telling us that there was no beginning. More precisely, he is telling us that at the beginning, there was already a relation—another way of saying that an absolute beginning never occurred. This is why Prodi holds that at the beginning, there was the event, not the thing: at the beginning "we could say, 'there was change', if only we weren't disposed to think of change as the change *of something* already given" (Prodi 1982: 27). At the beginning there are "logical relations", and for this reason, "the concept of a thing is not primitive" (Prodi 1982: 27). It can be seen how Prodi always goes back to his core guiding ideas: the circle, continuity, and natural semiosis. If relations are at the beginning, then things are nothing but "particular kinds of logico-material relationships" (Prodi 1982: 28). Hence the evolutionary equation—at the beginning of semiosis (i.e. of meaning), there is natural semiosis

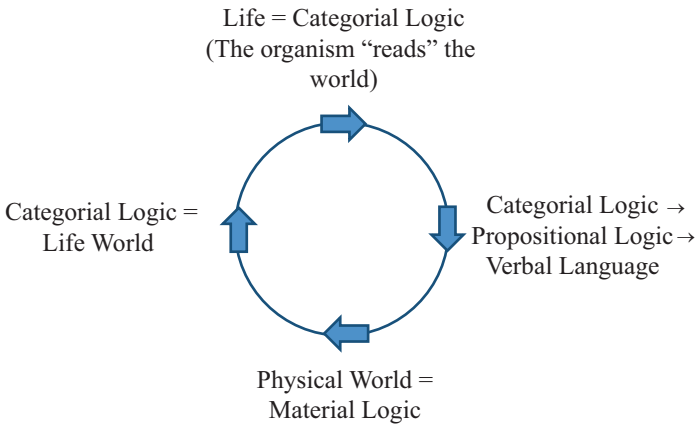

Fig. 4.3 The natural world as a whole of relations: material logic, categorial logic, and propositional logic

("material logic")—is not an empty tautology. Prodi is arguing that the world is this relational continuity, a relational circle wherein every moment presupposes and develops the previous moment. It is crucial that this figure should be a circle, since only this model allows us to understand how a virus can develop into a scientist and a philosopher. Essentially, Prodi is uniquely concerned with this question: how is it possible to arrive at a scientist or a philosopher starting with a virus? In Fig. 4.3 I tried to schematically summarize this chain of identities (the arrows represent the direction of the process, considered as both an evolutionary and a foundational model, see Cimatti 2000b).

What happens when from propositional logic—the core of human language—we arrive at material logic? That is, when language refers to the world? This is more a return than a point of arrival: language can *say* the world because, in the final analysis, language is simply the world saying the world. It is always the same world, albeit manifesting itself in different ways: "man […] is nature thinking itself, [it is] the interiority of nature" (Prodi 1987b: 93). This statement already alludes to the internal dynamics of this circle, which is not closed onto itself (if it was, language would be useless, since there would be no necessity to express what one already knows) because such a self-consciousness of nature is continuously expanding. That is to say that this movement—no longer a circle but a spiral—(see Chap. 10) will give access to ever larger parts of previously unknown regions.

If we return to Fig. 4.3, we realize how paradoxical—and unfashionable—this model appears today. According to it, the great dream of contemporary analytic philosophy is unattainable: to naturalize the mental, the project feverishly pursued by many contemporary philosophers and scientists (see, e.g. Millikan 1984; Dretske 1995; Papineau 2003). For Prodi, language—and semiosis in general—is not something distinct from the world of life nor is it set against nature, biology, or matter. Prodi does not think it necessary to simplify complexity but rather to show how what we thought as simple was always already complex. This ultimately means to

completely get rid of the distinction between simple and complex. If life is *already* semiosis, it is meaningless to puzzle about the correct placement of the border between nature and culture. We should rather try to understand *how* nature becomes culture and—and this is a *far more* interesting question—how nature is *already*, somehow, cultural:

> [t]he duality cannot be overcome by synthesis, but rather through the acknowledgment that, at bottom, there is no duality at all. Penetrating deeply into the study of nature we can see how, on the one hand, in its most sophisticated and recent regions it becomes moral. On the other, going back towards its origin, we can see how every form of knowledge is a commonality with things, it is participation. So it is for man. Knowable reality is very different from what is usually presented to us: things are mute, but they can respond when suitably interrogated. By doing so, a fundamental transaction with the instruments used to probe it — that is to say, with us — can be revealed. Our knowledge derives from more ancient forms, and goes all the way back to the root of the biological, which appears to us as "elementary knowledge", ever since the very first steps of its organization. (Prodi 1987b: 119)

Finally, it is for this reason that for Prodi every kind of dualism, epistemic and semiotic (that is to say the question of the relation between form and content, sign and reference, or, more generally, subject and object), literally vanishes. His circular model is developed as an image of continuity, the same continuity that links all living beings together. For this reason—since a clear split between knower and known, internal and external, is never given—the world's primary characteristic is its intrinsic knowability:

> [an] organism constitutes itself because reading some external meanings grants it some advantages, it really *constitutes itself onto them.* It is necessarily complementary to these external things, since they are what the organism can read, and with whom it can selectively interact. There obtains, therefore, a relation of complementarity and of adaptation between an organism and reality, because the reader builds itself onto its reality (a given reader constitutes itself onto a given reality). […] An organism knows/interprets (has a specific relationship with) the reality *onto which* it has constituted itself. It interprets the world through its own categories, but these categories have been constituted by *that* world itself. *An organism interprets its own genetic area*. […] The organism knows the reality that constituted it. Things let themselves be known, because they have constituted the interpretive categories needed for their knowledge. (Prodi 1987b: 143–144)