15 Toward an Ontology of Consciousness with Nicolai Hartmann and Hans Jonas

Karim Akerma

Abstract

The place of consciousness in reality and its relation to organismic existence receive special attention in the philosophies of Nicolai Hartmann and Hans Jonas. Although consciousness belongs to reality, its mode of existence is rather peculiar: consciousness is not spatial. It is different from the spatiotemporal objects and processes that surround sentient beings in their physical, chemical, and biological reality. In spite of its lacking spatiality, consciousness is bound to spatial organismic existence, on which it exerts influence and by which it is affected.

This intimate relationship between consciousness and organismic existence makes consciousness to a certain extent accessible to the natural sciences. The biological constitution of living beings includes a disposition for agency that links consciousness to the exigencies of metabolism, which is a decisive feature of organismic existence. The character of the earliest consciousness must have been self-concern. Organisms have to incorporate matter that is located outside themselves.

Many organisms are conscious (sentient), while many others are not. To find appropriate matter, sentient organisms have an ability to encounter outer being. Without this ability the organism would be indifferent to having matter at its disposal. Such indifference must be attributed to plants since a need to find suitable matter cannot be ascribed to them. Plants do incorporate matter but they do not find it outside themselves; to them, matter is provided via their roots. Consequently, plants need not encounter outer being.

I suggest that we distinguish between nonsentient organisms and sentient organisms by considering only the latter ones as living beings. This assertion rests on the idea of a coextension of consciousness with life. Since plants are not conscious (sentient) they are not alive; they are to be considered as organisms but not as living beings.

Nonetheless there is a profound difference between organismic existence as spatiotemporal and consciousness as a nonspatial though temporal reality. A view from the organism (metabolism, motility, and organismic transcendence) neither explains consciousness nor reduces it to the organismic level. One must be careful not to biologize consciousness.

For any ontology of consciousness time is far more fundamental than space because time is a category that applies to any process or entity while space applies to many though not all processes or entities. Time encompasses nonorganismic, organismic, and conscious entities and processes, and by virtue of this makes intelligible their belonging to one and the same reality.

The claim of a coextension of life and consciousness has practical aspects. First, it makes possible a definition of when individual life begins: an organism's life begins with its becoming conscious. Accordingly, there is a difference between (e.g., human) organisms and living (e.g., human) beings. Second, the idea of a coextension of life and consciousness sets free an argument against patenting those organisms to which we ascribe consciousness. If we define as patentable any machine, manufacture, or composition of matter, then living beings are not to be considered patentable. In contrast to organisms, living beings are not just matter in process. Instead, living beings are entities that own a nonmaterial stratum of consciousness.

Is There Any Space for an Ontology of Consciousness?

Because ontology is concerned with the nature of existence, an ontology of consciousness explores the place of consciousness in the scheme of things and events, in the whole of being. There are only two modes of being: ideal being and real being. Ideal being is independent from consciousness and probably best known in mathematical or logical laws and relations. Thus, the mode of ideal being is neither spatial nor temporal. In contrast, real being manifests essentially within four different strata or layers, each of which has basic categorial features. Real being reveals a fourfold structure, namely the levels of the nonorganismic, the organismic, consciousness, and spirit.[1] The strata of reality must not be confused with actual entities such as stone, rose, butterfly, or human, each of which participates in various strata (figure 15.1).

The quest for an ontology of consciousness accepts the phenomenon of consciousness as something real. At the same time, however, there is no evidence that consciousness is also corporeal. This, in turn, precludes all spatial extension for consciousness. These assumptions explain, at least in part, the historical evasiveness of consciousness from the methodological scrutiny of the natural sciences. The reality of consciousness seems to open consciousness research to empirical methods, while at the same time its presumed nonextension makes it a difficult candidate for empirical methods.

In spite of its reality, phenomenal consciousness[2] in principle stands outside a theater of research that is accessible to the natural sciences. This constellation gives rise to ontology as a philosophical discipline that is more encompassing than what can be accounted for by methodologies of the natural sciences. Such are the ontologies of Nicolai Hartmann (1882–1950) and Hans Jonas (1903–1993). Hartmann's work can easily be called the twentieth century's most comprehensive ontology. His pioneering work acknowledges the reality as well as the nonspatiality of consciousness while never losing contact with the natural sciences. These remarkable features deserve more attention in the current debate about consciousness because they evade the wrong conclusion that the nonspatiality of consciousness is the same as the nonreality of consciousness.

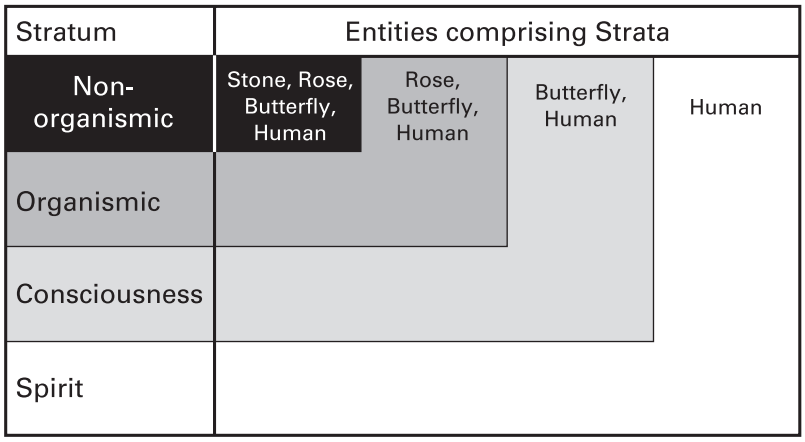

Figure 15.1
The four ontological strata according to Hartmann. Nicolai Hartmann recognizes that reality displays a fourfold ontological structure. The scheme demonstrates that reality must not be confused with and is not limited to materiality. Various entities exist in more than one stratum. A stone only comprises the stratum of nonorganismic matter, while a rose comprises the strata of nonorganismic and organismically organized matter; a butterfly is a conscious organism; only humans cover all four of reality's strata. (Hartmann (e.g., 1950, 485; 1964, 476) acknowledges the possibility of intelligent life forms on other planets.)

Taken as a philosophical discipline engaged in consciousness, ontology is not restricted to any metrical natural science of consciousness that requires spatiotemporal coordinates. This methodological prerequisite is correctly given as a reason why the nonspatial aspects of consciousness (i.e., qualitative phenomenological contents) evade scientific scrutiny. Unless the mentality of consciousness is demonstrated in correlation with spatial parameters, it will rarely, if ever, be transformed into what we may call a ''normal object'' of scientific methodology, since a normal object has spatiotemporal extension, while consciousness is extended only temporally.

Physics is considered the basic science if it is assumed that, by means of what John Searle (1994, 113) calls ''ontological reduction,'' any spatiotemporal entity that is in principle accessible to the natural sciences can be shown to consist in nothing but physical elements or processes. Obviously, such a reduction also applies to biochemical phenomena. As long as one does not accept, for example, a separate vitalistic life force, or morphogenetic fields (see Sheldrake 1981), this reduction may also be extended to organismic processes. Principally, all features of organismic systems can be accounted for in physical terms.

Simply pointing to concomitant physical processes when a person enjoys a cup of coffee, to take but one example, does not reduce the taste ontologically; one must also

consider the fact that methodological restrictions will not allow for alternative interpretations of ''enjoyment,'' say, in terms of one's bodily alignment with physical fields, or in the context of balance, or suitablity of sustenance. Ostensiveness does not reduce one's well-being, which belongs, as Searle stresses, to first-person ontology. Searle's contributions to an ontology of consciousness are of further interest here, because, notwithstanding his refusal of ontological reduction in the case of consciousness, he maintains that consciousness is a regular object of science. For him, consciousness is an irreducible subjective physical component of physical reality (Searle 1994, 116f., 123). By conceiving consciousness as a physical component, Searle also endorses the spatiality of consciousness: ''It is easy to see that it is spatial, because it is located in the brain'' (p. 105). However, localizing consciousness ''inside'' the brain does not prove its spatiality—an argument that has been made in great detail by many contemporary consciousness researchers (see McGinn 1995). Indeed, conscious processes, by virtue of their occurrence in spatial organismic systems, can be ascribed a somewhat unprecise place in space without consciousness being spatial or made up of smaller spatial processes (McGinn 1989, 357f.). Consciousness exerts its influence somewhere where certain spatial organismic activities take place, without owning spatiality itself.

By attempting to make consciousness a genuine component of physical reality, scientists heedfully delegate the research subject into a domain that is suitable for the natural sciences. This practice is supported by a widely held conviction that, with physicality, the actual reality of any entity or phenomenon is at stake. In the advocacy of this kind of reality for consciousness, Searle apparently joins the ranks of other researchers who see the only means of warranting to it full citizenship within the realm of reality (real mode of being), by assimilating consciousness to physical reality. Obviously there are alternatives for conceptualizing consciousness without making consciousness a component of physical reality, especially in such concepts of reality that allow for the existence of being independent of its spatiotemporal manifestation. Real being, then, comprises a much wider range of entities than those that are accessible to the natural sciences. This is the case with Hartmann's ontology of consciousness that recognizes its reality without being spatial, though undeniably localizable: Hartmann (1953, 24f.) stresses repeatedly that reality is not to be confused with materiality. Thus, he endorses a view of reality that is not limited to its spatial parameter, and enables one to make a difference between what is spatially extended on the one hand and conscious inwardness on the other hand, without declaring, as Descartes did, that these stand for two disparate substances.

Even in a time of prevailing and successful neurosciences and related reductionist methods, there is a meaningful and significant space for an ontology of consciousness. In fact, the metrical natural sciences, just because of the nonspatiality of consciousness, invite an ontology of consciousness and even demand it.[3] Consciousness shares one and the same reality with material things and organisms; this is so because it

has the same temporality, the same coming into being and passing away, as material things and organisms. However, having a common ontological basis for physical and conscious reality does not reinforce a reductionist scheme. Reality encompasses two different kinds of processes: those that can be observed by many different persons from without and those that are observable only from within as inner experience. Consciousness as a nonspatial reality cannot be reduced to spatially extended entities. A reductionist scheme presupposes an analysis of mental phenomena in terms of phenomena that are already regarded as physical. Such a conception of consciousness is not available at present (see Nagel 1979, 175ff.).

Organism and Consciousness

A comprehensive ontology can neither define the nature of being, nor of matter, nor reality. The same is true for understanding consciousness; all we can do is to circumscribe it, or to contrast it with something different. With this understanding, the phenomenon of organismic existence can be appreciated for providing a semantic encasement of consciousness. A comprehensive modern discussion about the relation of consciousness and organismic existence is found in the works of Hartmann and Jonas. Both relate the ontology of consciousness to the natural sciences and identify it as a borderline problem of biology (see Hartmann 1958, 173; Jonas 1966, ix). Both claim to have overcome a dualism between matter and consciousness. That is, they do not oppose a classification ''mind and matter,'' because they assert an additional level of reality between mind and matter: the organismic stratum. This shared assertion will lead them to systematic research about the relationship between consciousness and organismic being. They do agree that even the lowest or faintest form of inwardness or sentience should count as consciousness. Consistent with their theory, the following terms can be used as placeholders for consciousness: awareness, perception, sensation, feeling, striving, want, desire, fear, pain, fulfillment, suffering, enjoyment. Enjoyment and suffering or pain are to be understood as life-affirming twin possibilities (see Jonas 1966, 105) of conscious animal life. Without want and fear there would be no activity either to find prey or to avoid becoming someone else's prey.

From Heidegger to Philosophical Biology: Hartmann, Plessner, Jonas

While Jonas (p. 96) explicitly mentions Whitehead's ''basic ontology, whose intellectual force and philosophical importance are unequaled in our time,'' Hartmann only once finds—incidental—mentioning in Jonas's autobiographical recital ''Wissenschaft als persönliches Erlebnis'' (Science as a Personal Experience). Here, Jonas discusses the special importance that academic teachers have for their students in the subject of philosophy. He says: ''We did not just study 'philosophy' as a subject, but studied under Husserl, Heidegger, Hartmann, Jaspers.''[4] Jonas had chosen Heidegger as his teacher.

Under him, Jonas regrets, ''we heard about Being related to concerns—as far as mental dispositions are concerned, Dasein as Sorge, but we heard nothing about the basic physical reason for such concerns of Sorge: our corporeal existence being a living organism . . . man must eat. . . . But in Being and Time organismic existence was omitted and nature is delegated into an indifference of the on-hand (Vorhandene).''[5]

Jonas's reproach does not apply to Hartmann, who takes into account the natural setting where human life takes place. However, Hartmann died in 1950, just as Jonas began to publish a series of articles on philosophical biology that were later brought together in his book The Phenomenon of Life. Many of the topics Jonas addresses in his analysis of the phenomenon of life are to be found in Hartmann's earlier works. One might be inclined to ascribe this to mere accident, or simply take it as a sign of synchronicity that is often found in the formation of new conceptualizations representative of a cultural era. Both have a precursor in Helmuth Plessner (1892–1985), whose book in philosophical biology Die Stufen des Organischen und der Mensch (The Levels of Organic Being and Man) was published shortly after Heidegger's Being and Time and probably for this reason never received the attention it deserved.

Biological Boundaries—Actively Maintained

Plessner (1975) holds that consciousness is to be understood out of the biological constitution of living beings. A living being, he explains, is a metabolizing (stoffwechselnde, that is: stuff-exchanging) entity that sets its own boundary; it does not just have a boundary, but actively holds it upright. In his analysis, Plessner tries to anchor consciousness in the level of organismic being. He describes how the biological constitution of living beings entails a disposition for consciousness: the membranes of primitive organisms must be selective in order to leave certain materials outside and to allow entry only to specific ones. This selective interactivity between an organism and its surroundings is considered the basic level of perception.[6]

Plessner gives interesting insights into consciousness as a variable of biological complexity that matches a plan of life from the lowest rungs of animality onward. He conceives of organisms as entities that are capable of actively maintaining a constituting border (Grenze), as opposed to nonorganismic things, which simply have a confining frame (Rand). The organismic border not only secludes the organism; it also works as a presupposition for constituting the organism's openness toward its surroundings. An organism's outwardness with its corresponding consciousness (inwardness) is made possible by seclusion via an actively maintained border. The topic of actively maintained biological boundaries is of interest here as an organismic category that, it is true, does not explain consciousness, but contributes in explaining how it is situated in reality.

Some of Plessner's reflections do reappear in Hartmann's and Jonas's ontologies of consciousness. Hartmann (1949, 110) actually refers to Plessner's study, while Jonas mentions neither of them. However elucidating and germinating Plessner's elabora-

tions may be, in his philosophical biology the ontology of consciousness remains somewhat imprecise. This is so because the ontological status of consciousness in its otherness toward the biological constitution is not mentioned.[7]

Metabolism as Freedom

Metabolism exhibits what, from an ontological point of view, can be labeled ''freedom of organismic existence with regard to nonorganismic matter.'' To show that freedom here denotes an objectively discernible relational mode of being, Jonas (1966, 3) is right to demand that mental connotations must first be disregarded. He seeks to understand the presence of consciousness at the dawn of animal life by proceeding from metabolism as the basic organismic category.

One must be careful to analyze the stratum of organismic existence without presupposing consciousness, since the latter belongs to an adjoining higher stratum of reality (see Harmann 1950, 27f.). As a stratum of reality, organismic being has to be kept free from the aspect of inwardness or psyche (p. 518). Consciousness, even as an organism's consciousness, marks another stratum of reality. The spatial organism and nonspatial consciousness do not gradually shade off into one another; there is no gradual transition from spatiotemporal to temporal reality. The basic freedom of the organism consists ''in a certain independence of form with respect to its own matter'' (p. 81). With respect to matter that constitutes the organism at a certain point in time, the organism is free insofar as it is constituted by different matter at a later point in time. The organism is preserved by an ongoing change in its constituting matter. Organismic existence is performed, so to speak, above matter. Metabolism displays a kind of ontological freedom that is not to be confused with freedom of the will, since there is neither volition nor agency at this level.

Ontological freedom recurs in the stratified structure of the world from rung to rung. Variously graded, it is common to all strata of being and inheres not only in humans. Even ''freedom of the will, ontologically considered, is only a special case of the general autonomy of higher forms in relation to the lower ones'' (Hartmann 1953, 124). Ontological freedom refers to the autonomy that is enjoyed by a higher stratum toward the lower. We should conceive of freedom ontologically as an ascending series of autonomies without denying the dependence of higher strata in relation to lower ones (organismic existence toward matter, or consciousness toward organismic existence). The nonorganismic stratum (atoms, molecules, and their laws) is to be considered ''matter'' for the organismic stratum, which overforms it, without changing it (Hartmann 1964, 491). This overforming in the process of organismic existence denotes the organism's autonomy in spite of its dependence. Organismic being is free relative to the determination that prevails in the nonorganismic stratum.

In organisms causal determination is overformed, though not abolished, by organismic determination. Organismic determination, which Hartmann calls central determination, refers to a ''plus of determination.'' This plus of determination at the same time

denotes organismic freedom vis-à-vis the nonorganismic stratum with its prevailing causal determination. As compared with the organism to which it is bound, consciousness remarks a new height of ontological freedom.

Organisms as Ontological Unities

A primacy of process is a characteristic feature of all organisms. The self-preservation of the organism happens while its own matter changes. Physically, the process of life boils down to the exchange of stuff (Hartmann 1950, 532, 539). On pain of its own decay, the organism is obliged to oppose perpetual renewal to its own decay.[8] One of an organism's basic functions is assimilative activity. Organismic freedom becomes visible in the fact that the organism, via metabolism, separates its own identity from its matter. Eventually all particles that constitute an organism at a certain point in time will be replaced by similar, though not identical, particles at some later point. Inasmuch as an organism metabolizes and so is a stuff-changing entity, its identity does not consist in the matter by which it is constituted at a specific point in time. Organisms, as we may say, keep their identity via their capacity for metabolism. As opposed to aggregates of mere matter, they have an intrinsic unity. The unity of composites of matter that are not organisms is mere phenomenal: we describe bodies like ponds or mountains as unities. Organisms, on the other hand, perform their unity. An organism's unity is there as an ongoing process, independent of our ascribing it to the organism. With organisms it is not our synthesizing perception that creates unity or identity, but an active performance. What takes place with organisms is a process of self-unification or active self-integration. As mentioned above, with respect to ''self-integration'' at the level of pure metabolism one must be careful not to put a connotation of consciousness into ''self.'' Self-integration or self-unification merely point to the fact that it is not the human observer who determines the boundary of an organismic being; rather it is the organismic entity itself. Self-unification of metabolizing entities must not be mingled with the idea of a conscious self because then there would be no metabolism without consciousness; there would even be a basic consciousness at the level of plants. Once used in the context of metabolism, the concept of ''self'' has a tendency to lure us away into presupposing concern and inwardness wherever organismic self-integration takes place. Jonas (1966, 79) is susceptible to this misunderstanding when he says that its duration and its identity in duration are the ontological individual's (i.e., the organism's) own concern: ''In living things, nature springs an ontological surprise . . . an entirely new possibility of being: systems of matter that are unities of a manifold . . . for the sake of themselves.'' This does not go together with the task of keeping metabolism free from all mental connotations. As will be shown below, there are organisms—that is, plants—that display ontological unity without concern or inwardness. Again, biological boundaries neither explain consciousness nor reduce it to the organismic level, but they contribute in making consciousness' place in reality intelligible.

Organismic Transcendence

The level of organismic existence not only represents ontological freedom toward its matter; the organism also ''stands in a dialectical relation of needful freedom to matter'' (p. 80). In spite of being independent from its temporary stuff, it is indispensable for the organism to have some outward matter—that is, nutrition—at its disposal. In the context of metabolism, consciousness seems related to the neediness of organisms rather than to an alleged freedom. The preponderance of neediness becomes evident as we proceed to the concept of organismic transcendence, which had been explained by Plessner as the organism's being beyond itself.[9] Hartmann (1950, 528) adopts the content of this concept and expresses it as follows: ''The organism is the spatially self-transcending being. With its self-transcendence it ultimately leaves behind the categorial character of dynamical structures.'' Our solar system is an example for a dynamic structure: up to a certain extent, it balances dissolving influences from outside. Moreover, it is not a mere accumulation of parts; its boundary, movements, and persistence depend on the interplay of divergent forces and processes. It is specific for organismic existence ''that the material boundary of the body does not coincide with the frontier of the living individual. The organism with its functions reaches far out into the encompassing physical world'' (p. 525). The organism extends its aliveness beyond its physical boundary (p. 526).[10]

To perpetuate its metabolism, the organism must have matter at its disposal. This indigence explains the organism's being turned outward. It has to incorporate matter that it finds outside itself. Consequently, it must have an ability to encounter organisms outside itself: ''Thus 'world' is there from the earliest beginning, the basic setting for experience—a horizon of co-reality thrown open by the mere transcendence of want'' (Jonas 1966, 84). Hence the character of earliest consciousness must have been self-concern.

The maintenance of metabolism implies perpetuated neediness, which corresponds to the organism's self-transcendence, its existence beyond itself. Self-transcendence becomes manifest in two ways: as the organism's motility and as its receptivity. Motility is guided by reception and urged by life-affirming neediness, it discloses a ''there'' into a ''here,'' a ''not yet'' into a ''now.''[11] Motility is the outwardly active aspect of animal-like self-transcendence. This spatial self-transcendence opens to an environment.

Life and Consciousness Are Coextensive

Life is where an organism's identity in duration becomes the organism's own concern. Accordingly, life must be coextensive with consciousness. This is so because without consciousness there would be no concern but indifference (Plessner 1975, 79).

The outward orientation, with motility as its decisive aspect, must have a corresponding passive aspect, an aspect of inwardness feeling, awareness, or sensitivity.

Inwardness corresponds to transcendence. Jonas (1966, 84) insists that ''it must be there for satisfaction or frustration to make a difference . . . in some (even if infinitesimal) degree of 'awareness' it harbors the supreme concern of organism with its own being and continuation in being.'' Without consciousness, however faint, there would not be an intrinsic momentum of neediness inherent in the organism. Motility and sensibility presuppose each other. Life's being conscious is internally linked with its being active. Hence an alleged consciousness of plants can be doubted. Food is ubiquitous to them. For the description of plant metabolism, neither neediness nor locomotion is an indispensable category for plant metabolism. Thus, the organismic existence of plants does not give any indication of consciousness.

For the underpinning of his idea of a coextension of life and consciousness (p. 58), Jonas (1973, 83) refers to what he calls the ''shattering of Cartesian ontology by evolutionism.'' Evolutionism made it impossible to conceive of mental phenomena as an abrupt ingression of an ontological foreign principle with the appearance of humankind. The acceptance of Darwinism established continuity between humans and all other organisms.[12] A person's isolation fell, ''and his own evidence became available again for the interpretation of that to which he belongs. For if it was no longer possible to regard his mind as discontinuous with prehuman biological history, then by the same token no excuse was left for denying mind, in proportionate degrees, to the closer or remoter ancestral forms, and hence to any level of animality'' (Jonas 1966, 57).

Any level of animality that displays sense organs or motility owns consciousness, even if one very much unlike ours (see Hartmann 1949, 48; 1959, 179). Only those forms of animal life are possibly exempt that show neither motility nor sense organs, as for example sponges. Indeed, until the second half of the eighteenth century sponges were regarded as plants. A plant and its environment form a permanent context into which the plant is fully integrated. In the case of plants we are dealing with immediate environment relations. The metabolism of plants corresponds to blind organic function; in the case of plants there is no need for appetition as the basic form of self-concern. Since they cannot move, plants do not ''find'' or look out for nutrition; they are provided with nutrition from their ecological environment. Because of this relation, there is no consciousness (awareness, want) with plants as opposed to animals, which must be aware at least of those organisms they prey on. Furthermore, being immovable, plants cannot escape other organisms. This is another reason why there is no basic consciousness (fear) with them. Plants need not escape other organisms. Becoming another organism's nutrition does not make a felt difference to them. As opposed to animals, the immovable plant's organismic processes take place without any kind of basic consciousness being involved.

All these reflections demonstrate a coextension of life and consciousness, in spite of a still lurking uneasiness that one must acknowledge when contemplating the consequences of such assertion. Plants, from an ontological point of view, must be

considered organisms because of their physical organization, yet they can hardly be recognized as living entities.[13] Of course, there might be faintly conscious single-celled autotroph motile organisms (e.g., euglena) that some would classify as plants.[14] Between rooted plants and their environment there is no gap, the mediation of which would become felt by the plant-organism as need or desire. A principle of mediation in which consciousness and motility reside cannot be applied to the mode of plant existence. In rooted plants there is no distance between need and satisfaction that would allow for concern and satisfaction as manifestations of consciousness.

Jonas (1966, ix) speaks of ''the dimension of inwardness that belongs to life.'' This assertion has an unexpected consequence that most likely evaded Jonas's attention: if inwardness belongs to life, then organisms that lack inwardness (consciousness) cannot be considered living beings. Asserting that consciousness and life are coextensive implies that there is a difference between nonconscious organisms and conscious living beings. If life and consciousness are coextensive, then the conclusion is unavoidable that plants are organismic though not living entities. This conclusion is urged on us by the investigations of Plessner, Hartmann, and Jonas, though none of them formulates the unexpected conclusion as such. Instead, they tacitly regard plants as living beings. What distinguishes living organisms from nonliving organisms is consciousness. A nonconscious organism functions, though it is not alive. Not being alive, nonconscious organisms such as plants do not die, they fade. The phrase ''living being'' cannot be extended to regular organisms if they do not display some sort of inwardness. Living systems are alive because they are conscious. To be alive is not just to be a physical system of a certain general kind. Consciousness (not a vital spirit) is the extra property beyond mere physical features of organismic systems that renders certain organisms alive. Consciousness, in essence, is life.[15]

The Otherness of Consciousness

Jonas developed a philosophical biology that aimed at dissolving the old juxtaposition of mind and matter. He had identified an ontological scheme of being where consciousness is not opposed to matter but is an aspect of organismic existence—that is, organismic organization of matter. At the same time, however, Jonas was urged by his own assumptions to draw the conclusion that some entities are organismic though not conscious. He was not able to ascribe consciousness to plant organisms. Consequently, the grip of a philosophy of organismic existence on consciousness must not be overestimated. Organismic existence does not necessarily go along with consciousness. A successful integration of consciousness into the interplay of some basic organismic categories (metabolism, motility, transcendence) does not abolish the profound otherness between organismic being and consciousness. The question persists how spatiotemporal organismic processes can produce nonspatial consciousness.

The Subterfuge of a Metaphysics of Steady Transition

Organisms are entities composed of particles containing only physical properties. By analyzing the modes in which physical properties are organized in organisms, philosophical biology will never find something that is not objective. It evinces that at least in some respect Jonas must have been aware of the fact that an analysis of organismic being, however penetrating, does not amount to bridging the heterogeneity between objective organismic existence and nonobjective consciousness ontologically; between spatial reality and nonspatial reality. Where he is aware of the persisting dualism, he ''solves'' this problem by means of an expansion of (germs of) consciousness into the depth of the nonorganismic stratum. Although Jonas (1966, 81) argues against a similar thesis held by Whitehead (who imagined the elemental to be endowed with inwardness), Jonas himself did not resist the temptation to attribute to matter ''an inner horizon'' so that ''its extended being need not be its whole being'' (p. 24). Jonas (1984, 73) also stresses that '' 'Psyche' and 'selfhood' are not identical, and the first may in a general form be an appurtenance of all matter.'' By means of the principle of continuity, Jonas (1984, 73) finally resolves the dichotomy of mind and matter in panpsychism: ''When hence we descend, from man down along the animal tree, the principle of continuity requires us to concede an endless shading, in which 'representational' subjectivity surely disappears somewhere . . . , but sensitivity and appetition as such probably nowhere'', Jonas applies a principle of substantive continuity that allows for the expansion of consciousness way below humanity. The principle of steady transition means ''that we must let ourselves be instructed by what is highest and richest concerning everything beneath it'' (Jonas 1984, 69). Since humans are highest and find anorganic and organic matter[16] beneath them, this amounts to nothing less than an expansion of consciousness into the realm of matter. This strategy of a metaphysics of steady transition had already been advocated by Leibniz and Schelling. Unconscious mind, for them, is already hidden or asleep in the lowest ranks of nature and awakens to consciousness in humans. In their philosophies, there are no different strata in reality. Instead, they gradually shade off into each other. This graduality allows for a ''deduction'' of consciousness from the underlying stratum of matter.

The solution of a substantive continuity is beguiling for those who are not ready to accept an irrational gap between the organismic and the conscious stratum of reality. An irrationality is given here, if matter is merely objective. There is no conception available to explain what a physical dimension of consciousness could be like. But there is a conception available to explain what a conscious dimension of physical entities is like. That conception is known as panpsychism. It is precisely the irrationality of the gap between spatial and nonspatial reality that Jonas is unwilling to accept. His rejection of a hiatus irrationalis in reality provides a reason for his panpsychistic solution of dualism. According to him, the acceptance of an irrational hiatus within reality leads ''to the dead end of the absolute leap and of the impotence of mind'' (1984, 69).

It is his resistance to an irrational gap within reality that leads Jonas to contradict his earlier statement that the beginning of inwardness is to be placed first at the lowest rungs of animal life (1966, p. 57). He sticks to the principle of continuity as allowing for a mediation where I hold that the gap between spatial and nonspatial reality denotes reality's decisive ontological incision. Jonas's application of the principle of continuity proves that philosophers share the general human weakness (see Nagel 1979, 166) for precipitately explaining what is (as yet) unintelligible.

The Ontological Gap

To some extent we are able to situate consciousness in the interplay of basic organismic categories such as metabolism, transcendence, and motility. We can explain how primitive consciousness is fitted into the cycle of assimilation and dissimilation and develops in its service (see Hartmann 1953, 86). However, the entanglement of organismic existence and consciousness does not overcome the prevailing ontological gap between spatial and nonspatial, experiencing and nonexperiencing reality. There are good reasons for regarding a philosophy of life as too narrow a frame for the treatment of consciousness. Hartmann (1958, 183) recognizes this early when he issues a warning that coincides with Jonas's aspiration of making consciousness intelligible exclusively within a philosophy of life—that is, in considerations inspired by organismic existence: ''Consciousness as such is indeed accessible to various biological categories which seem to reconfigure it into an aspect of life.''[17] Here we can notice how Hartmann shares Jonas's fascination with how consciousness is integrated into organismic existence, while at the same time he objects to the shortcomings of an interpretation of consciousness restricted to a frame of philosophical biology. Indeed, consciousness denotes a novelty in comparison to the organic processes; organismic existence and consciousness have to be acknowledged as two different strata of real being. Consciousness not only evades the grip of physics but also that of (philosophical) biology.

Unity of the World Despite Its Stratification? From the point of view of a philosophical biology, there is no dualism between consciousness and matter because it is in the organism where consciousness and matter meet inseparably; consciousness is prefigured in the exigencies of metabolisms. These assertions, however, do not take into due consideration the heterogeneity between organismic existence and consciousness. A prefiguration does not abolish the ontological heterogeneity of corporeal life and consciousness as two strata of living beings. Thus, in order to overcome dualism it has to be shown how consciousness and body are ontologically interconnected in spite of their profound otherness.

A genuine ontological solution to this problem has been envisaged by Hartmann, who conceives the unity of the world as made possible by a recurrence of two basic categories. His categories denote intrinsic determinants of objects or events of the strata of

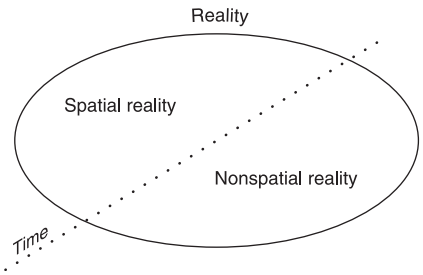

Figure 15.2
Matter and consciousness belonging to one reality. This model demonstrates how Hartmann exceeds a simple dualistic model of (organismic) matter and consciousness and how they belong to one and the same reality. The mode of being (i.e., reality) of spatiotemporal things or processes is the same as that of consciousness. Time is the fundamental characteristic of reality, not space and matter. Everything that is real is temporal though not necessarily spatial. To symbolize their temporal feature, the arrow of time crosses both spatial and nonspatial reality.

being. They are ''basic determinants of being'' (Grundbestimmungen des Seienden, Hartmann 1964, 2). Although consciousness is neither spatial nor corporeal, as matter or organisms are, it is nevertheless real. For an entity to be real is tantamount to having time as its fundamental category. Time and, therewith, process, recurring in all four strata of reality, provide the basic ontological unity of reality. The recurrence of time and process in all of reality's strata shows how the unity of the world can be envisaged despite its stratification. There is no such recurrence of spatiality and matter. They do not recur beyond the stratum of organismic reality (figure 15.2). In Hartmann's (1953, 25f.) words:

> Ontologically considered, time and space are not categories of equal worth: Time is far more fundamental than space. Only material things and living beings, including the processes through which their existence flows, are spatial. But spiritual and psychic processes, as well as material processes, are temporal. For everything real is in time and only a part of it in space—we might say, only one half of the real world, its lower forms.

Hartmann's ontology enables us to accept a great dividing line in reality (the profound otherness between the extended and the nonextended) and, at the same time, to bridge this chasm by claiming that both sides of the gulf belong to the same reality, with time as its most fundamental category. Time (and process) serves as the unifying categorial bond.[18] It is only by means of ontology—that is, by categorial analysis—that Hartmann bridges the gap between spatiotemporal and merely temporal reality. He is strictly opposed to the idea of a deduction of consciousness out of (organismic) matter. However complex spatiotemporal nerve processes and energies may be thought of, they will inevitably result in nothing but spatiotemporal processes and energies. By

pointing to these, it does not become intelligible how inwardness, a representation of the real, or even the most simple sensation, could be generated.[19]

Furthermore, it is Hartmann's contention that the gap between matter—however organized—and consciousness will not be bridged by achievements of the natural sciences. In contrast to him, today many philosophers and scientists seem to be of the opinion that detailed insight into the nervous system has already led to or will soon lead to a better understanding of consciousness. According to this view all that remains to be done is to gain a complete account of the brain. Once this task is fulfilled, consciousness would not only be intellectually transparent, but would find its place within the whole of being as just another part of (physical) nature. Raymond Tallis (1991) speaks of ''neuromythology'' to characterize the assumption that a full account of the brain would lead to the intellectual transparency of consciousness. The concept of reality as a stratified unity, as developed by Hartmann, is an early reminder that consciousness is not to be identified with processes that take place in the higher reaches of the central nervous system. Once we have acknowledged the ontological insight that organismic matter and consciousness are situated on different sides of the spatiotemporal hiatus, we can no longer think of consciousness as boiling down to nerve impulses.

When many scientists implicitly, and philosophers explicitly, advocate identity theories, they bypass the problem of how a transition between the strata should take place, how energy from objects or events, via patterns of neural activity, might be transformed into consciousness. Once we accept that physiological observations of the nervous system or brain do not render consciousness intelligible to us, we may ask with Tallis (p. 103), ''How has the myth become so powerful that many people . . . do believe that neurophysiology has advanced (or will advance) our understanding of the mind?'' The answer to this question lies in the promise to biologize consciousness and, by doing so, to establish the ontological homogeneity of the world. Hartmann makes it clear that the attempt to biologize consciousness aims at ontological homogenization.[20] But, from an ontological point of view, reality is not homogeneous. For Hartmann (1958, 182), this is a reason why neuroscience can contribute but little to the ontological problem of consciousness.

Jonas (1966, 1) contends ''that mind even in its highest reaches remains part of the organic [my emphasis].'' This presupposes an explanation of what we simply do not (yet) know about consciousness in the context of whole-part relations. I suggest that a more suitable metaphor is to perceive consciousness as being bound to organismic existence. The conception of consciousness being bound to organismic existence merely expresses the commonsense observation that consciousness is always being accompanied by organismic existence—without qualifying the nature of the coexistence. Jonas conceives of emerging conscious life as an ontological revolution in the history of matter (p. 81); to him, our body ''teaches us that matter in space, otherwise experienced only from without, may have an inner horizon too and that, therefore, its

extended being need not be its whole being'' (p. 24). This view requires an integration of consciousness into matter as residing in its primary nature. It renders consciousness an aspect of matter, which, in the conscious organism, gives full account of itself.

It is metabolism, organismic existence, that can be regarded as the result of an ontological revolution in the history of matter. The same does not hold for consciousness in relation to matter or organismic existence. The relation of organismic being toward inanimate matter is one of overforming, while that of consciousness toward corporeal life is one of overbuilding (Überbauung). In organisms, matter is overformed without being altered in its basic character. The relation of consciousness toward corporeal life is fundamentally different from the relation of corporeal life toward matter (Hartmann 1949, 66). Consciousness does not consist of atoms nor does it have, for instance, weight as a constituent (p. 98). Consciousness is not a source of superinformation on corporeal life: ''It does not integrate the organic processes and does not use them as integral parts'' (Hartmann 1953, 78). There is no steady transition from organismic existence to consciousness.

With Hartmann we must accept an irrational hiatus in real being that corresponds to a breaking off of categories prevalent in lower strata and a principle of novelty (novum). The principle of novelty implies that, compared with lower ones, each higher stratum of reality displays new features that are not determined by categories located further down. Spatiality and matter do not recur beyond the stratum of organismic reality. The novum remarked by consciousness toward organismic existence is only one example of noncontinuity in reality. Hartmann expresses this as an ontological law: The recurrence of categories ''does not in every case include all higher strata. At a certain level there is also a cessation of recurrence'' (p. 76).

Due to a cessation of recurrence, consciousness cannot be dissolved into the categories of the organismic: ''Consciousness rises above the organismic and rests on it in the same manner as the latter rests on matter; but neither has it organismic being in it as a categorial element, nor materiality and spatiality.''[21] Because of its profound otherness, owed to the categorial cessation of spatiality, consciousness designates the most remarkable novum in real being. Hartmann does not use the expression ''emergent properties.'' However, the way he conceptualizes ''novum'' demonstrates that he advocates a theory of emergence. Consciousness is emergent, because it cannot be considered a mere reshuffling of material units. It is by no means to be understood as a rearrangement of preexisting spatiotemporal elements. Of course, this does not necessarily imply that consciousness emerges from matter.

Of the countless problems that remain to be treated, I will pursue only a few in more detail here. Provided that consciousness has no spatial extension, how can the dimension of time (process) be the sole carrier of interactions between consciousness on the one hand and spatiotemporal reality on the other? And how is the assertion of the nonspatiality of consciousness related to its obvious localizability, since it is a well-

known fact that, if I have an idea, the occurrence of the idea happens not only at a certain time, but also in a certain place, say, in the café on the left bank?[22]

Localizability Does Not Warrant Spatiality

Hartmann's ontology explains the heterogeneity of consciousness and bodily existence by means of a cessation of the dimension of space beyond organismic existence. Since our conception of the nature of causation is conditioned by the phenomenon of causation in spatiotemporal (physical) reality, this heterogeneity makes it difficult for us to accept causal relations between spatiotemporal and merely temporal entities. It is a widely accepted scientific fact that causation requires spatial contact. Once we accept the nonspatiality of consciousness, causation between body and consciousness seems impossible. The fact that modern physics envisages nonlocal interaction has not yet altered a prevailing matrix of thought.

It is true that we do not in the least understand how something new is brought forth in causal relations. All causal relations include metaphysical and, by the same token, unsolvable problems (see Hartmann 1950, 328–330). The question of how something immaterial, nonspatial, and presumably nonenergetic (consciousness) could be affected causally by, or act on, something spatiotemporal (organismic being) constitutes a special case because we have extraordinary difficulty finding a scheme that makes intelligible how time as the basic condition of the real world could also be responsible for interactions between spatiotemporal reality (corporeality) and consciousness as merely temporal reality. The category of time does not appear to be sufficient for explaining how consciousness reacts on its spatiotemporal base and changes its course of action. For this reason, and without attempting to render consciousness spatial, one is urged to explore the possibility of a spatial aspect of consciousness. If such an aspect could be ascribed to consciousness, time would be exonerated from carrying the burden of being the sole categorial explanation for psychophysical causation.

Consciousness is not spatial but, by being connected to spatial existence, has a spatial aspect: ''The living individuals, as organismic beings, are in space, consciousness remains bound to the individuals.''[23] This spatial dependence of consciousness on the body, or the existence of nonspatial consciousness in a spatial world, creates an unsolved puzzle whose problematic character is not diminished when Hartmann explains contrariwise that spatial boundedness (Räumliche Gebundenheit) is something very elementary and nothing mysterious. The riddle persists because consciousness, as Hartmann unwittingly formulates, ''remains non-spatial even in its boundedness to space.''[24] Except for the phenomena of extrasensory perception, consciousness is where a conscious being is; that is, where organismic being supports its existence. Its localizability by virtue of any accepted scientific methodology ceases to exist with the demise of an organism. Consciousness is not localizable where there is no organism.

At present we have no fitting conception of what an explanation of nonspatial consciousness' position in space would be. A mathematical point must not be compared with consciousness, though it offers an analogy. A point designates a position in an area or in space. In spite of designating this position, the point itself is not extended. In a kindred manner one can envisage a position of consciousness in space, without having to ascribe to it features of spatiality such as figure and volume. Hence localizability might be thought of as an attribute of consciousness, without making it spatial. The analogy of consciousness and nonextended mathematical points has been criticized by the mathematician and scientist Leonhard Euler (1707–1783), who claims (1983, 103ff.) that being located is a feature that can be ascribed to bodily things but not to consciousness (his use of spirits differs from Hartmann's use of Spirit in figure 15.1). Instead of asking about the location of consciousness, Euler suggests, we should ask where consciousness acts on a 3.8-27864x.6(consciousneser)-4(.6(the)-37saysneser)-31exer6(act7)-35i6(acts1-27inf

pose of philosophical reflection is not the solving of riddles, but it is the exposing of miracles.''[26]

Conclusion—Patent Law and Consciousness

In the heart of scientific research there is still an uncontested belief that science proper is above and beyond all normative considerations. The pursuit of knowledge appears dissociated from any claim for wisdom. However, with advances in the study of consciousness it becomes apparent that the scientific dogma of value-free research is no longer feasible. One case in point is the debate about patenting organisms. Patents are exclusive rights granted for inventions: for a limited period others are excluded from producing or using an inventor's patented invention. Thomas Jefferson, author of the Patent Act of 1793, wanted ingenuity to receive liberal encouragement. He thus defined as patentable ''any new and useful art, machine, manufacture, or composition of matter'' (Act of Feb. 21, 1793, §1, 1 Stat. 319). Accordingly, the inventor of any new and useful composition of matter, machine, or manufacture ''may obtain a patent therefor.''[27]

For most of our history, organisms have been considered products of God or nature. An organism was deemed an invention rather than a product of nature for the first time in 1980. That year a patent was granted for a genetically modified organism. The classification of an organism as an invention caused a controversy that is still alive. The controversy is about the question of whether life has special properties that are beyond scientific scrutiny, or whether living organisms should be viewed as very complex chemical systems. According to the latter view, the difference between living and nonliving entities—for example, chemical compounds—lies only in the degree of organization. Patents on living entities would then be nothing but an extension of current practice.

How does the ontology of consciousness affect this controversy? Obviously, there is a difference between organisms and living beings. Because of a coextension of life and consciousness, nonconscious organisms can be regarded as mere (though very complex) compositions or processing units of matter. The same does not hold for living beings who, by virtue of being conscious, are more than just compositions of matter. Motility, irritability, and sense organs can be referred to as criteria to determine whether an organism is conscious or not. An organism qualifies as patentable subject matter if it can be regarded as a nonconscious composition of matter. From this point of view, certain immovable bacteria that do not display any kind of sensitivity or irritability can be regarded as patentable.

In 1972, a microbiologist, Ananda Chakrabarty, filed a patent application assigned to the General Electric Corporation. Chakrabarty ''invented'' a genetically engineered bacterium (from the genus Pseudomonas) that by virtue of the modifications, possesses

a property that does not occur in unaltered bacteria: it is capable of breaking down various components of crude oil and might play an important role in the treatment of oil spills. At first, the patent claim for the bacterium was rejected by a patent examiner, whose decision was then affirmed by the Patent Office Board of Appeals. A reason given for the rejection was that living things are not patentable subject matter under §101 (see note 27). Later, the Court of Customs and Patent Appeals reversed the rejection.[28] It argued that a microorganism's being alive has no legal significance for purposes of patent law. Instead, it held that genetically engineered bacteria are to be considered patentable subject matter under §101 because they constitute a ''manufacture'' or ''composition of matter'' within that statute. At this point in the discussion one has to determine whether a (genetically modified) organism constitutes (1) a ''manufacture'' or (2) a ''composition of matter.''

First, humans do not manufacture organisms in the proper sense of the word. Unless whole organisms are created in a laboratory, organisms are not made but simply modified. Organisms are entities capable of self-unification or active self-integration; they are products of nature. Even a genetically modified organism that displays human-made features is still a product of nature. Its decisive organismic features (metabolism and self-reproductivity) are not ''produced'' in the strict sense of the word but are ''arranged.'' From here it follows that claims that aim at patenting the organism itself are not justified. As for organisms, only inventions referring to technical methods and processes by which certain modifications are accomplished should be considered patentable subject matter, not the modified organism itself, which in the inextricable complexity of the vast majority of its processes and traits remains a product of nature. The nonpatentability of organisms with regard to their being manufactured or not becomes clear in still another respect: organisms are self-reproducing. This is a decisive aspect because, unlike the case with all other technologies, humans do not have to intervene as manufacturers in order to gain further copies once a few modified organisms are accomplished. The organism reproduces itself, so its reproductivity is not due to human invention. If at all, only those organisms can be considered patentable to which human technology has been applied. As a consequence all those generations of organisms that come into existence by virtue of self-reproductivity must be exempt from patentability according to §101.

Second, since the Chakrabarty case, organisms have been judged time and again to be patentable subject matter under §101 because they constitute a ''composition of matter.'' Under the proviso that organisms are processing material entities, self-integrating their parts, many organisms can indeed be considered compositions of matter. This definition is valid for many, though by no means all organisms. If one applies this strict definition to any organism, an ontological impoverishment of our world would result. Real being comprises more than just matter. A conscious organism is by no means exhausted ontologically by the assessment that it be a mere ''composition of

matter.'' The practice of claiming and granting patents for living beings—that is, conscious organisms—undermines the complexity of reality by failing to take consciousness into account as one of reality's strata. Certainly, living beings are also, though not exclusively, compositions of matter. But since patents are granted for whole organisms, we must ask whether an organism is ontologically exhausted by the criterion that stands for its patentability—that is, ''composition of matter.'' As shown in the present chapter, a conscious organism is not exhausted ontologically by this description. Accordingly, if one judges from the criterion ''composition of matter,'' mere organisms are patentable while living beings cannot be regarded, in principle, as patentable matter.

The factual patenting of organisms shakes our core beliefs about the essence of life. If one is opposed to the patenting of ''life,'' then the point at issue is: What is a living being? If a living being is a conscious organism, as this chapter argues, then there is good reason to refrain from patenting living beings: consciousness is something poorly understood, while patenting presupposes that something is well understood. The alternative to patenting living beings and their genes, to say nothing of human genes, is to hold them as a collective trust and make the knowledge of genetic sequences a ''common'' property.[29]

Notes

I am grateful for pertinent comments by Helmut Wautischer and for his translation of some quotations from H. Plessner and N. Hartmann from German into English.

1. Spirit is not coextensive with a single human consciousness; rather it transcends individual consciousness and links individuals in the phenomena of speech, knowledge, convictions, and prejudices or legal order (see Hartmann 1953, 45). Because of its expansiveness, spirit combines, where consciousness separates: ''Consciousness exists only as the consciousness of the individual. . . . Consciousness divides; the spirit unites'' (p. 80).

2. By phenomenal consciousness I do not mean the brain; the latter is a physical entity, while the former denotes a layer of reality that exists above physical reality (though not independently from physical reality).

3. Searle is right in concluding that nobody should exclude the possibility of a major intellectual revolution that might accomplish an as yet unimaginable concept of reduction, in the wake of which consciousness would be rendered ontologically reducible.

4. ''Man studierte denn auch nicht einfach 'Philosophie' als Fach, sondern ging eben zu Husserl, zu Heidegger, Hartmann, Jaspers'' (Jonas 1987, 13f.).

5. ''Hörte man vom Dasein als Sorge—in geistiger Hinsicht, aber nichts vom ersten physischen Grund des Sorgenmüssens: unserer Leiblichkeit. . . . Der Mensch muß essen . . . . Aber in 'Sein und Zeit' war der Leib übergangen und Natur ins bloß Vorhandene abgeschoben'' (p. 19f.).

6. This view is confirmed, for instance, by Roth (1997, 82).

7. With respect to a deduction of man's spirit (Geist) from organismic systems see the critical remarks of Dux (1994, 96f.).

8. See Hartmann 1982, 125. Because of a perpetual opposition between renewal and decay, Jonas (1966, 5) says similarly, ''Life carries death in itself . . . [and] is at bottom continual crisis''; it is ''precariously balanced between being and not-being'' (p. ix; see also Plessner 1975, 132ff.).

9. An organism, according to Plessner (1975, 132), has a ''positional character.'' That is: ''Zum positionalen Charakter gehört, daß das Ding über ihm hinaus, in ihm hinein ist. Um dieser Forderung Rechnung zu tragen, muß das Ding sozusagen in die Lage versetzt sein, von ihm Abstand

Leben zu: So ist es nichts als eine tropische Anwendung des Wortes Leben, welche ihren Grund in der Ähnlichkeit hat, welche man zwischen den Thieren und Pflanzen wahrnimmt, indem die letzteren eben sowohl, als wie die Thiere, von innen heraus wachsen, genähret werden und sich fortpflanzen. [Even though people do say that trees and plants are alive, this is due to the mistake of ascribing a soul to them, which is considered as the subjectum quo of life. If one does not take the soul as a sentient soul, but simply as animam vegetativam, one still either has to furnish it with ideas or one uses the concept in an obscure manner, as if not knowing what one is talking about. However, if one does not assume a soul in plants and still ascribes life to them, then this is nothing but a tropic use of the word life, the origin of which is to be found in the similarities that can be observed between animals and plants: growth from within, nourishment, and procreation. Trans. K. A.]

If one characterizes plants as living beings, one either attributes a sentient soul (consciousness) to plants, which is a mistake according to Crusius, or one merely attributes a nonsentient animam vegetativam to plants. However, people who envisage a nonsentient soul do not know what they are talking about. Crusius discusses a further constellation in which someone does not ascribe a soul to plants and still attributes life to them. This, he says, is just a figure of speech, a use of the word life as a trope, which stems from similarities between plants and animals. Both grow, assimilate, and procreate. With these remarks, Crusius implicitly criticizes the views of Aristotle, who states in De Anima (411b 27–28) that ''the vital principle in plants also is a sort of soul.'' Aristotle uses the concept of ''vital principle'' with reference to an organism's ability to absorb nutriment. ''It is, then, in virtue of this principle that all living things live, whether animals or plants. But it is sensation primarily which constitutes the animal'' (De Anima 413b 1–2). For Aristotle, there is no coextension of life and sentience (as a basic criterion for consciousness) but a coextension of life and the ability to absorb nutriment.

14. Euglena is unique because it displays either plant or animal features, depending on external conditions. Euglena differs from all other known one-celled organisms because it contains chlorophyll that enables it to exist like a plant when exposed to sunlight. In dark conditions, however, it lives like an animal by incorporating other microscopic organisms or their parts.

15. With these remarks I contradict David Papineau's point of view in two respects. Under the heading ''Life and Consciousness'' Papineau (1993, 335f.) ''denies that consciousness is . . . some further non-physical property which exists over and above any physicalistically specifiable property.'' To explain his view, Papineau refers to the nineteenth-century debate on the essence of life. Inasmuch as there is no nonphysical ''vital spirit'' or ''élan vital'' as an essence of life, Papineau argues, there is no nonphysical essence of consciousness. In contrast to Papineau, I hold that consciousness is a nonphysical entity, and that there is an essence of life: consciousness.

16. Organic matter refers to chemical compounds that contain carbon atoms; it must not be confused with organismic beings.

17. Trans. K. A. ''Das Bewußtsein ist als solches gerade auch einer Reihe von biologischen Kategorien zugänglich, die es gerade in ein Moment des Lebens umzudeuten scheinen.''

18. This view is shared by Foster (1991, 8, 204), who explains that consciousness and the physical realm share the same time dimension. In spite of this dimensional overlap, Foster speaks of ontological dualism—a denotation that, under his own presupposition of an ontological overlap, is not strictly required.

19. ''Aus raumzeitlichen Prozessen, Kräften und Energien, wie hochkompliziert man sie immer denken mag, resultieren immer nur wieder raumzeitliche Prozesse, Kräfte und Energien. Wie eine Innenwelt, eine Reflexion des Seins, eine Repräsentation des Realen im Erkenntnisgebilde entsteht, wird auf diesem Wege niemals verständlich. Dennoch postuliert der Materialismus dieses Entstehen. . . . Evolution soll Natur und Geist zu einer Welt zusammenschließen. . . . In Wirklichkeit versagt die Theorie schon beim ersten Schritt. Wie aus raumzeitlichen Nervenprozessen ein Bewußtseinsprozeß wird, wie auch nur der einfachste Empfindungsinhalt wirklich entsteht, kann sie nicht nur nicht nachweisen, sondern auch nicht prinzipiell verständlich machen. Zwischen dem einen und dem anderen liegt ein vollständig irrationaler Hiatus, den kein verfolgbar durchgehendes Band überbrückt'' (Hartmann 1921, 99f.). [''From spatiotemporal processes, forces, and energies independent of any highly complicated reflections, only spatiotemporal processes, forces, and energies will result. How such an interior world, such reflection of being, such representation of the real can form as a construct of epistemological contents cannot be explained from this perspective. And yet, materialism claims such an origin. . . . Evolution is called on to merge nature and spirit into one world. . . . In reality this theory fails from its first step. It cannot demonstrate how spatiotemporal neuroprocesses transform into conscious processes, nor can it explain the most simple sensory experience; it fails even in principle to make this transition understandable. Between the one and the other is a completely irrational hiatus that is not conjoined with a traceable cord.'' Trans. H. W.]

20. ''Der Vorgang der Objekterfassung wird zum homogenen Naturvorgang, wenn erwiesen ist, daß das Subjekt in nichts anderem als dem Komplex der Nervenvorgänge besteht'' (Hartmann 1921, 100). [''The process of obtaining objects becomes a homogeneous process of nature, once it is shown that the subject is derived from the complexity of the nervous system.'' Trans. H. W.]

21. Trans. K. A. ''Das Bewußtsein erhebt sich über dem Organischen, ruht auf ihm ebenso auf wie dieses selbst auf dem Materiellen, aber es hat weder die Seinsform des Organismus als kategoriales Element in sich, noch die Materialität und Räumlichkeit'' (Hartmann 1949, 305).

22. See also Helmut Kuhn's (1951, 311) remark: ''Hartmann, whose honesty as a thinker never fails him, takes cognisance of facts of this type, but he is at a loss to make sense of them. His formulae of a 'mediated spatiality' and a 'spatiality of the non-spatial' . . . only betray his perplexity.''

23. Trans. K. A., Hartmann 1964, 492: ''Die lebenden Individuen eben sind als organische Wesen im Raume, das Bewußtsein aber bleibt an die Individuen gebunden.''

24. Trans. K. A., Hartmann 1949, 95: ''bleibt auch in der Raumgebundenheit unräumlich.''

25. According to Hartmann (1921, 322f.), it ''ist sogar sehr fraglich, ob die beiden uns bekannten Gebiete, das Physiologische und das Psychologische, überhaupt aneinander schließen, ob sie sich wirklich in einer gemeinsamen, gleichsam linearen Grenze berühren, oder ob sie nicht vielmehr weit auseinanderklaffen und ein ganzes Gebiet zwischen sich haben, das dann eben ein drittes, irrationales zwischen ihnen wäre. . . . Das einheitliche Wesen des psychophysischen Prozesses liegt dann in dieser ontologischen Tiefenschicht; er ist ein ontisch realer, irrationaler Prozeß, der an sich weder physisch noch psychisch ist, sondern in beiden nur seine dem Bewusstsein zugekehrten Oberflächenschichten hat.'' [''It is also very questionable whether the two realms that are known

to us, the physiological and the psychological, actually connect, whether they really meet with a common and linear border, or whether they are far ajar with an entire additional realm between them, that would then be a third, an irrational in-between. . . . The unifying quality of psychophysical processes would then reside in this ontological depth layer; it is an ontic real, irrational process, that is neither physical nor psychic, but instead finds in both layers its surface components for consciousness.'' Trans. H. W.]

26. Trans. H. W. ''dass der letzte Sinn philosophischer Erkenntnis nicht so sehr ein Lösen von Rätseln, als ein Aufdecken von Wundern ist.''

27. Today the main body of law concerning patents is found in Title 35 of the U.S. Code: ''Sec. 101: Inventions patentable: Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.''

28. Relevant material for the Chakrabarty case can be found at http://supct.law.cornell.edu/supct/cases/447us303.htm.

29. For this suggestion, see Rifkin 1998.

References

Aristotle (1965), De Anima, trans. R. D. Hicks, Amsterdam: Adolf M. Hakkert.

Crusius, Christian August (1963), Entwurf der notwendigen Vernunftwahrheiten, wiefern sie den zufälligen entgegengestellt werden, Darmstadt: Wissenschaftliche Buchgesellschaft.

Dahlberg, Wolfgang (1983), Sein und Zeit bei Nicolai Hartmann, Frankfurt a. Main: Verlag A. V. I. V. A. W. Dahlberg.

Dux, Günter (1994), ''Für eine Anthropologie in historisch-genetischer Absicht: Kritische Überlegungen zur philosophischen Anthropologie Helmuth Plessners,'' in: Günter Dux and Ulrich Wenzel, eds., Der Prozeß der Geistesgeschichte, pp. 92–115, Frankfurt a. Main: Suhrkamp.

Euler, Leonhard (1983), Briefe an eine deutsche Prinzessin über verschiedene Gegenstände aus der Physik und Philosophie, Leipzig: Verlag Philipp Reclam jun.

Foster, John (1991), The Immaterial Self: A Defense of the Cartesian Dualist Conception of the Mind, London and New York: Routledge.

Hartmann, Nicolai (1921), Grundzüge einer Metaphysik der Erkennntnis, Berlin: Walter de Gruyter.

——— (1948), Zur Grundlegung der Ontologie, Meisenheim am Glan: Westkulturverlag Anton Hain.

——— (1949), Das Problem des geistigen Seins, Berlin: Walter de Gruyter.

——— (1950), Philosophie der Natur: Abriss der speziellen Kategorienlehre, Berlin: Walter de Gruyter.

——— (1953), New Ways of Ontology, trans. Reinhard C. Kuhn, Chicago: Henry Regnery Company.

——— (1958), ''Philosophische Grundfragen der Biologie,'' in: Kleinere Schriften III, pp. 78–185, Berlin: Walter de Gruyter.

——— (1964), Der Aufbau der realen Welt: Grundriss der allgemeinen Kategorienlehre, Berlin: Walter de Gruyter.

——— (1982), ''Zeitlichkeit und Substantialität,'' in Der philosophische Gedanken und seine Geschichte, pp. 79–132, Stuttgart: Reclam.

Jonas, Hans (1966), The Phenomenon of Life: Toward a Philosophical Biology, New York, NY: Harper & Row Publishers.

——— (1973), Organismus und Freiheit: Ansätze zu einer philosophischen Biologie, Göttingen: Vandenhoeck & Ruprecht.

——— (1984), The Imperative of Responsability: In Search of an Ethics for the Technological Age, Chicago, IL and London: The University of Chicago Press.

——— (1987), Wissenschaft als persönliches Erlebnis, Göttingen: Vandenhoeck & Ruprecht.

Kuhn, Helmut (1951), ''Nicolai Hartmann's Ontology,'' in The Philosophical Quarterly, Vol. 1, No. 4, July, pp. 289–318.

McGinn, Colin (1989), ''Can We Solve the Mind-Body Problem?,'' in Mind, Vol. xcviii, No. 391, July, pp. 349–366.

——— (1995), ''Bewusstsein und Raum,'' in Thomas Metzinger, ed., Bewusstsein: Beiträge aus der Gegenwartsphilosophie, pp. 183–200, Paderborn: Schöningh.

Nagel, Thomas (1979), Mortal Questions, Cambridge: Cambridge University Press.

Papineau, David (1993), ''Physicalism, Consciousness and the Antipathetic Fallacy,'' in Australasian Journal of Philosophy, Vol. 71, No. 2, June, pp. 169–182.

Plessner, Helmuth (1975), Die Stufen des Organischen und der Mensch: Einleitung in die philosophische Anthropologie, Berlin and New York, NY: Walter de Gruyter.

Rifkin, Jeremy (1998), The Biotech Century: The Coming Age of Genetic Commerce, New York: Jeremy P. Tarcher/Putnam.

Roth, Gerhard (1997), Das Gehirn und seine Wirklichkeit: Kognitive Neurobiologie und ihre philosophischen Konsequenzen, Frankfurt a. M.: Suhrkamp.

Searle, John (1994), The Rediscovery of the Mind, Cambridge, MA: MIT Press.

Sheldrake, Rupert (1981), A New Science of Life, London: Blond & Briggs Limited.

Tallis, Raymond (1991), ''A Critique of Neuromythology,'' in Raymond Tallis and Howard Robinson, eds., The Pursuit of Mind, pp. 86–109, Manchester: Carcanet Press Limited.

Whitehead, Alfred North (1979), Process and Reality: An Essay in Cosmology, corrected edition, David R. Griffin and Donald W. Sherburne, eds., New York, NY: The Free Press.