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PHILOSOPHY OF NATURE AND PHILOSOPHICAL ANTHROPOLOGY

by

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Preface

After Dooyeweerd had completed his first trilogy, "De Wijsbegeerte der Wetsidee" (1935-36; transl.: "A New Critique of Theoretical Thought"), already during World War II he began a second trilogy, titled "Reformatie en Scholastiek in de wijsbegeerte". The first volume of this work appeared in 1949. The second volume was completed as well, but for different reasons it was never published at the time, except for part of it in the form of articles. The third volume, which, according to the title of the manuscript, was intended to be an "Introduction to the anthropology of the Philosophy of the Cosmonomic Idea," was never finished unfortunately. It is much to be regretted that Dooyeweerd did complete his cosmology but not the anthropology which was the elaboration of it. This anthropology, which had a central place in his transcendental criticism (the "starting-point" of his philosophy), should have become also the "crowning" of his philosophy (cf. his "New Critique" III, p. 781-784). In an interview (J.M. van Dunne et al., "Acht civilisten in burger", Zwolle 1976, p. 54), Dooyeweerd sayd that after the war he was no longer interested in finishing the second volume (and therefore the third volume as well, WJO) of his "Reformatie en Scholastiek" trilogy because the traditional-scholastic school had suddenly lost all influence at the theological faculty of the Free University in Amsterdam.

The manuscript of the third volume was kept by the Free University, which made a microfilm of it. This formed the basis for a typescript made in 1978, which in the same year was carefully compared with the microfilm by the late dr. H.J. van Eikema Hommes. The typescript was the property of the Dr. Herman Dooyeweerd Archives Foundation in Amsterdam, and was later entrusted to the Herman Dooyeweerd Foundation in California. It was translated into English by dr. M. Verbrugge and edited by myself. This was no easy job because the text finishes in the middle of a sentence, shows many gaps, as well as some strikingly parallel parts, as if Dooyeweerd had rewritten certain sections. At the time of his death, the manuscript was therefore not at all suitable for publication. These things have to be taken into account when reading the edited version.

The contents of this volume are nevertheless quite important, however. Many points in Dooyeweerd's well-known "anthropological theses" (see "De leer van den mensch in de Wijsbegeerte der Wetsidee", *Correspondentiebladen* 7, 1942, p. 134-144; reprinted in *Sola Fide* 7, 1954/2, p. 8-18), which form a summary of this volume, are clarified by it. It is in this third volume that Dooyeweerd deals extensively with the "act structure", and particularly with the question which surpasses all the problems related to the temporal corporeality of being human: the question of the human I (or, the heart, the soul, the spirit).

It is with the greatest pleasure that I present this important volume to the reader. I sincerely hope that it will receive the attention which it deserves.

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Foreword by the General Editor

The main focus of this work is to give a systematic account of the structure and interlacement of non-living and living entities, including plants, animals and human beings. Initially, in the Dutch edition of his *Philosophy of the Cosmonomic Idea* ("De Wijsbegeerte der Wetsidee"), Dooyeweerd did not acknowledge a *foundational function* for material things, plants or animals. However, in his extensive article on the substance concept in the philosophy of nature, he explained that analyzing an enkaptic structural whole points in the opposite direction.[1]

In order to explain the nature of individual things (both natural and societal entities), Dooyeweerd introduced the concept of *individuality-structure*. This term arguably represents one of the most difficult concepts in Dooyeweerd's philosophy. Coined in both Dutch and English by Dooyeweerd himself, it has on occasion led to serious misunderstandings among scholars. Over the years there have been various attempts to create alternative terms, some of which are described below. However, in the absence of consensus, it was decided to leave the term as it is in the translation of Dooyeweerd's works.

"Individuality-structure" is the general name or the characteristic law (order) of concrete things, as given by virtue of creation. Individuality-structures belong to the law-side of reality. Dooyeweerd uses the term individuality-structure to indicate a structural order for the existence of individual entities. Thus the structural laws for the state, marriage, works of art, mosquitoes, sodium chloride, and so forth are referred to as individuality-structures. The idea of an individual whole is determined by an individuality-structure that precedes the theoretical analysis of its modal functions. The identity of an individual whole is a relative unity in a

1 "Het substantiebegrip in de moderne natuurphilosophie en de theorie van het enkaptisch structuurgeheel" (The substance concept in modern philosophy of nature and the theory of the enkaptic structural whole), *Philosophia Reformata* 15 (1950): 66-139, at 75, n. 8. See also "Het Tijdsprobleem in de Wijsbegeerte der Wetsidee" (The Problem of Time within the Philosophy of the Law Idea), *Philosophia Reformata* 5 (1940): 193-234, at 220, n. 49.

multiplicity of functions. Hendrik Van Riessen prefers to name this law for entities an identity-structure, since it guarantees the persistent identity of all entities.[1] More recently, Jacob Klapwijk also proposed to speak of identity-structures.[2] In his work *Alive*,[3] Magnus Verbrugge introduced his own distinct systematic account concerning the nature of what he calls *functors*, a word first introduced by Hendrik Hart to refer to individuality-structures.[4] As a substitute for the notion of an individuality-structure, Verbrugge advances the term *idionomy*.[5] Of course this term may also cause misunderstanding if taken to mean that each individual creature (subject) has its own unique law. What is intended is that every type of law (*nomos*) delimits and determines unique subjects. In other words, however specified the universality of law may be, it can never, in its bearing upon unique individual creatures, itself become something uniquely individual. Another way of grasping the meaning of Dooyeweerd's notion of an individuality-structure is, in following an oral suggestion by Roy Clouser,[6] to call it a type-law (from the Greek: *typonomy*). This simply means that all entities of a certain *type* conform to this *law*. The following perspective by Marinus Stafleu elucidates this terminology in a systematic way:[7] "typical laws (type-laws/typonomies), such as the Coulomb law – applicable only to charged entities and the Pauli principle (applicable only to fermions) – are special laws that apply only to a limited class of entities, whereas modal laws hold universally for all possible entities." Danie Strauss introduces the expression *entity structures*,[8] which was recently followed up by Andree Troost in his

1 *Wijsbegeerte*, Kampen 1970, p. 158

2 See J. Klapwijk, *Purpose in the Living World* (Cambridge University Press, 2009), p. 249.

3 *Alive*, *An Enquiry into the Origin and Meaning of Life*, 1984, Ross House Books, Vallecito, California.

4 H. Hart, *Understanding Our World*: *Towards an Integral Ontology* (New York: University of America Press, 1984), pp. 445-46.

5 Cf. *Alive*, pp. 42, 81 ff., 91 ff.

6 Communication at a conference in Zeist, the Netherlands, August 1986.

7 M. D. Stafleu, *Time and Again*, *A Systematic Analysis of the Foundations of Physics*, (Toronto: Wedge Publishing Foundation, 1980), pp. 6, 11.

8 D. F. M. Strauss, *Inleiding tot die Kosmologie*, (Bloemfontein: SACUM, 1980).

work on the philosophy of the science of faith.[1] The term *entity* comprises both the *individuality* and the *identity* of the thing concerned – therefore it accounts for the respective emphases found in Dooyeweerd's notion of individuality-structures and in Van Riessen's and Klapwijk's notion of identity-structures. The following words of Dooyeweerd show that both the individuality and identity of an entity are determined by its "individuality-structure": "In general we can establish that the factual temporal duration of a thing as an individual and identifiable whole is dependent on the preservation of its structure of individuality."[2]

Is the idea of *type laws* a form of essentialism?

Stafleu and Klapwijk, both thinkers within the tradition of reformational philosophy, hold that Dooyeweerd's thought is essentialistic. For example, when it is asserted that the meaning nucleus of the arithmetical aspect is *discrete quantity*, the way in which Stafleu understands *zin* (*meaning*) disqualifies it as essentialistic, because it does not contain a reference to the origin. In fact, Stafleu does not hesitate to invoke the development of modern natural science in its reaction to the essentialistic philosophy of Plato and Aristotle. He says that the question regarding the essence disappeared from modern natural science, and therefore it also should not find shelter in a "relational philosophy."

However, this is a deviation from Dooyeweerd's original idea. From the early 1920s, he took a principled stance in opposition to both the *substantialistic* ("essentialistic") orientation of Greek-Medieval philosophy and the *functionalistic* ("relationalistic") orientation of modern natural science.[3]

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1 A. Troost, *Vakfilosofie van de geloofswetenschap; prolegomena van de theologie* (Budel, Neth.: Damon, 2004).

2 H. Dooyeweerd, *A New Critique of Theoretical Thought*, 4 vols. (Lewiston, NY: Edwin Mellen, 1997), 3:79. The Collected Works of Herman Dooyeweerd, Ser. A, Vols. I-IV, General Editor D. F. M. Strauss. A more extensive discussion of ambiguities in Dooyeweerd's understanding of individuality structures is found in D. F. M. Strauss, *Philosophy*: *Discipline of the Disciplines* (Grand Rapids, MI: Paideia, 2009), pp. 449-53.

3 For an analysis of the shortcomings of the Aristotelian-Thomistic substance concept, see Geert ter Horst, *De ontbinding van de substantie; een deconstructie*

An integral cosmonomic idea, i.e. an encompassing idea of creation in its unity (coherence/relatedness) and diversity (uniqueness/irreducibility), has to affirm both sides of the coin – *uniqueness* and *coherence*. Dooyeweerd repeatedly emphasizes that *meaning* comes to expression in the *coherence* ('relation') between distinct (unique) aspects of reality.

Reference (relatedness/relation) depends on uniqueness, which depends on coherence. In the sense of concept-transcending knowledge, the ideas of uniqueness and (inter-modal) coherence explore modal numerical and spatial terms stretched beyond the boundaries of these aspects. It is not a sign of 'essentialism' when the uniqueness of aspects and entities is acknowledged. However, not being willing to speak of the "nature" of things does not avoid references to "denatured" *things*, which explains why Stafleu nonetheless still has to speak of the relations of (or between) things!

The (early 20th century) neo-Kantian philosopher, Heinrich Rickert, continues the functionalistic tradition with his view that the natural sciences have to proceed in a generalizing fashion, in contrast to the individualizing mode of thought predominant in the (historical) humanities.[1] Rickert initially develops this perspective by binding the natural sciences to the ideal of transforming all *concepts of things* into *concepts of function* (explicitly designated as *concepts of relations*). This neo-Kantian view of the natural sciences remains completely faithful to the aim of the classical science ideal, namely to reduce all reality to some *modal aspect*, *function* or *relation*. According to Rickert, the (functionalistic) logical ideal of the natural sciences finds its limit in the uniqueness (individuality) of experiential reality itself.

Rickert holds that:

> Whatever role the category of a thing may fulfill in a theory of the world of things, envisaged as closed, at bottom there is no doubt that the natural sciences must increasingly strive to resolve rigid and fixed things, . . . this means no less than transforming, as far as possible, all thing concepts into relation concepts. . . . Our the-

van de beginselen van vorm en materie in de ontologie en de kenleer van Thomas van Aquino (Delft: Eburon, 2008).

1 Rickert, H. 1913. *Die Grenzen der naturwissenschaftlichen Begriffsbildung*, Tübingen: Mohr (1902), pp. 68-69, 173.

> ory is valid for the logical ideal of natural scientific concepts, because this ideal solely concerns relation concepts.[1]

Moreover, highlighting the functionalistic background of an emphasis on relations is further supported by the fact that Stafleu views laws as *timeless*. "Individual things and events are intrinsically temporal, ... The timeless character conditions the existence of individuals concerned in their temporal circumstances."[2] (Rickert holds that values have an *ideal*, *timeless* being.)

As soon as Stafleu has to articulate more precisely what characters are concerned with, he takes recourse to the precision provided by modal terms. He then offers a description that looks like a quasi-compound basic concept: "A character determines an unlimited complete class of temporal subjects."[3] The term "determines" is derived from the modal meaning of the *physical aspect*, the terms "unlimited" and "complete" from the *spatial mode*, and the word "class" from a combination of the *numerical* and *spatial aspects*. The use of a metaphor, such as figuratively designating a *type-law* as a *character*, in the final analysis requires modal terms if a precise meaning is desired.

Stafleu says that he defines a character as a cluster of immutable ("onveranderlijke") natural laws instead of speaking of their *constancy*, because when anticipatory meaning moments are disclosed on the law-side of an aspect, then the-law-side itself in fact changes.

Constant modal laws versus variable type-laws?

Klapwijk argues that the mere acknowledgement of the "whatness" of entities by definition results in an unacceptable *essentialism*. As ontic *a priori's* only universal modal laws are acknowledged by Klapwijk: "If the analyses of this book are correct, then biological laws are not typically but only modally determined. They present themselves as a limited set of universal, level-bound prin-

1 Rickert, *op. cit.*, pp. 68-70.

2 M. D. Stafleu, *Een wereld vol relaties; karakter en zin van natuurlijke dingen en processen* (Amsterdam: Buijten & Schipperheijn, 2002), p. 14.

3 Ibid., p. 14.

ciples but with germinative power and an inconceivable adaptive ability."[1]

On the previous page, however, Klapwijk apparently does acknowledge *type-laws*.

> I shall not contradict essentialism's claim that the living world is characterized by type-laws. There are countless laws determinative of a particular type of micro-organism, plant, or animal. Consider microbes such as *Vibrio cholera*, the cholera bacterium, that moves by means of a flagellum. Plants such as *Kalanchoe daigremontiana* multiply by small plants on the leaves of the maternity plant. Also consider the many spiders, like *Latrodectus mactans*, the black widow, that catch their prey in a web made of very fine protein threads. Indeed, the cellular structure, the pattern of growth, and the behavior of all species is type-bound. These types are determined by law.[2]

Yet, these type-laws are not *genuine laws* but merely variable, although relatively durable "formulas" (patterns) appreciated as "standard applications of elementary biological principles" (similar to positivizations of normative principles):[3]

> Type-laws can be considered standard applications of elementary biological principles. They are ingenious key formulas that have been repeatedly tested in the evolutionary process, and codified, letter by letter, in the genome of every living organism in order to survive in the struggle for existence.[4]

The "elementary biological principles" refer to one of the abovementioned universal modal aspects of reality, acknowledged by

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1 Klapwijk, *op. cit.*, p. 254.

2 In the original Dutch text of this work, *Heeft de Evolutie een Doel*? *Over Schepping en Emergente Evolutie* (Kampen: Kok), the last sentence reads: "Deze typen zijn wetmatig bepaald" (Klapwijk, 2009:246). "Wetmatig" points at something subject to law, for only something subject to law can display the measure ("maat") of the law. The English translation therefore corrected the Dutch text inadvertently.

3 Klapwijk, *Purpose in a Living World*, pp. 253: "Thus, type laws are not to be ignored. They are a spontaneous and obvious presupposition in our daily life experience. They are also an obvious and unconscious starting-point in our biological research. However, type laws do not have a separate status. They are not to be identified with irreducible essences that originated from an original creating Word. Even less are they to be associated with an intelligent design that would have been inserted, in between times, so to speak, in the phylogeny of a population."

4 Ibid., p. 254.

Klapwijk as "ontic apriori's." His statement contains a subtle ambiguity, because instead of speaking of the adaptability of living things belonging to a specific level (namely that of *biotic subjects*), it treats these "level-bound principles" as if they themselves are entities with "germinative power and an inconceivable adaptive ability."[1]

When Dooyeweerd critically discusses Lever's work on *Creation and Evolution* (1956)[2] he speaks of the "successive realization of ordering types" and sees the *phyla* as the highest of ordering types, and species as the lowest (Klapwijk mistakenly identifies Dooyeweerd's idea of ordering types with the species level). Throughout all of this, Dooyeweerd consistently upholds the distinction between the law-side and the factual side of reality. Under the heading of "[T]he successive realization of individuality-structures as ordering-types of the plant and animal world," Dooyeweerd emphasizes: "The structural types of plants and animals as such are indeed not individual subjects that originate in the temporal process of becoming, for much rather they are ordering types belonging to the law-side and not the factual side of our empirical world. They can only realize themselves in transient individual living beings, but as ordering types they necessarily bear a constant and foundational character in the time order. This is the case because they *make possible* our experience of the plant and animal world irrespective of the way in which we *theoretically* envisage the *process of origination* of living beings."[3]

Dooyeweerd never casts his idea of individuality-structures in the terms used by Klapwijk: "irreducible essences." Dooyeweerd focuses on the *constancy* of God's law, which lies at the foundation of various *types* of entities. The crucial question to the view advanced by Klapwijk is therefore: why does he jump to the accusation of "essences" when the *constancy* of type-laws is at stake, but not when the universality and *constancy* of (ontic) modal aspects are defended? As noted, he states that "biological laws" are only "modally determined," because they form part of "a limited set of universal, level-bound principles," among which we find the biotic

1 Ibid., p. 243.

2 H. Dooyeweerd, "Schepping en evolutie, "*Philosophia Reformata* 24 (1959): 113-59.

3 Ibid., p. 132.

as one of the various modal aspects of reality distinguished by Dooyeweerd and Vollenhoven.

Modal universality specified in a typical way

The idea of *type-laws* aims at accounting for the fact that different entities *specify* the universal modal meaning of the various aspects of reality in peculiar (i.e., *typical*) ways. For example, both a state and a business enterprise can *waste* their money (and thus act *uneconomically*), and both ought to function under the guidance of economic *frugality*. This fact is stated from the perspective of the economic aspect in its modal universality, i.e. by disregarding the *typical* nature of the business and the state. This entails that modal laws hold universally without any specification. The implication of modal universality is that universities, businesses, states, families and sport clubs must observe the general meaning of economic norms, insofar as they function within the general modal structure of this aspect.

In other words, this is an instance of the general perspective that the modal universality of every aspect embraces all possible entities ('objects') functioning within all modalities.

By contrast, a law holding for a specific kind or type of entity does not hold for *every possible* kind or type of entity. Such a type-law nonetheless retains its universality, although its universality is *specified* and *typified*. The type-law for *being a state* is universal in the sense that it holds for *all* states. Yet not everything in the universe is a state; its type-law is specified in the sense that it applies to states only. The other side of this coin is observed in the uniqueness of the state and a business enterprise respectively functioning within the economic aspect in different ways (consider the difference between profit and tax).

Stafleu, in various articles and books, distinguishes between modal laws and type laws. For example, thermodynamics, as a general functional physical discipline that abstracts from the typicality of physical entities is not interested in the gaseous, solid, or fluid state as such, but concerns statistical physics, where the connection between the micro- and macro-structures is investigated. It makes a difference when it concerns the solid or the gaseous state.[1]

1 See M. D. Stafleu, "Quantumfysica en Wijsbegeerte der Wetsidee," *Philosophia Reformata* 31 (1966): 126-56, at p. 134.

It is the existence of type-laws that enables us to classify physical entities and place them in various categories. The typical nature of an entity specifies the modal meaning of the aspects in which it functions, but at once it also exceeds the boundaries of any single aspect, because the dimensions of aspects and (natural and social) entities are mutually irreducible. These typical natures of entities provide a peculiar "coloring" to their modal functions. Most importantly, type-laws do not hold for every possible kind of entity – they apply to a limited class of entities. Stafleu explains this distinction as follows:[1]

> Hereby we distinguish laws that are valid for a limited class of subjects (typical laws) from those that are valid for all kinds of subjects (modal laws). Typical laws, in principle, delineate the class of subjects to which they apply, describing their structures and typical properties. Examples of such laws are the Coulomb law (applicable only to charged subjects), the Pauli principle (applicable to fermions), etc. Often the law describing the structure of a particular subject (e.g., the copper atom) can be reduced to more general laws (e.g., the electromagnetic laws in quantum physics). On the other hand, modal laws are those that have universal validity. For example, the law of gravitation applies to all physical subjects, regardless of their typical structure. We call them modal laws because, rather than circumscribing a certain class of subjects, they describe a *mode* of being, relatedness, experience, or explanation.

Nominalism rejects any conditioning order.
The case of evolutionism

Since Descartes, modern nominalism has rejected all universality outside the human mind. Descartes clearly states that "number and all universals are mere modes of thought."[2] However, since both Klapwijk and Darwin accept universal *physical laws*, their view of such laws is not nominalistic. They differ in respect of *biotic laws* ("biological laws") because Klapwijk does acknowledge universal (ontic) biotic (and other modal) laws, something never asserted by Darwin. Only within the domain of physics (and the material world) does Darwin continue to subscribe to universal (and constant) *natural* laws, but as soon as living entities enter the scene, Darwinists deny any *typicality* while rejecting the existence of *biotic*

1 Stafleu, *Time and Again*, p. 11; cf. pp. 6 ff.

2 *Principles of Philosophy*, Part i, lvii.

laws. Darwin does speak of a "general law of nature"[1] and of "a universal law of nature"[2] – but he never speaks of *biotical* laws of nature – even when biotic phenomena are at stake. For him, physical laws (or natural laws) are sufficient – an underlying *physicalism* dominates his entire work, *On the Origin of Species*.[3]

Biological thinking prior to Darwin is embodied in the tradition of (a vitalistic and) idealistic morphology – from Aristotle to the neo-vitalism of Driesch and his followers. This orientation was accompanied by the idea of a (supposedly) immaterial *vital force* (*entelechie*). Since theory formation always explores certain *modes of explanation*, the effect of elevating one mode of explanation normally results in a *monistic* theoretical orientation.

Darwin opted for the idea that living entities are *intrinsically changeable* and subject to *chance processes*. But his eventual acceptance of the principle of *uniformitarianism* (derived from his acquaintance with Lyell's work in the field of geology) continued a feature formally similar to an element of idealistic morphology. Between 1831 and 1836, during his world tour, Darwin discovered animal fossils in South America and discerned similarities with variations of living plants and animals found on the Galapagos Islands. In his 1859 work, he developed the view of the (*incremental*) total process of becoming (*change*) stretching over millions of years – giving rise (through differentiation or speciation) to the rich variety of species we know today. According to him, adaptation is the mechanism through which living things survive, and Darwin characterizes the overall process as controlled by natural selection. In respect of his view regarding the continuous flux of living entities, Darwin reveals his indebtedness to modern nominalism.

As far as Darwin's original position is concerned, as presented in 1859, it should be kept in mind that his view of *natural selection* entails what Dobzhansky emphasized, namely that "Mutation

1 Charles Darwin, *On the Origin of Species by Means of Natural Selection, or the Preservation of favoured races in the struggle for life* (1859); edited with an Introduction by J. W. Burrow (Penguin, 1968), p. 143.

2 Ibid., p. 268. See also pp. 143 (2x), 147, 427, and 445.

3 See Strauss, D. F. M. 2007, Did Darwin develop a theory of evolution in the biological sense of the word? In: *South African Journal of Philosophy*, Vol.26 (2):190-203.

alone, uncontrolled by natural selection, could only result in degeneration, decay and extinction."[1] The fact that almost all mutations are defective and harmful make them solid candidates for elimination by natural selection. Darwin explicitly states that we "may feel sure that any variation in the least degree injurious would be rigidly destroyed" by natural selection.[2] For all practical purposes, the combination of Darwin's original view of natural selection with the neo-Darwinian understanding of mutation therefore rules out all Darwin's hope for evolution; what is left is only *devolution*. The fact of the matter is that natural selection is a conservative process in the sense that it cannot produce or create anything – it can merely select from what is "presented." As Mortenson puts it: "natural selection can explain the survival of the fittest, but not the arrival of the fittest."[3]

In respect of the typical structure of entities, nominalism does not accept any conditioning order (universal modal or typical structures), or any orderliness (universal structuredness) of such entities. Every entity is strictly individual. When rationalism is defined as reifying what is universal and irrationalism as reifying what is individual, then nominalism surely at once represents both an irrationalistic and a rationalistic view; irrationalistic insofar as every individual entity is completely stripped from its universal orderliness (law-conformity), and the order conditioning its existence, and rationalistic insofar as it acknowledges universal concepts or names (nomina) within the human mind.

When Simpson remarks that plants and animals are not types and do not have types, since every one of them is unique,[4] he represents a fully-fledged *nominalistic* conviction. The genesis of plants, animals and human beings are taken up in a *structureless continuum*. Darwin proceeds from the assumption that there is no discontinuity in nature, captured in the long-standing saying, *natura non*

1 Th. Dobzhansky, *The Biology of Ultimate Concern* (New York: New American Library, 1967), p. 41.

2 Darwin, C. 2005. On the Origin of Species by Means of Natural Selection or the Preservation of favoured races in the struggle for life (1859b). WEB version: http://www.infidels.org/library/historical/charles_darwin/origin_of_species/Intro.html (accessed on October 29, 2005), page 46.

3 T. Mortenson, *Origin of the Species*: *Was Darwin Right*? DVD, Hebron, KY, 2006.

4 Simpson, G.G. 1969. *Biology and Man* (New York: Harcourt), pages 8-9.

facit saltus (*nature does not make jumps*). This conviction, dating back to Greek philosophy and particularly dominant within modern philosophy since the Renaissance, entered modern philosophy at its very inception.

Dooyeweerd's penetrating analysis of the rise of modern Humanism during and since the Renaissance emphasizes that the *ideal of a free and autonomous personality* gave rise to the *natural science ideal* aiming at reducing all reality to the *continuity of human thought*, guided by whatever *aspect* of nature is elevated to become the all-embracing basic denominator for our understanding of reality.[1] Although the freedom motive gave birth to the natural science ideal, the latter turned into a veritable *Frankenstein* by leaving no room for human freedom and accountability within the context of a nature determined by causal laws ("laws of nature").

According to nominalism, systematic distinctions, exemplified in different taxonomies, are simply *arbitrary names* (*nomina*) given to a vast number of individually differentiated living entities. The universality implied in these names is a product of our constitutive human understanding without any foundation in the "things outside the mind." Charles Darwin explicitly advances this view in his "Origin of Species". He says that "no line of demarcation can be drawn between species" and continues: "In short, we shall have to treat species in the same manner as those naturalists treat genera, who admit that genera are merely artificial combinations made for convenience."[2]

Continuity and discontinuity

The last fifty to sixty years witnessed an increasing challenge to the classical Darwinian conception of a gradual and continuous transition through numberless incrementally (infinitesimally) small changes over millions of years. This challenge flows from what Gould and Eldredge characterize as the *dominant theme* of the fossil record, namely *stasis* (*constancy* or *fixity*). One may capture the core of this issue by employing the opposition of *continuity* versus *discontinuity*. In their famous 1972 article, they create a title consisting

1 See Dooyeweerd, *A New Critique of Theoretical Thought*, 1:188 ff.; cf. 4:37-38.

2 *On the Origin of Species* (1968 ed.), pp. 443, 456.

of opposing metaphors: "Punctuated equilibria: an alternative to phyletic gradualism."[1]

Their argumentation clearly shows that they seriously take notice of the developments within the contemporary philosophy of science – and in particular they question the positivistic assumption (prejudice) of objective and neutral "empirical" observations.[2]

The *Editorial Introduction* points out that "a larger and more important lesson runs" throughout their essay: "*a priori* theorems often determine the results of 'empirical' studies, before the first shred of evidence is collected."[3] The first point they make promise the following argument: "The expectations of theory color perception to such a degree that new notions seldom arise from facts collected under the influence of old pictures of the world. New pictures must cast their influence before facts can be seen in a different perspective."[4]

The most important and pervasive *a priori* assumption in Darwin's thought consists in his trust in the continuity postulate of the Humanistic science ideal. He employs the phrase "natura non facit saltum" four times in his 1859 work in spite of the fact that he must honestly concede that the evidence for this assumption is lacking. In connection with the "hoped-for" intermediate links of the fossil record, Darwin writes: "But just in proportion as this process of extermination has acted on an enormous scale, so must the number of intermediate varieties, which have formerly existed, be truly enormous."[5] On the same page, he adds an impor-

1 See Niles Eldredge and Stephen Jay Gould, "Punctuated Equilibria: An Alternative to Phyletic Gradualism," in T. J. M. Schopf, ed., *Models in Paleobiology* (San Francisco: Freeman Cooper, 1972), pp. 82-115.

2 Karl Popper is aware of the fact that, behind the idea of an "assumptionless" approach, a huge assumption is in fact hidden – something eventually also criticized by the prominent hermeneutical philosopher Hans-Georg Gadamer in his mockery of the prejudice of the Enlightenment against prejudices (cf. H.-G. Gadamer, *Truth and Method*, 2nd rev. ed. New York: Continuum, 1989), p. 276.

3 *Models in Paleobiology*, quoting p. 83.

4 Ibid.

5 Darwin, *On the Origin of Species* (1968 ed.), p. 96.

tant question: "Why then is not every geological formation and every stratum full of such intermediate links?"

Gould connects this *a priori* commitment to the widespread and generally defended neo-Darwinian basic definition of evolution as *continuous flux*. The stories we hear, so Gould argues, "begin from the same foundational fallacy and then proceed in an identical erroneous way. They start with the most dangerous of mental traps: a hidden assumption, depicted as self-evident, if recognized at all – namely, a basic definition of evolution as continuous flux."[1]

The dominant pattern of the paleontological record, according to Eldredge and Gould, is *stasis*. Berlinski remarks, "[M]ost species enter the evolutionary order fully formed and then depart unchanged."[2] "The clear predominance of an empirical pattern of stasis and abrupt geological appearance as the history of most fossil species has always been acknowledged by paleontologists, and remains the standard testimony . . . of the best specialists in nearly every taxonomic group. In the Darwinian tradition, this pattern has been attributed to imperfections of the geological record that impose this false signal upon the norm of a truly gradualistic history. Darwin's argument may work in principle for punctuational origin, but stasis is data and cannot be so encompassed."[3]

Jones affirms: "Far from the display of intermediates to be expected from slow advance through natural selection, many species appear without warning, persist in fixed form and disappear, leaving no descendants. Geology assuredly does not reveal any finely graduated organic chain, and this is the most obvious and gravest objection which can be urged against the theory of evolution."[4] This state of affairs explains Eldredge's remark: "and this destroys

1 S. J. Gould, *The Structure of Evolutionary Theory* (Cambridge, MA: The Belknap Press of Harvard University Press, 2002), p. 913.

2 D. Berlinski, The Deniable Darwin. In: J. A. Campbell, and S. C. Meyer, 2003. *Darwinism, Design, and Public Education* (East Lansing: Michigan State University Press), pp. 157-177, page 158.

3 P. McGarr and S. Rose, *The Richness of Life, The Essential Stephen Jay Gould* (London: Jonathan Cape, 2006), page 242.

4 Steve Jones, *Almost Like a Whale*: *The Origin of Species Updated* (London: Doubleday, 1999), page 252.

the backbone of the most important argument of the modern theory of evolution."[1]

The sole gradualist defense against *stasis* is to claim that the fossil record is "imperfect." Gould asks: "So if stasis could not be explained away as missing information, how could gradualism face this most prominent signal from the fossil record?" He continues by pointing out that paleontologists opted for the *most negative* of all strategies, namely to keep silent about stasis and thus demonstrate "the ineluctable embedding of observation within theory." Gould once more criticizes the positivistic trust in allegedly independent facts:

> Facts have no independent existence in science, or in any human endeavor; theories grant differing weights, values, and descriptions, even to the most empirical and undeniable of observations. Darwin's expectations define evolution as gradual change. Generations of paleontologists learned to equate the potential documentation of evolution with the discovery of insensible intermediacy in a sequence of fossils. In this context, stasis can only record sorrow and disappointment.[2]

It is precisely this assumption of continuous change that is challenged by Gould. He and Eldredge already started to formulate their concerns about the *assumed* continuous flux (gradualism) in the early seventies of the previous century. Their important article, which introduces the idea of *punctuated equilibria*, appeared in 1972, as mentioned above. After they first made their new ideas public in this article, another significant article appeared in the neo-Darwinian Journal *Evolution*, under the title "Paleontology and Evolutionary Theory."[3] In it, the paleontologist D.B. Kitts points out, however, that the spatial distribution and temporal sequence of organisms with which paleontology works is founded in the ordering principles of geology, and can therefore not be incorporated in biological theory: "Thus the paleontologist can provide knowledge that cannot be provided by biological principles alone. But he cannot provide us with evolution. We can leave the fossil record free of a theory of evolution. An evolutionist, however, cannot

1 Quoted by A. van den Beukel, "Darwinisme: wetenschap en/of ideologie?" In Cees Dekker, Roland Meester, and René van Woudenberg, eds., *Schitterend Ongeluk of Sporen van Ontwerp?; over toeval en doelgerichtheid in the evolutie* (Baarn: Ten Have, 2005), pp. 101-16, at 106.

2 Gould, *The Structure of Evolutionary Theory*, p. 759.

3 *Evolution* 28 (1974): 458-72.

leave the fossil record free of the evolutionary hypothesis."[1] According to him, the danger remains that biologists are convinced of the acceptability of the evolutionary hypothesis by a theory that is already inherently evolutionistic: "For most biologists the strongest reason for accepting the evolutionary hypothesis is their acceptance of some theory that entails it."[2] His final assessment reads: "Evolution requires intermediate forms between species and paleontology does not provide them."[3] To this, he adds: "But most of the gaps are still there a century later and some paleontologists were no longer willing to explain them away geologically."[4] In an extensive article from 1977, Gould and Eldredge cite this article by Kitts in their literature (page 150).[5]

> The extreme rarity of transitional forms in the fossil record persists as the trade secret of paleontology. The evolutionary trees that adorn our textbooks have data only at the tips and nodes of their branches; the rest is inference, however reasonable, not evidence of fossils.[6]

Also see Stark's reference to Gould in Van den Beukel, 2005: "The extreme rarity of transitional forms in the fossil record (the professional secret of paleontologists) is the most prominent problem for Darwinism."[7]

Eldredge's statement is even more upsetting in this context: "We paleontologists have said that the history of life provides support for the interpretation of gradual development through natural selection knowing all the while that it was not true."[8]

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1 Kitts, Ibid. p. 466.

2 Ibid.

3 Ibid., p. 467.

4 Ibid.

5 See Gould and Eldredge, "Punctuated Equilibria: The Tempo and Mode of Evolution Reconsidered," *Paleobiology* 3.2 (1977): 15-151, at 150.

6 S. J. Gould, *The Panda's Thumb*: *More Reflections in Natural History* (New York: Norton, 1980), pp. 179 ff.

7 Quoted by Van den Beukel, *art. cit.*, p. 105.

8 Ibid. As early as 1982, Mayr wrote: "What one actually found was nothing but discontinuities. All species are separated from each other by bridgeless gaps; intermediates between species are not observed. . . . The problem was even more serious at the level of the higher categories." See Mayr, *The Growth of Bio-*

Yet Darwin's *a priori trust* in the validity of the continuity postulate builds upon the idea of "infinitesimally small inherited modifications," that is to say, upon a view analogous to the idea that a line could be seen as a *continuum of points*. This continuity postulate is so deeply rooted in Darwin's approach, that he is willing to equate a refutation of this claim with the absolute *breakdown* of his theory: "If it could be demonstrated that any complex organ existed, which could not possibly have been formed by numerous, successive, slight modifications, my theory would absolutely break down."[1] Gould reminds us that "my theory" here specifically refers "to the mechanism of natural selection (and not simply to the assertion of evolution)."[2] Moreover, Gould calls upon Gruber, Barrett and Mayr who also noted the centrality of gradualism in Darwin's thought and even remarks that by following his chief guru, Charles Lyell, Darwin equated gradualism with "rationality."[3]

Against Paley's argument about the good design and the harmony of ecosystems, presumably illustrating God's existence and benevolence, Darwin reverted to the quasi-Hobbesian atomistic view of struggle, supported by his discovery of Matlhus in 1838, according to which this simply follows from natural causes operative among struggling individuals. Gould explains Darwin's view: "But his interpretations could not have been more askew – for these features do not arise as direct products of divine benevolence, but only as epiphenomena of an opposite process both in

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logical Thought: *Diversity, Evolution, and Inheritance* (Cambridge, MA: Belknap Press, 1982), p. 524.

1 *The Origin of Species*, p. 109.

2 Gould, *The Structure of Evolutionary Theory*, p. 150. Richard Dawkins also adheres to the orthodox Darwinian view, believing that the power of selection slowly and incrementally builds the exquisite and intricate outfit of living organisms. This conviction clearly shows a prejudiced and premature pre-occupation with continuous change by Darwin and his followers, a bias which prevents modern (neo-)Darwinian biology to come to terms with the fact that change always presupposes something constant.

3 Gradualism had been equated with rationality itself by Charles Lyell. All scholars have noted the centrality of gradualism, both in the ontogeny (Gruber, H.E., and Barrett, P.H. 1974. Darwin on Man: A Psychological Study of Scientific Creativity) and in the logic (Mayr, The Growth of Biological Thought.) of Darwin's thought," cited in Gould, *The Structure of Evolutionary Theory*, p. 151.

level of action and intent of outcome: individuals struggling for themselves alone."[1]

In following the analysis by the physicist and historian of science, Silvan S. Scheber, Gould even posits the claim: "the theory of natural selection is, in essence, Adam Smith's economics transferred to nature."[2] In their joint article (1977), Gould and Eldredge quote from a famous letter by Marx to Engels, in which he traces the intellectual climate of Darwin back to Hobbes, Malthus and Hegel: "It is remarkable how Darwin recognizes among beasts and plants his English society with its division of labor, competition, opening up of new markets, 'invention,' and the Malthusian 'struggle for existence.' It is Hobbes' bellum omnium contra omnes,' [war of all against all] and one is reminded of Hegel's Phenomenology, where civil society is described as a 'spiritual animal kingdom,' while in Darwin the animal kingdom figures as civil society."[3]

Apart from difficulties generated by stasis as paleontological pattern for Darwin's thought, the latter's honesty is striking in this regard.

> As natural selection acts solely by accumulating slight, successive, favourable variations, it can produce no great or sudden modifications; it can act only by short and slow steps. Hence, the canon of "Natura non facit saltum," which every addition to our knowledge tends to confirm, is intelligible [simply – inserted in Darwin, 1859:444-445] on this theory (Darwin, 1859:307).
>
> He also phrases this continuity postulate as follows: "Natural selection acts only by the preservation and accumulation of [infinitesimally – Darwin, 1859:142] small inherited modifications."[4]

The constancy of fossil forms – which generally appear fully formed and remain unchanged until they disappear – must be assessed against ever-changing natural conditions. Constancy (stasis) over millions of years inevitably face numerous "attacks" from environmental changes, providing *natural selection* with ample opportunity to cause visible changes to the adapting species.

1 Ibid., p. 124.

2 Ibid., p. 122.

3 Quoted in *art. cit.*, p. 145.

4 Darwin, C. 1859b. *On the Origin of Species* (2005). WEB version: http://www.infidels.org/library/historical/charles_darwin/origin_of_species/Intro.html (accessed on October 29, 2005), page 56. The insertion of "infinitesimally" is based on p. 142 of the 1859 ed.

The empirical (paleontological) fact that this is not the case did not bypass Gould's attention when he writes: "… if stasis merely reflects excellent adaptation to environment, then why do we frequently observe such profound stasis during major climatic shifts like ice-age cycles (Cronin, 1985), or through the largest environmental change in a major interval of time (Prothero and Heaton, 1996)?"[1]

This state of affairs explains why paleontologists avoid evolution. The observation by Eldredge is significant: "No wonder paleontologists shied away from evolution for so long. It never seemed to happen. Assiduous collecting up cliff faces yields zigzags, minor oscillations, and the very occasional slight accumulation of change over millions of years, at a rate too slow to account for all the prodigious change that has occurred in evolutionary history. When we do see the introduction of evolutionary novelty, it usually shows up with a bang, and often with no firm evidence that the fossils did not evolve elsewhere! Evolution cannot forever be going on somewhere else. Yet that's how the fossil record has struck many a forlorn paleontologist looking to learn something about evolution."[2]

An additional problem for the Darwinian view is the so-called *Cambrian explosion* (530 million years ago). Darwin states:

> Geological research, . . . yet has done scarcely anything in breaking down the distinction between species, by connecting them together by numerous, fine, intermediate varieties; and this not having been affected, is probably the greatest and most obvious of all the many objections which may be urged against my views.[3]

The Darwinian idea of incrementally continuous transitions therefore also cannot come to terms with the reality of the "Cambrian

1 Gould, *The Structure of Evolutionary Theory*, p. 878.

2 Miles Eldredge, *Reinventing Darwin*: *The Great Debate at The High Table of Evolutionary Theory*. (New York: John Wiley), 1995, page 95.

3 Darwin, *The Origin of Species*, 1859, p. 307. We may add more recent words, by one of the champions of the "New Synthesis," Mayr: "Paleontologists had long been aware of a seeming contradiction between Darwin's postulate of gradualism … and the actual findings of paleontology. Following phyletic lines through time seemed to reveal only minimal gradual changes but no clear evidence for any change of a species into a different genus or for the gradual origin of an evolutionary novelty. Anything truly novel always seemed to appear quite abruptly in the fossil record." Ernst Mayr, E. *One Long Argument: Charles Darwin and the Genesis of Modern Evolutionary Thought* (Cambridge: Harvard University Press), 1991, page 138.

explosion" where the basic anatomy of the main animal groups (*phyla*) appears *simultaneously*. No new *phyla* originated since then, and no common ancestors were found. Sterelny is therefore justified in his assessment that the standard (neo-)Darwinian story runs "slap-bang into a nasty fact," the fact that about 530 million years ago, most "major animal groups appeared simultaneously". He continues:

> In the 'Cambrian explosion', we find segmented worms, velvet worms, starfish and their allies, mollusks (snails, squid and their relatives), sponges, bivalves and other shelled animals appearing all at once, with their basic organization, organ systems, and sensory mechanisms already operational. We do not find crude prototypes of, say, starfish or trilobites. Moreover, no common ancestors exist for these groups.[1]

According to Gould, Darwin introduces "the historical axis" as a "pole of explanation," to which the "only alternative" is the "[I]mmediate appearance in a fully formed state."[2]

The predicament of neo-Darwinian evolutionary theory, shaped by the assumptions of continuous flux and natural selection, is indeed tragic. No one other than Gould highlighted this fact mercilessly. Let us consider his argument. He writes: "sample a species at a large number of horizons well spread over several million years, and if these samples record no net change, with beginning and end points substantially the same, ... then a conclusion of stasis rests on the presence of data, not on absence!"[3]

Gould is completely justified in asking: "So if stasis could not be explained away as missing information, how could gradualism face this most prominent signal from the fossil record?" The an-

1 See K. Sterelny, *Dawkins vs. Gould, Survival of the Fittest* (London: Icon Books), 2001, pages 89-90; and the new edition K. Sterelny, 2007. *Dawkins vs. Gould, Survival of the Fittest* (London: Icon Books), page 116. That this fact indeed is "nasty" is evident when it is mentioned in connection with Darwin's conviction: "If numerous species, belonging to the same genera or families, have really started into life at once, the fact would be fatal to the theory of evolution through natural selection. For the development by this means of a group of forms, all of which are descended from some one progenitor, must have been an extremely slow process; and the progenitors must have lived long before their modified descendants" Darwin, *The Origin of Species*, 1859, p. 309.

2 Gould, *The Structure of Evolutionary Theory*, p. 260.

3 Ibid., p. 759.

swer reveals an embarrassing perspective: "But this project could not even succeed in its own terms, for gradualism occurs too rarely to generate enough cases for calculating a distribution of rates". And: "Instead, paleontologists worked by the false method of exemplification: validation by a 'textbook case' or two, provided that the chosen instances be sufficiently persuasive. And even here, at this utterly minimal level of documentation, the method failed". Furthermore: "A few examples did enter the literature, … where they replicated by endless republication in the time-honored fashion of textbook copying". There are, for example, "stasis rather than gradual increase in coiling in the Liassic oyster Grypaea," and likewise there is "stasis within all documented species of horses."

And then the final verdict: "But, in final irony, almost all these famous exemplars turned out to be false on rigorous restudy."[1]

A diversity of type-laws

The systematic distinction between the dimension of modal aspects and that of typical (natural and social) entities not only fits the current picture of distinct plants and animals, for it is also supported by the dominant *stasis* pattern of paleontology. In line with this pattern, Schindewolf insists that *morphology* should be appreciated as key to an understanding of the past, for it is based upon the idea of the *structural design* of particular *types* of entities. He employs the German term *Bauplan*, which is meant to capture what we have designated as *type-laws*. It should be noted that Darwin, in one of his last letters, doubted that one can avoid the assumption of

1 Ibid., p. 761-62. By the way, what does Gould think about of the Autralopithecines (Southern apes)? Recently they were once more in the news after the discovery of a new, well-preserved species, Austrolopithecus sediba. According to Gould, the Australopithecines were "uniquely different" from the apes and human beings, and he recommends the "removal of the different members of this relatively small-brained, curiously unique genus Australopithecus into one or more parallel side lines, away from a direct link with man" S. J. Gould, S.J. *Reflections in Natural History*. *Ever Since Darwin* (New York: W W Norton & Company), 1992, page 60. Gould remarks: "For the two more substantial cases, the 0.9 and 1.0 million years of stasis in the first well-documented hominid species, Australopithecus afarensis (a.k.a. "Lucy"), has been presented with much data . . . Grine (1993) has recorded 0.8 million years of stasis in Australopithecus robustus from Swartkrans cave in South Africa." (Gould, The *Structure of Evolutionary Theory*, p. 834.)

a *plan* (design) in nature.[1] Gould too, frequently employs the term *Bauplan* (*Baupläne* = *designs*) in his work of 2002.[2](see pages 154, 582, 1156, 1198, and 1202).

Concluding remark

In the light of the tremendous uncertainties and lack of decisive evidence, we are reminded of the remark by Portmann, who said that the natural system is based upon what we *know*, what we now have at hand, but that the theories of evolution are what we *suspect*, what we do not really know.[3]

Only a strong, unsubstantiated *belief* (trust, faith) in what mankind has not witnessed supports the contemporary dominant evolutionary theories. Since Dooyeweerd's main focus in this work is an investigation of what we do have at hand, it is understandable that he largely leaves the questions regarding evolution in the background. Implicitly, his structural analysis of living entities in terms of individuality structures and enkapsis therefore anticipates the current situation, which could be summarized in the statement: *Evolution, a beautiful story spoiled by facts*.

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1 See I. von Eisenstein, "Ist die Evolutionstheorie wissenschaftlich begründet?" *Philosophia Naturalis, Archiv für Naturphilosophie und die philosophischen Grenzgebiete der exakten Wissenschaften und Wissenschaftsgeschichte* 15.3 (1975), Part 1, pp. 404-45, at 412).

2 Cf. *The Structure of Evolutionary Theory*, pp. 154, 582, 1156, 1198 and 1202.

3 The biologist Geoff Barnard has recently questioned the view that the genome provides evidence for a common ancestry. He remarks that retroviral arguments pointing at common ancestry could be interpreted alternatively "on the basis of independent species infection." G. Barnard, "Does the genome provide evidence for common ancestry?" In Norman C. Nevin, ed., "*Should Christians Embrace Evolution*?" (Nothingham, UK: InterVarsity Press, 2009), pp. 166-86, at p. 186.

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CHAPTER 1

The Enkaptic Structural Whole

We shall start with a provisional definition of what we mean by an enkaptic structural whole in order to delimit the ontological problem implied in it.

> *We shall speak of a genuine enkaptic structural whole when an interlacement between structures of a different radical- or primary type is realized in one and the same typical qualified total form, which embraces all these interwoven structures in a real enkaptic unity without encroaching upon their inner sphere-sovereignty.*

From our previous investigations it has become evident that the different individuality-structures interwoven into such an enkaptic whole cannot be related to one another as parts to a whole. In that case the configuration of enkapsis would be cancelled, since the enkaptic structural whole must embrace all the structures interwoven within its internal operational sphere and assign to them their due place within the whole. The enkaptic functions of these structures must serve the whole, and their leading and qualifying role within this whole must be assigned to the highest of the interwoven structures. Nevertheless the enkaptic structure of the whole is not identical with that (part-)structure that qualifies it.

The enkaptic structural whole and undifferentiated individuality-structures

We should, however, guard against identifying this structural whole with an undifferentiated individuality-structure such as we encounter, for instance, in a primitive organized community. For no differentiated social structures have been realized yet in such an undifferentiated internal sphere of operation, which may fulfil at the same time the role of a political community, a cult community, a school, a "club," a business, an artificial kinship, etc.

On the other hand, in a genuine enkaptic structural whole we always find different interwoven individuality-structures with internal spheres of operation. These interwoven individuality-struc-

tures maintain their own inner sphere-sovereignty. And insofar as the qualifying structural principle is of a differentiated character, the latter's differentiated leading function is at the same time that of this enkaptic structural whole – something that does not apply to the human body.

In this enkaptic structural whole the individuality-structures interwoven in its total form are to be viewed as belonging to the total-structure only as long as they are united by the latter in a mutual enkaptic bond. As soon as this enkapsis is broken the whole is destroyed. However, the component individuality-structures of the enkaptic whole – insofar as they do not play the leading or qualifying role in the whole – necessarily comprise two clearly distinct but mutually indissolubly cohering spheres of operation, namely:

1. an internal sphere revealing its own inner sphere-sovereignty, and
2. an external-enkaptic sphere originating from the fact that the higher[1] component structure in which it is bound appropriates the modal functions of the lower structure and arranges them in its own operating sphere; *all this occurs according to the ordering principle of the enkaptic whole*.

As a result of its extremely intricate composition the figure of an enkaptic structural whole presents the most difficult problems for a structural analysis. A critical complexity is evinced in the difference between *enkaptic relations* and *whole-part relations*. Confusing the former with the latter must lead our reflection inquiry astray.

The theory of enkapsis, developed by Heidenhain and Theodor L. Haering,[2] ran stuck on the very complexity of the *enkaptic structural whole*. They originally modelled it after the scheme of the organic whole with its relatively autonomous parts. Haering erroneously viewed the latter as a universal pattern of an enkaptic structural totality. This was a consequence of the methodological error implied in starting from the most intricate state of affairs,

1 *Editorial note* (DFMS): The opposition "higher" and "lower" receives its meaning through the idea of a foundational ontic order. For example, the physically qualified components of living entities will receive the label lower while the living organism will be identified as the higher interwoven structure.

2 Discussed in *A New Critique*, Vol. III, Part III, Ch. 1.

such as presents itself in the enkaptic structural whole, before a proper insight had been gained in the figure of enkapsis as such.

In my first introduction to the theory of enkaptic inter-structural interlacements, explained in De Wijsbegeerte der Wetsidee, I followed the reverse path. In my opinion this is the only correct methodological approach to the problem. It was of fundamental importance to arrive at an insight into the very different *types of enkapsis*, which are incompatible with any uniform schematism.

Therefore my first investigations into the problem of the enkaptic interlacements did not yet go into the most intricate questions, viz., that of the enkaptic whole. It is true that in this way the theory explained in my *Wijsbegeerte der Wetsidee* could not be complete in any systematic sense. Nevertheless, the inductive method followed in this introductory inquiry paved the way for a methodically correct approach to the problem to be explained in the present chapter.

It is of the utmost importance to establish that the intricate figure of an enkaptic whole by no means presents itself in *all* enkaptic relations. Let us consider this state of affairs in more detail.

The enkaptic structural whole and the different types of enkaptic interlacement

In *A New Critique* we examined the different "types of arrangements" of these relations. The results of this inquiry will now guide us in establishing within which of these types the configuration of an enkaptic structural whole may occur.

It occurs, in the first place, as that of the *irreversible founding relation*. We should observe, however, that even this founding type does not always function in an enkaptic structural totality, as is already clear from our inquiry into this type of enkapsis presenting itself in human relations. In a differentiated human society there is no "highest component individuality-structure" that can qualify a supposed enkaptic structural whole of human society.[3]

On the other hand, the figure of the enkaptic structural whole always presents itself in the irreversible founding relations which we find in the interlacement of structural types belonging to the three primary "kingdoms" (viz., that of physico-chemically qualified

3 In *A New Critique* [3:653-93] I explained how such a view leads to totalitarianism.

kinds of matter and things, the plant, and animal kingdoms).[4] In addition, the irreversible founding relation is found in the structure of the human body as the structural whole of the individual temporal existence of a person. Furthermore, we find the same type of enkaptic ordering in the different individuality types of artifacts made by animals and human beings.

Among the other types of *enkapsis* relevant in this context we may mention the different kinds of *enkaptic symbiosis* in which a real *encompassing structure* can be found. But in my opinion the figure of an enkaptic whole is lacking in the type of *correlative enkapsis* that we find in the interlacement of plants and animals with their environment (*Umwelt*), and of the latter with the primary types of the former.

Modern students of botany and zoology (Woltereck and many other scholars) often speak in this case, too, of an internal structural unity and totality. But to my mind this *cannot* be right. Plants or animals cannot be a part of their environments (though no doubt in their particular bio-milieu other plants and animals will also function), nor vice versa. And we can find no enkaptic structural whole, in the previously defined sense, embracing both of them in their correlative interwovenness. Only a universalistic biological theory may suppose that such a totality is really given in the universal unity of "life" and its conditions.

We shall now examine the problem of the enkaptic structural whole that presents itself in the three primary kingdoms. Only in the final stage of this investigation – which requires a continuous confrontation with the results of special scientific research – may we hope to find a solution to the problem of how such a whole is *ontically* possible.

For, as observed, the question is not how we can find an a priori consistent construction. Rather it is that we should begin with tracing structural states of affairs that reveal themselves in empirical reality itself and which pose serious difficulties to a credible structural explanation. Perhaps my provisional conception of the enkaptic structural whole will even turn out to lack the character of a consistent structural view when we engage in a more detailed

4 *Editorial note* (DFMS): Present-day biologists distinguish up to five kingdoms.

analysis of the ontological problem implied in it. In that case it will require a later revision. In the first phase of our inquiry, however, I prefer to run the risk of a merely provisional approach if at least I may hope to have accounted for the empirical states of affairs.

CHAPTER 2

Molecular Structures

The apparent paradox in the basic thesis of chemistry

Following the experiments of Robert Boyle it was considered a genuine paradox of chemistry that the properties of chemical elements in their different compounds are not perceptible, whereas it must be assumed that they are nevertheless really present.

Since then, the further development of atomic theory has shed new light on this question. It is now generally known that the atomic nucleus determines the place of an element in the periodic system and in what we have called its physico-chemically qualified primary type. It is also known that the typical chemical reactions resulting in chemical compounds are only related to the electrons in the periphery of the atom. It is very probable that in the heavier elements these typical reactions are bound to the outermost shell of electrons only. In the chemical compounds of such heavier elements changes in these elements therefore only occur in the outermost regions of the atoms. The inner structure of the inner shells of electrons, and a fortiori, the nucleus, is not altered.[1]

The philosophical problem of structure in the relation between dissimilar atoms and their molecular combinations

Of course the philosophic problem of structure is not solved by this empirical statement. We are of the opinion that only the theory of the enkaptic interlacements can give this solution in a satisfactory way.

In the light of our previous investigations it cannot be doubted that in the chemical compound water, for instance, we are confronted with a genuine irreversible *enkaptic founding relation*. The

1 Cf. Bernard Bavink, *Ergebnisse und Probleme der Naturwissenschaften*, 5th ed. (Berlin, 1933), p. 151, and in greater detail Harry J. Emeléus and John S. Anderson, *Ergebnisse und Probleme der modernen anorganischen Chemie*, transl. by Kurt Karbe (Berlin, 1940), pp. 12 ff.

atoms are enkaptically bound in the new kind of matter without losing their original primary type. Should we assume that they have become parts of the new compound water? Certainly not. For the compound H_2O is itself the minimal total form of water.

The H atoms and the O atom, on the contrary, remain hydrogen and oxygen, respectively. Their nuclei, which determine their chemical structural type, remain unaltered, at least as to their *structural principle*; they take no part in the compound; they are not governed by the internal structural principle of water.

This does not alter the fact that the atoms, as total units, function in an enkaptic bond inside the new individuality-structure. For without their internal connection with the nuclei the electrons of the outer atomic orbits could not display chemical functions. But they do not become *parts* of the chemical compound *as a new kind of matter*. Modern chemistry has clarified this state of affairs. The electronic theory of valence[2] has until now been the most comprehensive attempt at explaining the chemical compounds, though it is generally acknowledged that it only approximates reality.

The more recent and certainly more exact theories based on quantum mechanics are provisionally only applicable in a very restricted area of chemistry. We shall avail ourselves of the theory of valence since the other theories imply insurmountable difficulties for those who are unable to comprehend their intricate mathematical apparatus.

According to the former there are three different types of atomic bonds, viz., the electronic bond, the covalent bond and the coordination bond.[3] In the first type an electron of the outermost atomic sphere passes from one atom or group of atoms into another atom or group of atoms. The two atoms or groups of atoms are held together by their mutual electrostatic attraction.

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2 "Valence" expresses the numerical relation in which the different elements combine. Thus, e.g., elements forming compounds with hydrogen in a one-one relation of atoms have a valence of one, just like hydrogen itself. Elements which bind two hydrogen atoms or another element of the valence of one have the valence of two, etc.

3 Emeléus and Anderson, *op. cit.*, p. 12 and N. V. Sidgwick, *The Electronic Theory of Valency* (Oxford, 1927).

In the covalent bond two atoms possess common electrons, so that two common electrons – one of each atom – are available for a simple compound, four for a double bond, etc.. When the combining atoms or atomic groups are not of the same type, the electrons are not equally shared and the compound displays a so-called dipolar moment, i.e., a polar structure.

The coordination bond is as a rule identical to the covalent bond and is only distinct from it insofar as the two electrons effecting the compound belong to only one of the two combining atoms.

Apparently, therefore, the molecule always involves only the electrons of the outermost atomic shell. The constellation of the nucleus, and in the case of the heavier elements also that of the inner shells of electrons, remains unaltered. The more recent theory of quantum mechanics does not affect these results upon which the the theory of valence is based, at least not in principle. But it does break with the atomistic view of the former theory and with its sensory pattern of the atomic constellation.

In conclusion, we can state that the two hydrogen atoms and the oxygen atom, typically bound together in the water molecule, cannot be considered as *parts* of the new compound water. A part of a whole must display the internal structure of the latter and this is not the case here. We can say only that a *functional* connection occurs between the atoms, i.e., that the atoms function enkaptically inside the chemical *compound* called water.

That brings us to the question: can we point at an enkaptic structural whole embracing both the bound *hydrogen* atoms and the *oxygen* atom as its enkaptic parts?

The enkaptic structural whole as a typically qualified total form

In my opinion we do indeed have such an enkaptic whole here. Consider the water molecule as a typical physico-chemically qualified *total form*. The latter cannot be identical with the new matter water as a chemical compound. For we have seen that the nuclei of the atoms do not combine. Atoms are consequently not parts of the matter water. But they are certainly embraced by the molecule as the minimal total form in which the internal structural principle of water can be realized.

But how is the internal structure of this physico-chemically qualified total form to be conceived? The form is here a spatial configuration with a typically physical arrangement.[4] *This typical configuration is the foundation* for the qualifying physico-chemical function of the whole. The latter is to be seen as the new matter *water*.

In the more complicated or more highly qualified enkaptic natural totalities of the macro-world, such as a mountain, a multi-cellular plant or animal, the embracing total form will be of a different type and will display a macroscopic figure in the sensory space of perception. But, regardless of its modality and typical qualification, a typical founding spatial form is essential to the structural whole if we are to speak of an *enkaptic structural totality*.

This is, for instance, not so in the case of unordered aggregates, which, notwithstanding certain interactions between their different components, lack the typical *total form of an inner structural whole*.[5] Nor is this state of affairs to be found in the case of structural totalities that lack a specific form, such as a piece of granite or iron and in general alloys whose typical structural properties (like hardness, elasticity, malleability and micro-structures) have been examined in detail. On the other hand, we do find the figure of an enkaptic structural whole in the case of inorganic crystals with their 32 classes of typical symmetrical forms, determined by their inner total structure.

The same may be said with respect to the characteristic mountain forms, in which the internal totality structures of typical geological formations in the final phase of their development display typical totality figures.[6] The structural properties of such formations (such as shell lime, lithographic slate, chalk, etc.) are not de-

4 Cf. Richard Woltereck's explanation of the concept "ordered spatial figure" in his work *Grundzüge einer allgemeinen Biologie* (Stuttgart, 1932), pp. 97 ff. That the molecule is a physico-chemically qualified total form appears from the fact that its microstructure is constituted by electromagnetic forces effecting a typical ordering of the atoms in the *energy space*, which is not identical with the objective sensory space of perception.

5 For example, a heap of compost, or the upper mud layer at the bottom of a lake, which forms an unordered aggregate of all sorts of remnants, animals, bacteria, sand, etc.

6 The distinction between totality-structures with and without a typical total form is amply explained by Woltereck, *op. cit*., pp. 78 ff.

ducible from a mere addition of those of the minerals and petrified animal and plant remnants enkaptically bound in them.

In any case, the enkaptic totality structure must as such always be a typical total form that *embraces* its components, regardless of how this total form is qualified. For only such a total form can do justice to both the enkaptic inter-structural interlacement and the whole-part relation.

The form has turned out to be the nodal point of enkaptic relations. These enkaptic relations function inside a typically qualified total form, which cannot be identified with any of the structures that are intertwined in it, but embraces all these and assigns each of them their due place.[7] When we see the enkapsis in this way, there is no objection to speaking of a real relation between the whole and its part.

If such a typical total form is lacking, as in the case of a mere *correlative enkapsis*, we cannot speak of an enkaptic structural whole. In the case of a water molecule, however, there is no doubt that it can be discovered. For its internal total structure embraces both the atoms combined in its physico-spatial configuration, and the new chemical bonding. And it is really a *physico-chemically qualified* total form with a typical spatial ordering of atoms according to their valence. This physical spatial form is indeed the foundation of the typical chemical characteristics of the whole. This fact finds its exact expression in the structural formula H2O, which pertains to the molecular structure rather than to water[8] as the result of the combination.

7 According to the enkaptic founding relation that finds its nodal point in the total form.

8 *Editorial note* (DFMS): As will become clear below, Dooyeweerd distinguishes between (a) *atoms* and (b) *water* – the latter taken in the sense of the chemical bond that qualifies the enkaptic whole. The *water molecule* is constituted by the founding atoms (a) and the qualifying chemical bond (b) between them. The explanation given by Dooyeweerd in his article on the concept of substance in modern nature philosophy elucidates this point unambiguously; cf. *Phil. Ref.* 15 (1950): 66-139, esp. 76 bottom.

Two seemingly incompatible series of data can be reconciled with each other by the conception of the molecule as an enkaptic whole. The evidence in favor of the continued actual presence of the atoms in a chemical combination and that in favor of the conception that the combination is a new whole

The above structural analysis can account for two seemingly incompatible series of experimentally established facts. One of them seems to be in favor of the conception that in a molecule or atomically ordered crystal lattice the atoms remain actually present. The other seems to justify the view that both molecules and crystal-lattices are real wholes.

The strongest, and to my mind convincing, experimental proof of the first conception is the fact that the atomic nuclei are unaffected by the chemical bond. (In the case of the heavier elements this also holds for the more central shells of electrons.) From this fact it may be concluded that the atom does not undergo an *inner* and consequently essential structural change. Its alteration appears to be of a *peripheral* nature only. This conclusion is corroborated by a series of other data of which we shall mention only the two most important established facts. In the first place it has appeared that the half-life of a radioactive element is completely independent of its free or bound condition.

Secondly we refer to the integral preservation of the typical line-spectra of the elements in the X-ray spectrum of their chemical compounds. This fact is important in this context since this spectrum does not originate in the periphery but in the more central shells of electrons surrounding the nuclei of heavier atoms.

On the other hand, it has been established that the light-spectra of combined atoms are not transferred into this X-rays spectrum. But the former do not originate in the more central sphere but in the *periphery* of the nuclear environment in the atom.

Of these two arguments the one concerning the independent duration of the existence of a radioactive element is doubtless the most important. In a separate treatise we have shown that the time an individual whole lasts is determined by the typical temporal order of its individuality-structure.[9]

9 "Het Tijdsprobleem in de Wijsbegeerte der Wetsidee" II, *Phil. Ref.* 5 (1940): 216 ff.

In case of an intrinsic change of this individuality-structure the constancy of the existential duration of a radioactive element would thus be inexplicable.

Another argument, derived from the experimental confirmation of the so-called stoichiometrical laws[10] of chemical compounds concerning mass and weight of the latter, is not as conclusive in my opinion because the nuclear structure of atoms is not essentially at stake in these experiments.

The fact that the atoms really continue to exist in a crystal-lattice could be proved in a particularly convincing experimental way with the aid of a so-called Laue-diagram,[11] which shows the deviation of Röntgen rays through crystal-lattices. Crystals appeared to have a net-like structural form whose nodal points are occupied by the centers of atoms. The distances between these atomic centers in the different net planes could be calculated accurately.

Continued investigations demonstrated that the intensity of the rays reflected by the crystal-lattice is not only dependent on the ordering of the atoms, but also on the so-called "atomic form-factor," i.e., on the inner structural form of each separate atom. This intensity appears to increase in proportion to the number of electrons in the latter.

Also the elementary waves emitted by the electrons of the same atom proved to interfere with each other in a way depending on the atomic structure itself, as Hartree has shown (1928/9). A particularly convincing effect was produced by the recent experiments of Kossel and his collaborators. They radiated crystals by means of cathode rays and later on also by Röntgen rays and succeeded in influencing them in such a way that the *separate atoms* of the crys-

10 The Greek word stoicheion means "element." The laws referred to are the following: 1. the famous law of Lavoisier, according to which the mass of a compound is equal to the sum of the masses of the component elements; 2. the law of Proust, i.e., the law of constant proportions or of constant composition; 3. the law of Dalton or that of multiple proportions, according to which the total weight of a chemical combination is equal to the sum of the total weights of the component elements, each multiplied by a small integer (1, 2, 3, etc.).

11 This diagram is composed of a number of points regularly ordered around the point of incidence of the chief ray.

tal-lattice operated as independent sources of radiation.[12] *It is no wonder that in recent theory the actual existence of atoms in a crystal-lattice is accepted as an established fact*.[13] However, we certainly have no right to suppose that this is only a consequence of the classical mechanistic theory, which conceived of crystals as mere aggregates of separate atoms. For it should not be forgotten that modern physics and crystallography no longer rest on the classical mechanistic foundations. We may only establish that the philosophical structural problem raised by the persistence of the atomic structures in a crystal-lattice as yet lacks a satisfactory solution.

On the other hand, there is a series of experimentally established facts which doubtless favors the conception that a molecule is a typical whole. It has been found, for example, that the colors of the absorption-spectrum (i.e., the spectrum of light dispersed by matter) do not correspond to vibrations whose amplitude may *vary continually*, but are bound to typical quantum conditions. This is certainly not in accordance with the classical atomistic conception of a molecule as a mechanical aggregate of atoms. There are additional facts which favor the opinion that a chemical compound is a new totality. But it is not necessary to sum them up since the older atomistic view has been definitively abandoned by modern physics and chemistry.

The philosophical background of the older conception of the chemical combination as an aggregate of elements

In classical physics and chemistry this atomistic view was generally accepted. Insofar as experimentally established facts were known to confirm the continued existence of atoms in their different compounds they were considered convincing proofs that this atomistic conception was correct. The fact that the latter was not easily relinquished was no doubt due to the influence of the deterministic science-ideal which implicitly or explicitly dominated the theoretical view of empirical reality.

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12 Cf. F. Laves, "Fünf und zwanzig Jahre Laue-Diagramme," *Die Naturwissenschaften* 25 (1937): 705 ff.

13 Cf. e.g., F. M. Jaeger, *Lectures on the Principles of Symmetry*, 2nd ed. (Amsterdam, 1920), p. 158: "These atoms preserve, therefore, apparently their individuality as constituents of such crystalline substances."

This classical mechanistic view reached its acme in the atom model projected by Rutherford according to which an atom, too, was conceived of as a mechanical system of elementary corpuscles (a kind of solar system with planets in micro-dimensions). But after the rise of quantum physics in the twentieth century, this conception became outdated. It could only have an after-effect in modern atomic theory as a sort of atavism. This can, for instance, be clearly pointed out with respect to Bohr's new atomic theory. Bohr tried to accommodate the classical pattern of Rutherford to the quantum theory of Max Planck, although this mechanistic model of atomic structure had already run into insoluble conflicts with the electromagnetic theory of Maxwell.

In this way, to be sure, Bohr arrived at a formula which in an amazingly exact and elegant way could account for the experimental results with respect to the atom-spectrum. But his theory resulted in new anomalies because it maintained certain mechanistic conceptions which were in principle incompatible with the foundations of quantum mechanics. In the present context we cannot go into this subject in more detail; we refer the interested reader to some other works[14] in which Rutherford's and Bohr's atomic theories have been subjected to a thorough analysis.

The neo-Thomist theory of Hoenen concerning the ontological[15] structure of atom and molecule

We shall, however, have to pay special attention to the neo-Thomist theory of Hoenen, emeritus-professor of the Gregorian University in Rome, concerning the ontological[16] structure of atoms, molecules and crystals. The reason is that this theory gives us occasion once again to confront the Aristotelian-Thomistic concept of substance with our idea of an enkaptic structural whole.

Hoenen is of the opinion that the acceptance of a lasting actual existence of atoms in molecules or atomically ordered crystal-lattices necessarily must lead to the atomistic conception of the latter as aggregates. According to this view he propposes only one alter-

14 P. H. J. Hoenen, S.J., *Philosophie der anorganische natuur*, 2nd ed. (Antwerp and Nymegen, 1940), pp. 408 ff., and Louis de Broglie, *La Physique moderne et les quanta* (Paris, 1936), pp. 152 ff.

15 ["Ontic" would be more correct.]

16 [See previous footnote.]

native: the neo-Thomist conception which conceives a *mixtum* (i.e., a composite) as a new substance in which the elements are no longer *actually* present but only *virtually* or *potentially*.

In this condition the properties of the latter may be preserved to a greater or smaller extent, but their substantial form has been destroyed by their combination; the preserved properties have become "accidents" of a new substance that can only possess one single substantial form.[17] This preservation of properties is derived from the affinity of the nature of the elements with that of the *mixtum*, revealed in the temporal connection of the latter with the former.

The *mixtum* is thus a "substance," a new totality, consisting of one "primary matter" and one "substantial form," which gives to this primary matter *unity of being*. Its matter is a potentiality with reference to a form. From the Aristotelian view that there is only one primary matter in all natural bodies, it should not, however, be concluded that this potentiality is the same with respect to all "forms."

The neo-homistic doctrine concerning the "gradation" in the realization of potencies; the conception of a heterogeneous continuum

The point is that there is a "gradation" in potencies, revealing itself in a combining of elements in such a way that "primary matter" is first disposed to give rise to the elements and only through the latter to the "mixtum" or composite. The number of these gradations will increase in proportion to the distance between primary matter and the substantial form ultimately assumed by it.

From the unity of substantial form, however, it cannot be concluded that the new substance must necessarily be a homogeneous whole, i.e., that all its parts display the same properties. The inner unity of an extended substance does not exclude a diversity of properties in its different parts. This implies the possibility of a "*heterogeneous continuum*."

Hoenen applies this neo-scholastic view to the modern theory of atom and molecule, and to that of the crystal forms. According to him, the atom is thus a "composite substance" whose true "ele-

17 Cf. Thomas Aquinas, *Summa Theol.* I, qu. 76a, 4 ad 6.

ments" are protons, neutrons and electrons. It is a "natural minimum" in the Aristotelian sense; in other words, according to its "physical nature," determined by its "substantial form," it cannot be further divided into material substances of the same kind. This implies that splitting it up into its most simple components results in "elementary substances" of a different physical nature.

The molecule, as the natural minimum of a chemical compound, and the crystal-lattice are all new substances. If they consist of atoms of a different chemical kind, they must be seen as "specific heterogeneous totalities." In other words, the specific heterogeneous properties of the atoms are preserved to a certain degree in the compound. This preservation of specific atomic properties is nothing but the result of the affinity in "nature" of the compound with the atoms from which it has originated. The fact that medieval scholasticism assumed inorganic composites necessarily to be composed of homogeneous parts is ascribed by Hoenen to inadequate experience.

Hoenen thus acknowledges the preservation of the nuclear properties of atoms in a molecule or atomically ordered crystal-lattice. However, he does not consider this to be proof of a continued actual existence of the atoms in their compound. He explains this preservation from the principle that the heterogeneous compound virtually retains the heterogeneous properties of its components.

Critique of Hoenen's theory

The manner in which this neo-Thomist scholar has tried to conceive of the recent results of modern natural science in terms of Thomist philosophy deserves special attention. His argument is always strong and clear whenever he subjects the classical atomistic conception, founded on a mechanistic view of nature, to a fundamental philosophical criticism. It stands to reason that in this respect he may find support in recent ideas connected with quantum theory that have entered modern physics, although it is not to be assumed that physics will in the future return to the Thomist concept of substance.

On essential points, however, this neo-scholastic theory fails to account for the experimental results in a satisfactory way. First, even from a Thomistic viewpoint, the integrity of *atomic* nuclei – and in the case of the heavier elements also of the inner shells of

electrons – with respect to the compound, cannot really be explained from the scholastic principle concerning virtual preservation of certain heterogeneous properties of atoms. For the nuclear structure of the atom is not simply a specific accidental property. Rather, it is *that part of the atom's total structure which determines the particular type of that element*. In the Thomistic line of thought this nuclear structure should be viewed as the *substantial form* of the atom since it gives to its "matter" the indispensable "unit of being."

In the face of the established fact that this "substantial form" is not destroyed by the combining of the atoms, Hoenen's argument against the actual presence of the latter in the compound is doomed to fail. And thereby this neo-Thomist theory concerning the structure of a molecule has come to an impasse. For, by accepting the actual existence of atoms in the compound, the unity of a molecule as a whole would no longer be tenable from the viewpoint of the Thomistic substance concept.

Also, the experimental datum concerning the integrity of the temporal duration [or half-life] of a radioactive element with respect to its bound condition in a molecule cannot be accounted for from this point of view. Here, too, there is no question of an accidental property of an element, but its internal structure as an actual whole is at issue. Its internal process of decay is a real *nuclear* alteration giving rise to a new element. It remains completely incomprehensible how Hoenen can give a philosophical interpretation of this datum as simply altering the properties of the composite in which the radioactive element is bound while at the same time defining the continual actual presence of the bound element.

The same objection must be raised against Hoenen's neo-Thomist conception of the structure of a crystal-lattice as a *heterogeneous continuum*. This view may perhaps be able to account for the experimental datum concerning the distances of the nodal points of the net-like structural form. But Hoenen does not mention the influence of the "atomic form-factor" on the intensity of reflection of the incident Roentgen rays discussed above, nor the results of Kossel's experiments. Both sets of these experimental data are not really compatible with a denial of the actual presence of the atoms in the crystals. For they, too, are related to the internal individual-

ity-structure of the bound elements and not to simple accidental properties of the latter.

In addition, the entire neo-scholastical concept of a heterogeneous continuum is hardly compatible with the foundations of modern quantum mechanics. The famous French scientist De Broglie has rightly observed that the quantum condition of energy does not agree with the classical conception of physical space as a *continuum*. From this it follows that the structural form of a crystal is not to be viewed as a real continuum.

The Aristotelian-Thomistic concept of substance implies a dilemma which must be deemed unacceptable from the point of view of modern science. It must lead to the conclusion that atoms can only actually exist in a free condition as "substances." If they do not exist as "substances," they cannot actually exist at all. But a free atom no more corresponds to this metaphysical concept than a bound element. Temporal reality is in principle built up in enkaptic structural interlacements which leave no room for absolute metaphysical points of reference.

Here we arrive at the philosophical inadequacy of Hoenen's theory with respect to the structural problems raised by the experimental data of modern physics and chemistry. The substance-concept in principle precludes the insight into the idea of enkapsis. But thereby it precludes at the same time any possibility of a distinction between the molecule – or the atomically ordered crystal-lattice, respectively – as a typical qualified enkaptic total form, and the genuine chemical compound of which the former is only the bearer. As a consequence the structural problem concerning the relation between the bound atoms and the molecule or crystal, as typical wholes, is oversimplified.

There is no question here of one simple totality-structure which would destroy the internal structure of its components. Rather there are three different structures to be distinguished, functioning in enkaptic interlacement. If only the relation between the molecule (or crystal) and its atoms were at issue, and there were no *enkapsis*, the neo-Thomistic dilemma might seem to be inescapable: either the molecule or crystal is a new totality, which would destroy the actual existence of the atoms, or the former are merely aggregates of atoms.

This unacceptable dilemma prompts us to employ the enkapsis relation to account for the structural problem at stake. A molecule or crystal, as an enkaptic total form, is very well able to embrace in a particular manner the interwoven structures of its bound atoms, without destroying the latter in any way in their internal sphere-sovereignty. To my mind only this conception can do justice to the two series of experimental data which at first sight seemed to contradict one another.

The Aristotelian-Thomistic concept of substance is inseparably tied to the form-matter motive, which governs its philosophical approach to the structural problems: an individual whole can only have one substantial form. The constituent atoms are consequently obliged to become "matter" of the substantial form of molecule or crystal. For if they should preserve their own substantial form, the "unity of being" of the compound would be impossible.[18]

Only if one starts from the Greek form-matter motive and the metaphysical substance-concept oriented to it is this reasoning logically sound. But it is not permissible to impose upon philosophy and science the dilemma either to accept the neo-Thomist solution of the structural problem, or to fall back upon the atomistic view of the classical mechanistic theory. By positing this dilemma Hoenen shows a dogmatic attitude with regard to the transcendental presuppositions of theoretic thought.

Surely classical physics, too, held to a substance-concept, albeit in a sense quite different from that of Aristotelian metaphysics. Therefore it may seem that Hoenen's dilemma is unavoidable when the neo-Thomist view is compared only with the classical atomistic conception. But a really critical philosophy should not posit such dilemmas as if they were simply founded in a logical alternative. It should always be ready to account for the presuppositions which govern the manner of positing the philosophical prob-

18 Hoenen, *Philosophie der anorganische natuur*, p. 325 (with regard to a "living being"): "In the mixta which are living beings the material components, inclusive of the elements, cannot be actually present; a living being cannot be an aggregate of substances since it is a substance; it is a totality; it has the substantial unity inherent in an ens (being). If the components were actually present, it would at the same time be one and plural in substance, i.e., in the same respect, which is absurd." This reasoning is also applied to inorganic combinations (cf. *ibid*., p. 326).

lems. It should not mask these presuppositions by a dogmatic metaphysics, which is presented as an unprejudiced ontology.

This implies that our conception of the enkaptic structural whole should not be judged by the standard of Thomistic metaphysics or the classical mechanistic view of nature. According to our theory of structure, both the bound atoms and the new chemical matter are ordered within a typical total form. In my opinion this conception can account for the experimental data. But it is impermissible to conclude from the neo-Thomist concept of substance that such an enkaptic structural whole cannot satisfy the ontological requirement of a "unity of being." For the very structure of such an enkaptic total form requires the binding of multiple structural wholes in an embracing new totality in such a way that the inner proper nature of each of the interwoven structures is preserved.

To my mind, Hoenen's neo-Thomist theory is no more able to account satisfactorily for the real structure of a chemical compound than for its termination. The elements which may be detached from the compound must be actually present in the molecule, though in a bound condition. Every theory denying this is obliged to demonstrate from empirical facts that the atoms in the combination display an essential structural change. And we have seen that Hoenen has not succeeded in this proof. But even if he did succeed in making acceptable a "substantial change" of the elements, then he would not yet have solved the structural problem concerning the termination of an existing compound.

What solution has his theory to offer in respect of this question? Hoenen thinks it is implied in his above mentioned conception concerning the gradations in potentiality. If the atoms are "virtually" present in the composite they can reappear actually when the *mixtum* is broken down into its elements: their potentiality is no longer *pure* potentiality, it has already been predetermined to return the components in exactly these quantities, if the composite falls apart.[19]

This theory may doubtless claim respect because of its ingenuity, but we cannot acknowledge it as a real solution to the problem. From a Thomistic point of view the question should be framed as

19 *Ibid.*, p. 326.

follows: *How can the atoms regain their substantial form in the process of breaking apart after having lost it in the chemical compound*? This cannot be explained from the virtual preservation of some heterogeneous atomic properties within the molecule. For, according to the neo-scholastical conception, the atoms themselves have lost their substantial form in the compound. They have been made into "matter" with reference to the new substantial form of the latter.

But the reappearance of the atom's "substantial form" cannot be explained from the specific "matter" of a *molecule*. An appeal to the genetic affinity between the "nature" of the elements and that of the composite is of no avail here. If indeed from the combination of elements a new totality arises which is more than the sum of its parts, its internal individuality-structure is not deducible from that of the elements in a genetic way. Nor can this new totality (e.g., the matter *water*) fall apart into its elements, if the "substantial form" of the latter has actually been destroyed. There is no natural genetic affinity between the composite and its separate elements. If Hoenen were to accept this affinity, his conception would not be intrinsically different from the classical atomistic view of the compound that he so sharply combats. In this case he would hold to the opinion that water is nothing but an aggregate of its elements.

"The preservation of properties of the elements after their transition into a *mixtum*," so he observes, "should be explained by the material cause, as the *ratio sufficiens* of this state of affairs; new properties of the *mixtum* should be explained from the efficient cause, at least insofar as they do not result from the mutual cooperation of the preserved properties."[20] This reasoning should also hold in the reverse direction with respect to the rise of actual free atoms from the dissolution of the compound. In this way the virtual preservation of certain properties of the elements in the composite can never explain the actual reappearance of those atoms in their proper "substantial form." A "material cause" is not *ratio sufficiens* (sufficient for this result) and Hoenen fails to indicate its *efficient* and its "formal" cause.

20 *Ibid*., p. 530.

The conception of material composites in pre-Thomist medieval scholasticism

In medieval scholasticism the Arabian Aristotelians and the older Christian scholastics before Thomas had already been keenly aware of this state of affairs. Though we can find many differences in the details of their conceptions, they almost unanimously assumed a certain actual presence of the substantial forms of the elements in the composite. But, in order to save the unity of the *mixtum* as a "new substance," they denied the preservation of the "substance" of the components. From a scholastic metaphysical point of view the inner contradiction of this solution is obvious. Thus Thomas could easily show that a plurality of "substantial forms" is incompatible with the "unity of substance."

But does this scholastic controversy not confirm our view that the *vitium originis* (the origin of the error) is to be sought in an inner contradiction of the substance-concept itself? It is not the intricate structure of empirical reality which implies this contradiction. Rather, this condition originates from the attempt to conceive this structure in a metaphysical *a priori* way which does not fit reality.

CHAPTER 3

The Living Cell Body

Meanwhile our theory of the enkaptic structural whole has to prove its applicability in a wider field of structures than that of the inorganic kingdom alone. We must now pay attention to the structural problems arising in connection with the enkaptic relation between the living organism[1] and the different kinds of matter of the living cell body.

In our *A New Critique of Theoretical Thought*[2] we have explained that the atoms and chemical combinations of these kinds of matter cannot be viewed as parts of the living organism of a cell. Rather it appeared that these compounds are enkaptically bound in the cell according to a particular *type of ordering* of the inter-structural interlacements, viz., that of the irreversible foundational relation.

In itself *a living organism is only an individuality-structure*. In its realization it is inseparably bound to different material structures which do not coalesce with it. Thus is born the problem concerning the enkaptic structural whole embracing both the material structures and that of the living organism of the cell.[3] If such an enkaptic whole should be lacking, a real cell would lack the inner structural unity of a concrete "thing." For the *enkapsis as such* cannot guaran-

1 [Dooyeweerd uses the term "living organism" in the sense of the biotically qualified individuality-structure within the enkaptic *structural whole*, i.e., *the living being* (= "organism" in the traditional sense of the word.), as will become clear in the text below. We will retain this use of the term "organism," but will supply notes in cases where the use of this word might create misunderstanding. Part of the confusion is due to the fact that Dooyeweerd does not always clearly distinguish between "structure" in the sense of entity and the "structure" *of* an entity (i.e., the way an entity is structured). Thus he speaks of "organism" as the living being and of the "organism" as the individuality-structure *of* this being.]

2 *WdW*, 3:564-72 [*NC*, 3:640-46].

3 [I.e., the physically qualified and the biotically qualified individuality-structure, respectively, of the cell as an enkaptic structural whole.]

tee this inner unity. It is thus necessary to distinguish between the *cell organism* and the real cell *body*.[1]

No doubt the cell body contains chemical elements, combined in a typical, extremely intricate way. It is also known that only a relatively small number of elements play a role in these compounds. In the main there are four which are indispensable, viz. hydrogen (H), oxygen (O), carbon (C) and nitrogen (N). As a rule phosphor, magnesium, calcium, sodium, potassium, chlorine, sulphur, iodine and iron are also present. Some elements of the latter group may be lacking, viz. calcium, and in plant cells sodium and chlorine.

The more complicated organic combinations of these elements in the plasma and the nuclear sphere of the living cell are, however, extremely complex and thereby extremely labile. And because the basic structure of nucleus and plasma is preserved, the metabolic processes in which these compounds are formed and decomposed bear so little ressemblance to ordinary chemical reactions – or even to the spontaneous decay of radioactive material – that so-called "living matter" seems to elude a closed physico-chemical determination.

Bohr's biological relation of uncertainty

In order to isolate from the cell compounds that are fully chemically determined, it is first necessary to "kill" the relevant regions of the living cell body. The famous Danish physicist Niels Bohr has tried to approach this state of affairs by means of an analogous extension of Heisenberg's relations of uncertainty which occur, e.g., in the case of determining the position and velocity of an electron in an electromagnetic field. According to Bohr, an analogous state of affairs presents itself in biophysics and biochemistry. The determination of the physico-chemical processes occurring in the living cell finds its limit of certitude and exactness in life itself.[2] We have already encountered this conception in an earlier context.

Of course Bohr's biological relation of uncertainty cannot solve the philosophical structural problem with which we are concerned

1 [That is, between the biotically qualified individuality-structure within the cell and the cell itself as an enkaptic structural whole, qualified by the biotic individuality-structure.]

2 Cf., for example, the explanation of Bohr's view in *Naturwissenschaften* 21 (1933): 245.

here. But his conception is no doubt of particular importance as a pregnant formulation of the limits which a mathematical causal explanation encounters in the internal physico- chemical constellation of a living organism. These limits must be posited by the individuality-structure of this organism. They cannot pertain to the physico-chemically qualified individuality-structures of the different kinds of matter functioning in the biophysical and biochemical processes. Except in the case of the highest, extremely complicated organic compounds (such as globulin, nuclein, albumen, etc.), it has up till now appeared to be impossible to find fixed structural formulas. But this does not detract from the fact that, since Wöhler's famous synthesis of urea (1828), chemistry has succeeded in synthesizing a great number of organic compounds. And since the discovery of the role of catalysts[1] in fermentation processes, it has even made great progress in disclosing the secret of the way in which the organic production of these materials is accomplished by the living organism, at least insofar as this process can be approached by means of physico-chemical methods of research. For the central role of the organism's biotic function in it can never be eliminated in these investigations.

What is the meaning of Bohr's relation of uncertainty with respect to the methods of organic chemistry in their application to biochemical processes?

We cannot answer this question in a satisfactory way without having gained insight into the philosophical structural problem involved. This problem concerns the relation between a physico-chemical compound as such and the genuine *bio*-chemical constellation in the individuality-structure of a living organism.

We must emphatically repeat that by "living organism" we do not refer to an individual living being, such as a plant, an animal or a human being. Rather we use this term in the sense of the typically biotically qualified *individuality-structure*, functioning within an

1 By "catalyst" chemistry understands a substance that produces a chemical reaction in other combinations without itself taking part in this reaction. The fermentation process turned out to be a catalytic process in which a complex of compounds functions as a catalyst. Though the latter are not living "substances," they are produced by a living organism.

enkaptic structural whole that will turn out to be the body of the living being.[1]

It should not be thought that in this way an *artificial* distinction is introduced which does not correspond to real states of affairs. The distinction concerned is inseparably connected with the insight that a "living body" is not built up in a simple or singular individuality-structure, and that it cannot coalesce with its living organism. That this insight corresponds to real states of affairs will appear from what follows.

The Aristotelian-Thomistic substance-concept and the identification of a living organism with the animated body

The neo-Thomistic view of the relation between the material components and the body of a living being has been summarized in a succinct manner in the publication by Hoenen, quoted in the previous chapter. Starting from the Aristotelian concept of substance Hoenen cannot accept the actual presence of material elements and their chemical compounds in a living whole. The living body is not distinguished from its living organism. Instead, the material body is conceived as a specific "matter" (in the metaphysical Aristotelian sense) which is completely animated by a specific "soul" as its "substantial form," giving it "actuality" and "unity of being."

We have seen that this conception starts from an unacceptable dilemma. Acknowledging an actual, though bound, presence of material components in the living body does not at all imply that the latter would be only an "aggregate" and would lack the integral individuality-structure of an individual whole.

The question as to whether all components of a living body are "living" in a subjective sense cannot be answered from the viewpoint of an *a priori* metaphysics. It should be answered on the basis of empirical research. We need only remember that biotic phenomena cannot be scientifically conceived of apart from the individual-

1 [This seems to contradict the end of the previous paragraph, where Dooyeweerd speaks of "the individuality-structure *of* a living organism." The original text speaks of "individual structure." This confusion reflects the traditional confusion of "structure" in the sense of entity and "structure" in the sense of the principles of how that entity is structured. In this way one could speak of the structure of a structure, just as Dooyeweerd speaks here of the individuality-structure of the living organism (= biotic individuality-structure).]

ity-structure in which they present themselves. And as soon as the individuality problem proper is at issue, the difference in philosophical insight and religious starting point appears to play a decisive part in the scientific debate.

From the neo-Thomistic standpoint, however, the above-mentioned question is already answered *a priori* by the logical implications of the Aristotelian substance-concept. In this case empirical investigation is factually superfluous since it cannot teach us anything about the problem concerned, which is of an exclusively metaphysical nature. This is a kind of *a priori* reasoning which is unacceptable from any scientific viewpoint.

The distinction between living and non-living components in a cell body has urged itself on biology as a result of empirical research. It rests on a firm factual basis and as such has nothing to do with atomistic-mechanistic conceptions of "life." Therefore we have to account for these empirical data in our theory of the "enkaptic whole." Of course, we cannot go into a detailed inquiry into the discoveries of modern cytology (i.e., the scientific investigation of the composition of cells). We are not competent to do so and, in addition, we must observe that this research is making rapid strides. Nevertheless, we must pay attention to at least those scientifically established facts which are of essential importance with respect to the structural problems at issue in the present context.

The cell as the minimal unit capable of independent life

First of all we have to establish that the cell with its nucleus and cytoplasm is the smallest unit capable of independent life that has up till now been discovered. It is true that in the bodies of higher beings, especially of animals, and *a fortiori* in the human body, many non-cellular tissues occur (such as tendons, cuticular formations, etc.) which share in the biotic function of the organism in an active sense. In addition it cannot be denied that even in protozoa an extra-cellular bifurcation (the so-called exoplasm) of the genuine cellular plasm (endoplasm) has been found in which different biophysical and biochemical processes occur apart from any contact with the cellular endoplasm. This so-called exoplasm often displays a very intricate structure. All such exoplasmatic, hence extracellular, components no doubt display the typical characteris-

tics of autonomous division, increment, capability for stimulation etc., albeit to a less intensive degree than plasmatic cellular organelles. *But apart from a connection with genuine cells these exoplasmatic components have appeared to lack viability.* In this respect they have no other relation to the living cell organism than the innumerable smaller living units occurring in the latter itself.[1] For the subjective biotic function of these units, too, is dependent on the total cell organism, as will appear presently. It is true that bacteria and blue-green algae have no genuine cell nucleus. But they do possess a more diffuse central cell sphere which fulfills the same role as a nucleus.

The typical physico-chemical aspect of a cell structure

From a physico-chemical viewpoint the first remarkable fact is that by far most living cells are materially constituted as colloidal systems. This means that they do not contain true solutions of matter, nor only suspensions or emulsions, but display a typical intermediate distribution of matter.

It is this colloidal condition which lies at the foundation of that extremely intricate physico-chemical constellation which is found in the internal structure of a cell's living organism.

A colloidal mixture contains dissolved material in such a fine distribution that this matter acquires an enormous surface, surpassing the ordinary macroscopic condition millions of times. On the other hand this development of surface does not occur to such an extent that it destroys all specific properties which the material components concerned display in greater dimensions. On these surfaces enormous electric charges are present. This is why colloids are very "sensitive" to changes of electric condition, but also to alterations of temperature, etc.[2]

As a colloidal system, protoplasm may pass from a sol- (= solution) condition into a gel- (= gelatin) condition and vice versa. It has also been established that colloidal a-biotic systems very often display a crystalline or semi-crystalline structure. In this structure the form of molecule passes without sharp boundaries into that of micro-crystals (molecular complexes).

1 Cf. Woltereck, *op. cit.*, pp. 313 ff.

2 Cf. Bavink *op. cit.*, p. 340.

Secondly it is a remarkable fact that the great majority of cells displays an *alveolar* form of plasm. This means the plasm is divided into a great number of small bubbles (*alveoli*) covered by membranes. This, too, is of the highest importance to biotic processes.

The so-called hylocentric, kinocentric and morphocentric structure of a living cell (Woltereck), viewed from the physico-chemical aspect

The chief point, however, is the typically centered structure of the living cell. For here the genuine internal structural principle of its living *organism* reveals itself even in its physico-chemical aspect. It is an established fact that the entire process of metabolism, and also the typical organizing, determining and regulating effects are directed from a *central sphere* in the cell body. The *nucleus* (or the diffuse nuclear cell sphere) is no doubt involved in this directing role, regardless of the question of whether it must itself be seen as the operating center or whether it is serviceable only as a sort of storeroom for the necessary materials. In addition we must pay attention to the more passive part of *chromatin* (i.e., the nuclear matter) in the process of cell division.

Secondly, at least in animal plasm, a typical *internal center of movement* is present, viz. the so-called *centro-soma*. The entire process of cell division and its preparation, starts from this center.[1]

In the third place the cell's living organism appears to display a centered structure with respect to the production of typical somatic part-forms. This latter state of affairs is of fundamental importance to the enkaptic structural whole; we shall return to it.

By this three-fold centered structure the living organism of a cell is fundamentally different from all physico-chemically qualified enkaptic micro-wholes (molecules, crystals).[2] And this difference is already revealed in its physico-chemical aspect. It seems to be a direct expression of the individuality-structure of a cell's living organism, in which the biotic function has the central role of a *qualifying radical function*.

1 Such a centro-soma, as a rule, is absent in plant cells. Cf. E. Köster, "Die Zelle und die Gewebe des pflanzlichen Organismus," in *Handbuch der Biologie*, edited by L. von Bertalanffy, 1942) 6.1:13. Woltereck, as a zoologist, generalizes too much.

2 Cf. Woltereck, *op. cit*., pp. 132-133. See also *Phil. Ref.* 15 (1950): 92.

Even the most complicated model of a polypeptide molecule, projected by organic chemistry (Emil Fisher) to approximate the structure of a so-called "living albumen molecule," lacks this centered structure. It only displays the picture of a bipolar binding of amino acids ordered in the form of a chain with many radicals,[1] groups or side chains. This model may suffice for certain atomistic and materialistic conceptions of the hereditary process, based on the ordering of genes in the chromosomes of a cell nucleus. But it definitely fails if the entire physico-chemical aspect of a living cell organism is taken into account.

The same applies to the hypothesis of the Russian materialistic biologist Koltzoff concerning the "molecular components of living albumen substance." According to him these components should be conceived as crystals and the assimilation processes are supposed to be *crystallization* processes of amino acids present in the solution, and of other fragments of albumen. This hypothesis, too, can at best account for the colloidal material content of the living plasm. But it can never explain the typical centered structure of the living plasm. As minimal enkaptic form-totalities of chemical compounds, molecules and crystals in principle lack such a concentric structure.

The phenomenon of bi- or poly-nuclear cells

When a protozoan cell has several nuclei, each one of them appears to be the potential center of a new cell body.[2] In many protozoa this poly-nuclear condition is only a temporary phenomenon in connection with propagation. These protozoa increase the number of their nuclei by means of a series of nuclear divisions. Finally they divide into as many new individuals as there are nuclei. Consequently the nuclear division here performs the same function as cell division does with metazoa (poly-cellular beings).

Other protozoa are characterized by the permanent possession of several similar nuclei. An actinosphaerium may even contain more than a hundred of them. When the single cell body is then cut

1 In organic chemistry the term "radical" means an element or atom, or group of these, forming the base of a compound and remaining unaltered during the ordinary chemical changes of a compound.

2 Cf. on this subject and the immediately following data E. Reichenow's treatise *Protozoa* in *Handbuch der Biologie*, 6:2, 42 ff.

into pieces it turns out that such pieces of cytoplasm are able to become complete individuals. Each separate nucleus is thus the center of a particular sphere of protoplasm. The poly-nuclear cell body in this case appears to embrace different centered units, each of which can develop into a new cell body. Sachs called such a potential unit of nucleus and protoplasm-sphere an *energide*. Finally a form of poly-nuclearity occurs in which the nuclei are dissimilar. All *infusoria*, for example, possess at least two nuclei which, because of their very different size, are distinguished as a macro and a micro nucleus.

The significance of this phenomenon becomes clear when we consider the double function of a nucleus. It is the bearer of heredity factors and it also has a central task in the biotic processes. In metazoa the former function is assigned to the nuclei of germ cells, which have an unlimited capability of propagation; the second task is fulfilled by those of the somatic cells. In most of the protozoa both functions are combined in one nucleus.

With infusoria, on the other hand, the two functions are assigned to two different nuclei. The small nucleus is the generative, the large one is the somatic nucleus. The same division of labor, which in metazoa occurs among particular cells, is carried through in these most organized protozoa within the frame of the single cell in respect of the nuclei. Just as the cells of the different organs originate from the germ cells of metazoa, the macro-nuclei of the infusoria originate from the offspring of the small nuclei.

Thus the phenomenon of bi- or poly-nuclear cells does not detract from the centered structure of the cell body and its living organism.

The smallest living units within the cell structure

The atomistic view may object that a correct comparison between living and inorganic corpuscles implies that one should not start from the living cell as a whole but from the smallest living units. As observed, a cell contains innumerable particles which display the characteristic properties of living plasm: metabolism, autonomous reproduction, growth, division, autonomous reactions to stimulation, etc. Starting from this undeniable datum, different biologists have sought elementary components of living plasm. The latter were introduced under different names, such as bio-molecules

(Verworn), "*Miscellen*" (Nägeli), vitules (A. Meyer), protomeries (Heidenhain).

Nobody has, however, succeeded in proving indisputably that such minimal cell particles are capable of maintaining life apart from a living cell. In any case neither such endoplasmic units nor the earlier mentioned exoplasmic living particles can detract from the fact that the cell organism is the real normal minimal *center of life*. And it is exactly the centered structure of a living cell organism and cell body which, in its physico-chemical aspect, has no analogy in the minimal enkaptic form-totalities of inorganic chemical compounds.

Non-living components of the cell body and their enkaptic binding in the living organism

However, not all components present in a cell body subjectively participate in the biotic function of the organism. This participation may certainly not be assumed with reference to inorganic compounds such as water – by far the greatest component of plasmic matter, or carbonic acid, etc. Apart from the Aristotelian metaphysical substance-concept there is no single argument in favor of the conception that in the colloidal condition of plasma such chemical components alter their inner nature and are transformed into "living matter." There can only be an enkaptic binding within more intricate or more highly qualified individuality-structures.

Nor may the character of living components be ascribed to enzymes or ferments, which in all probability play such an important role in metabolic processes. Though produced by the living organism itself, they operate only as organic catalysts. The fact that they lack the character of living material components was experimentally proved by Büchner in 1896. The convincing force of this proof is not affected by the results of later investigations showing that fermentation processes have a more intricate character than was initially supposed.[1] In any case enzymes seem to be nothing but complicated protein combinations whose synthesis has not yet been possible.[2]

Continued research has shown that the so-called "organizers" are nothing but inductive, non-living material compounds capable

1 Cf. Bavink, *op. cit.*, pp. 348. and Woltereck, *op. cit.* p. 334.

2 [In the meantime, quite a few have been synthesized *in vitro*.]

of influencing living cells in a specific way, even after the cells producing them have been killed. We shall return to this state of affairs later on. Furthermore, we may consider as non-living components of a cell body the vacuoles present in plasm, the nucleoli[1] (or certain kinds of nucleoli), and other paraplasmic material particles.[2]

Among the non-living components we have also encountered the typical mineral formations of protozoa and protophytes secreted by protoplasm at the periphery. Their typical structure has already been analyzed in another work.[3] We have seen that the SiO_2 formations of radiolaria, for example, cannot be considered as aggregates of SiO_2 crystals. The reason is that the thousands of specific figures of silicon acid produced by the plasm of these protozoa completely deviate from the well-known inorganic crystal formations of this mineral.

In their internal structure, these animal formations are no doubt qualified by a *typical psychic object-function*, which expresses itself in their typical figure. And they are themselves already *typical form-totalities* functioning in their turn as *enkaptic components of the living cell body*. They are, however, no more to be considered as parts of the living organism of a cell than the enzymes, the "organizers," and the non-living paraplasmic components. Real minimal parts of the living organism can only be those particles of plasm and nucleus that actually take part in the *subjective* biotic function of the centered living whole.

Do bio-molecules exist?

Here we are once again confronted with the question: Are these "bio-elements" to be conceived as special kinds of "molecules" that deserve the name *bio*-molecules?

Molecules composed of dissimilar atoms have appeared to be enkaptic form-totalities of a typical physico-chemical qualification. It is true that the boundaries between molecules and crystals cannot be sharply indicated. In higher organic compounds the minimal form-totalities built up of chains of double molecules may rightly be called quasi-crystalline molecules. But this does not detract from their physico-chemical qualification. The term "bio-mol-

1 Nucleoli are the numerous nuclear corpuscles within a cell's nucleus.

2 According to Woltereck, *op. cit.*, p. 356, this is generally accepted in modern biological theory.

3 Cf. *WdW*, 3:75 f. [cf. *NC*, 3:108].

ecule" must consequently imply an inner contradiction if it is taken in the sense that a molecule of organic matter may be a living unit.[1]

It should not be supposed that we are falling back here on that *a priori* method of reasoning which we have emphatically rejected in our criticism of Hoenen's neo-Thomistic conception. Instead, our thesis is based on real structural states of affairs which have turned up in empirical research. The point is that a molecule or quasi-crystal of an organic chemical compound, however complex and labile its inner construction may be, in principle lacks that centered structure which turned out to be essential to an independent living unit. The individuality-structure of any molecule or crystal is in principle *physico-chemically qualified*.

The *bio*-physico-chemical constellation, however, does not concern the *internal structures* of such minimal form-units of chemical compounds. We are rather confronted here by biotically directed physico-chemical functions of material components, which in the metabolic processes are serviceable to the sustenance of a living body as a whole. In this sense these functions belong to the living organism itself, but they are not *internal* functions of the molecules or crystals which are enkaptically bound by this organism.

In the light of our theory of individuality-structure this state of affairs is to be characterized as follows: *In the internal individuality-structure of a living organism the physico-chemical constellation is necessarily disclosed or expanded by the subjective biotic function. It must thus remain completely open, dynamic and labile*.

This entire internal physico-chemical constellation occurs under the typical direction of so-called *bio-impulses*.[2] These can never be explained in a purely physico-chemical sense but are always quali-

1 In his repeatedly quoted work Woltereck has devoted excellent pages to the relation of a chemical compound to the biochemical constellation. Nevertheless he finally accepts the term "bio-molecule," "because the prefix "bio" clearly expresses that there is no question of molecules in the sense of chemistry but only of something comparable with the latter" (*op. cit.*, p. 318). To my mind the acceptance of this term is not advisable since it favors a conceptual confusion. We shall see later on that it has played a bad trick on Woltereck himself in his conception of the so-called *matrix* of "living matter."
[Of course there is no objection to the term "bio-molecules" *if* it is understood in no other way than that these molecules have an activated biotic *object-function* and are enkaptically bound inside the living organism.]

2 [This term seems to us of a rather metaphysical, speculative nature, which Dooyeweerd never intended. It is not generally used in biological literature.]

fied by the central subjective biotic function of the organism as a whole, though they no doubt have a physico-chemical aspect. It is an established fact that in the balance of assimilation and production of energy these bio-impulses are negligible because of their minimal use of energy; it has been shown that they possess a spontaneous character.

Our structural theory of enkapsis can thus completely do justice to Bohr's biochemical relation of uncertainty. But at the same time the latter is structurally localized and determined as an enkaptic relation. In other words: the biochemical constellation starts exactly at the point where the molecular or quasi-crystalline structures of organic matter end. But that does not eliminate these structures from the enkaptic whole of the living cell body; rather they are enkaptically bound inside it.

Without the formation of molecules or quasi-crystals there could be no biochemical constellation: the living organism avails itself of variability-types of the former, which the different kinds of matter only assume within the organism's internal biophysical and biochemical sphere.

Recent experimental research has indeed been able to establish that a living body contains molecular-crystalline structures of organic matter. Thanks to a significant chemical improvement of Röntgen radiation this research has succeeded in acquiring Laue-diagrams of living nerve and muscle tissues. Though the radiation of such tissues lasted only for ten minutes at the most, these diagrams turned out to be very clear. And at least in the case of nerve tissues, radiation did not diminish their susceptibility to stimulation nor their conductibility.[1]

It has now also been established that, with regard to their material sub-structure, tendons are built up of genuine crystals with large molecules and these crystals are ordered in a fiber pattern. At present we know that in muscular contraction myosin molecules ordered in the form of chains play an active role. In such contraction these myosin-molecules pass from a folded-up form, proper to their resting condition, into a more strongly folded shape of super

1 Cf. the interesting treatise of Francis O. Schmitt, "Erforschung der Feinstruktur tierischer Gewebe mit Hilfe der Röntgenstraleninterferenz-Methoden," *Naturwissenschaften* 25 (1937): 709 ff.

contraction.[1] But these molecular structures do not teach us anything about the enkaptic functions of these gigantic molecules within the *biophysical and biochemical constellation* of living organisms. The typical bio-impulses directing this contraction can never be explained from a physico-chemically qualified material construction.

The problem of living protein is incorrectly posited

Insofar as I may permit myself to have an opinion on this question, I think that the famous problem of so-called "living protein" is *insoluble on principle*, since it is wrongly posited. Nevertheless this problem has held biochemistry captive up to the present although this branch of science has become much more critical with respect to the requirements of so-called biosynthesis than it was in the days of Haeckel.

Proteins, such as are found in a living body, are only to be seen as extremely intricate and labile material compounds, which basically are physico-chemically determined in their inner molecular structure. The discovery of their ultimate structural formulas should never be supposed to be scientifically impossible. This even remains true notwithstanding the fact (established by Röntgen analysis) that in the living body these highest organic compounds do not form molecules of stable size, but only of a variable size. Insofar as here, too, Bohr's relation of uncertainty is at issue, it can only pertain to the enkaptic functions of these molecules in the living organism, not to their molecular structures as such.

It is true that plasmic protein with its colloidal properties has up to now only been known as an organic product of living organisms. Nevertheless, as a chemical compound, it may be detached from the latter, and, provided they are protected against micro-organisms, it can be kept intact for an unlimited time. As such it cannot be qualified by the subjective biotic function of a living organism.

Consequently, suppose that organic chemistry at one time or other succeeds in finding definite structural formulas and also in synthesizing these most intricate compounds, the genuine biochemical constellation would still lack a theoretical explanation. The only result would be the synthesis of "dead"[2] matter.

1 *Ibid*.

2 [Or, rather, lifeless.]

According to modern conceptions of a possible biosynthesis, such synthesis is not concerned with producing relatively simple proteins. This was already possible long ago. The point is rather to compose extremely complicated proteins containing, besides amino acids, other, so-called prosthetic groups, which can often be split off from proteins without any alteration of these proteins themselves.[1] In other words, science is looking for the so-called protoid molecule as an element of living plasm, and it hopes to be able to synthesize it. In addition, scientists take into account the requirement of this molecule's capability of propagation, implied in the nature of a living unit.

Woltereck has summarized the model program of biosynthesis as follows:

> The object would be to compose living plasm from colloidal protein substances and to produce in this plasm structures containing such kinds of matter which display a catalytic activity and maintain themselves in the process of cell division (heredity). On such kinds of matter the determination of all singular properties must depend.[2]

Woltereck acknowledges the possibility that in future it may be possible to synthesize such a material compound that displays the characteristic properties of metabolism, growth, movement, division, susceptibility to stimulation, tension, pluriformity, etc. He then observes:

> All this may be expected as a possible result with regard to formations composed of non-living labile compounds, for it implies nothing that is fundamentally new. Disintegration and reconstruction, formation and movement, increase of substance (growth) and division, even restoration (in crystals) and a sort of excitability (e.g., photosensitivity) – all this may occur in the world of inanimate things. It would here only be *brought together*. We may suppose that future biochemists will succeed in such a concentration of many properties characteristic of life in one and the same material compound, although this assumption seems improbable.[3]

1 Cf. E. Lehnartz, Die chemischen Voraussetzungen des Lebens in *Handbuch der Biologie*, 1.4:120.

2 Woltereck, *Grundzüge*, p. 521.

3 *Ibid.*

However, on two essential points any attempt at biosynthesis is doomed to fail:

1) First, such a synthetic colloidal system can never maintain its identity in the process of metabolism and exchange of energy, in its movement, dissimilation and increase. When non-living complexes alter themselves by producing something new or fall apart into their components, they disappear and are replaced by something different. The combination of continual active change with maintenance of the total system is, according to Woltereck, a completely new biotic phenomenon. It cannot be produced artificially by the concentration and combination of a-biotic components.[1]
2) Second, such an artificial "living" aggregate or system will never be capable of "experiencing something in itself," even if it could react to all sorts of stimuli. For, according to Woltereck, we must ascribe some kind of a-physical experience even to the most simple living beings, though we know such inward movements (*Innen-Erregungen)* directly only as feelings and volitional tendencies of an "experiencing I."

   In the present context we may leave this latter assumption, amply elaborated in the final part of Woltereck's important work, as is. As we shall see later on, it entirely depends on his irrationalistic, emergent evolutionistic starting point. It remains entirely obscure what is to be understood by "a-physical experiences" as the "inner side of life."

To my mind, Woltereck's first argument against the possibility of a biosynthesis already clinches the matter. For here he implicitly characterizes the typical fundamental difference between a biochemical constellation and a physico-chemically qualified constellation. Even in its biochemical aspect a living organism displays that remarkable centered totality structure which maintains itself

1 *Editorial note* (DFMS): The phenomenon of *thermodynamical open systems* sheds a different light on this issue. Von Bertalanffy describes an *open system* as a system in which exchange of matter with its environment takes place, thus presenting import and export, building-up and breaking-down of its material components. This 'flowing equilibrium' which, thermodynamically seen, is present in an open system, is sometimes designated by using the term *homeostasis*. Some examples of *open* systems are the following: a *glacier*, a *fire*, any *living entity*. Whenever a living entity approaches a true state of *physical* equilibrium *death* is in sight!

in the continual change of all material compounds functioning enkaptically in it. This structure has indeed no single analogy in any molecular or crystalline structure of organic matter, nor in a spontaneous disintegration of a radioactive element, nor in the "growth" of a crystal form in a matrix-lye. This centered structure guarantees to a cell's living organism the preservation of its biotically qualified individuality-structure. It has its necessary counterpart in the complete variability of all material compounds in their enkaptic function within this living organism.

How far can physics and chemistry penetrate a biochemical constellation?

Physics and chemistry are able to penetrate this biochemical constellation with their proper methods of inquiry only insofar as they take into account the individuality-structure of the living cell organism. The applicability of the specific methods of physics and chemistry dealing with the atomic, molecular and crystalline structures of material compounds is of course not limited to inorganic matter. Instead, these methods find their limit *at that critical point where in the internal physico-chemical sphere of a living organism they are no longer dealing with definite material components.*

To trace the real *bio*physical and *bio*chemical constellation, physics and chemistry should not seek for the *material results* of a biochemical process but rather for *the manner in which these results are produced*.[1] The issue here concerns processes rather than their products.

It is beyond doubt that a living organism, in building up and dissimilating the body's material components, sets about it in a way quite different from the methods used in a chemical laboratory. To mention only one characteristic difference: as a rule the organism accomplishes metabolic processes by means of enzymes; in the laboratory the chemist, on the other hand, performs this analysis and synthesis of elements by applying heat.

1 Driesch remarks in his Philosophie des Organischen, 2nd ed. (Leizig, 1921), p. 200: "... the effect of the ferment, once it is present, is chemical ... This, of course, does not mean, that all metabolism is of a chemical nature." As we shall see later on, Driesch does not know a genuine biochemical constellation in the sense defined earlier. Nevertheless he has sharply observed that only the *process* of forming enzymes has a typical connection with life.

Driesch has rightly observed that the most remarkable characteristic of organic metabolism rests on the very use of enzymes by a living organism. The characteristic trait is that, by means of regulation, this metabolism is made serviceable to the living whole. Depending on local and temporal needs a chemical process of compound formation or disintegration will occur.

Genuine *bio*-chemistry can consequently never be identical with *organic* chemistry. It can only start after the methods of the latter have been exhausted in an analysis of the material substrate of a living organism and the products of its biochemical activity.

Of course, both biochemistry and biophysics have to look for a physico-chemical explanation of the processes occurring within the internal sphere of a living organism. But the typical biotic qualification of these events will always remain the ultimate limit to these methods of explanation.

Suppose science looks for a physical explanation of the remarkable mineral formations produced by radiolaria or other kinds of protozoa. In the process of producing these forms a gel and mineral formation occurs which is stricly limited to certain sectors. When attempting to explain this manner of formation biophysics cannot do without assuming lasting typical inhibiting plasmic field effects, in contrast to the continual change of the material components of the plasm, and to the complete plasticity of plasm freely moving between the forms produced. But these field effects really belong to the opened or expanded biophysical structure of the living organism. They are directed by its qualifying biotic function.

From a physical point of view such a biotically qualified "field of formation" belongs to an assumed given physical constellation, which itself cannot be explained in a purely physical way. Both typical field reactions and the catalytic metabolic processes are started and directed by bio-impulses.[1]

1 *Editorial note* (MvB): As noted before, it seems that this term bio-impulse is an unintended remnant of the materialist presuppositions of authors like Woltereck. In Dooyeweerd's scheme it is the biotic individuality-structure by means of which the living cell directs all internal processes. The cell causes the production of catalysts, hormones, etc., which in turn accelerate or inhibit the chemical processes. But how the structural laws of individuality influence

And the latter are accessible to physics and chemistry only in their physico-chemical aspect, not in their qualifying biotic modality.[1]

Biotically qualified field effects are fundamentally different from electromagnetic field effects without such a biotic qualification. This difference is already implied in their non-homogeneous complexity and the spontaneous way in which they are started.

Does a specific living matter exist?

If this is the real state of affairs, the question may be asked whether it makes sense to look any further for a specific "living matter" as the generator of the biochemical constellation, as indicated by the terms "matrix" (Woltereck), "germ-plasm" or "idioplasm" (Plate)? This question is answered in the negative both by the mechanistic and the neo-vitalistic trends in modern biological theory.

According to Koltzoff, an outstanding materialistic representative of the first trend, the acceptance of such a specific "bio-substance" would necessarily lead to a vitalistic point of view. This viewpoint is supposed to imply that biotic phenomena are different in principle from physico-chemical processes and that "bio-substance" is exempt from physico-chemical laws.

But the founder of modern neo-vitalism, the famous biologist and philosopher Hans Driesch, emphatically denies the existence of a specific material bio-substance. He assumes that matter can only be "living" as long as some "entelechy" has a controlling influence upon a physico-chemical constellation.[2]

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bio-physico-chemical processes defies all explanation by physical laws. The author writes this in what follows immediately in the text.

1 Woltereck (*op. cit*., p. 458) elucidates the difference between the enzymes and hormones operating as bio-impulses in a living organism, and the catalysts of non-biotically qualified chemical processes as follows: "A catalyst accelerates or inhibits a reaction that is already going on. An enzyme or a hormone, and in a broader sense a bio-impulse, also determines the quality of the process. (This quality may possibly also be brought about by suppressing one part of the process and stimulating the other ...) Biotic impulses are characterized by their causing a condition of excitation in plasm or cell. This makes them very different from ordinary catalysts, which Ostwald compares with a mechanical lubricant facilitating the course of certain reactions."

2 *Philosophie des Organischen*, p. 504. [In any case no *chemical* "living substance" exists.]

The recent conception[1] holds that a specific "bio-substance," fundamentally different from a-biotic and necrobiotic matter, does not exist and wishes to take an intermediate standpoint between these two extreme trends. Woltereck is one of the most prominent adherents of this view. He is of the opinion that it should already be accepted from the viewpoint of the logical principle of economy in the explanation of phenomena. In opposition to Driesch's concept of "entelechy," which we shall consider presently, he observes:

> It seems to me that here too quickly a metaphysical notion is substituted for an unknown property of the real physical plasm without having shown the necessity of this introduction from the exclusion of physical possibilities. The possibility that the unquestionably present elementary bio-specificities are caused by a particular physico-chemical situation has not been refuted at all, not even by the well-known proofs formulated by Driesch in favor of the immaterial autonomy of biotic processes. These proofs do not concern the elementary processes in bio-substance but rather the intricate functions of development, restitution and activity...[2]

Let us see whether this argument is to the point.

1 The older vitalistic trends will be discussed presently.

2 Woltereck, *op. cit.*, p. 331.

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CHAPTER 4

Mechanism and Vitalism

The philosophical background of the mechanistic conception

The old dilemma, mechanism or vitalism,[1] is of course unacceptable from our standpoint. The mechanistic view, even nowadays adhered to by most of the biologists concerned with analytical investigations,[2] continues to seek a biosynthesis by means of protein compounds. According to this standpoint it is the task of colloid-chemistry to disclose all the "secrets of life." This trend is still entirely inspired by the classical science-ideal striving after

1 It is not correct to identify vitalism with the view according to which the biotic aspect has its proper laws and a living organism is characterized by its total individuality-structure. This identification is also found in Hans Driesch's *Philosophie des Organischen*, pp. 138 ff. The term "vitalists" may only be rightly applied to those who in any way *absolutize* the biotic aspect of a living body. This may occur either at the cost of its non-biotic components, or at the cost of the original and irreducible character of post-biotic modalities, or by elevating the biotic modality to a self-contained *substance*. Naturally, we cannot go into all nuances of the mechanistic and vitalistic trends here. Nor can we go into the divergent recent attempts at overcoming the dilemma by indicating a third possibility (the so-called *Stufentheorien* or emergent evolutionistic theories; the so-called *mnemism* of Ewald Heinrich Hering and Richard Semon, et al.); or into the attempts at evading the dilemma as a provisionally insoluble problem by restricting themselves to a merely descriptive and "empirical" criterion of organic biotic phenomena as "autonomous totality-phenomena" (Gurvitch, Ungerer, Bertallanffy, Alverdes, etc.). We shall only engage in a more detailed critical analysis of the conceptions of Driesch, Woltereck and B. Bavink. An excellent, though succinct survey of all these views is to be found in E. Ungerer's treatise "Die Erkenntnisgrundlagen der Biologie. Ihre Geschichte und gegenw rtiger Stand," in *andbuch* der Biologie, 1.3:76 ff. Cf. also R. Woltereck, *Philosophie des Lebendigen* (Stuttgart, 1940). The best description of the history of vitalism is to be found in Driesch's *Geschichte des italismus* , 2nd ed. (Leipzig, 1922).

2 Especially by the older scientists, such as Wilhelm Roux, Johann Herbst, Ludwig Rhumbler and Nikolai Koltzoff. Cf. L. Rhumbler, *Das Lebensproblem* (1930) and his treatise "Das Protoplasma als physikalisches System," *Erg. Physiol*. 1914.

perfect domination of nature by means of a complete causal determination even of biotic phenomena.

Mechanism starts from an *a priori* absolutization of the physico-chemical energy aspect of empirical reality. Consequently, it emphatically denies the irreducible nature of the biotic modality of experience. It necessarily involves itself in inner antinomies resulting from the absolutization of a modal law-sphere. In addition it employs a deterministic physical concept of causality, which modern physics has already been obliged to relinquish – though it is not permissible to identify all modern mechanistic conceptions with a machine theory of life, as is done by Driesch.

A deterministic causal explanation of physico-chemical processes encounters a first boundary in the micro-structure of atoms. This has found its scientific formulation in Heisenberg's relations of uncertainty mentioned above.

Bernard Bavink has rightly observed that the acceptance of a second boundary in the internal biophysico-chemical constellation of a living organism can never contradict the results of modern physics and chemistry. It is only in conflict with the *a priori* mechanistic starting point of classical science, which has turned out to be in conflict with the structure of empirical reality.

The modal aspect in which the physico-chemical functions of a living organism present themselves does not have a rigid structure. As we have seen, it opens and expands itself within the individuality-structure of this organism.

Neo-vitalism also holds to the mechanistic view of the physico-chemical processes

This latter state of affairs has also been lost sight of by Driesch and his adherents. These neo-vitalists do not deviate from the basic tenet of mechanistic theory concerning the complete closedness of any physico-chemical constellation as a mechanical chain of causes and effects. Their only concern is to withdraw "life" from the rule of the mechanistic concept of causality; they think they have proved experimentally that a living organism cannot be explained from a mere summation of already present physico-chemical elements. This view is based on Driesch's experimental proofs concerning the typical totality-character of the phenomena of self-reg-

ulation, regeneration and heredity occurring in living organisms, and in general of any animal and human action.

Neo-vitalism in contrast to older forms of vitalism

Initially vitalism generally accepted a fundamental difference between organic and inorganic matter. Without any basis in empirical research it proclaimed the *a priori* thesis: "chemistry will never succeed in synthesizing organic kinds of matter." Sometimes it started from a particular "vital force," though this conception could be meant in a mechanistic sense too.[1]

Neo-vitalism distinguishes itself from these older views by reducing all structures of matter to physico-chemical analysis and determination. It rejects both the *a priori* conception of older kinds of vitalism and the idea of a "vital force" as a particular potency of energy.[2] It intends to base its own vitalistic view only on experimental results. The older idea of specific organic matter, which would be exempt from physico-chemical laws, was exploded by the methodical physico-chemical analysis of almost the entire realm of organic compounds. Driesch and his adherents have abandoned this untenable position.

Driesch's experimental "proofs" of the existence of "entelechies." The so-called harmonious-equipotential system and totality-causality

The founder of neo-vitalism has tried to show experimentally that organic phenomena cannot be explained by means of the analytical causal method of physics and chemistry. He is of the opinion that these phenomena imply a particular type of causality which he calls "totality-causality" (*Ganzheitskausalität*) in contrast to mechanistic "individual or quantitative causality" (*Einzelkausalität*).

1 E. Ungerer has shown in his treatise cited above that the theory of a specific vital force was not at all meant in a metaphysical-vitalistic sense by all of its adherents. In Joh. Chr. Keil's treatise *Ueber die Lebenskraft* (1795), for example, it was even defended in a mechanistic way. In Hermann Lotze's writing, *Leben und Lebenskraft* (1842), the concept "vital force" is already fundamentally criticized and rejected.

2 [The "bio-impulse" which consumes a minimal amount of energy, to which the author refers in various places, seems to be similar in concept to this "vital force."]

The remarkable results of Driesch's famous experiments with sea urchin eggs appeared to be incompatible with the mechanistic view. These results showed that it is possible to take away any one part from the young embryo cells (or, in later phases of development, from separate embryo parts) without affecting the final result: the rise of a complete living individual. One may remove embryo parts or deform the latter (without killing them) by pressing them between two glass sheets. Yet the total ultimate result will be reached. The embryo cells themselves develop by continuous division as a "harmonious equipotential system," i.e., a system in which all the elements possess an equal disposition to lead to the total final result in mutual harmonious cooperation. Such systems lie also at the foundation of regenerative processes occurring in the full grown organisms. They do not operate after the pattern of quantitative physico-chemical causality but according to a typical totality-causality.[1] And the same applies to the propagation of organisms. Hereditary phenomena are never explainable from mere material "genes."

Insofar as these arguments merely elucidate the total character of a living organism in all of its manifestations, we can readily accept them. We can also agree with Driesch's distinction between quantitative and totality-causality, even though we may relativize the cogency of the arguments based on his experiments.[2] But this does not imply an acceptance of the neo-vitalistic view as such. It appears that Driesch lacks any insight into the modal structures of our experiential horizon. This is why he re-introduced the *substance concept* to account for the fundamental difference between biotic and physico-chemical functions.

Driesch now conceived "life" phylogenetically as a "supra-individual substance" lacking a temporal origin. It is to be an invisible,

1 *Philosophie des Organischen*, passim.; *Der Begriff der organischen Form* (1919), pp. 54 ff.; *Ordnungslehre*, 2nd ed. (Jena, 1923),

2 In the first place these experiments lead only to the results intended by Driesch in the initial phases of development of the embryo cells. The experiment with eggs of sea urchins is not successful in later developmental phases. This is also the case when one cuts the egg not vertically but transversely. Cf. J. H. F. Umbgrove, *Leven en materie* (The Hague, 1943), pp. 54 ff. We must remark, however, that Driesch himself has repeatedly acknowledged that his experiments are bound to the initial phases of development of the embryo cells.

immaterial "organic form" in a pseudo-Aristotelian sense, of which all visible individual forms are only materialized products. This substance is called "entelechy." With Driesch this term means an intensive (i.e., non-spatial) multiplicity which, on the one hand, manifests itself as "psychoid," governing the body when it has already been formed. On the other hand, it is a "form-entelechy," which brings forth the body as a total form.[1]

A "psyche" can never influence material natural phenomena, so Driesch argues; only a "psychoid," as its correlate, is able to do so:

> What is properly speaking an organic form? What is its essence, its constant "so being," what is substance in respect of it, to which consequently all properties belong? Our answer is: The proper substance of organic form is our entelechy: the latter is the "form," the "eidos" in the Aristotelian sense; that which is formed in a visible way is only the transitory product of its operation into matter.[2]

In Driesch's "Ordnungslehre" the substance-concept is not meant in a metaphysical sense

Now one should not conclude too quickly that Driesch reverted to metaphysics in order to explain empirical states of affairs. For he does not intend to do so. He views his "entelechy" primarily as a second *natural factor*, which he tries to conceive in the "purely logical" concepts of his *Ordnungslehre* (doctrine of order).

A metaphysical interpretation of these concepts is only at issue in his *Wirklichkeitslehre* (doctrine of reality) and Driesch is of the opinion that this doctrine can only arrive at probable conclusions. He wishes only to accept a metaphysics which is based on the results of empirical research of the natural phenomena and which can account for the *doctrine of order*.[3]

The primary theses of the latter are, according to Driesch, the necessary conditions of an ordered experience of nature without implying the transcendental idealistic sense ascribed to them by Kant.

1 *Philosophie des Organischen*, pp. 357 ff.

2 Driesch, "Der Begriff der organischen Form," *Abhandlungen zur theoretische Biologie* 3 (1919): 71.

3 Cf. Driesch, *Wirklichkeitslehre*, 2nd ed. (Leipzig, 1922), pp. 1-65.

Driesch emphatically rejects any view of metaphysics as an *a priori* and *primordial* basic science (*philosophia prima*). His starting point (viewed from the immanence standpoint) is the Cartesian *cogito*[1] (I am conscious of something, or I know something), not the ontological concept of being in its Aristotelian sense, governed by the Greek form-matter motive. His philosophical basis is not metaphysics, but his *Ordnungslehre*. And the latter is certainly influenced by Kant's epistemology, although Driesch – in contrast to Kant – also ascribes to his ordering concepts or categories an *intentional* relation to "reality in itself." Properly speaking, the question as to whether "entelechy" is an immaterial substance in a metaphysical sense, coordinated with the spatial substance of material body,[2] should not be answered in a categorical sense. It must remain an open question.[3] Nevertheless we shall see that Driesch does not maintain this critical standpoint and eventually does ascribe a metaphysical sense to his entelechy as "substance."[4]

In his opinion we may conceive entelechy as an ordering concept, but we cannot have any representation of it. The reason is that all our representations are bound to sensory perception. The latter is only concerned with things and events in time and space, consequently only with effects of entelechy in matter.

Furthermore, the concept "substance" or "essential form," as it is used in Driesch's *Ordnungslehre*, is only meant in the non-metaphysical sense of an "ordering notion." It is a concept belonging to a theory of the general logical relations in which it cannot mean anything but *relatum*, or the constant point of reference of all relations, which itself does not imply any relation.[5] "Entelechy," as "form" and "substance," is then to be understood as "the constant bearer of the whole of the properties of the latter, indicating its es-

1 Driesch only rejects Descartes' metaphysical conclusion from the "cogito": cf. his *Philosophische Gegenwartsfragen* (Leipzig, 1933), pp. 23/4: *Excurs über Descartes*.

2 Apparently Driesch has in view the two Cartesian substances.

3 Cf. *Philosophie des Organischen*, pp. 495-519.

4 This is overlooked by O. Heinichen, *Driesch's Philosophy* (Leipzig, 1924), p. 160.

5 *Ordnungslehre*, pp. 311-313. This is why it is called "das *reine* Glied der Relation" (the *pure* part of the relation).

sence as "*bedeutungshaft erfasztes Sosein*"(as meaningfully conceived being-thus)."[1]

Thus "entelechy" is meant here as an "empirical natural factor," i.e., a factor to be known from its phenomenal manifestation. In our experience it is at least intended as "an independent reality, foreign to the experiencing ego." In this context Driesch speaks of a "*gleichsam selbständig seiendes Etwas*"[2] apparently to exclude the metaphysical sense of a "thing in itself."[3] And in this sense he speaks in his "Ordnungslehre" of two substances of natural reality, viz. matter (mass) and form (entelechy).

But also in this non-metaphysical sense of entelechy, as substance, he certainly does not understand organic life as an *experiential modality*, as an *aspect* of reality. Instead, "life" refers to an immaterial and constant bearer of properties, which is opposed to the material natural substance as the immaterial independent cause of all its effects in this substance.[4] Neither Driesch nor Aristotle or Thomas knew a modal biotic aspect of empirical reality. By means of his substance concept Driesch tries to conceive the (logical) essence of an individual living whole in a direct way *before having acquired any insight into the modal structures of empirical reality*. This is why this concept, even in its non-metaphysical use, also impedes the insight into the individuality-structures.

Driesch's conception of entelechy differs drastically from the Aristotelian view

The point is that Driesch holds to the Cartesian substance concept, although he has reservations about its metaphysical interpretation. This implies a dualistic separation of an immaterial substance and

1 *Ordnungslehre,* p. 90. Driesch denies that this is a nominalistic conception of "essence." He observes that he also accepts *universalia in rebus*. But this does not deny the nominalistic character of his *Ordnungslehre*. Genuine "realism" always starts from the metaphysical concept of being and never from the Cartesian "I think" or "I am conscious of something," as Driesch does. So-called "critical realism" is therefore never genuine realism, since its starting point is subjective.

2 Something existing as it were independently.

3 *Ibid*., p. 156.

4 *Philosophie des Organischen*, p. 508: "In no form does the existence of the natural agent entelechy depend on something material, although its spatial achievements ... depend on given material conditions."

a material one, and a mechanistic conception of the latter as an independent, extended corporeal entity.[1] "Body" in Driesch is identical with "matter" and is separated as "substance" from the immaterial "entelechy."[2]

Aristotle on the other hand views a "natural primary substance" always as a composite of form and matter. With him the "entelechy" of a living body is never itself a "substance." All natural substances are material; their "form" is never an independent being.

Driesch's "entelechy," as the immaterial "natural form," potentially contains "also all particular potencies of a functional, adaptive, restitutive character to be found in the realized form." It even contains the possibility of all future generations, including the possibility of all future phylogenetic processes of mutation. From a phylogenetic viewpoint there are consequently not many entelechies. Rather there is only one, viz. the "superpersonal life,"

1 Driesch was fully aware of the fact that his concept of entelechy lacks the genuine Aristotelian sense. In his *Der Begriff der organischen Form*, p. 71 n. 1, he observes: "Aristotle's eidos consequently corresponds *more or less* to our concept of entelechy; it is well known that his entelechy has a different meaning." And in his *Philosophie des Organischen*, p. 170 he remarks: "We want to use the word entelechy only as a proof of our veneration for this great genius; we accept his word only as a form which we have filled and shall fill with a new content."

2 This clearly appears from Driesch's remarks (*Philosophie des Organischen*, pp. 209-210) with respect to Weismann's theory concerning the material continuity of germ-plasm: "Taken literally this thesis is self-evident, yet for all that not unimportant. Since all life manifests itself *in bodies*, i.e., *in matter*, and the development of all offspring originates *from parts of the parental bodies*, i.e., *from the parental matter or material*, it immediately follows that a material continuity exists in a certain sense so long as there is life, at least life in the forms known to us." *Life* and *material body* are thus separated from one another as "substances." Driesch does not know a biotic or psychic function of the body. "Body," as such, to him means an extended material substance, whose spatial figure, however, originates from the operation of an immaterial entelechy-substance. As to Driesch's Cartesian identification of "material substance" with space itself or at least with an extensive material element, I refer, for example, to *Philosophie des Organischen*, p. 497, where we read: "Inorganic substance is either itself extension, i.e., space as the bearer of phenomenal reality, or it is something consisting of absolutely singular elements which in *extension* are *next* to one another."

of which all individual entelechies are only temporal and transitory ramifications.[1]

"Entelechy" as a metaphysical substance. Driesch's view of the scheme act-potency confronted with the Aristotelian conception

In this context Driesch now also expressly raises the *metaphysical* question as to whether this "entelechy" itself develops, in which case it could not be the "constant substance" of the empirical "organic form." His answer is:

> Here we can only advance by applying the conceptual pair *actus* and *potentia* to two essential *sides* of the substantial entelechy. As *potentia* the entelechy is the constant substance of the "form," but according to its *actus*, manifesting itself in matter, the entelechy changes in the sense of a development of the type of a nonmechanical evolution.[2]

This statement shows that Driesch really ascribes to his entelechy a metaphysical sense, in spite of his earlier statements that this question should remain "open." For the "constant substance," which is at issue in this context, is no longer meant in the sense of an ordering concept. It can only be understood as an immaterial "thing in itself." At the same time we may establish that the metaphysical conceptual pair *actus et potentia* is also used here in a sense fundamentally different from its Aristotelian meaning. For in Aristotle "potency" (*dunamis*) is always inherent in "matter." But according to Driesch, the very entelechy, viewed from the perspective of its "form" and "immaterial constant substance," is a pure "potence," which only in its material operation becomes "actus."

1 Cf. *Der Begriff der organischen Form*, p. 72: "By the relationship of a given form and its personal eidos to inheritance and phylogeny, the 'form' in the substantial sense is immediately divested of its actually personal character: the entelechy which is actual in the material production of person is not itself 'personal,' as if there were 'many' entelechies. Life is one, a great whole, divided over persons who descend from one another." This thesis is explained more amply in Driesch's *Logische Studien über Entwicklung*, 2 vols. (Heidelberg, 1918-19), 1:9 ff.

2 *Der Begriff der organischen Form*, p. 72.

Driesch denies a typical biochemical constellation. The problem of how the entelechy influences purely mechanical matter

Besides the existence of a particular "living matter" Driesch also denies the existence of a particular "biochemical constellation" in the sense defined by us above. According to him, a living organism, when viewed from its physico-chemical side, is nothing but "non-living matter," which *as such* possesses a completely closed constellation determined in a mechanical causal way.

From the physico-chemical viewpoint, material organisms with and without entelechy (i.e., living and non-living organisms) are therefore basically not different.[1] The difference is exclusively to be found in the controlling influence of entelechy on matter, and this influence is not of a physico-chemical character.

This raises the crucial problem: How can such an immaterial entelechy influence matter in its physico-chemical constellation without breaking through its causally determined mechanistic system? And inversely: How can mechanically determined matter influence an immaterial entelechy without encroaching upon the latter's autonomy?

1 This is not in conflict with Driesch's conception that, as a "living organism," a body is a material system whose behavior does not conform to mechanical, but to vitalistic laws (cf. *Philosophie des Organischen*, 1:851 ff.; *Leib und Seele*, 3rd ed. (Leipzig, 1923), p. 88). For the body is certainly not such an autonomous biotic material system from the physico-chemical point of view. The latter cannot show us anything but mechanical causal processes. It is only in consequence of the controlling influence of an immaterial entelechy that a living body displays the typical traits of a *biotic* material system. But this influence is of a non-physical character, and its causality is a *biotic* causality which, according to Driesch, always presupposes the mechanical causality displayed in the physico-chemical constellation of matter. This clearly appears from his discussion of the relation between the brain as a "physico-chemical system" and the "psyche" which operates by means of this system. In his *Leib und Seele*, pp. 89-90, he observes: "The brain is necessary for an action as a natural event, its construction in the various animal groups conditions the particular form and level of action; brain defects determine occasionally, though not always, certain defects in action. But the brain's physico-chemical condition at any given moment is *not* the complete sufficient genetic ground, but only a partial genetic ground for what happens in it and proceeds from it; and this though at any given moment the brain as a material thing possesses *its specific physico-chemical, or, in short, mechanistic defining characteristic*."

Driesch has amply discussed these questions in his large work *Philosophie des Organischen*.[1] In a later treatise, entitled *Logische Studien über Entwicklung*, he has improved his former view to an important degree.

He assumes four possibilities with respect to a causal mode of operation of entelechy:

1. Entelechy is itself able to originate physical movement (energy). In this case, however, the basic law concerning the preservation of energy would be violated.
2. Entelechy removes energy by means of a sort of "turning" of material systems (Descartes, Hartmann), and it functions in this way as an *arbeitslose Kraft* (a force without energy). Suppose a force is working upon a physical system, perpendicularly to the momentary direction of its movement. In this case the work done by this force is zero but the latter is nevertheless able to cause a change in the direction of moving-matter particles. We can imagine that entelechy adds such forces to the physical forces of the material system, or withdraws such forces from the material system if need be. In this case all particles concerned will be led into different directions without the balance of energy being altered.
3. Entelechy may "suspend" motion by temporarily transforming actual kinetic energy into potential energy. Entelechy may also set free kinetic energy bound by it so that the latter changes into actual energy; and this may occur in a teleological relation to the needs of the living whole.
4. Entelechy imposes a rough building plan on the material system; but within the frame of this plan it leaves free scope to the physico-chemical movements of the material system. It thus creates within the material system of cells only certain chances (*naturwirkliche Bedingungs-gleichungen*) within which each separate physico-chemical event may freely proceed.

The first of these hypotheses is rejected by Driesch because of its incompatibility with the basic law of the preservation of energy. It would imply that energy arises from an immaterial source. In this case entelechy would operate in a *quantitative* causal way by originating a certain quantum of energy. The three remaining hypothe-

1 *Op. cit.*, pp. 153-240.

ses are equivalent in his opinion as acceptable attempts at explaining the method by which entelechy operates.

In 1908 he chose the third solution, but later on he preferred the fourth theory of the rough building plan. The reason was that the latter was supposed to give a satisfactory explanation for the undeniable fact that the biotic total form is only realized in a rough outline while the position of the individual cells in the separate organs remains accidental. The Russian biologist Gurwitch probably meant something similar by what he called a vital form (*morphe*) which only *regulates* the physico-chemical system without *determining* it.[1]

The second and third hypotheses have already been subjected to a decisive criticism by Bernard Bavink.[2] First he observes that the physico-chemical laws are not exhausted by the law of the preservation of energy. According to the classical view, apparently adhered to by Driesch, a physical system proceeds in conformity to certain differential equations combining the initial condition with the changes of the magnitudes concerned. The law concerning the preservation of energy is only one integral of these equations. Driesch might object to this argument, maintaining that he has also taken into account the law of entropy. But it remains true that the laws of thermodynamics alone cannot completely determine the closed physico-chemical system of classical physics and chemistry.

Driesch should have shown how an entelechy might be able to alter the direction of a physico-chemical process that is already completely determined by its initial condition and the classical laws of nature. His arguments, however, lead his explanatory attempts into a vicious circle, for they presuppose a physico-chemical function of entelechy itself, contrary to its assumed immaterial nature.

In order to illustrate that entelechy can influence matter, Driesch adduces that by means of a machine a human being may guide a physico-chemical process to certain ends without violating physico-chemical laws. This is of course true. But human beings can only bring this about either by means of small quantities of en-

1 Gurwitch, *Biologisches Zentrallblatt* 32 (1912), p. 458 and *Archiv für Entwicklungsmechanik der Organismen*, 30.1 (1900): 139.

2 *Op. cit*., pp. 445 ff.

ergy inserted by them (or by others) in the process concerned, or by constructing a machine in such a way that the physico-chemical processes in it must occur in the direction required.

When applied to an entelechy this would mean in the first case that this entelechy itself must produce energy although in minimal quantities. In the second case the argument would result in the assumption that the organism, though originating from entelechy, functions completely as a machine. Both consequences contradict the neo-vitalistic view. In addition, if the working of entelechy upon matter is conceived after the pattern of the human direction of a machine, we are once again confronted with the problem: How can a human being influence physico-chemical processes? For human beings themselves are living beings in which an entelechy must be at work – if the neo-vitalistic conception is true. But the mode of operation of entelechy was to be explained by its very comparison with the human direction of a machine; so we move in a vicious circle.

The so-called suspension theory, developed in Driesch's third hypothesis, in any case presupposes the production of some energy on the part of an entelechy. As to the second hypothesis it should be observed that a force which does not do any work is nevertheless a *physical* force, whereas an entelechy was supposed to be an immaterial cause.

Finally we will briefly consider Driesch's fourth hypothesis, which Bavink does not discuss. The so-called building plan theory is no better than the two former explanatory attempts. This theory also supposes "a physico-chemical realization" of the rough plan in the material organism, which, as a "closed physico-chemical system," is supposed to be completely determined by its initial condition and its self-contained laws.

When the building plan of an architect is realized, this realization can never occur in a purely immaterial way. Rather it needs physico-chemical energy not belonging to the physico-chemical constellation of the building materials. This comparison, too, implies the vicious circle in which we were moving when Driesch compared the working of entelechy with the human direction of a machine.

It is the dualistic substance-concept that leads theoretical thought into such insoluble (because wrongly posited) problems. As long as "life" is viewed as an immaterial "substance" working upon a "material substance," the question of how such an operation is possible will remain the chief crux of theoretical biology. For the substance-concept itself, whether or not used in an explicitly metaphysical sense, implies an insurmountable antinomy, which we have amply discussed earlier.[1] The reason is that it elevates a theoretical abstraction to an independent being.

An entelechy in Driesch's neo-vitalistic sense cannot exist in temporal reality; for it is simply a theoretical abstraction of the biotic modality of experience, absolutized to an "immaterial substance." This concept of entelechy is nothing but the vitalistic counterpart of the mechanistic concept of "matter" which modern physics was obliged to give up because of its incompatibility with the microstructures of energy.

The neo-vitalistic view confronted with the neo-Thomist conception. Driesch's philosophy of nature transforms the Greek basic motive into the humanistic basic motive of nature and freedom

The question may be asked why Driesch has refrained from reverting to the genuine Aristotelian conception of entelechy. For it cannot be doubted that the latter, revived in the neo-Thomist philosophy of nature, is in different respects in a better position than neo-vitalism. It does not involve itself in the contradictions of a vitalism which is at the same time intended to maintain the basic tenets of the mechanistic view of matter. For it holds that the specific "matter" of a living being has no independent being but, as a *hylē* in the Greek sense, can only occur in the substantial form of a *psychē*. It equally denies an independent being of the latter but assumes (apart from the Thomist reserve with respect to the human rational soul) that the substantial form of a composite can only be realized in a specific "matter." The Aristotelian-Thomsitic view does not know any matter in a living body other than "living" matter, i.e., *animated* matter.

The answer to the question concerned must be: In his philosophy of organic nature Driesch does not start from the Greek basic

1 See *WdW*, 3:1-128; [cf. NC, 3: 3-153].

motive of neo-Thomism. Rather his basic motive is that of nature and freedom in the modern humanistic sense.[1] The Greek idea of *hylē* remained entirely foreign to him. His concept of matter is completely oriented to the modern deterministic science ideal of classical natural science.

It is true that he continually avails himself of the scheme of matter and form and that of act and potency. Seemingly he even connects the particular Greek concepts of *anangkē* and *tychē*[2] with his notion of matter. But in reality all these basic ideas have been fundamentally transformed by the humanistic motive of nature and freedom.

In his *Ordnungslehre* Driesch speaks of a basic dualism in the world which he characterizes as the irreconcilable contrast between "totality" and "chance."[3] But his idea of chance is diametrically opposed to the Greek idea of *tychē* and *anangkē*. When he introduces this notion, he immediately adds: "I explicitly define the concept 'chance' as *Nichtganzbezogenheit* (i.e., what is not related to a totality), consequently not, for example, as 'lack of cause'."[4]

And then he continues as follows:

> This contrast between totality and chance is the fundamental opposition from which all contrasts, occasionally called "dualistic," derive, such as the contrast between animate and inanimate, form and matter, mind and body, soul and body, and so on. One may define chance as a concurrence of mutually independent causal

1 This is also implicitly granted by Heinichen in his *Driesch's Philosophy*, p. 150, where he summarizes Driesch's view of the relation between entelechy and causality as follows: "In natural philosophy, the concept of freedom, which is the prerequisite for all that is creative, or new, does not exist; in natural philosophy, freedom is not *allowed* to exist, for, in the strict sense of the word, freedom implies the denial of unequivocal determinedness, and it is inconceiveable that, under given circumstances, *either* the one *or* the other could happen." This statement is completely oriented to the classical deterministic view of nature in its dialectical contrast with the humanistic freedom motive.

2 Cf. what we have observed with respect to these Greek notions in *Reformation and Scholasticism*, 1:99 [cf. *NC*, 1: 62; 3: 746f.].

3 *Ordnungslehre*, pp. 446 ff.

4 Cf. also Driesch's treatise "Wahrscheinlichkeit und Freiheit" (*Philosophische Gegenwartsfragen*, 1933), p. 170: "A random event is consequently not an '(organic) part' of a whole, but only an 'element' of a sum total of elements." The concept *summenhafte Gesamtheit* (sum total of elements) in Driesch's terminology always has an atomistic and mechanistic sense.

> series, as, for example, the great embryologist C. E. von Baer does. But this is only a particular instance of chance which is subsumed under our comprehensive definition of chance.[1]

In "matter" (i.e., "inanimate nature") chance rules universally (*schlechthin*), though we have seen that Driesch conceives of "matter" in *a rigid mechanically determined way*. Only a few traits of unity and totality are realized in it (for example, the unity of the three-dimensional physical space in which all matter is supposed to move).

Yet the dualist motive of "totality" and "chance" is not identical with the humanistic basic motive of freedom and nature, which in its deepest sense governs Driesch's entire thought. In his *Wirklichkeitslehre* Driesch opposes *genuine freedom to univocal determinateness* in the process of becoming. The question whether freedom exists in this sense is seen as a metaphysical belief which should remain unanswered by philosophy as a science.[2] This standpoint differs from that of Kant. For Kant in his *Critique of Practical Reason* Kant answers this question in a positive sense, and he may do so because he does not view philosophy exclusively as being scientific. Driesch and Kant agree, however, in the opinion that "freedom" is not a question of scientific demonstration, but of belief.

In any case, Driesch's philosophy of nature remains entirely enclosed within the frame of determinism. His neo-vitalism is also not at all intended to place a barrier in the way of the classical science ideal with its postulate of a closed causal explanation of nature. On the contrary, its true intention was to save the concept of natural law within the sphere of bio-phenomena, although this concept must assume a different sense here from its mechanistic conception. The concept of totality (*Ganzheit*) remains with Driesch an ordering notion pertaining to natural phenomena. As such it seems not to be oriented to the freedom motive of the humanistic personality ideal, as was the case in German freedom-idealism.

And yet, when we penetrate into the deeper strata of Driesch's philosophy of nature, it is hardly to be denied that in the dualist theme of totality and chance, the influence of the dialectical basic motive of freedom and nature is present. Driesch's particular idea of totality, in its contrast to that of a mere summation of mechanical

1 *Ordnungslehre*, p. 446.

2 *Wirklichkeitsslehre*, pp. 93-122.

elements, no doubt depends on the influence that Schelling's freedom-idealism had on the philosophy of nature. In Driesch the romantic idealist idea of totality has only been transformed into a second concept of natural causality. The purpose of this transformation was to save the classical science ideal with respect to the bio-phenomena.

The common origin of Driesch's and Schelling's idea of totality was that developed in Kant's *Kritik der teleologischen Urteilskraft*.[1] In that work this notion only served the dialectical attempt at bridging the cleft between nature and freedom, if only by way of an "as if" judgment.

Driesch has intentionally elevated this teleological idea of totality to a new category of natural science, next to the mechanistic categories of classical physics.[2] So it has become a constitutive category of science itself. Nevertheless, this "ordering notion" continues to betray its origin in the humanistic freedom-idea by its polar contrast to the mechanistic concept of a determined aggregate of elements. This contrast between "mechanism" and "totality" cannot be bridged in Driesch's philosophy of nature. It implies a mechanistic view of "matter" in the sense of classical physics and – as its polar counterpart – an entelechy as a "substance" which works upon matter after the pattern of a "totality-causality." An acceptance of the Aristotelian-Thomistic view of a living whole was thus already excluded by the transcendental basic idea of Driesch's philosophy.

1 Immanuel Kant, *Critique of Teleological Judgment* (1790).

2 This scientific transformation of the Kantian notion of a teleological whole was facilitated by the fact that Driesch denies the genuine freedom character of Kant's practical idea of liberty. Kant had identified the latter with the idea of "moral autonomy" of the "pure human will" regulated by the "categorical imperative." According to Driesch, genuine metaphysical freedom is incompatible with any general law imposing itself upon human action. This thesis must consequently include Kant's categorical imperative. In Driesch's opinion genuine freedom is only compatible with a consistent pantheism, in the sense of a "becoming deity" lacking also any determination by a constant divine nature.

CHAPTER 5

Molecular Structures and the Living Organism

Woltereck's hypothesis concerning a particular bio-substance

After our critical analysis of the mechanistic and neo-vitalistic standpoints, we shall now consider in more detail Woltereck's hypothesis concerning a particular "bio-substance" mentioned earlier. Initially Woltereck explicitly made the reservation regarding this hypothesis that he accepted it only "until it should be refuted."

It must be evident from the outset that the introduction of this hypothesis has nothing to do with the older vitalist view of a vital matter. Woltereck does not at all intend to withdraw his hypothetical material bio-substance from physico-chemical scientific investigation. On the contrary, he blames Driesch for having prematurely substituted the "metaphysical notion of entelechy" for an as-yet-unknown property of the "physical real plasm." He is of the opinion that Driesch has not proved the necessity of this substitution by the exclusion of genuine physico-chemical possibilities.

On the other hand his standpoint is equally opposed to the mechanistic view which claims that bio-phenomena can only be explained from intricate physico-chemical processes. He thinks that his hypothetical material bio-substance is connected with "immaterial and conditional structural constants" as potencies, which as such pass away together with their material bearer.

Physico-chemical bio-phenomena, accessible to sensory perception and logical analysis, are, according to him, only the temporal-spatial *exterior* of living organisms. Their genuine *essence* is their immaterial *interior*. Biological investigation may only approach this essential inside by conceiving a biotic process as an "inner experience" of the living being.

As we have seen, Woltereck considers an artificial biosynthesis to be fundamentally impossible. He agrees with the opinion that a causal physico-chemical analysis of bio-phenomena encounters an insuperable limit:

> Our causal-material analysis of bio-phenomena cannot exceed a certain limit. However wonderful the advances which we owe to experimental analysis . . . , by clarifying material hereditary units, organizers and hormones, and by discovering the behavior and operation of these bearers of impulses, the material causal analysis has reached its ultimate limit; or to be more precise: it *will* have reached this limit once we arrive at a complete knowledge of the field conditions and field processes underlying the factors mentioned.[1]

And finally we must remark that Woltereck's hypothetical "bio-substance" is no more meant in a metaphysical sense than Driesch's "entelechy" was initially. Woltereck himself points to the ambiguity of the term "substance" in its philosophical use. He explicitly declares that he wants to understand by it nothing but "living mass." But with this, however, he decidedly means a specific "living matter," a complex of molecules fundamentally distinct from inanimate matter or dead plasm flowing from a physico-chemical property not yet known, a so-called "primary biochemical moment."

In addition, this bio-substance is supposed to be characterized by the two basic biotic properties of autonomous capability for stimuli and genetic continuity. Woltereck compares this specific physico-chemical condition of his "bio-substance" with that of radioactive elements and aromatic compounds, which are also distinct from other kinds of matter by specific "moments."

In favor of his hypothesis he first points to the fact that, in spite of our lack of knowledge of the "biochemical basic moment," we may clearly establish a fundamental difference between the material components of a living cell body: on the one hand we discover components which *produce* other kinds of matter without disappearing themselves; on the other hand we encounter material components which *are produced* without being capable of producing.

An intermediate position is taken by enzymes, which do not reproduce themselves and consequently cannot be viewed as "living components," but nevertheless do not partake in the chemical processes influenced by them in a regulative sense.

1 Woltereck, *op. cit.*, pp. 512/3.

Woltereck only regards the producing "chief substance" of all bio-systems as "living substance." Every bio-system seems to contain three components:

1. units bringing about metabolic processes;
2. so-called inductive material units which operate in a determining, or regulating, or organizing way (genes, hormones, enzymes, organizers);
3. the "matrix" (germ plasm, idioplasm, reserve plasm), i.e., that unknown living basic matter of the cell which remains constant in spite of all changes in the biochemical constellation. This "matrix" reproduces itself and potentially guarantees all typical properties of the different species as well as all operative functions of the living cell. And it also produces, if need be, the inductive material components.

The inductive material components in the living cell body: enzymes, hormones, organizers and genes

We can now state that modern biology has indeed succeeded in showing the presence of inductive material factors in the living cell body. This result has been reached in a threefold way.

First, biochemistry has succeeded in establishing the catalytic operation of enzymes in metabolic processes. In addition, by serological (immunological) research it has established the function of the specificity of protein compounds produced by living organisms according to their different primary types. In recent times biochemistry has also elucidated the enormous significance of the hormones or internal secretions.[1]

The existence of "organizers" has been indisputably shown by so-called "developmental mechanics" founded by Wilhelm Roux. These "organizers" were found to exercise a determining influence upon the embryonic development of a living body and its particular organs. Continued research has brought to light that here, too, we are confronted with particular material factors. There is an abundance of experimental *evidence* with respect to this subject matter. We have already mentioned the experiments of Hans Spemann and his school with the transplantation of cells from the

1 Biochemistry has already succeeded in synthesizing different kinds of hormones (insulin, adrenalin, thyrotoxin, different sexual hormones, etc.), which have found an extensive application both in medicine and zoology.

so-called blastopore, i.e., the invagination of the gastrula[1] of a developing embryo.

It was found that the closer the separate parts of an embryo are located to the blastopore, the sooner their developmental direction becomes fixed. It was already known that, in the developmental phase of an embryo, a living cell (or groups of cells) has many more genetic potencies than are ultimately realized.

The neighboring cell or group of cells appears to exercise a determining influence on the fixation of the ultimate developmental direction. This operation occurs in a strict conformity to laws and may eventually also deviate from the total building-plan of the organism. The question, for example, of which of the two halves of a sea urchin egg develops into half an embryo and which becomes a complete embryo, depends on a complex of causes. These causes lie partly beyond the internal working sphere of this single cell, though it is certain that, in the first place, the decisive factor here is whether or not the internal polar-bilateral structure of the egg's protoplasm does have the capacity to *regulate*.[2]

If the cell is separated from its fellow cell, it will produce a complete embryo; if it remains united with this other cell, it will produce a half embryo. In this case the developmental law of the separate cells apparently suits the building plan of the total organism. But under certain conditions it also appeared possible to cause entirely abnormal formations of organs and even a double embryo by means of transplantation of cells.

Spemann's pupil, Hans Mangold, managed to produce an entirely new embryo by transplanting a piece of the blastopore of a gastrula into the tissue of another embryo, viz., that tissue which later on develops into abdominal skin. This new embryo, however, arising from the implantation, did not merely grow from the trans-

1 By means of division of the animal egg cell, first two cells arise, then four, then eight, sixteen, etc. Finally a solid ball of cells appears, which is called a *morula* (i.e., mulberry). By secretion of liquid the latter turns into a hollow ball, called a *blastula*, which is then further transformed into the *gastrula*. During this transformation, called gastrulation, two different layers of cells develop, the inner and outer blastoderm, between which in all higher animals very soon a mesoblastoderm is formed.

2 Cf. Driesch, *Philosophie des Organischen*, pp. 56 ff.

planted cell groups, but largely developed in a totally different direction determined by the cells of the host embryo!

Later on, many other experiments with such remarkable "phantom formations" were carried out. They have indisputably established that the cells of the blastopore have the potency of compelling the neighboring cell groups to develop the form in question. This was the experimental proof of Spemann's hypothesis that the blastopore must contain the organizing center.[1]

The mechanistic school naturally conceived of these "organizers" as material substances expanding themselves from the center under discussion to the periphery. The neo-vitalists, on the contrary, viewed these "organizers" as effects of the immaterial entelechy. The experiments with abnormal organ and chimera-formations seemed to contradict this neo-vitalist interpretation. But Driesch tried to reconcile these experiments with the neo-vitalist view by means of his building-plan theory or by assuming "sub-entelechies" which operate without subjecting themselves to the rough building plan of the whole.[2]

Meanwhile, later experiments have shown that the "organizers" are indeed inductive material factors. Holtfreter and other investigators of the Dahlem Institute succeeded in producing the induction of an embryo in the indifferent abdominal tissue of the host animal by means of dead cellular material originating from the blastophore.[3] Thereby the earlier supposition that the embryonic organizers are kinds of hormones (developmental hormones) was elevated to a near-certainty. But of course these experiments did not prove that the mechanistic interpretation was correct. For the determining influence of the material organizers depends entirely on the potencies of the living cell organism of the host animal.

Still another kind of inductive material factors has been brought to light by modern genetics in combination with a microscopic investigation of the cells, especially the embryos and their nuclear

1 At a more advanced stage of development, however, the direction of the development appears to be already determined to such a degree that a fundamental change is no longer possible.

2 Driesch, *Philosophie des Organischen*, p. 483.

3 Cf. the report of these experiments in *Naturwissenschaften* 51 (1932): 972 ff.

components. These combined investigations have led to the discovery of the *genes* in the chromosomes[1] of the cell nucleus, which are viewed as the material bearers of factors of hereditary characteristics.

The existence of these genes and their local distribution in the chromosomes can no longer be doubted. For it has been experimentally proved that in the case of an artificial partial destruction of a chromosome in the germ cells of *Drosophila* particular properties of the individual had also vanished. According to the genetic analysis of Morgan and his school (whose results have been recorded in the famous chromosome maps), these properties must have had their seat in the missing piece of chromatin.

Morgan, who was certainly not an adherent of the mechanistic standpoint, supposed that the genes are fitted into a linear ordering of the chromatin particles of a chromosome. In this case, the structure of a polypeptide molecule urges itself upon us. Within it the separate genes are supposed to function as changeable radicals. Other investigators have supposed that genes are also a kind of enzyme-like material component which have some connection with the above-mentioned "developmental hormones."[2] It needs no further argument that the discovery of these genes also has nothing to do with a mechanistic interpretation of the hereditary phenomena.

Woltereck is of the opinion that the experimental material briefly outlined above may be considered to be a sufficient foundation for his view of the cell structure which starts from the existence of a material bio-substance. As we have seen, he distinguished three components in the biochemical constellation of the cell: a "matrix," material components bringing about the metabolic processes, and inductive material factors of a determining, organizing and regulating character. Now he assumes that this distinction as

1 Chromosomes are the threads into which, during the process of cell division, the chromatin (i.e., the nuclear material that can be stained) condenses itself. This phenomenon is usually accompanied by a temporary disappearance of two other nuclear components, viz., the nucleoli (nuclear corpuscles) and later on also the nuclear envelope.

2 [One should bear in mind that this was first written before the structure of DNA, gene action and regulation, and protein synthesis were elucidated.]

such has been *proved*; opinions may differ only concerning the question how these three kinds of components are *interrelated*.[1]

In his opinion, the best founded hypothesis is the following. In every living being there exists a specific living material substance, viz., the "matrix," which differs with the different species of living beings. There are simpler constellations of matter (radicals), dependent on the matrix, which cause the metabolic processes. These radicals are continually changing by partially falling apart and partially taking up material compounds, i.e., by dividing and growing, etc. They may be considered to be identical with Heidenhain's "protomeries" or minimal living particles.

Finally there are particular material components (produced by the matrix) which are operative in organizing, differentiating and regulating the cell organism. Among these latter the genes have their seat in the nuclear loops of the cells. They must be seen either as micrograins of chromatin or as radicals inside the chromatin.

The localization of the genes is known. As to the material components causing metabolic processes, it seems probable that they are distributed over the whole cell as "protomeries." But as to the matrix we do not know where it has its proper seat.[2]

With respect to this question Woltereck assumes two possible hypotheses: either the matrix is spread everywhere in the cell plasm and nucleus in equal proportions, and it produces, besides other structures and material components, the chromatin threads and the genes; or the matrix is present in a concentrated form in the chromosomes, perhaps in the form of a chain of molecules with many side chains, radicals, etc. more or less loosely combined with the latter. In this case the radicals hanging on it are the genes, which later on produce differentiating impulses.

This latter hypothesis seems to Woltereck the best founded supposition because it corresponds more precisely to the results of cytological and genetic research. But he does not want to exclude the possibility that outside the cell nucleus there are also determining

1 *Op. cit.*, p. 352.

2 *Ibid.*

hereditary material components in the cell[1] which might be called "plasmic matrix."

The question concerning the seat of the "organizers" and "regulators" within a cell body then remains unanswered. But in any case, these material components are also produced by the matrix.

Criticism of Woltereck's theory

Undoubtedly, the core of Woltereck's theory must be sought in the assumption of a "matrix" as a material bio-substance. It is remarkable that he initially introduced it only in a hypothetical sense and cautiously qualified this hypothesis with the reservation: *bis zu ihrer Widerlegung* (until it is refuted). He even explicitly warned his readers "that an unknown moment" (viz., the assumed biochemical basic moment of the matrix) "can neither be strictly proved nor refuted," but only "be rendered probable or improbable." Meanwhile this reservation has apparently been abandoned in the continuation of his argument. It is indeed surprising that later on Woltereck speaks of the existence of his "matrix" as an experimentally established or proven fact.[2]

He does not inform us how his hypothesis concerning a bio-substance has been proved. This "proof" can certainly not be derived from the experimental evidence briefly mentioned above. On the contrary, we have seen that the material components of a cell whose inductive, determining or regulative functions have been experimentally established, have more and more proved to be *non-living* compounds.

Regarding genes, Woltereck himself has observed that they cannot be pure living units.[3] And he has also emphatically stated that the existence of "biomolecules," which are supposed to bring about the metabolic processes, has never been proved.

Thus the question arises: How has Woltereck arrived at his hypothesis concerning the "matrix" as a constant bio-substance which would continually reproduce itself? To answer this question we should consider that Woltereck himself has identified his "matrix" with the concepts germ plasm, idioplasm or hereditary mate-

1 [Which is indeed, as we now know, the case.]

2 *Op. cit.*, p. 352.

3 *Op. cit.*, p. 353.

rial. He prefers his own term only because the other terms are more or less burdened by the theories which involve them.

Weismann's theory concerning the continuity of the germ plasm

The term germ plasm has been introduced by the famous biologist August Weismann, one of the prominent representatives of the older Darwinian theory of evolution. Weismann was of the opinion that, from the very beginning in the process of embryonic development, those cells are separated which later on become the so-called mother cells of embryos. They form the continuous germ lineage (*Keimbahn)*, as Weismann called it, passing through the generations, whereas the body cells, or the *soma*, are again and again split off from this *Keimbahn*.

The germ cells of the present generation are thus not produced by the individual bodies in which they are taken up; rather they are the direct products of the germ cells of the previous generation, from which also the soma cells of the present generation originate. This was the theory concerning the *continuity of germ plasm*, which in spite of the strong opposition it aroused at first, has at present been rather generally accepted. This acceptance was especially due to the fact that the so-called cell lineage research succeeded in directly tracing the isolated developmental course of the germ cells.[1]

Meanwhile, Driesch has pointed to the fact that all this only concerns empirical data of *descriptive* embryology. The more recent discoveries concerning the restitution of a living organism have made it necessary to add so many reservations to the theory of the specific *Keimbahne* that it practically loses any significance. For these discoveries have shown that in the earliest phases of development a cell possesses a so-called "masked" prospective potency which may lead to results quite different from what is borne out by the facts.

According to Driesch, this new experimental evidence entitles us to basically ascribe to all the cells of a *soma* all morphogenetic possibilities. Possibly, certain (as yet unknown) conditions may

1 Cf. Bavink, *Ergebnisse und Probleme*, pp. 406 ff., who apparently assumes that Weismann's theory has been *proved* by the results of this research.

obtain causing any soma cell to become a germ-cell.[1] This is why Driesch is of the opinion that Weismann's concept of *Keimbahn* has only a descriptive character and cannot be elevated to a fundamental concept.

However this may be, Weismann himself has certainly not conceived the "continuous germ plasm" as a specific "bio-substance" in the sense of Woltereck. Rather, the intention of his theory was to provide mechanistic evolutionism with a general foundation. And this evolutionistic view in principle rejected the assumption of a specific "bio-substance."

Even if Weismann's theory should be considered as proved by the research of cell lineage, this proof can thus certainly not pertain to Woltereck's hypothetical "matrix." The real existence of such a material bio-substance *can never be proved in a purely experimental* way. For the question as to whether material compounds as such may be qualified by a subjective biotic function necessarily involves a *philosophical problem of structure*.[2] And the standpoint chosen with respect to this problem of structure basically determines any theoretical interpretation of the results of experimental research.

It is not the continuity of germ plasm which is at issue here. Rather we are confronted with the question concerning the relation between typically *biotically* and typically *physico-chemically* qualified *individuality-structures* within an apparently present *totality individuality-structure* of the living cell body.[3]

We are certainly entitled to say that the results of experimental research have made it necessary to distinguish between living and non-living components of a cell. Woltereck himself does so em-

1 *Philosophie des Organischen*, p. 210. From a quite different standpoint Weismann's theory is rejected by the neo-Lamarckians, such as Oscar Hertwig, *Allgemeine Biologie*, 6th and 7th ed. (1923). The latter holds to the transmission of acquired characteristics in the hereditary process by means of an alteration of the idioplasm of the egg cell. Of course this theory is obliged to deny the independence of germ plasm with respect to the *soma*.

2 This is implicitly acknowledged by Woltereck himself insofar as he ascribes to his hypothetical matrix an "invisible basic structure."

3 [This demonstrates that Dooyeweerd clearly *distinguishes between* the biotically qualified individuality-structure ("organism" in his terminology) *within* the totality structures of the cell body *and* the latter as such.]

phatically. But this does not solve the structural problem as such. The way in which a scientific investigator posits it is philosophically conditioned.

The influence of the metaphysical substance-concept on Woltereck's theory of "matrix"

Now it seems to me that Woltereck, regardless of the reservations he appeared to have with respect to the metaphysical substance-concept, has nevertheless unconsciously been influenced by it. We could establish the same state of affairs with Driesch. Even the *term* "substance," although used with reservation, turns out to exercise a kind of magic influence on many serious scientific theorists. Driesch elevated his "entelechy" to a "substance" of the living organic total form.

Woltereck conceived his "matrix" as a "bio-substance," in the sense of a specific "living matter," which in addition was supposed to possess an interior as an "experiential center." When elaborating his matrix theory, Woltereck appears to return to the hypothesis that the "bio-substance" may display the intricate structure of a polypeptide molecule. And he does so in spite of the fact that he himself had emphatically established that such a structural model can never account for the typical *centered* structure of a living cell.

But a molecular theory of "living matter" necessarily implies the tendency to eliminate the typical totality individuality-structure of a living organism.[1] And this consequence decidedly contradicts Woltereck's earlier statement that the living cell is the minimal whole capable of life in an independent sense.

Now we should bear in mind that until the twentieth century the modern concept of matter was itself connected with a mechanistic substance-concept. Classical physics founded by Galileo and Newton held to the metaphysical conception of "matter," as a spatial mechanical substance remaining quantitatively constant in all physico-chemical changes. As soon as this classical substance-concept of matter appeared to be untenable, it was methodically transformed into a mathematical-physical concept of *function*, a func-

1 [Here Dooyeweerd inconsistently uses the term "organism," not in the sense of the biotically qualified individuality-structure *within* the totality individuality-structure of the living cell body (cf. some paragraphs above), but in the traditional sense of "living cell" or "living being."]

tional mass-concept, which as such lacks any ontological connotation as a rigid substantial constant. This mass concept only pertains to the physico-chemical energy aspect of experiential reality.

Modern chemistry ascribes to the general concept "matter" only the meaning of a certain system of equilibrium between protons, neutrons and electrons. Specific kinds of matter are only known in the atomic structures of chemical elements and in the molecular or crystalline form-structures of their chemical compounds.

These structures have proved to be physico-chemically qualified, in the sense of our theory of individuality-structures. Only by restricting the concept of matter to these typical structures can we ascribe to it a univocal sense, founded in the plastic horizon of human experience.

As soon as matter is seen as mere potentiality, in line with the Aristotelian idea of *hylē*, it can no longer be viewed as a real constellation in itself. In this case it must be reduced to a metaphysical component of a "composite natural substance," implying a specific "substantial form" as its complement. But neither in the frame of thought of modern natural science nor in that of the Greek and scholastic form-matter theme does it make sense to speak of a specific material *bio*-substance, in contrast to an *inorganic* substance of "dead matter."

Woltereck's standpoint regarding this bio-substance is indeed far from clear. On the one hand, he emphatically rejects any mechanistic reduction of a living organism to mere material processes. In this context he observes that his hypothesis of a "matrix" only leads to "shifting the indubitable visible particularity of all living bodies to the invisible basic structure in which the spatial and temporal specificities of the organism must be somehow represented and prepared."[1] On the other hand, he parallels the "primary biochemical element" by which "living matter" differs from "dead matter" with the specific properties of radioactive kinds of matter and aromatic compounds.

By so doing Woltereck apparently overlooks the fact that the characteristic properties of these latter kinds of matter are no doubt determined by their physico-chemical structure. The assumption of a specific "living mass" or "*bio-substance*," however, implies an inner contradiction. For, on the one hand, this bio-substance is sup-

1 *Op. cit.*, p. 330.

posed to have a typical physico-chemical structure (although unknown up to now) by which it is determined as matter; on the other, it must be qualified by a typical biotic moment.

No doubt such a *biotic* qualification must be assumed if there be any question of a *bio-substance*. Roux[1] has already repeatedly pointed to the fact that a system of material compounds (A, B, C, D, etc.) may chemically effect the rise of a matter X in a continually increasing quantity, but that from a purely chemical point of view it is entirely impossible that X assimilates itself. Such an assimilation can certainly not be a *purely* chemical process.

As our analysis has shown, in Woltereck's own explanations the above-mentioned contradiction is unmistakable. He starts with accepting the living cell in its totality as the minimal unit capable of independent life. But, in consequence of his hypothesis concerning a "bio-substance," he finally arrives at the hypothetical assumption of a molecular structure of a material "matrix," which must explain even the typical centered structure of the living cell organism.[2] He does so even although he himself has emphasized that the causal physico-chemical analysis encounters insuperable limits in the biochemical constellation!

In this way Woltereck has also involved himself in the inner antinomies of the substance-concept. Thereby his attempt at overcoming the vitalism-mechanism dilemma was doomed to fail. The course of his argument clearly shows that he also had to fall back onto the substance-concept owing to a lack of insight into the modal structures and the typical individuality-structures of our experiential horizon. Driesch elevated "life" to an "immaterial substance" and called it "entelechy." Woltereck on the one hand reduces "life" to a particular physico-chemical constellation of a material bio-substance; on the other hand, he sublimates it to an immaterial inner experience of a non-spatial ontical center. How can we explain this remarkable dualist view?

1 Wilhelm Roux, "Ueber die bei der Vererbung von Variationen anzunehmenden Vorgänge," in *Vorträge und Aufsätze über Entwicklungsmechanik* 19 (1913): 4.

2 That is how Woltereck later on elaborates his thesis "that the indisputably present bio-specificities are caused by a particular physico-chemical situation" (*op. cit.*, p. 331).

Woltereck's philosophical standpoint. His dynamic ontological "Stufentheorie"

Woltereck's biological view is only explicable from his later work, *Ontologie des Lebendigen* (1940), in which he reveals himself as an adherent of a dynamic *Stufentheorie* of reality. This "theory of levels" tries to overcome the vitalism-mechanism dilemma by means of a genetic monism which nevertheless accepts irreducible levels of becoming. This means that on the one hand the irreducible character of life as a new level of reality is acknowledged, but on the other the process of becoming is conceived as a continuous evolution in which "life" is viewed as an "emergence" of physico-chemical constellations. We have already encountered this "emergent evolutionism" in an earlier context.[1]

Woltereck is of the opinion that "life" may very well be conceived genetically as an "emergence" from lifeless compounds – just as the origin of the various chemical elements may be explained from an increase in the possibilities of a material basic substance, or psychical life as an "emergence" of merely biotic, and "mind" as an "emergence" of psychical life.

According to Woltereck, the rise of different autonomous "levels of reality" is governed by "structural constants" which he also calls "autonomous powers," "determinants," "imagoids" or "ideas." Thereby he involves himself in the antinomy between the assumed constancy of these structural determinants on the one hand, and the continuity and unity of the process of becoming, on the other.

Woltereck himself has acknowledged that in terms of his point of view this antinomy is insoluble: "As to the living determinants of becoming," he observes, "and the determinants of value, an unsolved antinomy exists between the state of affairs meant by the term *validity* and that concerning the *origin* of validity." The former requires exemption from time or at least indifference to time; the latter refers to the *origin* of ideas and values which undeniably arise

1 This emergent evolutionism has in recent times been in vogue with many philosophically trained biologists and physicists. L. Morgan is one of the chief representatives of this view. It is also adhered to by J. H. Woodger and A. N. Whitehead, by B. Bavink and Woltereck and other scholars. The *ontological* view of Woltereck is strongly influenced by Nicolai Hartmann's *Schichtentheorie* (theory of layers).

from human cultural activity and which we surmise in the becoming of organisms.[1]

Woltereck rejects the solution of this antinomy presented by Platonism and the modern philosophy of values, which makes an appeal to a supra-temporal kingdom of ideas or values. Rather he resigns himself to the skeptical conclusion: "we will not succeed in solving the antinomy between the validity and the origin of values."

The origin of this antinomy, however, is evident. It is due to an unjustified stretching of the modal aspect of biotic development in its *subject*-side. We are confronted here with an irrationalistic evolutionism that views the structural laws as products of the creative freedom of a *Welt-Subjekt* (world-subject), which itself is involved in a process of continual development. Here, too, the humanistic basic motive of nature and freedom is the ultimate, indeed *religious*, moving power of theoretical thought. The evolutionistic basic idea of humanistic thought implies the attempt to conceive "freedom" (in the irrationalistic sense of "creative subjective freedom") as the "completion of nature" (*Vollendung der Natur*).[2] On this standpoint any insight into the modal structures and individuality-structures of empirical reality is precluded, just as in the case of Driesch. This appears also from the following statement of Woltereck:

> . . . the spiritual psychic phenomena, achievements, and products belong just as much to life as, for example, the shell formation or movement of protozoa. A temple, a book, a sonata or a strategic plan are bio-phenomena, achievements of living subjects capable of achieving something. And literally the same holds with respect to the constructions made by termites, the cocoon spun by a caterpillar, the melody of a bird

1 *Ontologie des Lebendigen* (Stuttgart, 1940), § 176. [Cf. *NC*, 3:763 n. 1.]

2 *Ontologie des Lebendigen*, p. 9: "A self-evident statement will become of essential importance to our inquiry: expression, *laws* and *meaning* do not derive from causes but are only to be understood as *free ordinances*. If any metaphysical state of affairs is beyond all doubt, then it is the *creative freedom* of the *meaning-giving* World-Subject . . . Besides we should not deny the foundation from which our investigation starts, viz., the knowledge of the one total reality of 'nature' embracing everything empirical in 'nature'– call it a 'naturalistic' foundation, if you will." (Ital. mine, HD.)

call, the leaf incision made by a birch leaf roller: *Anybody who does not want to understand this coherence because it seems to be paradoxical will hardly ever fully conceive the extent and contents of the concept of life*.[1]

Such an utterance clearly testifies to a complete lack of insight into the difference between the modal sense of the biotic aspect and the biotic *analogies* presenting themselves within the modal structures of all post-biotic modalities of experience.

In addition, this utterance reveals a lack of insight into the difference between the modal structure of the biotic aspect and the typical individuality-structures functioning in it. As a result, Woltereck slips back into a genuine "biologism" whereby the concept of life loses any defined modal sense.[2]

We have seen, however, that a clear insight into the relation between the physico-chemically qualified material compounds and the living organism within the total structure of a cell depends on a clear insight into its different modal aspects. And the very insight into the inner nature and the unbreakable intermodal coherence of these modal aspects is basically precluded by the acceptance of the substance-concept. Our critical analysis of the theories of Driesch and Woltereck has continually confirmed the correctness of this thesis.

1 *Op. cit*., p. 52 (ital. mine, HD).

2 Also, the irrationalistically conceived freedom motive thereby assumes a biologistic sense. Compare the following statement (*ibid*., p. 122): "The second part of the expectation expressed [viz., that the total process of the world's becoming strives after "completion" in the sense of perfection], views the possibility of a completion of the world *in the human mind*, and such in a future, ennobled, creatively free spirit. *This is the Messiah expectation biologically viewed*" (ital. mine, HD).

CHAPTER 6

A Brief Summary of My Own View

When we began to investigate the intricate structure of a living cell we sharply distinguished between three different individuality-structures:

1. those of the physico-chemically qualified material compounds, which themselves turned out to be genuine enkaptic structural wholes in their molecular or quasi-crystalline form-minima;
2. that of the cell's living organism, in which these building materials are enkaptically bound;
3. that of the cell body as a biotically qualified enkaptic total form embracing the other structures in the enkaptic bond of its form.

These distinctions were oriented to the plant cell. In the case of an animal cell the structure of the living organism[1] is the foundation of a higher individuality-structure, viz., that of the *sensorium*,[2] which has a psychic qualification. This implies that the enkaptic structural whole of an animal cell body is also psychically qualified.

The genuine biochemical constellation turned out to occur in the individuality-structure of a cell's living organism,[3] not in the molecular or quasi-crystalline structure of the material components of the cell body. When a cell is killed, the *internal* structure of its building materials is not immediately changed. Only their biotically qualified enkaptic chemical function disappears. This means that the biochemical constellation is only built up by means of those

1 [Remember: this is the biotically qualified individuality-structure (see above, point 2) within the totality individuality-structure of the living cell or living being.]

2 [This, in our opinion unfortunate term, refers to the psychically qualified individuality-structure within the total individuality-structure of the living cell or living being, in which it is the highest, and therefore qualifying, sub-structure, enkaptically founded in the "organism" (see previous note).]

3 [The reader is reminded that Dooyeweerd inconsistently speaks both of the "organism" as an individuality-structure and of the individuality-structure of the "organism".]

physico-chemical functions of the material components which are enkaptically bound in the living cell organism.

Such functions fall outside of the internal structure of these material components. They are not physico-chemically determined since they are subject to the continual guidance of the leading biotic function of the cell organism. They are as such internal physico-chemical functions of the latter and not of the material molecules.

But this living organism can only realize itself *within the enkaptic total form of the living cell body*, of which (in the case of a plant cell) the organism is only the *qualifying* component, just as the chemical compound was found to be the qualifying component of the molecular form-whole.

In the case of an animal cell the higher individuality-structure of the *sensorium* binds the lower individuality-structures of the living organism and the cell's material components. This means that we are confronted here not only by a *bio*chemical constellation, but also by a *physico-chemical* one. This state of affairs explains why a confirmed psychically qualified reaction observed in protozoa also displays a physico-chemical and a biotic aspect.

All this has been completely misinterpreted by the current dualistic viewpoint, which speaks of a *psyche* in distinction from the *material body*. Theodor Haering also appeared to adhere to this view which, with respect to a human being, adds a "spirit" or "mind" to the "psyche." This is why his conception of an enkaptic whole is not fruitful. Since "psyche" and "spirit" are conceived here as immaterial entities, regardless of the question whether they are or are not conceived of as "substances," this view raises insoluble problems. How can a "psyche" or "spirit" influence a material body? As it turned out, Driesch too became entangled in this problem flowing from a question wrongly posited.

The living organism[1] of a cell is indeed living in all of its inner articulations. It can as such not contain lifeless parts. The cell body, however, cannot be identical with this "part-structure" of its total existence. As an enkaptic total form the cell body also contains the lifeless material compounds, bound by its living organism, which

1 Here it becomes clear again that the term "organism" is used to denote the biotically qualified individuality-structure, which, as *law-side* cannot contain material parts.

itself has turned out to be enkaptically founded in this material substructure.

In an animal cell the biotically qualified individuality-structure is bound in its turn by that of the *sensorium*, and the latter qualifies the cell body as an enkaptic total form. This does not detract from the fact that in the more highly differentiated multi-cellular animals, the differentiated psychic functions are bound to complexes of cells belonging to the central nervous system.

Now the significance of our distinction between the living organism and the body of a cell becomes completely clear. This distinction is not at all artificial, but, on the contrary, necessary to account for the real states of affairs within the cell as a whole.

Our previous analysis of the molecular material individuality-structures has shown that by applying our theory of enkapsis, culminating in the idea of the enkaptic structural whole, two series of experimental data could be harmonized, which by the application of the substance-concept, seemed to contradict each other. The same holds with respect to the individuality-structure of a living cell body. *As long as biology continues to cling to the intrinsically contradictory substance-concept, the futile contest between the mechanistic and the vitalistic views will continue without any prospect of its definitive resolution.*

The Aristotelian-Thomistic substance-concept contrasted once more with the problem of the individuality-structure of the living body

Vitalism, in its relatively justified opposition to the mechanistic view, cannot strengthen its position by reverting to an Aristotelian-Thomistic concept of substance. For, as observed, this scholastic substance-concept compels any theory based upon it to neglect or misinterpret the ever-increasing series of experimental results which seem to corroborate the mechanistic position. These results have undisputably shown that a living body contains many lifeless components which *in their internal individuality-structure* are completely determined in a physico-chemical sense.

We have seen that the neo-Thomist theory cannot account for these experimental results by means of its doctrine concerning a virtual preservation of properties of the material components in a living whole.

The question is not whether the material components in their enkaptic function inside the living organism play an essential role in the biotic processes of the body. The only question is whether they can participate in the body's *subjective* biotic function, i.e., whether they can be really *living* components of the body, just like the nucleus and plasmatic complex, as enkaptically founded organic parts of the living cell: whether they undoubtedly are *living* parts.[1] In the light of the experimental results, this question can only be answered in the negative.

The neo-Thomist philosophy of nature can save this vitalist view only by denying the continual actual existence of the lifeless material components in the living cell body. But precisely on this critical point the Thomistic substance-concept is shown to contradict the structure of reality.

The ontological problem concerning the enkaptic structural whole of the living cell body. An objection to our theory

Meanwhile a critical question concerning our theory of the enkaptic structural whole may be asked from the ontological point of view. We have to consider it cautiously in order to secure our view against a possible misunderstanding.

From the very beginning we have observed that our conception of the enkaptic structural whole does not entail the conclusion that the internal molecular or crystalline structures of the different material components are *as such* sub-structures of the living body. Such a conclusion would certainly contradict our basic tenet that the whole-part relation is exclusively determined by the structure of the whole.

However, is our theory not involved in another contradiction? How can an enkaptic structural whole display an *inner unity of structure* if it seems only to be made up of an intricate system of enkaptic interlacements? Does not the very plurality of individuality-structures interwoven in its internal sphere contradict this structural unity?

1 It should be borne in mind that the concepts "nucleus" and "protoplasm" are biotically qualified notions and do not pertain to physics and chemistry, insofar as these sciences are concerned with lifeless material compounds.

Our answer to this question is: Such a contradiction can only originate from an erroneous way of positing the intricate problem of structure. This error consists in once again mistaking our theory of the living body as an enkaptic whole for a theory of aggregates. But it might be that our terminological description of the structural state of affairs still lacks that ultimate precision which is necessary to preclude such misunderstandings.

A first misunderstanding may arise from defining the enkaptically *interwoven* structures inside the living body as "*part*-structures" of the body. Strictly speaking, this initial definition cannot correspond to the real structural state of affairs. For even the fact that the interwoven structures are enkaptically bound by the total form of the whole cannot divest them of their own genuine individuality-structures, which are different from that of the body as a whole.

Therefore we should now abandon this this confusing terminology [of "part-structures"], which is certainly inadequate from the ontological point of view. We have used it temporarily because our first concern was to account for the empirical data, which could not be explained by applying the Aristotelian-Thomistic substance-concept. These data testified to a plurality of structures bound by a whole. The metaphysical neo-Thomist theory was built up by means of a closed *a priori* reasoning, which from a logical point of view implied no contradiction as long as the internally contradictory substance-concept itself was taken for granted. But the real structural states of affairs proved not to fit in this *a priori* construction.

By paying attention to the role of the material compounds in a living cell body, we may formulate the real state of affairs as follows: *A cell cannot be alive within the molecular or (quasi-)crystalline matter-structures as such. Yet such structures are actually present in the living cell body because its organism can no more live without than within them, and because the material substructure really functions within its total form*. Any philosophical theory which does not wish to distort the data for the sake of a closed *a priori* argument is obliged to account cautiously for this state of affairs.

To arrive at complete clarity in respect of the subject matter of this chapter we shall now engage in a more detailed ontological

consideration of the structure of a cell body as an enkaptic total form.

A more detailed ontological consideration of the cell body as a (typically qualified) enkaptic total form

We have seen that a living cell organism is enkaptically founded in a very particular constellation of matter, which it binds within its own individuality-structure. The nodal point of this intertwinement has appeared to be the earlier-discussed alveolar-colloidal and centered *form* of the plasm. This form maintains itself in the continuous process of breakdown and formation of molecular matter-structures. In this form the material components also disclose those particular variability-types which function in the biochemical constellation and are no longer physico-chemically but biotically qualified.

However, it is the cell body as a whole which gives the plasmic matter this particular form; and this form, as the *bodily* form of the living cell organism, is qualified by the subjective *biotic* function of the enkaptic whole, or, in the case of an animal cell, by the *psychic* function of the *sensorium* qualifying the animal cell body.

This biotic or psychic qualification, respectively, is immediately obvious in unicellular beings. The plasmic form here remains entirely plastic, leaving room for contraction and expansion of its surface in all directions and for a mutual exchange of the parts. In this way the cell body is capable of adapting itself to its various biotic or primitive psychic functions, respectively, without being fixed within rigid form boundaries. Woltereck observes:

> In the protozoa and protophytes it is crystal clear that the total form is an *expression of the total system*, in this case of the cell. With respect to multi-cellular beings this state of affairs can only be deduced from particular observations and considerations. Also, the separate organelle of the extensions of the plasma, the cilia, fibers, vacuoles, etc., are produced by the total basic structure of the system ... The living "cell body" as a whole is the bearer and producer both of all of its sub-forms and of the specific total form (configuration) of the radiolarium, infusorium, bacterium concerned.[1]

1 Woltereck, *Grundzüge einer allgemeinen Biologie*, p. 117.

The cell form as an elementary total form[1]

The answer to the question as to whether a cell body is a real structural whole or a mere aggregate of individuality-structures enkaptically intertwined with one another, depends in the first place on the insight into the nature of the cell form. Is this indeed an elementary total form, or is it rather a mere aggregate of differently qualified forms?

This question is of primary importance if it is borne in mind that it is the very body-*form* in which the different typical structures distinguishable in a cell body are to be enkaptically interwoven. If it should be shown that this form is only composed of molecular matter-configurations, or of the latter and of typical biotically qualified organs, respectively, then there could indeed be no question of a typical total form of the body. In this case the typical foundational function of the assumed enkaptic structural whole would be lacking, and thereby the latter would turn out to be impossible in an ontological sense.

It undoubtedly belongs to the credit of Driesch, Woltereck, von Bertalanffy and other famous biological theorists that they have refuted the aggregate theory on experimental grounds. Driesch in particular has shown that the visible shape of multi-cellular plants, animals and the human body is not only built up from organic forms, tissue forms and cell forms, but that, in addition, it is obedient to the *specific form-laws of a totality*.[2]

Driesch's demonstration of the impossibility of a purely physico-chemical theory of the biotically qualified process through which shapes are formed[3] was particularly convincing. The older theory of Weismann concerning the predisposition of all fully grown organic forms that were supposed to result from a material morphogenetic primary structure in the nucleus of the germ cells (though invisible), was thereby definitively refuted.

In particular Woltereck has also demonstrated that the separate cell form should be viewed as an elementary total form in which a typical structural whole expresses itself.

1 For the biological form problem, cf. Bertalanffy's *Kritische Theorie der Formbildung* (Berlin, 1928), and particularly Woltereck's *Grundzüge*, p. 114 ff.

2 Driesch, *Philosophie des Organischen*, pp. 1-180.

3 *Ibid*., pp. 125 ff.

Woltereck's investigations of the "biotic elementary forms"

Woltereck's investigations devoted to the "biotic elementary forms" are of particular interest for our theory of the enkaptic structural whole. We shall therefore briefly summarize some chief points of his pertinent explanations.

Some unicellular beings (such as bacteria, unicellular green and bluegreen algae and amoebae) display a limited number of closely undifferentiated, and in this sense simple, shapes. But many cells of complicated animal bodies and in particular of plant bodies likwise display such a simple shape, of which, besides cell membrane and nucleus, no particular constant organic forms have developed.

On the other hand, the shape of tissue cells and of unicellular beings have differentiated figures, either as a result of the secretion of complicated forms by the plasm, or by an intricate organic articulation of the cell body itself.

The flagellated cells especially deserve our interest. They are known either as independent plants, animals and bacterial beings, or as developmental phases of multi-cellular beings. (The sperm cells also are a kind of flagellated cell provided with a whip-like appendage.) Woltereck calls the morphological structure of flagellated cells the "elementary form *kat' exochēn*" common to all main groups of living beings. This type occurs in very simple shapes in bacteria and monads,[1] and with finely elaborated organs in the peridinidiae[2] with their spiral circulation for the flagellae, their cellulose shells, complex eyes, tentacles, etc.

All these differentiated partial forms are produced by the living cell body as a whole and are a differentiated morphological expression of its inner structural totality. The same holds for the specialized tissue cells of plants and animals, which equally, though not in the same multiplicitly, display partial forms within the frame of their specific total form, such as epithelial cells, muscle cells, gland cells, etc. Here, too, the total cell form with all its particular articu-

1 Very small protozoa belonging to the flagellates.

2 So-called silico-flagellates which move forward in water by means of two dissimilar small flagellae. It is not certain whether they belong to the protozoa or to the protophytes.

lations of inner and outer architecture is a function of the total cell body.

In this context Woltereck's above-mentioned observation concerning the typical totality character of the form of different protozoa and protophytes[1] is also of particular importance. The typical silico-lattices, tubes or radii, for example, secreted by the cell body of radiolaria and silico-flagellates were found to display specific total forms, varying from species to species. They all fundamentally deviate from the physico-chemically determined crystal forms of the mineral silicon dioxyde (SiO_2). Nevertheless it must be assumed that in these specific silicaforms, molecular forms of the combination SiO_2 are enkaptically bound, for they remain typical SiO_2 figures.

The production of these typical forms always starts with alterations of the colloidal plasm, which in zones passes from the sol-condition into the gel-condition. The plasmic zones which have arrived at the latter condition already display the typical physico-spatial relations of the skeletons and shells originating from them in the process of silica formation. The formation starts from the cell body in its centered and entirely movable colloidal fluid figure, and this plastic whole is present both within and between the parts of the produced form.

Similar complicated fixed formations arise in the plasm of calciumforming algae and foraminifera and here, too, the plasm is present within and between the parts of the produced calcium shells. All of the produced parts of the skeletons or shells have fixed proportions of dimension and direction. They cannot be the result of independent,[2] physico-chemical operations of material components of the plasm, because, during the production, the parts of the plastic cell body continually change their position within and between these fixed formations.

1 Cf. the ample discussion of these formations in E. Reichenau's treatise "Protozoa" in *Handbuch der Biologie*, 6.2:53 ff.

2 [That is, random.]

The distinction between plasmic, alloplasmic and xenoplasmic forms is indifferent with respect to the form-structure

Some plants and animals, of both the unicellular and multi-cellular kind, can build up specific sensorily perceptible spatial forms with the aid of materials of three kinds, viz., either plasmic matter, or cell secretions, or even foreign kinds of matter which the organism has taken up from outside. For that reason Woltereck distinguished three kinds of formations, viz., plasmic, alloplasmic and xenoplasmic shapes.

Plasmatic forms are found, for example, in the pseudopoda and organelles that are used for motion by unicellular beings; they are also found in the cotyledons, and in the nerve cells and sense organs of animals. All these organic forms arise from solidified plasm having passed into the gel-condition.

Alloplasmic forms are of two kinds. *Either* the living cell secretes inorganic kinds of matter (which it has taken up in liquid form) in a solid form. Well-known examples are the silico-skeletons and calcium shells of many unicellular beings, the silico- and calcium skeletons of sponges, coral polyps, echinoderms, and vertebrates. Or the organism produces organic forms of its own, for example the cellulose coverings of uni- and multi-cellular plants, the chitin of articulate animals and horny formations (scales, hairs, feathers, etc.).

Xenoplasmic forms are also found with both unicellular and multi-cellular beings. Many rhizopoda, which are provided with shells, and the simplest kinds of the different groups of foraminifera are able to collect grains of sand, silico-needles, microshells of diatoms, etc., and from them form coverings surrounding the cell body. Similar phenomena are found with articulates. Lobsters cover their shells or hind part with pieces of seaweed, sponges or snailhouses; larvae of insects build up artificial tubes and "houses" from shell pieces, etc.

It is a particularly interesting phenomenon that, especially with protozoa, the xeno and alloplasmic forms may be similar. With foraminifera we find, for instance, tube-like and bottle-like formations consisting either of sand particles stuck together, or of a porcelain-like calcium mass. *From this it appears that the different nature*

of the materials cannot be of essential importance to the form produced by the living bodies. The same form may be built up from different kinds of matter (both organic and inorganic). And the same matter may serve for the construction of quite different forms. The only essential thing is the *formative principle* that selects the materials and works them into particular kinds of shaped products.

Now we have seen that not all the typical products of formation mentioned are *living* parts of the cell body. The alloplasmic and xenoplasmic forms are not typically qualified by the biotic or a post-biotic subject-function, but by an object function of the biotic or post-biotic modality. In the living organism and the animal *sensorium*, they can, consequently, only function enkaptically. But this structural subject-object relation does not detract from the enkaptic *total form* of the living cell body. And the same holds for the multi-cellular body.

In the first place, the founding total form of a living body as such is always an *objective sensory-spatial figure*. The latter no doubt gives expression to the biotic (or psychic) subject-object relation between the living organism (or the animal *sensorium*) and its non-living form-product. But the latter itself was found to display a figure which obeys the form-laws of the cell body *as a whole* and not the laws of crystallization of the materials used.[1]

The internal structural unity of the body is not threatened by the fact that its morphological sensory figure encompasses forms of an objective biotic (or objective psychic) qualification. For this morphological sensory figure as a whole implies the very subject-object relation. The bodily form of plant and animal as such is an objective expression of the body's qualifying function. The non-living form-product is an autogenous product of the living body and not separated from it, but taken up in its *objective sensory total form*. And this total form apparently is the foundational function of the enkaptic structural whole.

Only after the separation of the non-living form-product from the living body that has produced it, does the function of the former cease to belong to the total bodily form. Nevertheless, even in

1 [I.e., as occurs when these materials crystallize in random fashion from a solution in a test tube.]

this case this formation retains its objective biotic (or objective psychic) qualification as plant or animal form-product, respectively.

The chief point is, therefore, that both the form of a living cell body as a whole and that of its organic parts is a morphological expression of an enkaptic structural whole of a higher than physico-chemical qualification.

The different individuality-structures interwoven by this enkaptic form-totality are indeed not parts of the total individuality-structure. The material components of the body are only realized in the morphological interlacements of the individuality-structures concerned. This is why no single morphological criterion is suitable for distinguishing the different "structural layers" of a living body. But the living body itself is a morphological whole typically qualified by the highest individuality-structure enkaptically bound by it. Therefore it is (at least insofar as it is of a plant or animal character) a *real thing*, accessible to naive experience. For the latter does not theoretically distinguish the different individuality-structures in whose morphological interlacements the enkaptic total form is constituted. It immediately grasps the *morphological whole*.

The sensory total form, as the foundational function of the living body, does not coalesce with the typical foundational functions of the interwoven structures

It should be noted that the sensory total form of the living body, as an enkaptic whole, does not coalesce with the typical form-functions which have a foundational role in the various interwoven individuality-structures. This is immediately evident in the case of the physico-chemically qualified individuality-structures of the molecules or crystals of the bodily matter. But the same must be true with respect to the typical foundational function of a body's living organism. This has a typical biotic qualification, and its foundational form is of an objective bio-spatial character. As such, it is not able to constitute in itself the enkaptic total form, characteristic of the bodily whole, though it certainly binds the different kinds of bodily matter in an enkaptic way within its bio-spatial form.

It is only in the objective sensory space that an enkaptic total form can be built up which lies at the foundation of the real whole of a living body, and not merely of the whole of one of the struc-

tures interwoven in it. For in this modality of spatial figures all the earlier modalities of spatial forms are objectified in the same analogous sense, so that they cannot obtrude at the expense of the sensory total image of the body.

This sensory total form gives a living body its objective *material* sensory figure, which in the dynamic biotic space is still lacking. It is the objective sensory image of the *materialized* living organism. In the case of an animal body it gives at the same time objective expression to the higher individuality-structure of the *sensorium*, and in a human body, in an anticipatory direction, to the act-individuality-structure of the enkaptic whole. In other words, the sensory total form of the body embraces the interwoven individuality-structures. It gives expression to an enkaptic totality which consists of interstructural intertwinements, without being reducible to the latter.

This is a second reason why the enkaptic whole is immediately accessible to naive experience, since the latter does not penetrate into the interwoven individuality-structures themselves, but grasps the continuous whole only. Nevertheless, naive experience is implicitly aware of the qualifying role of the highest individuality-structure in its sensory total form.

The sensory spatial form of the enkaptic whole certainly does not contain the modal nuclear type of individuality of this qualifying individuality-structure, but only the type of individuality of the body as a typically qualified morphological unity, realizing the enkaptic totality in all of its interwoven layers of individuality-structures. Therefore, this form is only the foundational function of this realized whole, and not that of its abstract qualifying individuality-structure *in the internal sphere of the whole*. The qualifying function of the latter, if present, can only be that of the body, insofar as it is enkaptically bound by the body, and not in its purely internal role in this qualifying structure.

The form-type of the living body as variability-type. The living body and its environment

Of course, this bodily total form is at the same time the nodal point of enkaptic interlacements between the living being and its environment (*Umwelt*) and in this way it is codetermined by its relation to the latter. But this state of affairs does not detract from the fact

that the bodily form is produced by the living being itself and that, consequently, this form is not at all mechanically imprinted on it by its bio-milieu.

In his voluminous study of plant organology[1] Goebel has shown by a wealth of empirical material that the multiplicity of the organs by far surpasses the prevailing conditions that obtain for living entities. This already appears from the great diversity of form of unicellular plants living under completely or nearly equal environmental conditions.

Woltereck distinguishes three main groups of morphological types in which the relation to the environment finds expression:

l. the *plankton type* of living beings which are "suspended" in their environment (water, air);
2. the *motile type* which move by swimming or creeping in a particular direction;
3. the *sessile type* which with a plane or a pole of their body fasten themselves to the bottom, so that with the other pole they are turned the other way.

In each of these types the organs are never a result of mechanical adaptation to the environment, but always codetermined by the structural primary types of the living beings concerned. The thousand-fold abundance of forms within the motile type, for example, should never be explained one-sidedly from the entirely homogeneous environment of the beings belonging to this type. In order to become convinced of this state of affairs, as Woltereck observes, one need only turn up an atlas of the freely swimming peridinidiae, or of diatoms, or of radiolaria, in the same part of the ocean.

We can say that Woltereck's three basic types of being that are determined by the environment are in fact variability-types, although they, nevertheless, realize themselves in accordance with the nature of the primary types. In this sense they are an expression of the internal structural type of the living body in its relation to the environment.

Woltereck formulates this state of affairs in terms of his conceptual framework by observing: "that the organisms are doubtless

1 Karl Goebel, *Organographie der Planzen insbesondere der archegoniaten und samenplanzen*, 3 vols., 3rd ed., vol. I (Jena, 1928).

autonomous in the production of body-forms, but that this autonomy already presupposes particular relations to the *Umwelt*."[1] So it appears that the total form of a living body is a real nodal point of enkaptic interlacements, both in its internal constitution and in its external environment. Yet at the same time it remains the *morphological expression of an internal structural whole*.

We have already mentioned the important methodological consequence of the insight into this state of affairs with respect to the individuality-structures interwoven in the body form. The criterion of these strata of individuality-structures can never be of a morphological character, but *should be oriented to their internal structural principles of individuality*. In this way each of these layers of individuality-structures has its own internal criterion. But the body, as an enkaptic structural whole, *intertwines them in its typically qualified total form*.

The objectivistic conception of the body as an absolutization of the objective sensory bodily form

In this context we finally have to pay attention to the old controversy between the Platonic and the Aristotelian view of the material body, which even today continues to influence scholastic thought. Plato viewed the body as a vehicle (*ochēma*) of the soul. This was obviously an *objectivistic* conception, whereas the Aristotelian view of the animate body was much more of a *subjectivistic* character since it ascribed all the "formal" qualities of the body to the soul as its substantial form.

How can we explain that the Platonic conception again and again urged itself upon the Augustinian school of scholasticism, in contrast to the Aristotelian view? The answer to this question is implied in our previous analysis of the body as an enkaptic structural whole. For although this analysis mainly pertained to the cell body, as the simplest example of a living bodily whole, its method is also applicable to the multi-cellular bodies of plants, animals and even of human beings.

The Platonic conception is apparently oriented to the objective sensory form of the body, which is only the foundational function of its structure as an enkaptic whole. If we only pay attention to this

1 Woltereck, *Grundzüge*, p. 137.

objective sensorily perceptible aspect of the body, the *psychic subject-object relation* naturally surfaces.

This sensory shape of the body is no doubt related to possible subjective sensory perception. If then, furthermore, this perception is considered to be metaphysically related to a "soul," in the sense of an "immaterial substance," the "material body" is indeed hardly to be conceived of as anything but a "vehicle" or an objective "organ" of the soul.[1] This means a reification of the objective morphological aspect of the body, an operation that is particularly detrimental to insight into the human body as the enkaptic structural whole of the *total* temporal human existence.

In modern existentialist philosophy, we can observe a return to the subjectivist view of a human being's corporality, especially with Sartre and Merleau-Ponty. Here this view is completely emancipated from the Greek metaphysical substance-concept and the form-matter motive, which was its religious starting point. But, especially in Merleau Ponty, "experienced corporality" is considered to belong to a supposed "pre-objective" experiential field, which is sharply opposed to the objectivistic analytical mode of scienctific thought. This involves a fundamental misinterpretation both of the subject-object relation of pre-theoretic experience and of the antithetic *Gegenstand*-relation of theoretic thought. This leads Merleau Ponty to his characterization of human corporality as a "blind adherence" (*adhésion aveugle*) to the pre-objective world.

1 This background of the Platonic conception is particularly clear in the French sociologist and constitutional law theorist Maurice Hauriou. His view of the relation between soul and body has always remained dualistic Platonic, for he based this conception explicitly on a pure morphological concept of form. Consequently, he rejected the Aristotelian-Thomsitic view of the soul as the *substantial form* of the material body.

CHAPTER 7

The Problem of Form in the Animal Body

Up to this point we have deliberately limited our theory of the living body as an enkaptic structural whole to the cell body. On the one hand, we did this in order to state the structural problems which present themselves in their simplest form. On the other hand, we did not wish to anticipate the second part of this book, in which we will develop our philosophic theory of the structure of the human body.

Thus far we have been content with laying a general foundation for this anthropological theory by demonstrating how the body as an enkaptic structural whole is ontically *possible* in such a way that the individuality-structures intertwined in it retain their internal sphere-sovereignty while at the same time the diversity of the intertwined individuality-structures does not cancel out the intrinsic unity of the body as a structural whole.

We owed a formulation of this theory of the enkaptic structural whole to those readers already familiar with the *Philosophy of the Law Idea*. This obligation follows from our fundamental opposition to the scholastic substance-concept in philosophic thinking. For it is not appropriate to demolish a concept that is so rooted in tradition without pointing the way to a better concept.

Complications in the structural problem of the living cell body

Initially we limited our investigation to the structure of the cell body. This does not mean that we could in this limited way solve all the problems of the complicated body structures as they occur in the more highly developed animal body, and *a fortiori* in that of human beings. That would be impossible, if only because the cell shows a real individuality-structure in the radical types of "kingdoms" with their descending differentiation in primary- and variability-types.

Even when we limit ourselves to the unicellular beings, we cannot avoid distinguishing between animal and plant protists, no

matter how difficult it may be to establish the boundaries in a concrete and accurate way, let alone the open question of whether we may place the bacteria and viruses under one of these two.[1]

We have assumed that the animal kingdom is distinguished by a psychic radical function from the plant kingdom with its biotic radical function. This already raises a problem with the protozoa, the unicellular animal beings: how, in this case, does the individuality-structure qualified by its psychical aspect relate to the individuality-structure of the living cell organism which is qualified by the biotic aspect? And how are these two structures intertwined with the molecular structures of the material components in the one enkaptic structural whole of the unicellular animal body?

For in this case this body cannot be qualified by the structure of the living cell organism. Rather an individuality-structure with a psychic qualification – however primitively – must superimpose itself upon the organismal individuality-structure. Such a psychic individuality-structure binds the organism in an enkaptic fashion. It will also have its internal biotic, physico-chemical, spatial, and numerical functions, and will be represented in the normative law spheres in its potential object-functions.[2]

1 Insofar as I may allow myself an opinion in this matter it appears to me that what we know about the "viruses" up until now does not give us the right to view them as "living beings." They appear to me rather to belong to the realm of inorganic crystals. Against this, some point to their ability to reproduce *themselves*. The question is, however, whether they are not rather multiplied by the living body within which they appear as "parasites." If the latter turns out to be the case, then the main argument for viewing them as "living" collapses.

2 Two examples may illustrate for now how we ought to visualize the biotic, physico-chemical and other functions of such an individuality-structure of psychic qualification in the binding of the lower enkaptic structures. The first example is derived from the way in which multi-cellular animals adapt their color to that of their environment. Such an adaption can take place by expansion and contraction of chromatophores (bearers of pigment) already present in the body, or also by the formation of pigments *ad hoc*. The first type of adaptation takes place under the influence of the nervous system: apparently this requires an optic sensory perception because animals that are blinded on both sides never appear to adapt themselves in this fashion. Cf. Minkiewicz, *Archiv zoologique* cap. et gén. sér. 4, 7 notes, and Driesch, *Philosophie des Organischen* (l92l), p. l934. We find a second example in the area of metabolic physiology in the phenomenon of psychic or associative secretion discovered by Pavlov

But in the case of this psychic individuality-structure we will again have to distinguish these internal structural functions just as sharply from those of the living cell organism as we have distinguished the latter from those of the physico-chemical structures. The unicellular body will then have to express its psychic qualification in its function of a total form.

Is it indeed possible to distinguish between biotically and psychically qualified individuality-structures in the case of the protozoa? The problem of the human germ-cell

At this point morphological research runs into a seemingly insurmountable obstacle, which reveals itself succinctly in the investigation of the animal and human germ cells from which the entire complicated animal and human bodies arise during development.

The internal differentiation of the body in biotic, psychic and (in the case of human beings) in still more highly qualified individuality-structures seemingly cannot be demonstrated in the case of the unicellular stage of development. The higher individuality-structures apparently are still in a completely potential condition. This potential can only gradually actualize itself in the development of the body, which in the case of human beings takes a relatively long time.

This state of affairs also explains how the Aristotelian-Thomistic theory came to assume that the fertilized human ovum still continues to have the substantial form of an *anima vegetativa*. The vegetative soul would subsequently enter into an animal stage of development. Only after sufficient preparation of the material body would the *anima rationalis* enter from outside through a special creation of God. After the destruction of the *anima sensitiva* this *anima rationalis* would take over the development of the body as its only substantial form.

(e.g., the secretion of saliva in the dog upon hearing a sound which he associates with food). Again by means of the nervous system something occurs here which is foreign to all metabolic processes which have only a vegetative qualification. It is the associative sensitive function that is the typical regulator of physico-chemical transformations. Apparently the physico-chemical and biotic processes operate here under the typical guidance of the psychic function. We will submit the senso-motoric form-type of the animal as such to a closer investigation. Only then will we be able to gain a fundamental insight in this state of affairs, even in the most primitive unicellular beings.

Meanwhile, genetic investigation has demonstrated that in the germ-cell the psychic, and in the case of human beings also the higher hereditary factors, are present in potential. In the light of our theory this means that the higher individuality-structures must already exist in the germ-cell of the human body *in potential*. (We will come back to this in the second part of this volume.) But these higher individuality-structures can only *actualize* themselves during the further development of the body, in which a morphological[1] differentiation must take place, which cannot yet be accomplished in the unicellular stage.

What is the situation in the case of unicellular animals that do not go through multi-cellular stages of development? Does the psychically qualified body structure only remain *potential* in this case? But this supposition only makes sense when a developmental stage is given in which the potential can be actualized. This is ruled out in the case of the protozoa, which never rise above the unicellular body structure.

Bavink's psycho-vitalistic theory of emergence with respect to the problem

Alternatively, must we cut the knot with psycho-vitalism, which is also held by some adherents of the monistic evolutionistic *Stufentheorie* (*theory of levels*), discussed above, such as Bernard Bavink? Or should we, on the basis of an assumed *principle of continuity* in the world of living beings, assume psychic processes in *all* living creatures, from the unicellular plants up to human beings? In this case a "cellular soul" is to be assigned to the living cell organism as such.[2]

In a certain sense the latter opinion simplifies things. With Woltereck, it can view the "living cell organism" in its corporal re-

1 [*Morphic* would be more correct. Differentiation can never be morpho*logical*; only research can be. Due to the influence of rationalism in Western thinking people speak of psycho*logical* disorders and geo*logical* layers. In some cases it is hardly possible to get rid of such words, as in the case of "psychological."]

2 Cf. Bavink, *Ergebnisse und Probleme*, pp. 390 ff. From an entirely different point of view we find this same opinion also defended by Scheler in his well-known booklet *Die Stellung des Menschen im Kosmos* (Bern, 1928), pp. l6 ff. who apodictically asserts: "The doctrine that the psychic begins only with 'associative memory,' or only in the animal – or even only in human beings (Descartes), has been proven erroneous." But he adds: "It is however arbitrary to ascribe

alization as a "material expression" of an inner "experiential center," which – in deviation from Woltereck himself – is then identified with a "psychic center," a "cellular soul." In this case one does not have to worry about a radical-typical dividing line between plants and animals. For in a monistic evolutionistic sense one starts with a continuity principle that has no room for fixed boundaries between these kingdoms as required by our radical-typical criterion.

"It is utterly inconceivable," writes Bavink, "to assume such a deep gap *inside* the series of organisms, i.e., a gap between 'animated,' and 'non-animated'."

But one can eliminate the problem that we have raised only at the expense of abandoning the insight into the modal distinction of the biotic and psychical aspect of reality. This may not imply a sacrifice for the scholastic theory, which was used to identifying its metaphysic concept of the "soul" with some "life principle." But in the *Philosophy of the Law-Idea*[1] it would mean abandoning one of the most fundamental insights into the structure of reality. Whoever rejects the *modal* structures cannot acquire an insight into the individuality-structures either.

Let us therefore see what Bavink adduces in support of his categoric pronouncement in his book, a work which in general is highly esteemed and rightly so.

He begins with an argument that does not affect us at all. According to him, the entire system of zoology speaks out against the adoption of a chasm between "animated" and "non-animated" beings. This we do not deny of course,[2] although the terms "animated" and "non-animated" sound quite "metaphysical." Our

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something psychic to what is inorganic!" We will return to this view in the text.

1 *Editorial note* (DFMS): In order to avoid a limited *legal* (mis-)understanding of the nature of this philosophy, the first English translation of Dooyeweerd's magnum opus, *A New Critique of Theoretical Thought*, coined an expression with a *cosmic scope*: *Philosophy of the Cosmonomic Idea*. The Greek word *cosmos* refers to creation in its ontic reality, subjected to God's creation-wide *law* (*nomos*).

2 [I.e., zoological systematics might indeed not know such a clear-cut dividing line, but on Dooyeweerd's presuppositions it must nevertheless be there.]

view is precisely this that the entire animal[1] kingdom is characterized by a psychical radical function.

Bavink argues that we should not make an exception for the protozoa, and that we should not assign the monopoly of a psychically qualified organization to animals provided with a central nervous system either. This argument runs entirely parallel to our view.

The evolutionistic principle of continuity

However, the way in which Bavink argues already demonstrates that, for him, the psychical function has no modal delineation. It shows that he does not argue purely from empirical data, as initially seems to be the case, but that his argument is dominated from the outset by the presupposed evolutionistic continuity principle.

It is impossible to draw a sharp boundary line between unicellular and multi-cellular animals. The gap between the most highly developed animals without a central nervous system and the least developed possessors of such a system is very much smaller than the distinction between the latter and the still more highly developed animals such as mammals and birds.

In short, we can turn things any way we wish, but the fact remains that every such attempt [to place the boundary between animated and non-animated animals on the basis of having or lacking a central nervous system] appears to be an *ad hoc* assertion, an act of applying artificial divisions to the nearly continuous series of the animal world.

And then there follows, without further argumentation but merely on the basis of the principle of continuity, the transition to the assumed "animation" of the plant kingdom:

> If we are now forced on this basis to admit that the most primitive animals, the amoebae, the radiolaria, the paramaecia, the foraminifera etc., also have a psychical experience, albeit of an ever so vague sort that is quite unintelligible to us, then this very principle of continuity leads us to the further consequence that human beings must also arise from those unicellular beings that form the common root of the vegetative and animal kingdoms, to the

1 [Or, for that matter, "animated." Both words come from Latin: *anima*, "soul" (Greek: *psychē*).]

> higher plants, even if we find it the more impossible to imagine in some relative way the "life" of their "soul."[1]

The lack of delineation in Bavink's concept of the psychic[2]

When we read this passage we cannot help but wonder what scientific use the word "soul" can have if it is apparently no longer associated with any delineated concept. If one understands "soul," as Aristotelian scholasticism does, to mean nothing but a metaphysical bearer of the life principle, then of course the entire preceding argumentation was redundant. In that case it was taken for granted from the start that every living organism, no matter whether it is of a vegetative, animal, or human kind, is equipped with such a "soul."

If one understands "soul," as Bavink apparently intends, to be a certain "experiencing" of stimuli, then one should wonder again in what respect this "experiencing" (*Erleben*) is to be distinguished from "living" (*Leben*) – the same question we had to ask Woltereck. Woltereck's reply to this would be that to experience (*Er*leben) is the inner side of living (*Leben)*. But this reply only makes sense if, with Woltereck, one breaks up the biotic function in a material (physico-chemical) and an immaterial central sphere. As we have seen before, the modal boundaries between the physico-chemical and the biotic aspect of reality are again erased in this way as well.

Such an "erasure of boundaries" has been very much "in vogue" since Leibniz formulated his principle of continuity especially in biological thinking. But one must indeed be very naive to believe that this principle is merely the condensation of a sober, unbiased acceptance of what reality teaches us.

Bavink asserts that the unicellular beings constitute the common root of the vegetative and the animal kingdom. But this thesis is based merely on the evolutionistic assumption which, as we will examine more closely in Part Two of this volume, is not based on facts but rather on an unprovable postulate of the humanistic science-ideal.

If, in fact, the world of the unicellular beings *as we know it* is the common root of the animal and the vegetative kingdom, why then does science still distinguish so carefully between protozoa and

1 Bavink, *Ergebnisse und Probleme*, p. 391.

2 [Throughout the text "the psychic" means "that which is of a psychic nature."]

protophytes? Is it because of a preconceived dogma? Indeed, in the case of the majority of biologists their discipline is still predominantly under the "hypnosis of the evolution dogma," though no longer in the obsolete form in which it was preached by Darwin and Haeckel.

The distinction referred to can only be made with this much care because the world of the unicellular organisms, as it is known to us, simply imposes this distinction upon empirical science, even though up until now theoretical investigation has not succeeded in finding so-called "purely empirical" criteria that are valid in all cases. But only the world of unicellular organisms *as we know it* can form an empirical basis for such an investigation. Everything that relates to an assumed common root of the vegetative and the animal kingdom *behind* this known world is "gray hypothesis."

According to Bavink, in the case of plants we may also reckon with psychical processes, although we should proceed with great caution in the field of "plant psychology." In particular, the material which R. Francé, Haberlandt and others have collected in this area should not be ignored, no matter how critical one may view Francé's experiments in plant psychology.

The ability to receive and utilize stimuli is not a psychic but merely a biotic characteristic

Bavink judges that the most important result of the investigations is the fact that plants also "have received the ability to be stimulated and to react to stimuli, and have special organs for these purposes, to a much higher degree than was hitherto believed to be the case." But we must remark that these characteristics as such are of a biotic nature and can in no way be interpreted in a psychic sense, as long as we cannot supply forms of plant behavior that transcend the boundaries of the biotic reaction to stimuli.

The folding of the leaves of Mimosopudica (Touch-Me-Not) and of the insectivores plants (Sundew) has been known for a long time. The phenomena of the so-called nonspecific tropisms, as can be observed in more highly developed plants which turn toward the light (heliotropism), while they always turn towards the earth with their root and away from it with their stem (positive and negative geotropism), as well as those mentioned before, are as such no more than *bio-organic reactions to stimuli*. Why we "may on good

grounds place a psychic experience side by side" with these phenomena remains completely absent from Bavink's argumentation. He has no argument other than the principle of continuity in the entire "living world," through which one can obviously prove "everything and nothing."

Pan-psychism and the substance-concept. Once more the ground-motive of nature and freedom

For this reason we are not surprised that Bavink, in the further course of his argument, wonders whether the concept of "animation" (*Beseelung*) for "reasons of continuity can or must be pursued still further back beyond the unicellular beings, whether we therefore must not ultimately also ascribe the possession of a soul to their precursors in inorganic nature." For the moment he rejects this consequence – which would lead to *pan-psychism* – on the basis of the thesis that *life* has "emerged" in the development of the earth, i.e., as an undoubtedly *new* stage of development, although it is connected *with the inorganic through continuous transitions.*

Even so, this provisional rejection is not in the least fundamental or definitive. Returning to this question later on, Bavink declares explicitly that the idea of "pan-psychism" has, to a considerable extent, already been developed from a pure philosophy of nature into a well-founded natural-scientific doctrine on the basis of biological, psychological (including animal psychology) and occult investigations.[1] Edington's hypothesis that the "substance" of the "material world" in the final analysis would be itself of a psychic character therefore does not appear objectionable to him at all. And in the elaboration of this thought we find, along with Bavink, the humanistic ground-motive of *nature* (causality) and *freedom* again coming to the fore in an undisguised way.[2]

In this psycho-vitalistic conception, the "psychical" is therefore absolutized via the "biotic" into the hypothetic *substance* of all of temporal reality.

After the discovery of the "subconscious" in empirical psychology many tend to assume an unlimited expansion of the psychical aspect of reality. The modal horizon, which has nothing to do with the contrast between conscious and subconscious, is completely ig-

1 *Op. cit.,* p. 508.

2 *Ibid.,* pp. 511 ff.

nored in this way. And the substance-concept demonstrates anew that it is fundamentally irreconcilable with the insight into the modal structures of our temporal world.

No fundamental division between psychically and biotically qualified beings? The views of Ungerer and Von Uexküll

The body of data of recent animal psychology is no doubt still in a stage of infancy. Yet, in the face of this material, the thesis that we cannot draw a fundamental dividing line between psychically and biotically qualified beings[1] can hardly hold water if we do not *a priori* let the boundaries of the "psychical" coincide with those of the biotic. Emile Ungerer, who does not adhere to the theory of dynamic "levels" or the "emergence" theory, sees a "nearly fundamental difference in being between vegetative and animal organisms" on the basis of the investigations of Beer, Bethe, and especially those of Jacob von Uexküll. He bases this on the fact that the lowest animals react not only to individual stimuli or a combination of them but to "a body of stimuli" (*Reitzgestalten*) and a "body of impulses" (*Impulsgestalten*). Therefore stimulus and response evinces the character of a whole.[2] He points to memory in particular as the basis of animal behavior (the "historical basis for biotic response," as he calls it in an unfortunate terminology). Earlier experiences thus co-determine later behavior in a purposeful manner.

Von Uexküll particularly points out that in all animals the influences of the "environment" turn into real impressions, into "signs" (*Merkzeichen*), out of which an animal "world of signs" (*Merkwelt*) is built up. In the case of the animal, its own influences upon the "environment" turn into active operations, into "effect signs" (*Wirkzeichen*). In this way it responds in an active fashion to its biotic needs, to these alterations in its "world of signs" according to an "achievement plan" (*Leistungsplan*).[3]

These notions are even more important because Von Uexküll has deliberately abandoned all methods of so-called "empathic psychology" – just as Beer, Von Bethe and others did – in his attempt to approach animal behavior in a psychological way. He

1 [That is, animated and non-animated beings in the sense of Bavink.]

2 Emil Ungerer, "Erkenntnis von Soziologen der Biologie," in *Handbuch der Biologie*, 1:75. In his judgment though, this criterion is not sufficient for the autokinetic animal spores and the gametes of lower plants.

3 Jakob von Uexküll, *Umwelt- und Innenwelt der Tiere*, 2nd ed. (Berlin, 1921).

only wishes to allow for an objectifying characterization, according to the objective-sensorily perceptible expressions of the animal (the so-called "environmental theory" [*Umwelttheorie*]).

However, as Ungerer rightly remarks, it is not possible to detach this objectifying description of the psychic function of the animals from the *subjective* psychic function itself. The perceptible body "gestures" of animals can, in our opinion, only be understood as the *form of expression* of a *subjective*, *psychically qualified totality-structure*.

Earlier we pointed to the experiments in animal psychology with the unicellular trumpet-infusoria. These infusoria responded to irritating stimuli in a way that undoubtedly transcends the boundaries of biotic responses to stimuli. It has been established with these same unicellular beings that they sensorily respond to the colors of the spectrum. Such a thing cannot be demonstrated in any plant. When illuminated with the various colors these infusoria gather in a certain color zone (the phenomenon of so-called *phototaxis*).

Now the infusoria undoubtedly belong to the most highly organized protozoa. And we do not in the least wish to deny that a strict proof for our thesis—namely, that the animal body is qualified by a psychical radical-function in the sense of a subjective sensitive function according to its inner structure—can never be given in a purely experimental way, for the experiment as such remains inevitably bound to objective sensory data. The interpretation of the experiments is always influenced either consciously or subconsciously by a philosophical view of the structure of reality, as we have continually tried to show. But such an interpretation must be able to *account* for the established characteristic differences between the objectively perceptible responses to stimuli in animals and those in plants.

The evolutionistic principle of continuity, held by Bavink, ultimately ends in the psycho-vitalistic identification of biotically and psychically qualified radical-types. That certainly does not satisfy the demand just mentioned. It simply will not do to assume merely a gradual difference between the earlier mentioned behavior of trumpet-infusoria and the phenomena of helio- and geotropism in higher plants. The experimental data themselves here *hint* at least

at a *radical* difference, which can only be understood by a structural theory.

The indeterminacy of the so-called purely empirical criteria separating plants and animals

All non-structural criteria, purely based on visible characteristics and used for distinguishing between plants and animals, have ultimately failed to establish a fixed boundary. The well-known chlorophyll criterion, which biology still views as the most decisive one, is an example. Plants possess chlorophyll, the green pigment that enables them, under the influence of sunlight, to produce organic compounds, primarily sugar and starch, out of carbon dioxide and water (i.e., from inorganic material).

By contrast, animals and humans must acquire all organic components of their body in one way or another in their food in the form of fat, carbohydrates and protein. For this reason plants are called autotropic because they can maintain themselves, grow and multiply, through their own photosynthetic activity, whereas humans and animals are heterotropic because they cannot do so.[1]

However, the possession of chlorophyll is indeed not a decisive characteristic throughout. While it is true that the animal kingdom shows no exception to heterotropism, the vegetative kingdom does show exceptions to autotropism. Mushrooms, for example, lack chlorophyll and are therefore just as heterotropic as the animals.[2] The same holds for bacteria,[3] which many biologists still see as belonging to the vegetative kingdom, although others, including Driesch, view them as animal beings.

A second so-called "purely empirical" criterion is derived from the seemingly always present cellulose covering of the plant cells by means of which they form a firm cell wall. In contrast, animal cells do not possess such a fixed envelope. But this criterion also fails us when we examine the world of the unicellular beings. Quite

1 Cf. E. Küster, *op. cit.*, pp. 2 ff. on this empirical criterion and the next two.

2 In deviation from animals, however, they only need one single organic compound for the normal course of their biotic processes, whereas animals need three compounds for their metabolism, viz., fat, carbohydrates and protein. See Driesch, *Philosophie des Organischen*, p. 197.

3 *Editorial note* (DFMS): Uko Zylstra points out that *autotropic* bacteria are meant, since some bacteria are *heterotropic*.

a few unicellular beings possess no cellulose covering, and yet on the basis of their possession of chlorophyll they must be assigned to the vegetative kingdom. There are also cases in which plant cells rupture their cell wall, as a result of which "the living content" appears "nude" and revolves freely while later on covering itself again with a cellulose envelope.[1]

The third criterion stems from Aristotle, who, by the way, most certainly intended to give an (albeit metaphysical) intrinsic structural criterion in distinguishing between the *anima vegetativa* and *sensitiva*. According to him, animals are distinct from plants in that they can move freely from their place whereas plants are rooted in one place. This criterion has generally been given up by modern biology. Both animals and plants show numerous deviations: many animals are attached to a fixed place or undergo a transition from a stage of rather mobile larva into one of a permanent sessile condition. Conversely, at least among the unicellular plants (algae), many species are completely mobile.

But this indeterminacy of the so-called *empirical* criteria does not prove that within "living reality" fixed *structural* boundaries are absent. Neither would this of course prove that these characteristics are *empirically* useless. The chlorophyll criterion in particular has rendered very good service until now. It cannot be a coincidence that autotrophism is only found in plants. The absence of this characteristic holds good without exception, at least for the animal kingdom. In one way or another it must be related to the radical-typical structure of the vegetative and animal kingdoms and to a fixed hierarchic order, in which both have been fitted in relation to the kingdom of inorganic compounds. Scheler has supplied us with a very readable view, to which we will shortly return.

But only the radical-typical structural difference itself can be *fundamental*. This difference must express itself somehow or other in a radical difference in the objective sensory form of the body of plants and animals. The question that we now have to face is therefore this: how can the form of the animal body be a total form with a *psychical qualification*?

1 Küster, *op. cit.*, p. 3.

***Further delineation of the concept "psychical" by the* theory of the law-spheres. The relation between sensitivity and sensation** (*Empfindung*)

Before we attempt to answer this question, we must once again emphasize that we view the psychical as an aspect of temporal reality with a modal delineation, characterized by the modal meaning nucleus of *sensitivity*. By recognizing sensitivity in its primarily *modal* sense, we *a priori* exclude any identification with *human* sensitivity.

Furthermore, we take account of the modal subject-object relation within this aspect, and we notice the fact that in its modal structure the moment of *sensitivity* occurs as a necessary analogy of the *organic* (sensory) moment incorporated in the structure of the biotic aspect. We can therefore not accept the fundamental contrast between "sensitivity" and sensation (*Empfindung*) as made in current psychology.

The fundamental distinction between sensation and sensitivity goes back to the obsolete "faculty psychology"

This current view has a long history and can be traced back to the old "faculty psychology," which we also encounter in Kant. It distinguishes between the faculties of knowing, feeling, and willing or desiring. Sensation (*Empfindungen*) are then delegated to the first faculty.

This distinction of three faculties is based on an abstract coordination of both the act-dimensions of knowing and willing with the modal sensitive function, which cannot possibly be compared with them. In Part Two we will return to this fundamental misconception when we analyze the structure of human acts.

In the present context we restrict ourselves to stating that there can be no question of an act-structure in the animal body. In the animal, knowing and striving (*Trieb*), as well as imagining (fantasy), are merely dimensions in a concrete inner habitus or activity, respectively, which is always *qualified by the sensitive function*. In animal psychical life, knowing and desiring therefore manifest themselves only as *sensitive* dimensions and are never in opposition to or fundamentally distinct from the sensitive function.

Now, as far as sensation is concerned, it is always related to impressions from the *objective* psychic side of reality. This can be the objective-sensory organ function or the sensory "outside world."

But sensation nevertheless retains its *subjective* psychic character, which in the modal sense can only be understood as subjective feeling. Above, we already touched provisionally on the question of why we cannot speak of "experiences" (*Erlebnisse*) in the case of the animal psychic process.[1]

The emotional character of sensation

A distinction between feeling and sensation becomes impossible particularly in the case of *animal* sensations. For these are fundamentally different from human sensations because in animals these sensations are not controlled by higher modal functions such as the logical function. Every sensation, including the optic one, is to be understood as *emotional*, and e-motion is nothing other than being sensitively "moved" (the psychical analogy of motion in its original sense).

In the human adult, this emotionality of sensation can be inhibited in the so-called act-life, particularly in the case of indifferent optic perception. In the *theoretical* acts with their *Gegenstand* relation, such emotionality can even be restricted to such an extent that the incorrect impression arises that the sensitive function is entirely eliminated.

In the young child this possibility is still only developed to an extremely small extent; in the first stages of life it does not even exist yet. In animals, this inhibition is never present. Sensation always freely manifests its original *emotional*, i.e., sensitive character. Every optical sensation, be it of prey, of enemy, or of the other sex, is emotionally laden.

Now the *sensitive* response is fundamentally different from the purely *biotic* response to a stimulus. It has a fundamentally different modal character in animals. The "stimulus" in this case becomes a real *sensitive impression* and these psychical impressions and their sensitive responses manifest themselves indeed in the

1 It is clear that "experience" – no less than "consciousness" – has a modally delineated sense. No doubt it also has a sensitive *aspect*, but as a concrete process it cannot be fully described by this modal function. In our view, to be further elaborated in Part Two, experience belongs to the typical human act-structure, which is oriented to a religious (spiritual) center and therefore cannot occur in animals.

psychic total form of *Reizgestalten* and *Impulsgestalten* (bodies of stimuli and impulses) (Ungerer).

The psychic is not identical with the conscious

In the second place, we must repeat our earlier warning against the identification of the *psychic* with the *conscious*. In animals we find the first empirical indication for a distinction between conscious and subconscious sensitive life. Here, a clear distinction can be observed in more highly developed animals between being awake and being asleep. In lower animals and particularly in unicellular beings we have no reason to assume a consciousness, for such a consciousness undoubtedly presupposes a highly differentiated organization of the senses and the nervous system.

In animals, we can never speak of a *self*-consciousness. Even their conscious sensitive utterances and sensations are always *im*personal. The psychic center is as such no more than the biotic center, an I that experiences all sensation as temporal and at the same time knows how to put at a distance what is not I. This psychic center is *wrapped up* in sensations and impulsive sensitive responses. It is an "It," which in the animal follows individual sensitive drives and which is psychically coherent with its own species and the environment in an inseparable way.

However, that which is proper to the psychic in its closed animal manifestation is the orientation of every sensation to a subjective sensitive *center*, in a so-called "reflex arc" of the sensations.

The psychic reflex arc

This state of affairs is founded in the modal structure of the psychical aspect. Everything that is *sensory*, as being bound to the bio-organic *senses*, remains necessarily qualified by the *sensitive nucleus* of the psychical aspect. This psychic reflex arc is absent in plants because they have no subjective sensitive function.

Does the plant have sensory organs? Haberlandt's view disproved by the investigations of Blauw

Haberlandt discovered that there are special cells in the plant body for receiving stimuli of light, pressure, and gravity. He has tried to make it plausible that we are indeed dealing here with *sensory* organs. We do not need to doubt that such receptor cells indeed play an important role in movements that orient the plant towards stim-

uli of light, gravity or otherwise. The form of plant movements does not give us an indication that these cells are sensory organs.

The investigations of the botanist Blauw and his pupils in the Netherlands[1] have shed an important new light on the phenomenon of plant tropism. These investigations make it highly probable that, for instance, the positive phototropic growth reaction (turning towards light) in the young oat plant is based on a growth inhibition on the side directed towards the light. If we assume that, starting from the growing tip, substances regulating the growing process – which are evenly distributed in the tissue – are directed towards the base of the plant, and if we assume these substances can be photochemically destroyed, then growth on the shaded side simply predominates, and the stem will curve towards the light. The explanation of the so-called thigmotropic growth reactions in vines such as those of morning glory leads us in the same direction.[2]

Of course this is not to say in the least that vegetative tropism could be explained in a purely physico-chemical way. They undoubtedly belong to the growth movements, and the growth of a plant is radically different from the "growth" of a crystal.

In Blauw's explanation, the introduction of the regulating material at the right time and place remains a typically *biological* problem, and the tropisms remain stimulus responses which are typically qualified by the biotic aspect and only occur in an enkaptic binding of physico-chemical material.

We can only agree with Driesch[3] that even the change of the "sense" of a certain tropism contains an implication with respect to the regulating role of the living organism. (The "sense" of tropism is its positive or negative character, for example, the intensity of light or of the chemical stimulus and the subsequent acclimatization of the plant to the increased intensity.)

The data that concern a change of the "sense" of heliotropism when the general biotic conditions change are significant in this re-

1 Helmuth Plessner, *Die Stufen des Organischen und der Mensch: Einleitung in die philosophische Anthropologie* (Berlin, 1928), pp. 224 ff.

2 Positive thigmotropism refers to the phenomenon that when a plant accidently touches a fixed body it reveals a reaction that fortifies the touch.

3 *Philosophie des Organischen*, pp. 296 f.

spect. In this case a transition from positive to negative tropism, externally induced, turns out to play a real restitutive role in the change of the plant shape. When, for example, the crown of a spruce is broken off, one of its side branches takes over the negative geotropism of the lost main trunk. Something similar occurs when parts of a plant change the sense of their tropism according to age or stage of ripening. But in all this the boundaries of the biotically qualified stimulus responses are never transgressed.

The psychic function which qualifies the corporal individuality-structure of an animal is herewith sufficiently delineated in a *modal* sense in contrast with the biotic stimulus response. The latter is also found in the vegetative kingdom where the radical-type is qualified by the biotic function. All that remains is to defend this view against the deviating conception of Scheler dealing with the essential distinction between plant and animal.

The theory of Scheler concerning the essential difference between plant and animal: the successional order of psychical life

Max Scheler left a posthumous publication, *Die Stellung des Menschen im Kosmos* (1928), which is still quite relevant. In it he sought the essential boundary between plants and animals in "sensation" (*Empfindung*), which, also according to him, is fundamentally absent in plants. Nevertheless he wished to ascribe an "unconscious sensitive urge" to plants. He began here with a successional order (*Stufenfolge*) of the psychical functions as they have gradually been brought to light by science: unconscious sensitive urge, instinct, association memory (*mneme*), practical intelligence (bound organically), whereas he views the "spirit" as the essential characteristic of being human, completely transcendent to all that is "psychic-biotic."

As in Bavink, the boundary of what is psychical coincides for Scheler with the boundaries of life itself (*das Lebendige überhaupt*). "Life" has an "inner" side, which is fundamentally absent in all that is lifeless, inorganic. Again we encounter here the view noticed in Woltereck. It is the view that the organic-biotic is merely the *external*, objectively perceptible and material manifestation of an *inner* "experiential sensitive center," which Scheler, like Bavink – but in contrast with Woltereck – views as "soul" (the so-called psycho-vitalistic conception of "life"). The lowest stage of the psy-

chical is then formed by the "sensitive urge" (*Gefühlsdrang*) we mentioned earlier. As the word "urge" highlights, "feeling" and "drive" (*Trieb*), are not separated here. A drive always involves a specific purposiveness, for example, towards feeding or sexual satisfaction. This unconscious "sensitive urge" supposedly cannot be denied to plants either. But it will not do to ascribe sensations and consciousness to them as, for example, Fechner did.[1]

Scheler admits that if, following Fechner, one views sensation and consciousness as the most elementary components of the psychic, we would have to deny to plants "animation." While it is true that the "sensitive urge" in plants is directed in general to the earth and to light in geo- and heliotropism, as we discussed earlier, it is not directed to *differentiated* components of the environment and to stimuli to which specific sensory qualities and visual elements belong. The plant, for example, does react in a specific way to the intensity of light rays but it does not differentiate colors and the direction of light rays.

According to Scheler the "most general concept" of sensation includes, as an essential characteristic, "a specific *reporting back* (*Rückmeldung*) of the momentary condition of organs and locomotion of the living being towards a *center*, and an ability to modify the movements that follow each time thanks to this report."[2]

In the sense of this definition a plant does not exhibit sensation. A plant also does not have a specific "memory" beyond the dependence of its living conditions on the totality of its past. Neither does a plant have a learning ability in the genuine sense that we find even among the simplest infusoria. What we call drive in animals is only matched by plants in their general urge to grow and reproduce. This alone is included in the "sensitive urge."

Scheler's theory of the coherence of plant autotropism with the plant's inner structure of being

The fact that "life" is not essentially "will to power," in Nietzsche's sense, is therefore most clearly proven by the plant, because it shows no spontaneous hunt for food and also no active sexual selection. It is fertilized through winds, birds, and insects, in a passive way. Because the plant in general prepares the food it needs

1 Max Scheler, *Die Stellung des Menschen im Kosmos* (Bern, 1928), p. 16.

2 *Ibid*., p. 17.

from inorganic material, which to a certain extent is available everywhere, it does not need to set out for a certain place, like the animal, in order to find food. The plant lacks the animal's free play of spontaneous locomotion of the animal, it does not know any specific sensation drives, associations, conditional reflex, power system or nervous system in the proper sense. This amounts to a whole range of shortcomings which become entirely clear and understandable from the plant's essential structure.[1]

According to Scheler, it can be demonstrated that if the plant possessed only one of these functions, it necessarily would have all the others as well. No sensation (*Empfindung*) exists without a "drive-impulse" and without the concomitant beginning of a motile action. Where the "power system" is absent (active capturing of prey, spontaneous sexual selection), a system of sensations is necessarily lacking as well. The variety of sensory qualities which the animal organism possesses is never greater than the variety of its spontaneous movements *and* is a function of the latter.

The word "vegetative" points to an essential biotic dimension, an urge that is entirely directed *outward*. Scheler calls it the "ecstatic sensitive urge" (*extatischer Gefühlsdrang*) in order to characterize the total lack of the ability of animals to "report" organic conditions back to a center, and therefore to an ever so primitive reflection (at least to a certain extent) of a "conscious" inner condition. For *consciousness* according to him only originates in the primitive reflection of sensation, always occasioned by occurring *resistances* to original spontaneous movement. *The plant, however, can do without sensations only because, as the greatest "chemist" among living beings, it itself prepares its organic building material out of inorganic material*.

Yet even in plant life we find the primeval phenomenon of expression, that is to say, of a certain physiognomy of its inner conditions such as limp, strong, luxuriant, poor, etc. "Expression" is, according to Scheler, a primeval phenomenon of *life* and not, as Darwin thought, a complex of atavistic "basic acts." On the other hand, what the plant in its turn altogether lacks is the possibility to *communicate*, which we find in all animals. This ability makes the ani-

1 *Ibid.*, p. 18.

mal independent of the immediate presence of things which it needs to survive.[1]

Scheler's view of feeling lacks a modal delineation

How shall we assess this theory? It undoubtedly contains very important and stimulating elements. The view of the coherence of autotropism and the plant's biotic structure particularly deserves ample consideration. What gives pause, obviously, is the fact that Scheler, in metaphysical fashion, accepts a divergence between this structure and the empirical data. For example, he still works with the Aristotelian principle, already abandoned long ago, according to which the free movement in space is a typically animal characteristic.[2]

Definitely unacceptable, on our standpoint, is the foundation of his theory, which ascribes an "unconscious sensitive urge" to the plant, which then in turn is to be fundamentally distinguished from the conscious sensation in the animal. We already remarked that the analysis of the modal structure of the psychical aspect shows that the nuclear moment of "sensitivity" and the organic analogy of "sensuousness" belong inseparably together. Also in the higher, opened up feelings encountered only with human beings, this sensory moment is never eliminated but merely deepened through the disclosure of the normative anticipatory spheres in the sensitive aspect (logical feeling, lingual feeling, feeling for beauty, feeling for what is right, etc.).

1 *Ibid*., pp. 18f.

2 So-called "transitional forms" between the plant and the animal kingdom are unacceptable as "empirical" deviations from an ideal structure, viewed metaphysically. In normal animals and plants a deviation from the *fundamental* radical-type, which makes their realization at all possible, never exists. We can only speak of "transitional forms" if we render the sensory form independent, in violation of the structural principle, and in this way separate the two. In this instance one banks on the external *per se* and attempts to apply a "purely empirical" criterion, that subsequently again turns out to be incorrect. But the body-form can only be viewed as the expression of the *inner structural whole*. The form-type is undoubtedly a variability-type in relation to the environment. A tree monkey for instance is morphologically built in a way different from a gorilla, which predominantly lives on the ground. But since the completion of creation this variability never transcends the boundaries of radical- and primary type. This has been established by modern genetics since Mendel and Johanssen.

In animals the sensitive life of feeling is still rigidly bound to the sensory organic and is in fact sensorially *absorbed*. In its modal psychical subject-object relation, sensation is entirely bound to the sensitive nucleus, which qualifies it. Scheler himself recognizes that sensation is absent in the plant, and that, if we take sensation to belong to the elementary structure of the psychical, we cannot ascribe a psychical function to the plant. But that implies at the same time that we cannot speak of a "sensitive urge" in the plant either, without losing sight of the modal structure of the sensitive aspect. If we still do so we introduce an entirely undefined and therefore scientifically useless terminology.

Scheler, therefore, nowhere tries to make his identification of the "sensitive urge" with the "biotic urge" of plants scientifically plausible. When he calls the *purposive biotically directed action* a "state of pleasure or suffering without object,"[1] we are dealing with a poetic metaphor rather than with a scientific definition. Such poetic freedoms may sound very convincing to the reader, but since theoretic investigation demands strict self-control, they are out of place in a scientific argument. In this case they are doubly misleading because the biotic urge in plants does not lack an object at all but is evidently directed towards biotic objects (food, etc.).

Unconscious sensation

To restrict sensation to *conscious* psychical life is also unacceptable, as we have seen above. Such limitation conflicts with facts of depth psychology, which have effectively demonstrated in human beings the existence of unconscious sensations (*Empfindungen*). In Part Two we will return to this point. It cannot be denied, therefore, that an *unconscious* psychical "reporting back" to a sensitive center exists as well.[2]

We already remarked earlier that the empirical data do not give us an indication for assuming a *conscious* sensitive life even in the least developed animals.

1 *Ibid.*, p. 16.

2 This has been generally known in philosophic psychology since Leibniz. Kant also devoted an entire paragraph to the "notions which we have without our being conscious of them" in his *Anthropologie in pragmatischer Hinsicht* (1790).

The senso-motoric form of the animal body and the active orientation in the environment

We have now further elaborated our view concerning the psychically qualified animal structure (in contrast to the biotically qualified plant structure) and defended it against the current ill-defined conception of the psychical. We now return to the question which forced us into this further elaboration: *How can the animal body-form be a psychically qualified total form?*

In higher animals we obviously think immediately of the so-called animal (senso-motile) nervous system (in contrast to its autonomic counterpart) and of the specialized forms of sensory organs. But the organically least developed animals, in particular the protozoa, lack a nervous system and sensory specialization. Even apart from this, the presence of such a differentiated sensory organization as just a part of the body is not in the least sufficient to view the animal body as a psychically qualified total form. In the same way, the absence of such a differentiated sensory organization cannot exclude the psychical qualification of the total form. The body as a whole, and not just certain of its components or complexes, must express the mentioned psychical qualification in a morphological sense. This is only possible because as a whole it shows an objective-sensory form, which we like to call "*senso-motoric*."

In its sensory *form*-function the animal body expresses that it is designed for *active* orientation in its environment, for capturing prey, fleeing its enemies, sexual selection, etc. This activity is *senso-motoric* in the full sense of the word: the received sensation expresses itself immediately from the psychical center by way of movement. The plant body fundamentally lacks this activity even in cases – for example, in various algae – where it can freely propel itself in water. As Scheler has remarked, it is indeed oriented towards its environment in a passive way. Its movements are guided from within but are directed merely in a *biotic*, vegetative fashion. However, the way in which even the bare amoeba forms its pseudopodia by projection of its plasma at will, whereby it moves and engulfs its food, shows the senso-motoric form of the entire primitive animal cell body.

The difference between the form of movement in the animal and the plant is not merely an effect of the particular slowness of the plant. In that case we could indeed call to our aid a thousand or ten thousand times accelerated film projection of a developing plant – as did various biologists who defend that plants are "animated" – in order to bridge its difference with the animal form of movement in a suggestive way. In that case we would indeed have to submit to Bernard Bavink's appeal to the relativity of psychical time and to stand dumbfounded by the complete analogy of the observed movements with those of the animals. "When, for instance, the sprouts shoot up from an asparagus bed, one almost believes to have caught neighbors in the act of competing for light and air."[1]

This illusory optical suggestion, however, does not give us the scientific right to reason away the fundamental structural difference between the vegetative and the animal form of movement. The plant body never exhibits a *senso-motoric* form. It is nothing more than a vegetative biotic urge that also expresses itself in the speed of the film image in the sprouting asparagus.[2]

In the animal, including the paramaecia, the stentor and other protozoa, it is not the living organism as such, but a psychically qualified individuality-structure that expresses itself in the dynamic total form of the body, in which all lower individuality-structures – and therefore also that of the living organism – are enkaptically bound.

Even with the amoeba, undoubtedly the lowest unicellular animal, Mast and Pusch (1924) were able to observe senso-motoric alterations of form when this animal encountered a light ray with a projected pseudopodium in the field of the microscope. The

1 Bavink, *Ergebnisse*, p. 392.

2 Helmuth Plessner expresses himself in a similar way in his *Die Stufen des Organischen und der Mensch*, pp. 224-225: "It is of course impressive when we watch the movements of, for example, the Cucurbitacea vine or of a morning glory on film, shortened ten thousand fold. We see how it goes through a phase of "searching" for points of support into a phase in which the vine turns back and stops growing backwards on itself. Here, too, there is not the slightest basis for assuming processes that are based on sensational or just central transmission as the basis of these phenomena. Just as in plant "tropisms" the corresponding reaction here also does not follow as a response to the situation which is objectively given for the living being, but purely according to the laws of growth." In the same sense also A. von Tachermak, *Allgemeine Physiologie*, 1:425 ff.

pseudopodium was then immediately retracted. After continued experiments the animal was found to have learned something, and the number of pseudopodia that encountered the light ray steadily diminished. These investigators assumed a primitive basic associative memory in their experimental animals.[1] Whether or not this latter interpretation finds sufficient support in the experiments themselves, it has been established in any case that in the infusoria, too, a basic associative memory, albeit in a modest way, also comes to expression in their senso-motoric behavior.[2] *The dynamics of the body-form itself manifests the psychically qualified individuality-structure of the animal whole*.

The senso-motoric form is the form in action

This does not mean that we can establish the degree of psychical development of animals by the degree of *organic* differentiation of their body-form. The echinoderms (such as the sea urchin) and tunicates, for example, are counted among the highest invertebrates according to the organic differentiation of their body-form. For instance, they possess nerves and specific organs for seeing, touch and hearing. In psychical respect, however, they certainly belong to the lowest animals.

The psychically qualified individuality-structure expresses itself only in the total form *in action*, which we have called the senso-motoric form. In a fundamental sense we can only study the degree of psychical development of animals in their body-activity (although this does not negate the fact that in animals which possess a cerebrum the degree of psychical development is most certainly and inseparably related to the size of the two cerebral hemispheres in proportion with the other parts of the central nervous system).

Driesch's concept of action and that of entelechy as "psychoid"

Driesch undoubtedly also had this in mind when he introduced his distinction between *psychoid* and *form-entelechy*. He placed the psychoid as the typical entelechy of the action or *of the body in ac-*

1 Cf. concerning these experiments J.A. Bierens de Haan, *Die tierisches Instinkten und ihr Umbau durch Erfahrung* (Leiden, 1940,) pp. 280 ff. Whether these experiments indeed prove an "assessment of experiences" in amoebae is, according to the author, not entirely sure. Mast himself afterwards gave a different interpretation.

2 *Op. cit.*, pp. 278 ff.

tion, in opposition to the "form-building entelechy" as the typical entelechy of the *developing* organic body-form. We will have to reject this contrast, however.

For our part we would not wish to extend the act-concept to the animals.[1] The *action* is a typical realization in the external world of an inner "*act*," which is necessarily oriented to a *self-consciousness* and therefore only occurs in *human beings*. We will deal with this further in Part Two in our analysis of the typical act-structure of the human body.

In the animal, however, *senso-motoric* activity is undoubtedly essential: the total form of the animal body is entirely oriented to this activity and in that sense it is, as we remarked earlier, a senso-motoric form in the full sense of the word. The animal instinct, the associative memory, and practical intelligence are merely typical *psychically qualified* hereditary factors. According to their qualifying function they nowhere transgress the boundaries of the *closed sensitive life* which is bound by what is sensory and biotic. They cannot be ordered by an evolutionistic scheme of levels in the sense that the animals with the lowest organic development would lack the "higher levels."

Basically, in this case we can only discern a difference in the degree of differentiation, although it may be the case that in certain animals it has not yet been possible to demonstrate expressions of psychical associations and intelligence. To this point we will also return in Part Two.

Wherever a higher psychical differentiation expresses itself in the locomotive form of the animal, the senso-motoric basic type is always preserved. The animal kingdom does not know an evolutionistic transgression of its radical-type.

The objective-psychic qualifications of the animal environment and the animal form-type

The senso-motoric form of the animal body gives expression to its inner radical- and primary-type – as a psychically qualified structural whole – as well as to its active interlacement within its specific

1 Driesch understands by "action" as an "objective natural phenomenon" a certain "coordination between individualized stimuli and individualized effects occurring on the basis of a reaction caused historically from the outside" (*Philosophie des Organischen*, p. 354).

environment. As we have seen, the inner radical-type and phenotype as structural wholes with a psychical qualification also express themselves in the same way.

The animal environment is not the objective vegetative biotic space of the plant. It is, in fact, a "world of signs" (*Merkwelt*) in the sense of Von Uexkühl, which has an objective sensory qualification, and which for the animal becomes the "world of effects" (*Wirkwelt*) of its senso-motoric activity. It is accurately delimited in the structural subject-object relation by the specific sensory sphere of sensitivity and locomotion in the animal. This sphere is not completely universal such as in the case of human beings, which extends to all that is sensorily perceptible in a modal sense. Rather this sphere is generally bound in a strict and rigid way to the specific organic biotic needs of the species. It is objective-psychically and not biotically qualified, although it undeniably has its biotic aspect.

Von Uexküll, Buytendijk and other investigators have supplied us with remarkable examples of this strict specialization of the sensory world of feeling and locomotion of animals in relation to their environment. For example, Von Uexküll points to the tick, whose environment (according to its aspect of sensory perception) consists only of sensory light and heat qualities and a single objective olfactory quality, i.e., that of butyric acid, the smell of which is exuded by all mammals. The animal lies in wait on the branches of a shrub in order to drop down on warm-blooded animals or to be brushed off the branch by them. It does not possess eyes but merely a general sense of light in its skin, probably in order to orient itself on its way when it crawls up to its waiting post. The arrival of the prey is announced to the otherwise blind and deaf animal by its olfactory sense, which only reacts to the stimulus of butyric acid. At this signal the tick drops itself and when it falls on something warm and has reached its prey, it follows its sense of touch and temperature in order to find the warmest, i.e., hairless place, where it bores into the skin tissue and sucks itself full of blood.

Similarly many sea urchins respond to all shadows that enter their light sense with a rejection movement of their spines, regardless of whether the shadows originate from a fish swimming by, from a boat, or even from a passing cloud that darkens the sun. Their sense of light is "poor" but "purposeful." For these animals

this part of their environment does not contain any colors or forms but merely shadows.

Bees see only *open* forms in their environment such as stars or crosses; they see no *closed* forms such as circles and squares. Only open flowers, which correspond to the former type, have a biotical interest for these insects, not buds that are still closed.

In his *Psychologie des Animaux*,[1] Buytendijk gives a remarkable example of auditive sensation in lizards and frogs. One cannot train them with a sound, not even when we connect it with an electric shock. On the other hand, a lizard in a terrarium reacts immediately to a gentle scratching of the bottom which simulates the rush of a moving insect; the animal is specialized for reaction to this auditive sensation only. Its environment has no other sounds.

As we have remarked earlier, the specific environment [to which it is adapted][2] never expresses itself purely externally and mechanically in the animal body-form. The form-type is always manifested as a variability-type according to the inner nature of the primary type. Various monkeys, squirrels, and parrots all demonstrate their active adaption to the senso-motoric *tree life* in their body-form: they are tree animals. But in each of these animals the interlacement with their environment is yet again expressed in their body-form in a fundamentally different way *according to the nature of their primary type*.

Once more Driesch's distinction between "psychoid" and "form building" entelechy

The senso-motoric form of the animal body is undeniably of a psychical qualification. Is it, in spite of that, a *product* of the living germ organism that possesses an individuality-structure of a biotic qualification? Driesch appears to accept this from his own structural-theoretical standpoint, which we rejected. For the development of the body-form he holds the "form building" entelechy responsible, but on the other hand he holds the "psychoid" as a natural factor responsible for the body "action" of the animal.

In our own view the *development* of the animal body can only manifest a different structural principle as a *result* of the developmental process. The zygote of the animal body already possesses

1 F. J. J. Buytendijk, *Psychologie des animaux* (Paris, 1928), p. 74.

2 *Editorial insertion* (DFMS).

its psychical qualifications in primordial form, and the living organism is therefore bound from the outset in a senso-motoric body-form within the enkaptic structural whole of the animal body.

If the developing form were merely the product of a living organism, it could as such not be senso-motoric and therefore not bear an animal character. Animal activity can only be the realization of a potential which expresses itself in the development of its configuration from the zygote stage onward.

CHAPTER 8

Conclusion

The place of man in the temporal world

It becomes clear now that the theory of the enkaptic structural whole forms the necessary connecting link between the theory of the individuality-structures with their temporal intertwinements and what is called a philosophical anthropology. All our previous investigations have been nothing but a necessary preparation for such an anthropology. They all implicitly turned to the ultimate and no doubt most important problem of philosophical reflection: What is the position of human beings in the temporal cosmos in relation to their divine Origin? This question urged itself upon us at the outset of our inquiry and it also returned at the end of our *New Critique of Theoretical Thought*.

Nevertheless, that work did not yet contain a philosophical anthropology. We had reserved this theme for the present volume. The reason was that in our opinion the really philosophical problems concerning the position of human beings in the temporal cosmos cannot be properly formulated without proper insight into the transcendental conditions of philosophical thought. In addition a philosophical anthropology pre-supposes an inquiry into the different dimensions of the temporal horizon with its modal and individuality-structures.

This opinion is certainly not in line with the existentialistic fashion in contemporary European thought.[1] Existentialism seeks an immediate approach to the innermost sphere of a person's temporal existence in order to interpret the I-ness in its situation in the temporal world in terms of those emotional dispositions (concern, care, dread) which are supposed to be the most fundamental strata of human existence, i.e., its "existentials" *(Existentialien)*. If Heidegger's "existential" of dread is replaced by that of "love" in the sense meant by the Swiss psychiatrist Binswanger (the "meet-

1 [The reader must keep in mind that this was written in the 1940s.]

ing" between "I" and "thou"), then this hermeneutic approach to human beings seems to acquire a trustworthy Christian meaning.

This existentialism is not interested in the structural investigations which we deem to be a necessary condition of a really well-founded philosophical anthropology. As a "suprascientific" approach to a person's existence, existentialism believes it has elevated itself above all structural conditions of temporal experience and can penetrate into its subject-matter by means of an immediate "encounter." "Encounter" and "experience" are opposed to one another as "genuine inner knowledge" is opposed to "objectifying outer knowledge."

It is disappointing but not surprising that different trends in Christian neo-scholasticism have welcomed this existentialistic anthropology as a "more Biblical" way of thinking than found in the proud rationalism and idealism of a former period. Not surprising, for what trend of immanence philosophy has not been "accommodated" to the Biblical point of view and in this sense proclaimed to be "Biblical"?

It was readily forgotten that the genuine Biblical view of "encounter" transcends any *philosophical* approach to temporal human life and that the dialectical opposition between "encounter" and "experience" contradicts the very core of the Biblical revelation. It was also forgotten that even the Christian founder of existentialism, Sören Kierkegaard, considered existentialistic philosophy and the divine revelation in Jesus Christ to be separated by an unbridgeable gulf.

The ultimate and central questions about human existence cannot be answered by any philosophy in an autonomous way, since such questions are of a religious character. They are only answered in the divine Word-revelation. However, our transcendental critique of theoretical thought has shown that this answer has an intrinsic connection with the philosophical questions concerning the position of human beings in the temporal world. For this answer indeed reveals human beings to themselves and gives theoretical thought, as soon as it is ruled by its radical moving power, that true concentric direction which precludes any absolutization of temporal aspects. It also lays bare the root of all lack of true self-knowledge and it thereby unmasks the hidden basic motives of any kind

of anthropology which holds to the immanence standpoint. Consequently, any expectation that an existentialist philosophy might contribute to true self-knowledge should be abandoned. This philosophy is no more fit to do so than modern psychoanalytic psychology. Of course, I do not mean that this recent philosophical trend has nothing to say to Christian thought. Its great representatives are no doubt serious philosophers, and their ideas deserve special attention as a manifestation of the spirit of our time, though the most prominent leaders of this movement have already broken with it. But it is a veritable *spectaculum miserabile* to see how Christian theologians and philosophers seek their philosophical equipment here and join the existentialistic movement to combat the former invasion of Greek ideas into Christian thought. Apparently they have learned nothing from the history of Christian scholasticism. They reject the radical transcendental critique of philosophical thought because they do not wish to break with the time honoured spirit of the scholastic accommodation of immanence philosophy to the Christian doctrine.

All those, however, who have understood the necessity for an inner reformation of the philosophical attitude of thought on the basis of a radical Biblical standpoint, will understand why we emphatically warn against any exaggerated expectation concerning a philosophical anthropology. They will also understand our thesis that the central question, What is Man? means both the beginning and the end of philosophical reflection.

The question concerning the human selfhood as the center of human existence has already appeared in the Prolegomena of our transcendental critique.[1] But the question about the temporal existential form of man has been seen to imply a series of preliminary problems which should be considered first. At least one central point of a truly Christian anthropology must be made perfectly clear. Human beings, as such, have no temporal qualifying function as temporal things and differentiated societal structures do. Rather, at the root of its existence humankind transcends all temporal structures. Therefore, the search for a "substantial essential form" of human nature, in the sense of the Aristotelian-Thomistic

1 [*A New Critique*, 1:3-165.]

metaphysical anthropology, is incompatible with what the Scriptures have revealed to us about created human nature.

According to the divine order of creation, in the radical community of the human race, man is not defined as a "rational moral being"; he is defined only by his royal position as the personal, religious, creaturely center of the whole earthly cosmos. The rational-moral functions, too, find their concentration in him, and through him the entire temporal world is included both in apostasy and in redemption. All things, beings, and factual relations qualified by a temporal modal function are transitory, the temporal bonds of love included. But man has an eternal destination, not as an abstract "rational soul" or spiritual "mind," but in the fullness of the concrete personality of the person. This puts beyond any doubt that the various conceptions of "body" and "soul," or of "body," "soul" and "spirit," devised from the immanence standpoint, are fundamentally of no use in a Christian anthropology which starts from the radical basic motive of the Word-revelation.

The all-sided temporal existence of a human being, i.e., that person's "body," in the full scriptural sense of the word, can only be understood from the supra-temporal religious center, i.e., the "soul," or the "heart," in its scriptural meaning. Every conception of the so-called "immortal soul," whose supra-temporal center of being must be sought in rational-moral functions, remains rooted in the starting point of immanence philosophy.

But all this merely relates to the only possible starting point of a Christian anthropology. Anyone who imagines that, from our standpoint, human existence is no more than a complex of temporal functions centered in the "heart" has an all too simple and erroneous idea of what we understand by "anthropology."

What has become apparent in the course of our investigations in *A New Critique* (Vol. III) is that in temporal human existence we can point to an extremely intricate system of enkaptic structural interlacements, and that these interlacements presuppose a comprehensive series of individuality-structures, bound within an enkaptic structural whole. This insight implies new anthropological problems, which can in no way be considered as solved. But they do not concern the central sphere of human existence, which transcends the temporal horizon.

No existentialistic self-interpretation, no "act-psychology," no phenomenology or "metaphysics of the mind" can tell us what the human ego is. We repeat: only the divine Word-revelation in Christ Jesus can. The question "Who is man?" is unanswerable from the immanence standpoint. Nevertheless it is a problem which will again and again urge itself on apostate thought with relentless insistence, as a symptom of the internal unrest of an uprooted existence which no longer understands itself.

PART TWO

PHILOSOPHICAL ANTHROPOLOGY

CHAPTER 1

The Task of a Philosophical Anthropology

The well-known professor from Königsberg, Arnold E. Gehlen, wrote an important book about "the nature of man and his place in the world."[1] In the introduction the author remarks that a philosophical anthropology proper has not been produced until now, in spite of the many attempts undertaken in earlier and recent times. He sees the cause of this failure in the fact that "the idea of the totality and unity of human nature" has been lost behind the dualism of body and soul:

> As long as we have no totality-view of humankind, we have to stick to examination and comparison of separate characteristics, and as long as it remains like that, there is no independent anthropology because there is no independent "human" being.[2]

However, if we do wish to cling to humans as independent beings we must recognize the *whole* of human existence. But as long as we keep clinging to the dualism of soul and body we abandon the idea of such a unity. And we also do not really overcome this dualism by proclaiming an individual to be a "unity of body and soul." Such a concept remains abstract as well and only has a negative tenor. It only expresses the *rejection* of dualism without contributing anything in a positive sense towards a fundamental insight into the unity of human nature. The question why exactly such a *physis* has a "consciousness" and why a nature of exactly that kind remains unanswered here. The question what is actually "soul" and what is not remains unanswered as well.

1 Arnold E. Gehlen, *Der Mensch: seine Natur und seine Stellung in der Welt* (Berlin, 1940).

2 *Op. cit.*, p. 5.

Gehlen sees a second ground for the failure of the attempts to produce a fundamental philosophical anthropology. It is the lack of a guiding philosophical viewpoint by which one is able to bring the data of the various humanities together under one theme and in this way to relate them to the unity "man." This guiding philosophic viewpoint cannot be derived from one of these special sciences as such. It must be a totality-viewpoint if a philosophical anthropology is to be possible. It must bear a very *central* character and at any rate make it impossible to declare a special characteristic such as "reason," the hand, the erect posture, language, etc. to be the "whole." For this can never succeed. Every isolated characteristic of the human being can be found back somewhere in the animal kingdom and becomes ambiguous as soon as it is taken by itself.

Gehlen believed he had found the really "unifying" viewpoint, under which the dualism of soul and body disappears and all peculiarities by which a human being is distinct from the animal are brought together into one basic concept. This viewpoint is his conception of a person as a "being of action." In fundamental contrast to the animal, human beings have not been provided by "nature" with all the necessary means for their survival in specific adaptation to an environment. On the contrary, they are born with such a primitive and unspecialized body equipment that they can only stay alive through purposive action. According to their biotic existence, they have been given as a "task" (*Aufgabe*) to themselves. A human being is, as Nietzsche said, "the yet undetermined animal." By biotic necessity a person is forced to transform nature into "culture"; the world of culture is the world of human beings. Human beings are beings of action because according to their body-form they are not specialized, and therefore lack an environment adapted to their nature.

This idea of a human being as a "being of action" supposedly also accounts for the plasticity of the scheme of human movements, of the liberation of the hand for labor, of the completely "non-animality" of man's world of perception of persons, which they must construct for themselves. Humans do so by "relieving" their senses of the abundance of sensory impressions by means of taking symbolic distance from the things of the outside world, by

means of language, morals, even the life- and world-view which human beings build for themselves, and their religion.

We will not pursue the positive elaboration of Gehlen's philosophical basic conception any further, though. Stimulating and often original as his expositions may be, the idea of a "being of action" cannot be considered as the philosophic basic concept of a human being. One reason for this is the fact that it *eliminates* the basic philosophical problem concerning the unity of human nature in a dogmatic way, instead of pointing the way to a solution. Exactly in its *unity* the "being of action" is a philosophical problem, if we eliminate the diversity of individuality-structures in the corporal existence of a human being in an a prioristic fashion. Now we cannot proclaim that which itself is a philosophical problem to be the totality-idea that must guide anthropology. The consequence of such a really dogmatic starting-point is that in Gehlen's book the *biological* viewpoint in fact becomes the guideline, and the psychical and post-psychical aspects of human existence are treated as a mere extension of the organic life aspect.[1] Underneath the idea of the "being of action" a *biologistic* ground-idea unexpectedly slips in, which as such is subject to Gehlen's own criticism, namely that it proclaims a special aspect as "totality." This "biologism" is strongly anti-naturalistic, activistic, and irrationalistic in color. This does not need to surprise us in a thinker who, from the national-socialistic sphere, seeks in Nietzsche his spiritual guide.

In spite of this we have specifically chosen Gehlen's view of the task of a philosophical anthropology as a starting point for our own introductory considerations concerning the basic philosophical problem of the place of human beings in the cosmos. The reason for this is the fact that this thinker has laid bare the fundamental shortcomings in current philosophical anthropologies in an exceptionally sharp and honest way. Moreover, he has pointed out the task

1 *Op. cit*. p. 8: "However, throughout this book anthropology means the biology of man; and "anthropological" means always anthropo-biological... [T]here is one – and only one – anthropo-biological view, which can encompass the peculiar bodily structuredness of human beings with the total, unabridged and very complex, complicated inwardness; which knows how to bear the whole weight of the body-mind problem; and which therefore elevates itself entirely above the whole outward contrast between psychology and biology."

that confronts a fundamental anthropology in a perfectly correct way.

Anthropology was indeed burdened with the dualistic conception of "soul" and "body" as with an "eternal disease." The attempts to overcome this dualism from the immanence standpoint have as yet never yielded positive results because a fundamental anthropology is indeed impossible as long as we do not base our inquiry on upon a totality-idea of being human. No attempt at surmounting the body-soul dualism can possibly succeed as long as philosophy has not laid bare the deepest foundation of the dualistic viewpoint by means of the transcendental critique.

Gehlen himself did not really reach this critical viewpoint because he believes he can build his anthropology exclusively upon the empirical and factual which science can establish in an exact way that is compelling for everyone. For that reason he wants to go explicitly into the existential problems of a "reflected existence," i.e., of the "poetic" and *religious* existence.[1] This is entirely in line with Nietzsche, who wanted to build his views about being human exclusively upon the exact data of the natural and historical sciences because for him the historicistic ideal of science had already broken down all belief in an eternal idea of being human in the way humanism had viewed it.

My work *De Wijsbegeerte der Wetsidee* first had to clear the way for building a fundamental philosophical anthropology by means of a radical critique of all totality-ideas that had been designed from the immanence viewpoint and that have turned out to be pseudo-ideas. If the concentration point of all diversity within the temporal cosmos is given in the individual human being, then created nature of this individual must possess that deepest unity which transcends a mere unity *within* the diversity as it is given in every modal and individuality-structure. As long as we believe we can view human beings only according to their temporal existence, they remain the most divided and conflicted beings on earth. For it belongs to the "being" of humankind that it cannot possess such a closed unity that is guaranteed to all purely temporal creatures by their enkaptic structural whole within the limits of time. *A human being is the creature which is not and cannot be enclosed in time*, and be-

1 *Ibid.*, p. 6

cause a person is such a creature, the human being is called to *self*-consciousness.

Of what use is it to raise the human person as a "being of action" to be the leitmotiv of anthropology as long as we fail to indicate the intrinsic point of orientation for this action? As Gehlen has formulated the basic problem of anthropology: "What most complicated and wonderful system of achievements is needed in order to enable a being of just this corporal constitution to *live* tomorrow and next week and the coming year." Does a person then "act" merely out of *biotic* necessity? If a person is radically distinct from the animal because of the biotic aspect, it must be certain that being human unites all aspects of temporal reality and at the same time *transcends* them in the human *selfhood*.

Let us assume that a person, just like the animal and the plant, is merely a structural unity, i.e., a temporal individual unity *within* the diversity of modal functions and individuality-structures. In that case we would after all have to search again for the qualifying *aspect* of his or her existence which we may believe to find in the theoretic-logical, in the aesthetic, in the moral or in some other aspect. For it is self-evident that this qualification cannot be found in the organic aspect itself. But then at the same time we would again undergo the depressing experience that we had lost sight of the human being *as a totality*. For every attempt to discover in one of the temporal aspects that which is really *central* to man's existence is doomed to fail.

If we look for the concentration point of human nature in the theoretical function of thought or in the moral function of the will or in the aesthetic function, then "matter" or "life" or the "sensitive function" will claim its own right against such an absolutization. In that case human nature is necessarily split up again before the philosophic eye into a "material body" and a "rational soul," or into a psycho-vital corporality and a spirit altogether detached from the entire psycho-vital sphere and related to one another in an antagonistic way. In the polarity of the dialectic ground-motive which inspires anthropologic thought we may oscillate by turns between the one and the other pole of human existence. Sometimes we may depreciate the "spirit," at other times the "body." Finally we may proclaim the human person as a composite "substance"

with the aid of the Greek form-matter theme, in which the *anima rationalis* is construed as the form of the material body. But in this way we will find no veritable *totality* of being human. The schism of such an anthropological totality-view will remain and will not tolerate being reasoned away by dialectic stunts.

It was through the fruit of our transcendental critique of philosophical thought that we that enbaled us to lay bare the *root* of this entire immanent dialectics in the anthropology of immanence philosophy. In this regard my book, *De Wijsbegeerte der Wetsidee*, although explicitly discussing the place of human beings in the cosmos only in its final part, was a preparation for a philosophical anthropology, which ought to be construed from the scriptural ground-motive of the Reformation. Apparently this has not been understood by those congenial critics who after the appearance of my first major philosophical work expressed their disappointment about the lack of an anthropology of its own in the *Philosophy of the Cosmonomic Idea*. At that moment they apparently still lived entirely in the spirit of polemics. The traditional scholastic view of a person had been unraveled by the transcendental critique of this philosophy: the current notions of "soul" and "body," "spirit" and "matter" had been rejected. Where then was the new anthropology towards which one could direct one's criticism?

Inevitably it is the seemingly paradoxical characteristic of a philosophical anthropology that it stands both at the beginning and at the end of philosophical reflection. Consciously or subconsciously we begin our philosophical investigations with an idea of what is man. It dominates the entire philosophical view of reality. But when it becomes a matter of indicating the place of man in this anthropologically based view of reality we discover that such an anthropology can only form the closing part of philosophical investigation.

Is it too bold a turn of thought if we seek the reason for this state of affairs in creation itself? In man God sums up the entire meaning of his temporal creation in a concentric way. In this sense the human person stands at the "beginning" of creation. But human beings only appear in time when the entire world has been prepared for their arrival. They are at the same time first and last among all temporal creatures.

Before Reformational Philosophy could develop its anthropology and after it had submitted philosophical thought as such to a transcendental critique, first of all an insight into the structures of temporal reality had to be gained. The theory of the modal spheres, epistemology, the theory of individuality-structures as well as the theory of the enkaptic interlacements of individuality-structures therefore necessarily had to come first. This preliminary investigation had to be continued in the new theory of the enkaptic structural whole, which I developed in the third volume of *A New Critique of Theoretical Thought*. Also,[1] the fundamental problem of time demanded further reflection. I gave my first elaboration of a philosophy of time in a separate investigation, included in the publications of the Christian Association of Natural and Medical Scientists as well as (somewhat expanded) in the journal *Philosophia Reformata*.[2] Only now, after all the foundations have been laid and the building materials have been furnished, can we venture an attempt to submit the deepest problem of philosophy, that of man and its place in the cosmos, to a closer investigation.

The task of a philosophical anthropology: it is the science of the entire temporal existence of humankind

If we wish to define further the task of such a philosophical anthropology from our scriptural-reformational viewpoint, we must first of all state that it must be a *totality-science* of *temporal* human existence. In this preliminary delineation of its task our entire transcendental-critical standpoint is already enclosed. For the deeper unity of human existence is not given in time itself. With that statement, the necessary *transcendent-religious determination* of all philosophical anthropology and the impossibility of an autonomous scientific concept of human existence is implicitly recognized.

If philosophical anthropology wants to be heard in the circles of the special sciences it *must* take its clues for the philosophical formulation of its problems from the data of ongoing scientific research concerning man. In this process one is compelled to pene-

1 [See also Part I, chapter 1, of the present volume.]

2 ["De Wijsbegeerte der Wetsidee en het Substantiebegrip," *Orgaan van de Christelijke Vereeniging van Natuur- en Geneeskundigen in Nederland* 40.2 (1940): 41-58, and "Het tijdsprobleem in de Wijsbegeerte der Wetsidee," *Phil. Ref.* 5 (1940): 160-182, 193-234.]

trate deeply into the problems of these special sciences themselves. This in itself is already an utterly precarious task for someone who knows himself not to be a specialist in these areas, and therefore a task which can only be undertaken in the closest contact with the specialists themselves.

But anthropology cannot be content with scientific *interpretations* of the data which are of interest to it, because such interpretations, consciously or subconsciously, are always charged by a philosophical idea of human existence. For it is clear that no single special science as such can give us an idea of human nature, since man is a *whole*, which, in its temporal manifestation, comprises *all* aspects of reality within a typical hierarchy of individuality-structures.

As is the case with all philosophical investigation, anthropology must therefore, in its relation to the special sciences, at the same time *give* and *take*. It should never uncritically adopt theories from the special sciences; for in truth its task is not to carry out these special-scientific investigations itself, but, at the same time, these investigations remain continually subject to philosophy's critique as soon as they have been formulated in a scientific theory.

Whoever wants to build a philosophical anthropology from the scriptural-reformational standpoint must ultimately be prepared to do battle with prejudices: those from the special sciences and current philosophy as well as those from the scholastic theological tradition. In this situation, a balanced and courageous spirit are not sufficiently trustworthy human characteristics. They often turn out to be rooted in a form of "hubris" which is possibly hidden from a thinker, a species of pride that blinds such a thinker to everything that does not fit in a laboriously constructed theory.

Thus wherever the battle against traditional prejudices appears unavoidable, we would rather seek our support where, in our view, in the *dynamis* of the Divine Word-revelation itself, which like a leaven must permeate, purify, and reform also our scientific thinking. This *dynamis* does not give us scientific infallibility. But as a critical principle it will permeate our investigation. And where it has intrinsically transformed our view of the structure of reality it will at least continually protect us from that scientific dogmatism which thinks it represents the end of all contradiction.

Rejection of metaphysical psychology

Now what can philosophy teach us about man in a scientific way? Can it give us an insight into the "essence of the human soul"? This was indeed the opinion of traditional metaphysics, of ancient, medieval and modern humanistic metaphysics until Locke and Kant and also later on. To be truthful we must add to this that the Aristotelian-Thomistic metaphysics recognized the "irrational basis" of the *anima rationalis* as a *substantia incompleta*. Meanwhile this did not prevent this metaphysics from developing a metaphysical psychology.

In the preceding part we have seen why Kant rejected the possibility of such a metaphysical psychology. Reformational Philosophy has done the same, though on entirely different grounds. Scientific knowledge, including philosophical knowledge, is fundamentally limited to temporal reality in all its aspects. Man's soul, in the emphatic sense of Scriptural revelation, is of a spiritual, religious nature and transcends cosmic time. Another human soul, as a center of existence distinguishable from the body, does not exist.

It betrays a lack of true self-knowledge if we think we can obtain a really scientific concept of the human soul. We owe all our knowledge of the soul, as the hidden root of our existence, to the Divine Word-revelation, and this knowledge is religious, spiritual knowledge in the specific Scriptural sense.

No irrationalistic agnosticism with respect to the possibility to know the human soul

Now this must be properly understood. Our view of the transcendence of the human soul beyond the boundaries of science does not lead to an irrationalistic agnosticism. That would only be the case if the human soul or spirit had no connection with temporal reality. But the opposite is the case. The human soul expresses itself in the entire temporal existence of a person. It is the spiritual center of this existence. We can know it as such in the religious concentration of our knowledge – including our *scientific* knowledge – concerning the corporal existence of a human being. But we gain this knowledge exclusively from the light of the Divine Word-revelation which alone reveals humankind to itself. For true knowledge of the soul of human existence is spiritual *self*-knowledge, which is strictly dependent upon true knowledge of *God*.

The objection could be raised here that the human spirit cannot entirely be identified with its religious character. *Religion*, one might say, is a *relationship*, which presupposes two distinct *relata*. This objection in itself, although working with concepts which in the field of religion are necessarily inadequate, is not wrong. But it does not affect our view. For in the line of Scripture we view the human soul or spirit as the religious root of all man's temporal existence. This view implies *a priori* that this soul or spirit *is* not a relation but only that it, according to its essence, concentrically comprises all of the individual human being's existence in its relation to its Divine Origin.

In the "spirit" of human beings, their total creaturely existence is as yet *undivided* and *undifferentiated*. For this reason the spirit, in its emphatic scriptural sense, is no reified theoretical abstraction from the temporal existence of a person. Rather it is the *spiritual unity* of a person in which *all* temporal functions are concentrated without exception. This was Kuyper's masterful stroke when he emphasized this undivided character of the spiritual focus of our existence in his *Stone Lectures* on Calvinism.[1] At the same time he pointed out that this *total* concentration is only *possible* in the religious relationship to the Absolute Origin.

If we have no knowledge of the creation of humankind in God's image, of sin in its central religious meaning, and of the restoration of communion with God through Christ Jesus in the transformation of the *heart* of our existence, we do not know the human soul. And who has ever grasped creation, sin, and regeneration in *conceptual* form? Our concepts always remain enclosed in the diversity of temporal reality within the horizon of the modal aspects. They can only be *directed* as *ideas* towards that which transcends all conceptualization, towards that central point of our human existence which underlies all temporal diversity in its body structure. For that reason, those who, from a scholastic theological viewpoint, try to force us to define the "soul-concept" of the *Philosophy of the*

1 Abraham Kuyper, *Lectures on Calvinism* (1898), Lecture II: "If our relation to God . . . is to put its stamp on our entire life, it must start from that point in our consciousness in which our life is still undivided and lies comprehended in its unity – not in the spreading vines but in the root from which the vines spring. . . . [In] the depths of our hearts, at the point where we disclose ourselves to the Eternal One, all the rays of our life converge in one focus . . ."

Cosmonomic Idea in such a way that it becomes amenable to scholastic discussion, ought to be cautious. We openly declare that we know nothing of the human soul beyond what Scripture wanted to reveal to us about it, and no one has succeeded yet in constructing a *theory* and a *concept* of the soul from the Divine Word-revelation. Thank God that this knowledge is hidden from the wise and prudent and revealed to babes![1]

No *concept* of the human soul as the religious unity of human existence is therefore possible. All the greater is the fundamental significance of the *idea* which orients our investigation of the temporal existence of man upon its spiritual and radical unity as revealed to us in Scripture. Exactly because soul and body in the created nature of human beings are not two "substances," no purely spiritual knowledge is possible within our temporal life. Our religious or spiritual knowledge remains inseparably bound here to our knowledge concerning temporal reality and must make use of our temporal cognitive functions. Among these the psychical, logical, and pistic functions exist in an indissoluble coherence with all other modal functions of our corporal existence.

Religious knowledge indeed consists in the *Deum et animam scire* (the knowing of God and oneself) beyond which Augustine declared not to want to know anything. But in this life such knowledge is only available to humankind in the way of the religious concentration of our knowledge about what is temporal towards the true Origin of our existence. Such a concentration is accomplished by God's Word and Spirit. God has revealed Himself in his Word, and by the illumination of this Word-revelation also in His *entire* creation, in "all the works of his hands." But the Word does not come to us in a purely spiritual, but also in a corporal way. It has become flesh and has dwelt among us.[2] Nevertheless, the "body" is nothing without the "soul," just as the letter of Holy Scripture is nothing without the life-giving Spirit.[3]

Our temporal faith-knowledge is never without logical concepts or sensory representation, which are both bound to temporal corporal reality. But only the Divine Spirit, working in our hearts, can reveal the *spiritual*, i.e., *religious* sense, which transcends all

1 [Matt. 11:25.]

2 [John 1:14.]

3 [2 Cor. 3:6.]

concepts and representation and immediately touches the *heart*, the *root*, the *soul* of our human existence.

The words "spirit" and "soul" in their unequivocal scriptural sense ought therefore to be used only in a *religious* sense. They are deprived of this sense if we use them by way of contrast to the "material body" in the Greek and humanistic sense. The logical and post-logical functions of our temporal existence are not "spiritual"; they function in the temporal body structure of human existence. But they are, along with all other modal functions, *concentrated* in the *spirit* or the *soul*. This spirit or soul involves the spiritual root, and the modal functions are its temporal ramifications.

Scientific knowledge as such about a person therefore remains *limited* to the knowledge of that person's *bodily existence*. But it is only possible on the foundation of a transcendental *idea* of the human soul or spirit, in which our thinking is directed towards the root or center of human nature. Only this root or center gives human nature its *unity* and *individual totality*.

Here lies the immense significance of the *idea* of the human soul, as directed by Scripture, for anthropology as a totality science. The latter could never have gained this significance if Scripture had really pictured to us the soul as a "metaphysical substance," and in this way would have developed a kind of "metaphysical psychology." As soon as we attempt to grasp the soul in a "metaphysical concept" it necessarily ends up in a polar opposition towards another abstract complex of our temporal existence, regardless of whether we define this as "material body" or as "psycho-vital corporeity." In that case the *idea* of the unity of human nature remains *falsely directed*, and the onset of anthropology is unscriptural. The entire anthropological investigation will experience the scientific consequences of this.

As a matter of course we come back here to Gehlen's objection to the idea of a person as a "unity of body and soul." Gehlen remarked that this notion does not intrinsically overcome dualism, for although it rejects dualism fundamentally it is not a totality-idea in a positive sense. This critique is correct. Whoever thinks he can understand a person as a "unity of body and soul" starts off by accepting a duality, which he then would have to reconcile in a

higher unity. But where then can this higher unity itself be found? We cannot seek it either in the "body" or in the "soul."

The Aristotelian and Thomistic form-matter scheme is a good example of the intrinsic ambiguity of the attempt to overcome the dualism in a *formula* of the "unity of body and soul." The soul is the *form* of the material body, and a person is a "composite substance." The unity of soul and body must then be the human "substance." But since this substance itself is "composed" of form and matter, soul and body, it offers nothing that could indeed transcend the duality.

The human being is not a "unity of soul and body," but the body, as the form of one's entire temporal existence, only arrives at its intrinsic unity in its religious root, in the soul or spirit of a person. The soul is the "inner person" itself, in the Pauline sense, just as the body is the person in its external manifestation (the "outer person").[1] The "outer person" is nothing without "the inner person." However, because the inner person transcends cosmic time, (viewed as) the principle of corruptibility, it cannot be subject to temporal death. In the soul the entire human existence is concentrated as the spiritual unity; in the body this same total existence is broken through time, as through a prism, into a diversity of functions and individuality-structures.

The soul is therefore not *part* of human nature, no more than the body can be characterized as such. The soul constitutes *the* inner totality of a *person*, which differentiates itself in the body within the horizon of time. It can be such a totality only because it is a spiritual unity beyond all temporal diversity, which is the reason why it also transcends our conceptualization. If it were merely a *structural* unity, a unity *within* temporal diversity, or a *part* of such a unity, it could never lay down the body nor continue the existence of a person beyond the grave. However, because it is of an entirely different order, of a spiritual or religious order, it simply cannot be approached by the traditional "dichotomy." If we wish to keep speaking of a "dichotomy" from a scriptural viewpoint, then this word must assume an entirely different sense than it possessed in scholastic theology.

1 [Rom. 7:22; 2 Cor. 4:16; Eph. 3:16.]

The adherents of Reformational philosophy, who for this reason no longer wish to use the term "dichotomy," may therefore certainly no longer be badgered, and even less suspected of a "materialistic" view of human nature, as if they taught that everything is "over" at corporal death.[1] Rejection of the term rests on good scriptural ground, just as much as the rejection of the word "immortal" which is assigned to the "soul," and which simply cannot be reconciled with the Divine Word-revelation concerning "spiritual death."[2] For Scripture only knows "immortality" as the fruit of regeneration in Christ Jesus at the resurrection from the grave.[3]

An introductory summary of our anthropology

We may finally summarize our introductory considerations in a few theses, in which the starting point and the task of our anthropology have been sharply formulated:

I. During the development of Western thinking anthropological views have been dominated by certain religious ground-themes. Upon these ground-motives the entire development of Western civilization has been founded. They are:
   a. The Greek ground-theme of *form* and *matter*
   b. The scriptural ground-theme of the Christian religion: *creation, fall, and redemption through Christ Jesus*.
   c. The Roman Catholic synthetic ground-theme of *nature and grace*.
   d. The modern-humanistic ground-theme of *nature* and *freedom* (scientific domination and autonomous self-determination of the free human personality).

II. The ground-themes a, c, and d are of an intrinsically *dialectic* character. They are torn by an inner dualism, which time and again drives thinking, dominated by these themes, into polar directions.

1 Personally I have retained the term "dichotomy" for the time being because I have as yet found no better term which expresses unambiguously that, at the death of the body, a human being merely lays down the "body" but survives in its spiritual unity.

2 [Cf. Eph. 2:1; Col. 2:13.]

3 [Or at the transformation of the living believers at the coming of Christ (1 Cor. 15:51-54). For the notion of "immortality" also compare 1 Tim. 6:16: God "alone has immortality."]

III. The basis of this polar dualism is to be sought in an inner brokenness in the *idea of the Origin* of all things. This is caused by a complete or, in the case of the Roman Catholic theme of nature and grace, partial idolatrous direction of this idea of the Origin. Because self-knowledge depends on knowledge concerning God, anthropological views which are directed by one of the dialectic ground-themes mentioned must necessarily bear the same dualistic, polar character. This polarity comes to expression here in the view of "soul" and "body" and their mutual relationship.

IV. The ground-theme of the Divine Word-revelation – the theme of creation, fall, and redemption in Christ Jesus – radically excludes every polar dualism both in the self-revelation of God as the Origin of all things and in the revelation of human beings to themselves. Scripture does uncover the radical brokenness in the religious root of human existence through the fall, but it teaches just as much the radical recovery of this rupture through the redemptive work of Christ. This leads to a radical antithesis between the kingdom of God, and the kingdom of darkness under the dominion of common grace, but not to a polar dualism in the structure of the temporal existence of a person.

V. Wherever Scripture speaks about the human soul or spirit in the emphatic religious sense, it always views it as the *heart* of the entire temporal existence, from which are all the issues of temporal life.[1] Within this temporal existence it nowhere teaches a dichotomy between a "rational soul" and a "material body" (nor a trichotomy between "matter-soma," "psyche" and "spirit"). On the contrary, Scripture views this temporal existence in its entirety as "body," which is laid down at death. On the other hand, the spirit or soul of a person, as the religious root of the body or as the "inner person," is not subject to *temporal* death according to scriptural revelation, but outside of Christ Jesus it is subject to *eternal* death together with the body.[2] This revelation concerning the soul as the *integral* center

1 [Cf. Prov. 4:23.]

2 [Matt. 10:28a (soul not killed) and 28b (soul and body destroyed in hell); cf. Rev. 2:11; 20:6,14f. (second death).]

of the entire corporal existence of a person is in complete correlation with the self-revelation of God as the *integral* Creator of heaven and earth, who has no autonomous principle of origin opposing Him. This revelation does not in the least bear the character of a scientific theory; rather it serves as the religious presupposition of any truly Christian anthropology.

VI. The usual philosophical anthropologies, being oriented as one of the dialectic ground-themes, always try to give a metaphysical theory of the human "soul" or the human "spirit." They have done so insofar as they have not been driven to the "materialistic" pole of the Greek principle of matter or the modern-humanistic motive of nature (the humanistic ideal of science). However, from a scriptural-reformational standpoint every so-called metaphysical psychology must be radically rejected. For the human soul, in its assured scriptural sense, transcends all scientific conceptualization because such conceptualization is bound to time. Knowledge about the soul is *religious self-knowledge*, and true self-knowledge is only possible in the way of true knowledge of God from the divine Word-revelation.

VII. The proper *scientific* knowledge concerning the human being therefore remains fundamentally restricted to the structure of the human body in the broad sense of the temporal form of a person's existence. From a scriptural standpoint, however, philosophical inquiry about this state of affairs must, because of its religious determination, be *directed* by an *idea* of the human soul. In this idea the Divine Revelation concerning the root of a person's existence as its religious presupposition is oriented to the theoretical ground-problem of anthropology. This ground-problem can be formulated as follows: *How can we grasp the temporal existence of a person, notwithstanding its theoretically distinguished modal aspects and individuality-structures, as a deeper whole and a deeper unity*? We can therefore define the field of inquiry of philosophical anthropology as the totality-science concerning the temporal existence of the human being.

VIII. From the scriptural standpoint of reformational philosophy, neither the soul nor the body can be characterized as "part" of human nature. The view of a person as an individual unity of soul and body is equally rejected by this standpoint. For this view starts from the polar dualism of the conception of the

temporal existence of a person, and it tries to surmount this dualism in a *formal* way without being able to demonstrate a fundamental unity beyond soul and body.

IX. According to the scripturally determined anthropological ground-idea of reformational philosophy, the total human existence in its spiritual unity is concentrated in the human soul. Meanwhile, this same total human existence is broken up through time, as through a prism, into a diversity of functions and individuality-structures in the body. The soul is the "inner person" in the Pauline sense, just as we have to see the "body" as the external manifestation of a person (the "outer person"). The "outer person" is nothing without the "inner person," but the latter cannot be subject to temporal, i.e corporal death, because it transcends cosmic time.

CHAPTER 2[1]

The Human Body: An Enkaptic Structural Whole

We are faced here with a system of enkaptic structural interlacements of maximum complexity. In this system, the successive individuality-structures retain their own sphere-sovereignty in relation to one another. The type of these interlacements is that of a one-sided foundation, i.e., every individuality-structure that is placed later in the temporal order rests upon a previous one and cannot realize itself without it.

It is obvious here that the binding of the lower individuality-structures within the higher ones must result in the fact that, as the last individuality-structure can actualize itself more freely, the earlier ones will recede into a more latent condition within the enkaptic structural whole. Conversely, they will manifest themselves in their own internal nature the more clearly as the highest individuality-structure temporarily recedes in its guiding role. This state of affairs is known from so many empirical data that it is hardly necessary to illustrate it through examples. On the one hand, we have only to think of a temporary domination by the instinctive sensitive passions over all rational considerations, and on the other hand of the complete recession of the instinctive biotic drives in the case of a strong concentration of the conscious acts of knowing and willing.

Now, how is the enkaptic structural whole of the human body construed? *If this body is indeed an enkaptic rather than a simple structured whole, then the lower individuality-structures can only participate in the intrinsic unity of the human body through their being bound within the highest individuality-structure*. The lower individuality-structures do not become *parts* of the highest individuality-structure in this way, for they are only *parts* of the enkaptic whole. But the structural whole builds itself up only in the binding of all lower in-

1 [Unfortunately, both the title and the beginning of this second chapter are missing in the original. The chapter might have started in the following way: "The temporal corporal existence of a person is not to be understood as a single individuality-structure."]

dividuality-structures within the highest one. According to their internal sphere-sovereignty, i.e., viewed apart from the enkapsis, the lower individuality-structures are not really parts of, but merely the necessary *substrates* for, *the highest corporal individuality-structure*.

As is always the case with the enkapsis of radically different individuality-structures, so in the enkaptic whole of the human body the *form* is also the nodal point of all interlacements of individuality-structures. In this case, this form is not – as for example, in a work of art – an objective cultural form, but the *natural* form, through which a person is manifested according to that person's own temporal corporal existence. A consequence of this is that it is fundamentally impossible to distinguish the various corporal individuality-structures from one another in a purely *morphological* way. Likewise it will be impossible to classify certain organs in their morphological wholeness exclusively under one of the individuality-structures. The morphological components of the human body exhibit the same enkaptic nature as the body does as a whole. The various individuality-structures can only be distinguished according to an *internal* typical criterion.

The lowest individuality-structures of the human body

The primary and at the same time lowest individuality-structure is undoubtedly of a *typical physico-chemical qualification*. It consists of atomic compounds, which as such, i.e., outside the actual enkapsis, cannot yet be called a corporal individuality-structure. We can only call them so in their enkaptic binding within the next individuality-structures within the physical body.[1] This individuality-structure, which forms the substratum for all the succeeding ones, liberates itself out of its enkaptic morphological binding during the corruption process of corporal death. This is, however, at the same time its end as a corporal individuality-structure.

The second individuality-structure is of a *typically biotic qualification*. In its internal sphere-sovereignty it governs the vegetative

1 This binding can be best investigated chemically by examining the body secretions. For example, the gastric juice contains both inorganic and organic components. The former consist mainly of hydrochloric acid, and the latter mainly of enzymes. During digestion, hydrochloric acid is first secreted, and is subsequently bound by the protein molecules of the food so that primary proteoses are formed.

body processes insofar as these do not fall under the typical guidance of the sensitive function and of the later (normative) functions. It is only in this individuality-structure that the living cells and other biotically qualified structures make their appearance. It provides the vegetative substratum for both of the subsequent individuality-structures. It governs the so-called autonomous nervous system with the muscular and glandular tissues insofar as they are innervated by this system: the so-called smooth muscles of the eye, the hair, the bronchi, the intestines and the striated muscles of the heart.

Outside the enkapsis this second individuality-structure in its internal sphere is not to be viewed as a human corporal individuality-structure either. But just as in the case of the first one it functions in a new enkaptic binding within a third individuality-structure, which is *typically psychically qualified* through the *sensitive function*. In its internal sphere-sovereignty this third individuality-structure dominates those functions of the sensory and motor nervous system – particularly those of the brain (the sensory brain), the spinal cord, and the gland system (including the endocrine glands) – which in their being typically directed by the subjective sensitive function fall outside the domination by a person's acts of will, at least up to a certain point.

The highest individuality-structure of a person. The meaning of "acts"

This third individuality-structure in turn, and in combination with both earlier individuality-structures, functions enkaptically within a fourth individuality-structure, which I wish to call the *individuality-structure of the human acts* or *act-individuality-structure* of the body. By the word "acts" – differentiated in their basic dimensions of knowing, imagining and willing – I understand those activities which issue from the human selfhood but function within the enkaptic body individuality-structure. Through them, one orients oneself *intentionally* (i.e., with a purpose) towards states of affairs in temporal reality – or in the world of one's imagination – under the guidance of normative points of view. One internalizes these intentional (or intended) states of affairs by relating them to one's *I-ness*. Their "innerness" is involved in the intentional character of the "acts."

Only the action *realizes* the intention of the act. In this realization, the acts of knowing, imagining and willing are intertwined with the motivated process of decision-making, and then the decision is converted into the action. The still purely intentional subject-object relation, which only existed *internally* in the act, is hereby actualized through a causative intervention of the action in the "outside world." The action has an external causality.

The acts and the Gegenstand relation

The view of human "acts" defended here is fundamentally different from that which, since Franz Brentano, is defended in modern so-called "act psychology" and in modern phenomenology. For here the "acts" *are* taken in their fundamentally *intentional* character, but at the same time they are proclaimed to be "non-corporeal" activities of the "soul," or of the "spirit" in the sense of a "center of personality" (Scheler) which lives purely in its acts, or of an "absolute" consciousness, independent of all corporality (Husserl). Now it is characteristic that these people believe that the guarantee for the purely "spiritual" character of all acts can be found in the "intentional Gegenstand relation." Max Scheler, for example, writes in one of his last works:

> If we place at the top of the concept of "spirit" a special function of knowing, a kind of knowing which it alone can provide, then the fundamental destination of a spiritual being is its *existential liberty, freedom*, its capacity – or at any rate that of its *center* of existence – *to be set free of any ban, any pressure, any dependence upon the organic*, of "life" and of *all* that belongs to "life," therefore also of its own instinctive intelligence. Such a "spiritual" being is no longer bound to instincts or to the environment but *free* of the latter *Umweltfrei*, and, as we want to call it, "open to the world" [*Weltoffen]*. Such a being has "world." It is able to raise the centers of "resistance" and of its environmental reaction, originally given to it as well, in which the animal is *ecstatically* absorbed, to "objects" [*Gegenstände*]; it is able, as a matter of principle, to apprehend *in and of itself* the being-thus of these "objects," without the restriction which this world of objects or its actuality experiences by the biotic instinctive system and the sensory functions and organs destined to it.[1]

In this way the act is approached from the theoretical Gegenstand relation – wrongly identified with the logical subject-object relation

1 *Die Stellung des Menschen im Kosmos*, p. 48 (new edition: Bern-München, 1962).

– involving a theoretic confrontation of the logical function of the act of knowing with the pre-logical aspects of the fields of inquiry. The theoretical abstraction which is performed in this Gegenstand relation is re-interpreted in a metaphysical way as if the act of knowing were fundamentally independent of all biotic and psychical functions. The "purely spiritual" acts are then oriented upon a "spiritual center," which Scheler – in sharp contrast to the I-ness, which according to him is bound to the psycho-vital sphere – calls "person," but which itself is nothing but a "monarchic ordering of the acts." In this way Scheler's metaphysical concept of "spirit" originated. He rejects the view of the spiritual personality as "substance." The substantial view of the human spirit rests, according to him, on an entirely unjustified application of the external thing-category or, in its older form, of the metaphysical form-matter categories upon the relation between body and soul. Both applications of cosmological categories on the central being of a person – and with Scheler those categories are only related to the pre-logical aspects of reality – are untenable. The spiritual personality of a person is not a "substance," but merely a "monarchic hierarchy of acts, among which one always possesses the lead and guidance."[1]

In the present context we are only interested in the way in which the purely "spiritual" character of all human acts is derived from the theoretical Gegenstand relation. It is based on a typical misunderstanding of the individuality-structure of the theoretical act of knowing under the influence of the starting point that one has chosen for one's philosophic thinking. There was a pitfall here that has kept anthropology a prisoner beginning with Greek thinking. Time and again it has enticed anthropology to hypothesize a concept of the soul or the spirit which in reality had been gained from a theoretical abstraction. Because this point is of such fundamental importance for philosophical anthropology we should not rest until we have completely laid bare this pitfall.

In our transcendental critique of philosophic thinking we have already amply demonstrated that the Gegenstand relation is only proper to the attitude of theoretical thought. It must be fundamentally distinguished from the subject-object relation, which is as fa-

1 *Ibid.*, p. 75.

miliar to the naive or nonscientific thought attitude as the Gegenstand relation is foreign to it.

For this reason a theory of human acts cannot be built on the intentional theoretical Gegenstand relation because one will indeed have to admit that not all human acts are of a *theoretical* character. But even if we consider the theoretical thought-act itself, we must realize that this act as such cannot be a theoretical abstraction. It is not the *thought-act* that stands in a Gegenstand relation to the non-logical aspects of reality. Instead, the Gegenstand relation itself only exists within the individuality-structure of the real act, which as such embraces all aspects of reality without distinction. This act is only possible within this individuality-structure, which is enclosed by the continuous temporal coherence of the aspects.

It is therefore quite incorrect to identify the theoretical thought-act with its logical aspect. A purely logical act of thinking does not exist; it is structurally impossible for a purely logical thinking subject to exist by itself. And for the same reason it is impossible for a Gegenstand to exist by itself. The Gegenstand relation in the theoretical thought-act is merely intentional. It is based upon an intended abstraction of the real coherence between the logical and the non-logical in order to be able to theoretically analyze reality and to conceptualize its aspects. This intentional relation may in no way be re-interpreted as a metaphysical opposing of "act" and "biotic reality," or of "spirit" and psychic-physical "body." We have fundamentally opposed this "purely spiritual" view of the human acts by localizing these acts in the fourth or highest corporal individuality-structure.

The acts in relation to the brain

It has been established that the so-called associative portions of the cerebral cortex play an essential role in this fourth corporal individuality-structure, in which the human acts function. In the life of an individual this portion of the cerebrum develops at a later stage than the sensory centers. The latter assimilate the stimuli from the "outside world," which enter through the afferent bundles of the centripetal nerve cells and flow down along the efferent bundles.

The afferent nerve tract has thick fibers and travels mainly, but not exclusively, towards the sensory brain. The other (associative)

portions of the cerebral cortex only receive them[1] in very small quantity. By means of the sensory centers the direct sensation (*Empfindung*) of the sensory impressions is brought about. Free combinations in the higher whole of an act can only be achieved through the mediation of the associative cerebral portions with their associative fibers, which do not directly connect up with the nerve fibers from the sensory organs. The associative fibers are those nerve bundles which connect the various centers in the cerebral cortex within one hemisphere with one another.

Meanwhile it is again typical for the enkaptic construction of the body that a detailed morphological *division* of the cerebral cortex into a portion for sensory projection and a higher or "spiritual" portion for associations, as was attempted in modern physiology by Fleschig, was found to be impossible. Even in the associative portions the projection tracts of the sensory centers are not altogether absent; one can only say that their number is insignificant in relation to those in the sensory centers. Further, in a person, the predominantly associative portion of the brain is much larger than the sensory portion, and a large portion of this associative brain produces no sensory symptoms in the case of a local injury.

Now is it really the associative brain in the human body which does the knowing, judging, imagining or willing? This supposition would of course be preposterous. All acts issue from the indivisible center of human existence, from the spirit or the soul in its religious unity, in which the human I-ness is seated. All acts are oriented upon the I. But we must equally realize that the human soul is merely the spiritual *center* of the acts,[2] the *spiritual source* of the acts, which as such *transcends* the temporal order with its differentiation of aspects and individuality-structures.

The acts themselves, however, do function within the temporal order of reality. They possess various modalities in the various aspects, they have various modal subject-functions in them, and within this temporal differentiation they can only be enacted in a

1 [*Editorial note* (MvB): I.e., afferent fibers, and therefore, sensory stimuli.]

2 This is obviously no concession to the modern "psychological" view of the soul as an act-center. For in this view the human soul evaporates into a temporal point of reference that would only exist in the acts themselves.

person's corporal existence. It is the entire person, and not merely her "soul," which thinks, wills, imagines or judges.

In this respect the associative tracts of the cerebrum play an essential role. All associative processes in human consciousness presuppose the connection of impressions which are received by the central nervous system along the most different pathways. And these associative tracts have been discovered by brain physiology to be the anatomical basis for these synthetic processes. A person has, for example, a sensory, so-called psycho-optic, center and a psycho-acoustic center, in which visual and acoustic impressions, respectively, are processed. These centers consist of two spatially separated areas of the cerebral cortex, the optic and the acoustic fields of perception and the optic and acoustic fields of memory or sensory center. In the fields of perception the optic and acoustic stimuli, which enter via the afferent tracts, are actualized into psychical (sensitive) sensations.

In the fields of memory or sensory centers, the memory images of these sensations, supplied by the fields of perception and fundamentally different from the former, become psychically fixed. Both of these fields are connected in the cerebrum by associative tracts. When, for example, the sensory image of a thing that we have seen before is carried to the optic field of perception, the memory image that was fixed there earlier is reawakened at the same time with the sensation. With the aid of that fixed memory image we recognize the thing.[1] On the other hand we can also reawaken the memory image of a thing we have seen before without simultaneous optic stimulation, and with the aid of this memory image we can imagine the thing.

Now in the act of knowing, and in unbreakable coherence with it also in the other act-dimensions, complicated associative processes occur that are still little known. These processes, characteristic for the function of the cerebrum, occur in the associative tracts

1 Cf. Leonard Landois, *Lehrbuch der Physiologie des Menschen,* rev. by Hans-Ulrig Rosemann (1923), p. 734 ff., whose notion of a "depositing" of memory images is indeed of a primitive materialism. We must remember that according to our view the fields of optic perception and memory bear an enkaptic character. They therefore operate not merely in the physical and vegetative, but also in the psychical and in the act structure of the human body. A "materialistic" interpretation of our view is thereby automatically excluded.

and in the sensory centers. The stimuli are individually directed along the afferent tracts to the so-called *regio calcarina*, situated above the cerebellum in the occiput. They serve here as the material (or stimulant?) for the constitution of visual or acoustic images, in which the distinct sensational elements are perceived as a whole, standing in an intentional relationship with the optic (or acoustic) sensory object-functions of the things or events perceived.

The associative tracts and the sensory centers also play an essential role in logical conceptualization with its intentional orientation towards the logical object-function of the things or events perceived. We can say the same thing of the lingual, aesthetic, and other aspects of the act of knowing.

The act always displays a totality-structure which expresses itself *physiologically* in the biotic aspect of the associative brain processes taking place in the act. And the act of knowing is intentionally oriented towards a datum which itself possesses a totality-individuality-structure and is not just a product of a synthesis by the consciousness.

In the case of total destruction of the sensory visual center, so-called "psychical blindness" occurs: one can no longer recognize anything on sight. In the case of a certain injury of the cerebral occipital lobe "word blindness" (*alexia*) occurs. The letter signs are still seen but the written or printed words can no longer be grasped in their linguistic sense.

When the sensory speech center of Wernicke located in the sensory acoustic field of the temporal lobe, is damaged, impairments of speech occur (so-called sensory *aphasia*). This is a form of "psychical deafness," whereby words are heard but make no sense to the patient.

The cortical field for musical memory images is located more to the front. Through injury of this sensory center, so-called "musical deafness" occurs (*amusia*). Through injury of the motoric speech center of Broca a "motoric aphasia" occurs, i.e., words are understood according to their sense but they can no longer be pronounced because the speech muscles are no longer directed by the brain.

Does all this mean that human acts can be localized in the cerebrum? After the fiasco of Gall's fantastic theory of localization,[1] Paul Fleschig more recently has defended this view in his well-known theory concerning the associative centers.[2] In the human cerebral cortex he distinguishes forty-five distinct fields. These fields are ordered in three groups: (1) primordial areas, which already possess their myelin sheath at the time of birth; (2) intermediary areas, which only surround themselves with myelin during the first six weeks after birth, and (3) terminal areas, in which the myelinization begins later (starting with the second month after birth) and is completed approximately four months after birth.

The primordial areas coincide with the various sensory spheres; they are characterized by an ample provision with projection fibers, which form the sensory or afferent tracts. Fleschig therefore calls them *projection centers* and localizes in them the primary sensory impressions and the locomotion mechanisms.

The terminal areas possess little or no projection tracts but they are connected with the projection centers by numerous associative fibers. Fleschig therefore calls them *association centers*, and localizes in them the higher "spiritual" functions of the brain, as a bundling of the functions of the sensory centers into higher units (cogitative or thought organs).

He distinguishes a temporal center (located in the temporal lobe), a parietal center, and a frontal (located in the frontal cortex of the cerebrum) association center. Defects of intelligence always occur through disturbance of the association centers in both cerebral hemispheres. Direct sensory connections between the spheres of touch and vision, vision and hearing, smell and hearing, etc., are not present; the connections between these sensory spheres are always mediated indirectly through the association centers.

1 Franz Joseph Gall (d. 1829) distinguished no less than thirty-six "senses" or faculties in his phrenology (theory of the senses), among others the talent for poetry or mathematics, children's love, piety, the urge to possess, the sense for the metaphysical, etc. The more strongly developed senses among these would correspond to certain elevations of the cranium.

2 P. E. Fleschig, *Gehirn und Seele* (Leipzig, 1896); *Die Lokalisation der geistigen Vorgänge* (Leipzig, 1896); *Anatomie des menschlichen Gehirns und Rückenmarks auf myelogenetischer Grundlage* (Leipzig, 1920).

The earlier mentioned view of a series of physiologists (Hitzig, Goltz et al.), that the frontal portion of the cerebrum is an organ for higher "spiritual" activity (abstract thinking, but also normative volitional activity), corresponds with Fleschig's theory concerning the frontal association field. Acquired or congenital defects of the frontal cortex cause feebleness of the intelligence and idiocy without disturbance to the function of the motor or sensory nerves.

Meanwhile, both Fleschig's theory concerning the association centers in general and the hypothesis concerning the special significance of the frontal portion of the cerebrum for the higher "spiritual" activities (the "acts" in our sense) is being attacked by other physiologists such as Munk and Von Monokow.

The acts and the problem of space

In the debate about the question whether the acts can be localized in certain cortical areas of the cerebrum it is first of all necessary that we properly ask ourselves what we really mean by such a localization. We can only speak of localization in the sense of *spatial* relationships. Now we know from the general theory of the law-spheres that in the *original* sense we can only speak of "space" in the spatial aspect, which is investigated by geometry and which as such is not "sensory material." In all later aspects space only occurs in the *analogical* sense under the qualification of the modal meaning nucleus concerned.

When physiology investigates the biotic functions of the cortical areas of the cerebrum it must take its orientation only from the *objective sensory space of sensation* [*Empfindungsraum*]. It must do this when it tries to localize these areas first of all anatomically as they appear in their objective-sensory form. This objective sensational space is an objective spatial analogy within the structure of the psychical aspect, whose meaning-nucleus we find in sensitivity. This sensational space is neither identical with physical space as investigated by physics nor with the biotic space which biology investigates. We can only say that both the physico-chemically qualified processes and the typically biotic processes function as *objects* in the *sensory* space of sensation; they therefore also have an *objective-sensory* function in it.

When we, therefore, investigate the brain in its objective-sensory form we must irrefutably establish that it functions in this ob-

jective sensational space. But then the same has also to be said of the human "acts" as *real* activities of the human spirit within the enkaptic body individuality-structure, and not as activities *abstracted* by epistemology or phenomenology. For at least the physical and physiological aspects of the acts can function as objects in the sensory space of sensation, and in these aspects too the act individuality-structure must express itself as a totality-individuality-structure. The acts can function *in* the sensory space of sensation, and thus be localized in it, *according to their objective-sensory aspect only*. According to their other aspects, they do *not* function in this space, of course, no more than the brain and its cortical fields do so themselves according to their non-sensory aspects.

Of course, in this way we have not yet established anything concerning a possible localization of the acts *in the brain*. However, we must not accuse brain physiology immediately of "materialism" when it raises the question about such a possible "localization" of the acts.[1] It is rather the prejudice that only "matter" is spatial and all spatiality is "material" that muddies the entire phrasing of the problem here.

Not a single thing and not a single event or activity exists *in its entire scope* within the sensory field of sensation.

If, however, the human "acts" had no objective-sensory aspect, functioning in the objective visual, tactile, and acoustic space, they would be *closed* to any experimental physiological and psychological investigation. But in that case they would also fall entirely outside the framework of temporal reality, and thereby outside the domain of science.

When we define the problem of localization in this way, only two phenomena can be localized in the strict sense of the word, in certain portions of the brain. They are the separate sensory-sensational stimuli, which are carried to the perception centers through

1 Among the physiologists who investigate this problem seriously there are several who emphatically reject the materialistic starting point. For instance, the director of the Berlin Institute for Brain Research, Dr. Oskar Vogt, one of the most diligent advocates of the localization idea, has expressed himself sharply against the view that the psychical and post-psychical functions could be reduced to physical cerebral processes. As he put it, whoever seeks the human "soul" in the brain is like a person who takes a piano apart in search of the music. Cf. Artur Neuberg, *"Urentwicklung" des Menschen* (1921), p. 204.

the afferent tracts, and the motoric elements which are conducted through the motoric nerves.

When the nerve tracts or those cortical portions which are directly connected with them are injured, certain elements of perception or motion, differing according to the damaged brain portion, drop out. The parts which conduct or directly receive the stimuli behave, in the case of a localized injury, like a typewriter which has a few defective keys, as Professor Jordan has put it so poignantly.[1]

Things are altogether different, though, with the functions characteristic of the cerebrum, in the case of the bundling of the separate impressions into a sensory totality-image or representation, and *a fortiori* in the case of the human acts. In the case of a local injury, the activities of the cortex cannot look like those of a typewriter. Such processes depend upon a general cooperation and interaction of numerous brain cells, which probably every time extend over the entire hemisphere.[2] For instance, we can certainly not speak of a special *concept center* in the frontal cortex. What we can say is that certain act functions are more connected with certain cortical fields than with others, but this localization is quite relative.

After destruction of the sensory acoustic or visual center, neighboring brain portions gradually take over the function of this center, and better so with time. No regeneration takes place here. The actual center accomplishes the function better than the neighboring portions, and those located closer to the center do so better than those farther removed. As long as recovery in the patient is not complete the construction of visual and acoustic images is not distorted, as is the case when certain stimulus or motion elements are eliminated, but they are *primitive* in a structural sense (Jordan). The relativity of localization is also evident from the fact that the damage resulting from local tissue destruction is not limited to one function of the cerebrum. As Goldstein remarks, all activities of the cortex are hereby always more or less altered.[3]

1 Hermann Jordan, *Allgemeine vergleichende Physiologie der Tiere* (Berlin, l929).

2 See Hermann Jordan *et al*., eds., *Encyclopaedisch Handboek van het Moderne Denken*, 2nd ed. (Arnhem, 1942), p. 418.

3 Kurt Goldstein, "Die Lokalisation in der Groszhirnrinde," in Albrecht Bethe, ed., *Handbuch der normalen und pathologischen Physiologie* 17 vols. (Berlin, 1927-31), 10: 600.

We have to view the "localization" of the acts of thought (and will) in the frontal lobe (the so-called "psychencephalon") in the same relative sense. Tumors that occur in this portion indeed cause severe disturbances in the act life. But after removal of one or both frontal lobes together with the tumor, complete recovery occurs as a rule, albeit sometimes the capacity for more involved thought processes turns out to be impeded.

Meanwhile, it has been established that all human acts are bound to the function of the associative portions of the cerebral cortex *as a whole*. During the carrying out of every act these portions are in any case necessarily "in action," even though our knowledge of the corresponding cerebral processes in their physiologic aspect is still extremely deficient. The question thus arises whether the associative brain as such belongs to the act-individuality-structure of the human body. When we consider this question we must remind our readers of our previous fundamental remark about enkapsis: as a morphological whole, not a single organ of the human body can be assigned exclusively to one of the corporal individuality-structures. Without exception the organs all display the enkaptic configuration of the human body as an individuality structural whole because precisely the natural *form* is the nodal point of the individuality structural interlacements here. This therefore also holds for the associative brain. The ganglion cells of the cerebrum are primarily of a biotically qualified individuality-structure. However, they function enkaptically within the third and fourth corporal individuality-structures.

Why animals have no act-structure

In the more highly developed animals the associative tracts are not absent, although in relation to the sensory afferent tracts their number is greatly surpassed by that of the associative tracts of the human cerebral cortex. In the case of the animal, however, we cannot speak of a real act-structure because it is not a subject in the normative aspects of reality, and above all because it has no *spiritual act-center*. The associative brain processes here remain fundamentally enclosed in a psychically qualified corporal individuality-structure. The animal has no concept of language, logic, or culture, nor any other normative subject-function.

Certainly we cannot deny some *sensory* "intelligence" to the more highly developed animals. The well-known experiments with chimpanzees by W. Köhler have undeniably demonstrated that animals can respond to new situations according to a purposeful plan, which cannot be explained from the instinctive consolidation of the biotic urges of the species nor from purely sensitive associations. Chimpanzees carry boxes under a fruit hanging high in order to reach it. A banana that cannot be directly obtained is brought within reach of the animal with a stick. In one of Köhler's experiments a chimpanzee even managed to fit two pieces of bamboo together when one piece turned out to be insufficient for bringing the fruit within reach. And this occurs without "trying," provided the animal can see fruit, box and stick. Apparently the animal can grasp that the dynamic causal relationship between a moving stick and the desired fruit in sensory-dynamic imagination is useful for its own subsequent activity.[1]

The dynamic imagination occuring here is not a picturing by the animal to "itself" (no "*sich* einbilden"), it is no "act" in the sense of the human act of imagination, because it is not of a normative structure and lacks any orientation towards a spiritual center. It is a psychical function, which we might call "sensory intelligence" insofar as it is a productive imagination which, in the sensory representation, anticipates a new complex of facts not yet experienced. It is a sensory "prudence" and a "providence," a conscious, "sensitive" anticipation within a purposeful causal coherence of two things given, it is a "ruse" (*List*), to use an expression of Max Scheler.[2] The distinction from the associative memory is clear. The situation which has to be taken into practical account in animal behavior is not only new in its kind but above all also new to the individual. In addition, such a behavior occurs suddenly, and is not preceded by efforts of trial. However, "sensory intelligence" remains a sensitive function in the undisclosed sense. It moves

1 See Wolfgang Köhler, *Nachweis einfacher Strukturfunktionen beim Schimpansen* (Berlin, 1918), and idem, *Intelligenzprüfungen an Menschenaffen* (Berlin, 1931).

2 *Die Stellung des Menschen im Kosmos*, pp. 41 ff. Scheler calls this intelligence the fourth stage in psychical life, which he sharply distinguishes from the "spiritual acts." The first stage of psychical life is then formed by the "ecstatic sensitive urge," which in his opinion is already present in plants; the second stage is that of the instinct, and the third is that of the associative memory (*mneme*).

within the narrow boundaries of an only more highly differentiated psychical corporal individuality-structure. It is based on a sensitive fantasy, which pre-senses the causal-purposeful relationship between two things in its sensory imagination. It even lacks the sensorily bound conceptual representation of the causal relationship such as we form it in our pre-scientific thinking.

In animals, distinction and knowledge remain limited to their biotic and sensitive environment. They serve the instinctive biotic urges, also insofar as they cannot be explained by knowledge. Instinct distinguishes according to simple sensitive signals and has a certain purposive knowledge of the situation, but it is *inborn* and belongs to the structure of the genus or the species, to the primary-type of the animal. Identification of properties, which is the essence of logical analysis, is altogether lacking both in animal intelligence and in instinctual distinction. According to Grünbaum, a certain number of vibrations of the threads of its web (49 per second) are to the garden spider the signal for the presence of a prey in the web. But it knows of the situation "prey in the net" so little through analysis of logical characteristics that it also attacks a tuning fork which vibrates 49 times per second.[1] From this it is clear that this instinctive knowledge is of a *sensitive* nature, and remains limited to the immediate biotic environment. Yet it, too, has a typical *totality*-character and is fundamentally different from the reflex response to a distinct sensory stimulus.

Insofar as the associative brain is therefore only involved in sensory processes of consciousness with a typical psychical qualification, they do not function in the real act-structure of the human body but in the third individuality-structure with its psychical qualification. They only assume an *act*-structure in functions characteristic of the *human* brain.

The acts in relation to the body as a whole

However, this does not mean that only the associative brain is active in the acts. It is rather within the body as an *enkaptic whole* that the associative brain only fulfils a regulating task. For only inside the body can the brain be active in the act-structure. Similarly the study of hormones (internally secreted stimulants) has demon-

1 Cited by Jordan in *Encyclopaedisch Handboek*, p. 383.

strated the great significance of the system of the endocrine glands for the act-life. If, for example, the thyroid gland remains undeveloped in human beings, their logical and later functions[1] also remain undeveloped, and complete idiocy (cretinism) can be the result. It has further been found that the endocrine system forms a coherent whole, and that it in turn is closely connected with the mid-brain.

It is therefore necessary to assign *subject-functions* in the logical and post-logical aspects of temporal reality to the entire body in the act-structure, in which the associative brain has a regulating task. Naive experience does so indeed without any objection. It speaks of thinking as "brain work," without even a trace of a materialistic theory, and it knows that in this brain work the entire body is involved.

Only the philosophical view of the human body as a material substance is forced to deny all logical and post-logical subjectivity to the body if it wants to preserve the materialistic standpoint. But this view, if consistently worked out, must also deny the biotic and psychical subjectivity of the body. For these functions do not fit in the abstract view of the pure "material body" either.

Even though the human body in its act-structure has real subject-functions in the normative aspects of temporal reality, we still cannot say that the human "body" thinks, wants, imagines. We already pointed this out. For the acts not only function subjectively in the normative aspects, but they distinguish themselves precisely and fundamentally from all psychically qualified animal activities in this respect that they *issue from a spiritual center*. However, the human spirit cannot carry out any real acts outside its temporal corporal individuality-structure. For that reason we said: it is *the individual human being* in the integral unity of "body" and "soul" who accomplishes the acts. The full person as a totality is the subject of the act.

However, if the act is carried out in the enkaptic corporal individuality-structure, according to the temporal order, then it will not do either to assign to it functions merely in the psychical and the

1 *Editorial note* (DFMS): By "Later functions" are meant those functions that come later in the order of *cosmic* time, because Dooyeweerd assumes a serial order of modal aspects (of *earlier* and *later*) in *cosmic time*.

later aspects. All of modern "act psychology" describes the "acts" as "intentional experiences," and believes that these "experiences" belong to a so-called purely "psychonomic reality" (the term is taken from Georg Elias Müller and Narziss Kaspar Ach). Whoever does so must first give proof, however, that such an "intentional experience" is possible without bringing into action our entire body, also according to its physico-chemical and biotic aspects. It is impossible, however, to give this proof because the opposite has been established as a scientific fact. A so-called purely "intentional experience" is nothing but a theoretical abstraction. The *real* "experiences" cannot be purely "psychonomic" because temporal reality is only given in the *integral coherence of all its aspects*.

The acts, therefore, function in *all* aspects of temporal reality without distinction, and not just in the sensitive and subsequent aspects. In the acts, the "soul" is actually operative in the entire enkaptic structure of the body, and only in the body does the soul have the capacity to do so, insofar as the acts are included in the temporal order of the body. In other words, we can take the "acts" neither to be purely "corporal" nor purely "spiritual." They are *both* inseparably connected and precisely for that reason they bear a *typically human* character. Only the act-structure *in its fundamental dependence upon the spirit* stamps the body as human. Viewed from the *temporal* order, the human body is the bearer of the acts: viewed from the *spiritual, religious* order, it is the human soul or spirit.

This true state of affairs can only be seen from a Christian, Scriptural viewpoint. And this viewpoint alone will allow us to gain scientific insight into the structure of the human body that escapes the fundamental antinomies of current views. As long as one keeps seeking one's firm ground in an "autonomy of reason" in the area of philosophy, the dialectical-religious ground-motives, which consciously or subconsciously dominate this belief, will lead philosophical thinking to interpret the "human acts" alternatively in a "materialistic" or purely "spiritual" way (spiritual in the unscriptural sense of purely "immaterial" inner activities of the *anima rationalis*). Mediating views between these two poles are possible but basically such syntheses remain orientated towards the polar ground-theme.

The argument from the side of "idealism" that the "acts," as internal activities of the "soul" or of "pure consciousness," "occupy no space" and cannot be counted, measured, or weighed may appear to be a strong one. But in opposition to it, modern materialism, under the influence of the science ideal, will time and again point to its scientific experiments, which demonstrate that also the acts of thought and will manifest themselves, under the physico-chemical aspect, in electrical currents and chemical processes in the brain. And it will always be able to bring forward the fact of experience that without a foundation in the nervous system not a single so-called activity of the human soul is known to us in temporal life.

In opposition to that, the "spiritualistic" view may attempt to refute its opponent epistemologically. But the history of philosophic thought teaches that a materialistic concept of the human acts has never yet surrendered to epistemological arguments. The latter are only convincing to those who reject the materialistic standpoint. This is understandable because behind every epistemology, and in general behind every philosophical system, a cosmonomic idea is concealed which dominates the entire theoretical view of the structure of human knowledge and the view of reality as a whole, and which itself is dominated by pre-theoretical, religious ground-motives.

Time and again the purely "spiritual" view of human acts had to assert its relative right over against the materialistic view. Its apparent cogency stems from the fact that the acts in their proper nature can in no way be explained from the primary, physically qualified individuality-structure of the brain, and that acts issue from a spiritual center which everyone who has not been theorized in his consciousness and has not lapsed into a primitive "nature religion" must recognize to be irreducible to corporal reality. But this view lacks the *integral* totality-idea which only the Scriptural doctrine of creation can offer to philosophy.

CHAPTER 3

The Act-Structure and the Soul

Is the act-structure pistically qualified?

In earlier essays, Kuyper's *Philosophy of Science* and *The Problem of Time in Reformational Philosophy*,[1] I defended the view that the act-structure of the body is of a typically pistic qualification, but I had to abandon this. We cannot say that all acts have their typical qualifying function in faith, although they are all guided by the function of faith. On further consideration, moreover, I had to come to the conclusion that for the act-structure no typical leading qualification can be established in any of the normative aspects at all. I believe that this is based on the fact that it is the individuality-structure in which the temporal "acts" of the soul manifest themselves as knowing and willing, memory and imagination. With their projection into human "actions" these acts can assume very different individuality-structures. But these are then structures of temporal *human society* which, as we have seen, are not of the same order of reality as those of the primary bearers of individual reality.

The ultimate structure of human corporal existence is therefore an *undifferentiated* one, in which the typically human social structures with their normative qualifying functions are interwoven in the individual temporal existence of their human bearers.[2]

In the animal body these "social" interweavings are comprised in a differentiated structure of a typically psychical, instinctive qualification and on a biotic foundation. Within this narrow – not normatively qualified – structural framework, the possibilities of

1 H. Dooyeweerd, "Kuyper's wetenschapsleer," *Phil. Ref.* 4 (1939): 193-232, and "Het tijdsprobleem in de Wijsbegeerte der Wetsidee," *Phil. Ref.* 5 (1940): 160-82, 193-234.

2 At this point the theory of the races finds its systematic place in anthropology. According to purely scientific points of view no tenable concept of race can be formulated.

animal activity are extremely limited in comparison with those of a human being.

"Aacts" of a human being and actions for which the body provides the temporal structural framework, are oriented towards the spiritual-religious center of a person's entire temporal existence, which participates in the religious root-community of the human race. Only through its mediation are opened up all individuality-structures of pre-logical qualification, and actualized in their normative aspects, and in turn actually oriented towards the religious concentration-point of the entire temporal cosmos.

Do corporal individuality-structures of normative qualification exist?

For a long time I have searched for the existence of some differentiated individuality-structures of typically normative qualification in the human body itself. In the first place I looked for an individuality-structure typically qualified by the logical function of thought, hoping in this way to discover at least a point of connection for the traditional theory of the *anima rationalis*. The existence of such a corporal individuality-structure with a typically logical qualification would then encompass the existence of post-logically qualified individuality-structures. In this way it seemed also possible to classify the "acts" according to typical corporal individuality-structures. It turned out, however, that this course of my investigation led me into a dead end.

In Reformational philosophy, the theory of the law-spheres (of the modal structures) as well as the theory of the individuality-structures is oriented by data from our integral experience of reality as they manifest themselves in the light of our Christian reformational idea. Without data from experience, not a step can be taken here if one does not wish to lose oneself in a vain construction game.

Initially I believed I had some empirical data at my disposal that seemed to justify pursuing my investigation in the direction mentioned. One could point, for example, at the psychiatric syndrome of so-called moral insanity, in which logical thought and also logical feeling somehow seemed to function, whereas social, juridical, moral, and pistic sensitivity turn out to be fundamentally disturbed. On this basis one might be inclined to assume an individu-

ality-structure in the corporal existence of a person of a typically logical qualification; an individuality-structure which possesses an internal sphere-sovereignty in contrast with the individuality-structures qualified by later normative functions. However, before one could agree to its existence on scientific grounds one should have disposed of much more solid data than have been brought to light by science thus far. As we have seen, a real individuality-structure must typically express itself in all aspects of temporal reality. One should therefore also address reliable physiological data and others from which, in the light of our reformational idea, one could conclude that an individuality-structure with a typically logical qualification in the human body could exist. However, we have no such data. It certainly has been established that moral insanity can have a so-called physiological basis in a trauma of the cerebrum; but typical centers in it for logical, juridical, moral and pistic functions have not been discovered.

Bundles of nerves, called associative fibers, exist which connect the various centers in the cerebral cortex of the same hemisphere with one another. And it is true that in modern physiology it has been presumed that these nerve bundles specifically serve the logical thought-activity, because in a person, contrary to the animal, these nerves develop in abundance. But this supposition was more inspired by the traditional view of a person as a being qualified by logical thinking than by the nature of the empirical data mentioned. For the associative tracts in the cerebum, in contrast with the afferent tracts of the sensory brain,[1] are oriented towards the entire post-logical activity and definitely not just towards specific logical processes.

After Franz Josef Gall's fantastic localization theory became discredited, further investigations were continued on an experimental scientific basis with regard to the so-called localization of the various post-biotic functions in the cerebrum. These investigations have not led to results that sufficiently support the hypothesis concerning possible differentiated corporal individuality-structures with a typically normative qualification. Such support should involve the demonstration that specific centers for the logical and post-logical functions exist. But what has been found in this area

1 S. Jelgersma, *Leerboek der Psychiatrie* 3rd ed. (Amsterdam, 1926), 1:15 ff.

gives us nothing to go by. It is true that one has, to some extent, succeeded in localizing the lingual function, and perhaps also the musical-aesthetic function.[1] But the question remains unanswered in what sense this localization has to be understood, for example, to what extent certain brain centers are *exclusively* and typically related to these functions or whether they are merely *partial* conditions for them. Rather, the continuous interconnectedness of the brain cells (neurons) physiologically seems to point to an undifferentiated totality-structure in the higher organism of the human body.

In addition to all this, one has to take into account the functional coherence of the brain and the autonomous nervous system with the glands and their internal secretion. And at the same time, the enkaptic interlacement of the earlier individuality-structures within the fourth corporal individuality-structure again plays a large role. For the study of the hormones has demonstrated the tremendous importance of certain endocrine secretions for emotional life as well as for functioning in the normative aspects.

What ultimately made me definitively abandon the hypothesis concerning corporal individuality-structures of differentiated normative qualification was that it appeared to me to be impossible to classify human "acts" according to differentiated *primary* individuality-structures. This implies that these "acts" and actions are not enclosed within one single differentiated individuality-structure. Instead, in free human choice they can be realized in an entire series of individuality-structures with a normative qualification. Prayer, for example, assumes a different individuality-structure in the family circle than in a church setting. An act of knowing assumes a different individuality-structure in a scientific context than in a social circle with a typically practical destination. An imaginative act assumes a different individuality-structure in the world of the arts than in a gathering of politicians or engineers. An

1 The discovery of the so-called acoustic center (of Wernick), to which the lingual function is closely related, is nevertheless very important. When it is injured "word deafness" occurs, as mentioned before: one does hear the words but no longer understands their meaning. This forms a decisive proof against the Aristotelian-Thomistic doctrine concerning the independence of the actual rational activity from the body organization. The rational grasp of meaning, not the sensory perception is at stake here.

act of will assumes a different individuality-structure in sport than it does in scientific research or in the world of commerce.

The acts and human character

Meanwhile, the question remains: What gives the fourth corporal individuality-structure, in itself undifferentiated, its typical temporal character of a totality? ln my opinion this character must be sought in the fact that it has a *typically normative destination* – though undifferentiated in and of itself – as the corporal individuality-structure in which the spirit or soul expresses itself. The full religious individuality of the spirit or soul expresses itself in the temporal existence of human beings in that which we call their "character." The character is an individual unit of expression of a person's corporal existence in the normative structure of the acts and the actions. But this character is just as plastic as the corporal individuality-structure within which it brings human individuality to temporal expression, and it is interwoven in social structures in all kinds of ways such as tribe, clan, family, race, nation, church, school, etc.

The character, as being the temporal unit of expression, is not itself spiritual but *corporal*, in the sense always intended by us. This is evident from the fact that, among other things, it displays somatic hereditary properties (so-called character radicals) which function both in the normative and in the pre-normative aspects. It also contains peculiarities of temperament in enkaptic binding, which intimately cohere with the corporal individuality-structures of biotic and psychical qualification.[1] In particular the investigation of character properties of identical twins has established beyond doubt the corporal heredity of these properties.

In its individual subjectivity character functions within the corporal structure of expression. Now this structure displays a great differentiation of character *types,* which create in general humanity a large diversity, just as the enkaptic structural whole of the human body manifests itself in the so-called *constitutional types* (the ex-

1 Especially since Kant a *division* has been made between temperament and character. This is related to the dualistic ground-motive of "nature and freedom" and is therefore unacceptable on our standpoint. We do recognize a *distinction* in our theory of the individuality-structures, but "character" is not to be taken in a purely normative sense.

pression is from Kretschmer). The most important thing however is that the individual center of the acts and the actions, the human soul or spirit, fundamentally transcends every temporal individuality-structure.

We must therefore not be deceived by the phenomenon of the so-called "split personality," as it is known for instance from hypnotic conditions and from the psychiatric disorder known as schizophrenia. It can be demonstrated that this phenomenon concerns the *corporal individuality-structure* of the human personality. It can even be localized in the brain. In schizophrenia it manifests itself in a disorganization of the last corporal individuality-structure, in a falling apart and simplification of the conscious functions, a process usually ending up in dementia. In this way, in the temporal consciousness of the mentally ill person an *image* of a double personality arises as in a broken mirror. But we can obviously not deduce from this that the personality in its *spiritual center* itself would be split and of a temporary character. Not the "soul" itself, but only its temporal functioning in the body lacks integration.

In this way, every attempt to grasp this soul as a "substance," typically qualified by logical thinking, has been cut off at the root. God has put eternity in men's hearts.[1] The human spirit transcends time but *only expresses itself* in the whole of temporal corporal existence, in which it must assume typical individuality-structures.

The acts and the soul

The soul's immediate expression in time is the fourth individuality-structure of the human body, the individuality-structure of the "acts" and actions. The latter are always guided by the pistic function, even though we cannot say that they are necessarily of a *typically pistic qualification,* which, for example, *is* the case with typical *ecclesiastical* activities.

This extremely plastic structure stamps the entire temporal body of a person as a human, because the earlier corporal individuality-structures enkaptically function within the last one. This individuality-structure lends the body a spiritual *capacity of expression,* which is not a property of any other primary bearer of temporal reality as such. And it binds the body, in a one-sided dependence,

1 Allusion to Eccles. 3:11.

with the soul or the spirit of human existence. When this binding is broken up, the death of the body will irrevocably occur. In this death the entire enkaptic structure of the human body disintegrates, and the elementary physico-chemically qualified individuality-structure, which was interwoven only in the *sensory form or configuration* of the human body within the higher individuality-structures, frees itself. The body then becomes a "corpse," abandoned to the free operation of the physico-chemical processes of decomposition. But even so, it does not become abstract "matter" because it keeps functioning as an object in all the later (also in the normative) aspects of reality. Human nature is even then still preserved in the sensory form of the skeleton, which finds its origin, not in the first or elementary individuality-structure but only in the enkaptic structural whole of the human body.

According to the temporal order, the death of the body sets in as soon as the body, made up of enkaptic structural interlacements, is struck in its biotically qualified individuality-structure. For in that case the third and fourth individuality-structures can no longer maintain themselves either, since they are unilaterally *founded* in the second individuality-structure and are interlaced with it in the body form. However, the real *unity* of the body is not to be found in its perceivable *form* or configuration, which is merely the nodal point of the structural interlacements, but in its binding to the supra-temporal center, the human soul or spirit.

Now how could we not at least classify the "acts" – in contrast with human actions – as belonging to the internal sphere of the soul so that they as such would not bear a "corporal" character? It is clear that such a view is still altogether dominated by the traditional contrast between "matter" and "spirit," which does not take into account the scriptural view of the soul as the religious center of the *whole* of a person's temporal existence. It is in conflict with the entire structure of temporal reality.

The "acts" such as knowing, willing, desiring, imagining, remembering, etc., which appear to operate even within the sphere of the unconscious or subconscious, do not, as modern phenomenology teaches, differ from the outwardly, projected actions in that they are merely "intentionally" oriented towards corporal reality *without possessing a corporal character themselves*. For the acts are, ac-

cording to their entire structure of expression, *within* temporal reality, and our entire body is *internally active* in them, also in its physico-chemically qualified substrate. No act of knowing, willing, desiring, imagining or any other is possible without energy consumption. The "acts" function in *all* aspects of temporal reality, and not just in the sensitive and subsequent aspects.[1]

The acts issue from a spiritual center which everyone, who does not have a theorized view of consciousness and who does not lapse into a primitive "nature religion," must recognize to be irreducible to corporal reality. But this view lacks the *integral* totality-idea which only the scriptural doctrine of creation can offer to philosophy. It remains mired in the dualism of "matter" and "spirit," which makes a theoretical abstraction from temporal reality out of this "spirit," and thereby also views the acts merely as a theoretical abstraction from the pre-psychical aspects.

Aristotle's view of the soul

Aristotle sought the real independent spiritual activity in the *act of thinking*. The act also was to imprint the "spiritual" character upon the activity of the will. The act of thinking was basically supposed to be entirely independent of the material body and its sensory organization but, as we shall see, just as independent of the individual "soul."

In the final period of his philosophic development, the great Greek thinker had arrived at the insight that in individual human existence the "material body" and the *anima rationalis* cannot be two independent entities or substances but that the soul is merely the substantial "form" of the body and as such can only operate in the body. This view was formulated pointedly in the bold statement, also taken over by Thomas Aquinas, that the "soul" is nothing but the "body in actuality" (*corpus in actu*). We must remember here that Aristotle also assumed a "plant soul" (*anima vegetativa*) and an "animal soul" (*anima sensitiva*), and for these he also held the statement just quoted to be valid.

Within the framework of the Greek form-matter theme this view was indeed an admirable attempt to surmount the metaphys-

1 [The text here continues with a repetition of the final part of the previous chapter. This part is left out here. Only the last two sentences are repeated to catch up with that which follows.]

ical dichotomy in temporal existence which was dictated by this dualistic ground-theme for the "composite substances." When we closely consider this view we arrive at the conclusion that Aristotle already must have seen the *anima rationalis* in the real act-structure of the human body.

If this insight had been borne and fertilized by an idea of the soul in its integral, scriptural-spiritual sense it would indeed have enriched anthropology in large measure. Aristotle however identified the human soul with the *anima rationalis* as the "form" of the human body. For that reason he could not recognize an individual, continued existence of the soul after the laying-down of the body. He did not view the individual "acts" as acts of the soul but of the individual *person*. Since a person as a "composite substance" cannot exist outside the body, the soul cannot continue to exist as the "form" of the body after death either. A person can therefore also no longer *think* after laying down the body. The thinking of this particular person depends upon this person's existence.[1]

Meanwhile, forced by his starting point and religious ground-theme, the Greek thinker could not reduce thought activity as such – which according to him was of divine character – to the matter principle in the process of becoming and perishing. In Aristotle, the deity is pure thought-actuality, "pure form," which is safeguarded from all mingling with "matter." For that reason he could not make the real principle of thought activity in the *anima rationalis* dependent on the material body either. The dualistic ground-theme therefore ultimately had to make itself felt again in the view concerning the relation between soul and body. In this way a real crux arose in the Aristotelian view of the soul, and his mature writings, *De Generatione Animalium* and *De Anima*, give ample evidence of [the idea of] the thought activity of a universal spirit.

Thomas's view of the soul

However, because Thomas cancelled this distinction between soul and spirit again and transferred the arguments which Aristotle gave for the spirit's independence to the soul, he involved himself in even more acute antinomies than his Greek teacher. For now Thomas had to hypostasize the rational "soul" as "act-structure of the body" ("the body in actuality") into a substance, which can exist entirely independent of the body.

1 *De Anima* I, 4, 40d-b, 2429.

Aristotle at least had not fallen into this contradiction. With him, only the relationship between the individual thought-act of a person (composed of soul and body) and the thought activity of the universal spirit, remained caught in an antinomy. For he did not count thought activity to be an inner function of the *anima rationalis*, so that it cannot really be said that a *person* thinks but merely the "spirit" in him. For these reasons the whole view of the *anima rationalis* as the form-cause of the body is again implicitly cancelled. For the *anima rationalis* finds its center in the thought activity, and only through that is it distinct from the plant and animal soul as an "intellectual soul." But what should one do if the real thought activity does not stem from the soul itself but from a universal spiritual substance? In that case that which must qualify it remains intrinsically foreign to the *anima rationalis*. This was the crux in the Aristotelian theory of the soul, caused by the dualistic ground-theme of "form" and "matter." Thomas tried to avoid it by reducing the entire *anima rationalis* to a separate creative act of God. Whereas, according to Aristotle, only the "thinking sprit" as an immortal and eternal substance is implanted in a person from outside, according to Thomas this would be the case with the "rational soul" as such, that is, as the result of a divine act of creation which of course was out of the question with Aristotle.

The "body" is then [with Thomas] formed by means of natural generation from a pair of parents and the *formative* principle is then first a plant soul (*anima vegetativa*), and subsequently an animal soul (*anima sensitiva*), which in potential are enclosed within the body matter itself. But once the body organism is completely prepared in this way, the *anima rationalis* enters this body from outside through a divine act of creation and cancels the animal soul as an independent form-cause, just as the animal soul cancels the vegetative soul operating in the seed.[1] For every higher form contains the lower one as a potential. Therefore, a person has no separate *anima vegetativa* and *sensitiva* besides the *anima rationalis*, but the latter also contains the vegetative and sensitive faculties.

1 *Summa Theol*. 1, 118, 2: "Sic igitur dicendum est, quod anima intellectiva creatura a Deo in fine generationis humanae, quae simul est et sensitiva et nutritiva, corruptis formis praeexistentibus" (Thus it must be said, therefore, that the intellectual soul is created by God in view of human generation, a soul which is both sensitive and nutritive, so that the pre-existing forms are cancelled).

In agreement with Aristotle,[1] Thomas assumes that, in living beings born of the coitus of a man and woman, the "active formative" principle is contained in the male semen but that the "matter" of the fetus is furnished by the woman.[2] The "formative" power of the male semen stems from the *soul* of the procreator, who in the coitus strives to produce something that resembles him. But, as we must remark, the human procreator has an *anima rationalis*. As we saw he has no separate sensitive and vegetative soul. When, therefore, the formative power in the male semen is a potential of the *rational* soul of the procreator, how then can it operate in the body matter of the embryo as a purely vegetative or sensitive soul? For, according to Thomas, also in its vegetative and sensitive "faculties" the *anima rationalis* remains an *indivisible* and *singular unit*.

The greatest contradiction in Thomas's train of thought remains the fact that he hypostasizes the "rational soul" as the "act-structure of the body" into a substantial form, which can exist separated from the body. It is the result of the attempt to adapt the Aristotelian view of the soul to the doctrine of the Roman Catholic church. For the basic thesis of Aristotelian metaphysics, that in all composite substances "form" and "matter" cannot have an independent existence, is also accepted by Thomas. However, he attempts to reconcile the Christian doctrine of creation with the form-matter theme in a way that has to fail because the scriptural creation motive is radically opposed to the ground-motive of Greek thought. The doctrine of the *anima rationalis* as a "substance" does fit into the Augustinian-Platonic view; but in the Aristotelian doctrine of the soul as the "form" of the "material body" it is a contradiction. For a truly Reformational Philosophy and theology both concepts are equally unacceptable.

The act-structure as an undifferentiated corporal individuality-structure

We have now defended, against most current objections, our conception of the human acts as truly *corporal* expressions of the spirit. In doing so we had to reject radically the current views of the body. Now we have to enter more closely into the question of how we have to understand the act-*structure* of the human body. All earlier

1 *De Generatione Animalium,* lib. 1, cap. 2 and 20.

2 *Summa Theol*. 1, q. 118, 1 ad 4.

corporal individuality-structures turned out to be qualified by a typical leading function within a modal aspect of reality. Is such also the case with the act-structure?[1] In publications of recent years I expressed this view in passing, thinking I had discovered the qualifying function of this structure in the pistic function.

On closer consideration, however, this opinion turned out to be untenable. I must, therefore, return to my earlier view that the *temporal* (corporal) existence of a person is not determined by a typical leading function. For if all human acts, according to their temporal nature, were comprised in a corporal individuality-structure of typically pistic qualification, then all of them would necessarily bear the character of *typical faith* acts. This, of course, is untenable. The true state of affairs is rather that our acts can assume the most varying differentiated structures. A theoretical thought-act, for example, is of a typically *scientific* qualification through its theoretical-logical function. This does not mean, as we have amply demonstrated before, that it is exhausted in this function, but rather that it functions in *all* aspects of reality without exception.

The act of imagination in which artists conceive of their work of art displays an altogether different individuality-structure. This act is undoubtedly of aesthetic qualification, just as it finds its typical foundation in sensitive fantasy. However, both the thought-act and the imaginative act can also assume individuality-structures entirely different from the two just mentioned, for example, in a thought community of a typically political, ecclesiastical, or commercial-economical nature. The same holds for a volitional act. It can assume the differentiated individuality-structure of a typical act of *faith* but it can also manifest a typically moral, historical, jural, or other modal qualification.

If all of this is true the fourth corporal individuality-structure itself cannot possess a typically *modal* qualification. It must bear an *undifferentiated* character. This is entirely in agreement with the relatively undifferentiated physiological configuration of the associative fields of the cerebrum insofar as they function in the act-structure of the human body. For we have seen above that we cannot speak of a physiological differentiation of the cortical fields accord-

1 [This question was dealt with earlier at the beginning of this chapter. Because the texts are not identical we leave this repetition as it stands.]

ing to the various modal normative functions in act-life in the strict sense of the word. "Localization," as far as can be demonstrated, only exhibits a relative character here.

How to explain the undoubtedly remarkable undifferentiated character of the highest corporal individuality-structure, which makes it so acutely distinct from the three lower ones? The explanation can only be sought in the fact that the act-structure of the human body is a structure of *expression*, in which the human spirit manifests itself within time, in its indivisible unity.

Every differentiated individuality-structure that is qualified by certain modal aspects of temporal reality gives the activity occuring in it a typically rigid inner limitation. The human spirit transcends the entire temporal order with all its individuality-structures, and can therefore not be limited to a single *differentiated* structure because of the riches of its capacity for corporal expression. The spirit requires an extremely plastic and dynamic field of expression in the human body, in which it can differentiate itself in religious freedom. Therefore, human act-life with its three basic dimensions of knowing, imagining and willing, is not enclosed in a differentiated, but in an undifferentiated corporal individuality-structure. However, one may ask where the inner unity of this corporal individuality-structure should then be sought. The answer must be: precisely in its normative destiny as the individuality-structure of expression of the human spirit.

The act-structure and the subconscious

The act-structure of the body is the individuality-structure marking the boundary of a person's corporal existence, a structure in which the latter's fundamental lack of independence with respect to the soul finds a poignant expression. It exists in a close, harmonious coordination of all temporal act-functions, those in the normative as well as those in the non-normative aspects, in *concentration upon the spiritual center*, and further in a hierarchical normative ordering of *conscious* life above the *subconscious*.[1] For the fact that conscious human act-life is deeply rooted in a substratum of the subconscious can no longer be seriously denied since the advent of

1 We must remember that we are speaking here of the *structural principle* of the act body, and not of the subjective structural realization, which can deviate from the norm.

so-called "depth psychology." Nor can we deny that the so-called deep or obligate subconscious also functions in the logical and post-logical aspects. Therefore also in this stratum of human life, activities of thought, imagination, and will take place, although we cannot become directly conscious of them.

The discovery of the subconscious substratum underneath the conscious superstratum of human act-life at the same time turned out to be, for that matter, a new crux for the traditional dualistic view of the "material body" and the "thinking soul." It is true that modern psychology, insofar as it held to this view, has tried to maintain the "purely psychonomic" character of the subconscious. But it did so with the aid of an evident *petitio principii*. For example, Messer[1] argues that for the existence of a "spiritual law-conformity" (*Gesetzmässigkeit*) the real existence of a subconscious substratum must necessarily be assumed. It forms an inherent component of the factual coherence of the contents of consciousness but it has no demonstrable reality outside this psychical coherence. In arguing so, Messer makes things much too easy for himself by calling the opposite view – that "material" physiological processes can produce conscious "immaterial soul processes" – the result of a materialistic bias. The *petitio principii* of this argument is striking; it can be summarized as follows: When the immaterial processes of the soul can only be explained as being "psychonomic," then the subconscious from which "conscious psychical life" arises must of necessity bear a "purely psychonomic" character as well. But the real existence of the "immaterial soul" in the sense of an abstract complex of temporal act-functions is precisely what is here under discussion.

The discovery of the "subconscious" has, more than any other discovery, given a mortal blow to the elevation of this abstraction into a "really existing substance." For by means of the phenomena of suggestion it has been irrefutably demonstrated that within the subconscious substratum of human act-life the coherence of the physico-chemical, biotic and post-biotic aspects in temporal human existence is much closer than that in the conscious superstratum. For example, through suggestion we can cause the appearance of blisters in the skin as if it were burnt, although these blisters can heal faster than those caused in the normal way. We may also

1 August Messer, *Psychologie*, 5th ed. (Leipzig, 1934), pp. 345 ff.

think of the famous cases of "stigmatization." If, from the traditional dualistic standpoint, one does not wish to fall into the reverse error of explaining the physico-biotic aspects of the event from the "purely psychical," one will have to admit that the entire dualistic conception has been shaken by these facts.

If suggestion were a "purely psychonomic" interference with subconscious act-life, it could only exhibit "purely psychonomic" activities. Because it appears that the facts contradict this hypothesis, Messer's entire argument turns against his own conception of the "soul." The phenomena mentioned above become explainable only when we have come to see that in every real process the distinct aspects – while retaining their own inner nature and autonomy – are unbreakably coherent one with another. Also "suggestion" as a *real* interference can therefore bear no "purely psychical" character.

The individuality-structure of the act-structure

It becomes clear that we must indeed speak of an act-*structure*[1] when we take notice of the psychoses that are actually diseases of human act-life. Particularly in schizophrenia, this act-life gradually loses its structure of normative coordination and concentration. The functions of consciousness become simpler and as it were fall apart, and at the same time the hierarchical subordination of the subconscious under the conscious is broken. Naturally linked with this is a phenomenon called "split personality."[2] The act-structure of the body falls apart as it were,[3] and as a consequence the patient sees her personality as in a "broken mirror." Thinking, imagination, and the will are no longer oriented towards the spiritual center of the human personality and in this way lose their normal coherence. Patients speak in the third person about the subject of their acts, which they can no longer relate to their own I-ness. Strange, primitive symbols, intruding from the subconscious, play a dominating role in the so-called "autistic" thought-life of the schizophrenic. It has been noted that these symbols demonstrate a surprising similarity to the symbolism in the cosmogonies of prim-

1 [I.e. in the "individuality-structure" sense of the word "structure."]

2 We can also observe this "split" in a transient form under hypnotic conditions.

3 Of course this means: the act-structure in its subjective realization. As a structural *principle* or *normative law* it of course remains intact.

itive peoples, with this difference that modern concepts such as that of electricity also play a role in these symbols.

The fact that the act-structure of the human body is not a differentiated one is also proven by the psychoses. For although the cerebrum and, according to recent investigations, also the diencephalen and the mesencephalon, are always involved in this, attempts to find a *typical* (differentiated) physiological basis for the various psychotic forms within the brain have not been successful. The attempt by Wernicke to localize psychoses failed. Physiologically they rather manifest themselves in diffused afflictions of the entire brain.[1]

In the act-structure of the human body, a person's individual existence is also interlaced with the structures[2] of human society, which without exception are of a typical-normative qualification. It is especially within these social communities that the acts, with their projection into human actions, assume typically differentiated individuality-structures. But these individuality-structures, insofar as they themselves are not of a primary-typical nature, are of a secondary order for the acts, in contrast with the primary act-structure, which as such is undifferentiated. They are merely *variability-types* of the acts, imposed on them by the social environment.

In its basic dimensions human act-life is entirely plastic and dynamic, and precisely for this reason it is capable of assuming the most divergent social individuality-structures. The same holds for the primary types of the human body in its act-structure: race, tribe, and clan. It is characteristic that insofar as a society organizes itself upon a genetic basis – though this basis may be partly fiction – in the bond of tribe or clan, this organization also bears an undifferentiated character. In the form of a primitive bond it can interlace the most divergent social individuality-structures.

In the animal body, on the other hand, the social interlacements are comprised in a differentiated structure of typically psychical, instinctive qualification and biotic foundation. Within this narrow – not normatively qualified – structural framework, the possibili-

1 Jelgersma, *Leerboek der psychiatrie*, 5th ed., 1:24.

2 [In his works on sociology Dooyeweerd usually refers to the communities and institutions in human society, such as state, church, school, enterprise, etc., as "structures" of society. No doubt, this applies here too.]

ties of animal social activity are extremely limited in comparison with those of a human being.

When we consider all this the question may be asked whether one can call the act-structure of the human body *as such* indeed an individuality-structure. The reply must definitely be in the affirmative. As we have seen earlier, in contrast with the modal structure of the *aspects* of reality, an individuality-structure is nothing but the typical structure of an individual whole. The act-structure of the human body fits this definition perfectly. It is *typical* for the human body as an enkaptic whole, and stamps it as human only in that it is the typical temporal *structure of expression* for the human spirit.

In this way the act-structure also typically stamps the objective-sensory form of a person, in which the enkaptic structural whole comes to a sensorily perceivable expression: the erect posture, the typical shape of forehead, skull, and chin, the human eye with its lively gaze, the total lack of a biotically or psychically qualified equipment of the body for the struggle of existence, etc. All these typical morphological characteristics are determined by the act-structure as the individuality-structure through which the spirit expresses itself in the body. It is the act-structure which in its plasticity lends an entirely unique *capacity for spiritual expression* to the human body, which is altogether lacking in the animal body. But this act-structure also satisfies the remaining prerequisites of a true individuality-structure. It displays the entire typically descending series from the human *radical-type* to the farthest differentiation into primary-type (race, nation, clan, family) and variability-type (national type, religious type, political type, etc.).

The acts and the human character

Human individuality, manifesting itself within the framework of these types of the act-structure, is usually called the "character" of a person. This "character" must therefore most sharply be distinguished from the "heart" or the religious root of human existence. It is as such not of a *spiritual* (religious) but of a *temporal-corporal* nature. But at the same time it is the corporal *expression* of the spiritual individuality of a person, of the integral I-ness as the individual religious center of human existence.

Now this character, which undoubtedly is *individual*, keeps demonstrating, also in this individuality, the plastic and undiffer-

entiated nature of the act-structure. It has a depth-layer in the subconscious make-up, passions and inclinations of a person, which are inborn and hereditary in the corporal sense,[1] and a *superstratum* in the so-called *acquired* character. From the inborn character predisposition with its plastic structure, concrete character traits are formed in this superstratum in a convergence of disposition and social environment. It is the task of the acquired character to retain the leadership over the inborn character disposition.

A character's structure is of an undifferentiated, *normative* qualification. In it, the distinct character traits are *coordinated and concentrated* in a normative sense upon the spiritual center of the personality. But this structure is realized every time in an individual way.

The character traits mentioned are dispositions of a normative qualification, or relatively lasting normative tendencies, which leave a certain amount of latitude for their development later on. They have been distinguished in "purposive" volitional or directional dispositions and instrumental or aptitude dispositions ("*Richtung*- und *Rüstungsdispositionen*" according to Wilhelm Stern).[2] In our opinion it is incorrect to eliminate from "character" the dispositions of aptitude, to which especially the intellectual

1 The state of affairs which is fairly generally accepted in biology since Weismann, regarding the germ cells, does of course not form an obstacle here. According to him, the germ cells separate themselves from the beginning in the embryonic development from the other bodycells and form what Weismann calls the *germ tract*, which takes its course directly from generation to generation. Meanwhile, time and again the individual bodies split off from this germ tract so to speak. Therefore, the germ cells are not the product of the body but rather the body in which they are located is the product of the germ cells of the previous generation. This assumed state of affairs does not jeopardize our view because it would merely indicate that the heredity of character also belongs to the human body's *primary-type* which cannot be explained from the individual bodies of the parent pair. This is really a self-evident truth. This does of course not detract anything from the *corporal* nature of the inherited character traits. Meanwhile, Weismann's theory is emphatically rejected by neo-Lamarckians such as Oscar Hertwig (*Allgemeine Biologie*, 6th & 7th ed.; Jena, 1923), who hold to the inheritability of acquired characteristics. This occurs through an alteration of the idioplasm of the ovum, in which process the independence of "soma" and "germ plasm" automatically lapses. But this latter view does not find support in the facts as we will see.

2 L. W. Stern, *Die menschliche Persönlichkeit* (Leipzig, 1918); cf. August Messer, *Psychologie* (5th edition, 1934), p. 31.

dispositions are assigned, and, in line with "voluntarism," only to assign the "volitional dispositions" to it.[1]

There is an intimate coherence of the ground-dimensions of human act-life, which is also not to be ignored in the structure of the character. It cannot be denied that, according to the temporal corporal order of human existence, the driving impulses, including those for the enfolding of the intellectual predisposition, stem from the "directory dispositions" of a person's character. But a certain intellectual or ecstatic predisposition at the same time implies a special task for character formation, and its enfolding is a partial constituent of the individual acquired character.

The voluntaristic view of character is always related to the erroneous view which seeks the deepest nucleus of the human personality in the totality of the "directional tendencies" or "volitional dispositions."[2] However, the deepest root and driving force of human life lies neither in the volitional nor in the intellectual character dispositions but in the "heart," in the "spirit" in its religious, scriptural sense. For that reason all character research lies at the boundaries of science because, according to the religious order, the human character is rooted in a spiritual soil, which is only disclosed to our knowledge through the divine Word-revelation.

The situation is such that the "dispositions" of the lower corporal individuality-structure also function within the normative structure of the character in enkaptic binding. Thus character is interlaced with the "temperament" as the totality of the dispositions of a psychical qualification (i.e., qualified by emotional-sensitive factors). The dispositions of a typically biotic qualification (especially those in the area of sexual activity) and those of physical qualification (such as the energy of motion in the "tempo" of a person) are interlaced with his or her temperament. Character, therefore, also functions in the pre-psychical aspects of the body. And it also expresses itself morphologically in the entire body form, a

1 L. W. Stern, *op. cit.*; Theobald Ziegler, *Das Gefühl. Eine spychologische Untersuchung*, 2nd ed. (Leipzig, 1893), p. 300; Hermann Ebbinghaus, *Grundzüge der Psychologie*, 4th ed. (Leipzig, 1919), p. 203; Messer *op. cit.*, p. 31, and many others.

2 Thus also Messer (*ibid.*), who immediately after this voluntaristic thesis, however, again makes the pronouncement: "The total of the directional *and* instrumental dispositions (or the 'permanent dispositions,' as Marbe calls them) constitutes the 'entelechy,' the 'structure,' which consequently forms the nucleus of the 'person.' "

state of affairs which has especially found attention in Kretschmer's theory of types.[1]

From all this it follows that there can be no question of a sharp distinction between character, as the purely normative structure of the human personality, and *temperament*, as the "natural" predisposition. This distinction, especially worked out in Kant's anthropology, is governed entirely by the dialectical ground-motive of "nature" and "freedom" but does not correspond to the structure of reality. *"Character" is nothing but the expression of the spiritual individuality of a person within the enkaptic whole of the human body as qualified by the act-structure.* It functions as such in all aspects of temporal reality.

The corporal nature of character is undeniable when we consider that the normative predispositional factors (which in the current view are called "spiritual") and not just the biotic and psychical factors, are also hereditary, and are transferred in the hereditary factors ("genes") of the gametes (sexual cells).[2]

The investigation of identical twins in particular (think for instance of the Bach brothers, the Piccard brothers, etc.) has given an impressive illustration of this inheritance. The similarity of the potential character features (character radicals) turned out to be so striking here that some fell into a so-called nativistic view through a one-sided emphasis on heredity. This view emphatically denied the plasticity, the ability to be molded, of the character. Such a view however is identical with the *denial of the normative act-structure of the character,* and is in conflict with the facts. In every case it is only "dispositions" that are inherited.[3]

Lamarck's hypothesis concerning the inheritability of acquired characteristics has been rejected on the basis of modern genetic re-

1 This is of course not in conflict with our previous thesis that the various individuality-structures are interlaced in the body form. Marble has a structure of physico-chemical qualification, but in a sculpture it becomes the material for expressing the aesthetic conception, albeit only in the *form* of the work of art.

2 In the Netherlands the investigations of Heymans and Wiersma in particular have confirmed the inheritance of the so-called "spiritual" predispositional factors.

3 Cf. B. Bavink, *Ergebnisse und Probleme der Naturwissenschaften,* p. 439.

search founded on the investigations of Gregor Mendel and Wilhelm Johanssen. Also the influence of the environment and of the entire character formation upon individual character features in identical twins has been established, although the intellectual predisposition turned out to be less plastic than the emotional and volitional dispositions. Not a single character "disposition" is determined entirely in its development. Every character disposition contronts a person with a normative task of formation, and in the concrete *form* of the "acquired character," predisposition and social environment intertwine again. We can merely say that the disposition enables character formation.

Character types

Various attempts have been undertaken to approach scientifically the various character *types*. The German scholar, Eduard Spranger, has attempted to give a typology based purely on the humanities (*Geistenwissenschaften*) in his well-known and repeatedly reprinted work, *Lebensformen*.[1] In his view character types differentiate themselves according to certain normative aspects, which, he writes, were to be found in various "cultural values." In this respect he investigated what typical character is assumed by a personal "spiritual life" when the dominating place in it is assigned to one of these values. According to him the norms resulting from such a "value" determine a person's entire attitude towards life as inner driving forces, even though the person would not always be conscious of them; these norms stamp this attitude in a certain fashion. In this way Spranger arrived at a distinction of six "biotic forms," i.e., those of the theoretical person, the economic person, the aesthetic person, the social person, the "religious person," and the power person.

Such a typology, however, does not take into account the basic structure of every human character: the *act-structure of the human body,* which as we saw, can never be qualified by a differentiated normative function. At most this typology can give some insight into certain variability-types, which a character can assume in cer-

1 Eduard Spranger, *Lebensformen*; *Geisteswissenschaftliche Psychologie*, 2nd ed. (Halle, 1921).

tain differentiated social structures[1] such as those of science, art, business, church, the state, etc. The *inner* structure of character, however, can never be approximated in this way, for this structure is a *corporal* individuality-structure as the field of expression for the human spirit. As such it is necessarily *undifferentiated* in the sense we have discussed above.

Also, in the differentiated social spheres the individual character will ultimately assert itself according to its *inner* nature. The so-called economic, social, theoretical, and power-man are, after all, not inner *character* types but at most "*environmental* types" presupposing the radical-type and the primary-types of the human character.

Obviously in this way the study of the variability-types or "social environmental types" is not labeled as less important. I only object to the research methodology of the *Geisteswissenschaften* (the so-called sciences of the "spirit"), which is philosophically dominated by a non-scriptural view of the human "spirit." This actually breaks up a person's *corporal* existence in a dichotomistic or trichotomistic way, in a "material body" and a "spirit" or, respectively, in a "body," a "soul," and a "spirit." The anthropological study of character types and of individual characters is still in its infancy, and it is still entirely premature to speak of established scientific results. In various modern typologies such as those of the psychiatrist Ernst Kretschmer and the psychologist Erich Rudolf Jaensch, important insights have undoubtedly been opened up and proven fruitful. Both have paid much attention to the connection between body build and character, although Kretschmer really speaks more of temperament than of character. At the same time, however, the absolute necessity of a philosophical insight into the real individuality-structure of the human character and into the relation between "body" and "soul" comes to light here.

In his studies concerning the connection between body build and character, Kretschmer started out from a psychiatric point of view. He noted the typical correspondence between the manic-depressive form of psychosis and the so-called *pyknic* (obese) type,

1 Spranger himself remarks that he gives no "photographs of real life" in his "biotic forms," but "timeless Ideal-types," which must be applied as schemes or normal structures to the phenomena of historical and social reality.

and of schizophrenia and the so-called *asthenic* (leptosome or lean) type, and the *athletic* (muscular) type of body build.[1]

Jaensch started out from a psychological point of view: the so-called "eidetic" predisposition in children. It consists of the ability to retain an image of figures or things which one has briefly seen with sensory clarity against a sensory background – after their removal. He distinguished two eidetic types, a T-type, in which the images of sensory perception only display a scanty coherence (integration) with the rest of mental life, and a B-type, in which this coherence is vividly present. According to Jaensch, typical corporal characteristics correspond to these types of sensory perception.[2]

Both Kretschmer and Jaensch attempt to arrive at an anthropological theory of types on the basis of these results of their scientific investigation. But it is clear that the boundaries of their own special science are transgressed here, and that a philosophical totality-view of the structure of the human personality dominates the typological theory in its foundations. The question is only: *which* philosophical view?

Kretschmer's concept of "character," for instance, is altogether dominated by his view of "body" and "soul." He sharply distinguishes a person's character from his or her "constitution," by which he means the whole of all individual characteristics which are based on heredity, i.e., which are genotypically founded. He calls this concept of constitution "directed towards the confluence of the corporal and the psychical in an emphatically psycho-physical, total-biological fashion."[3] On the other hand, his concept of character is of a "purely psychological" nature. By this he means the totality of a person's possibilities for an affective-volitional reaction as they have arisen in the course of that person's life-development, i.e., from the hereditary make-up and from all exogenous

1 [The psychiatric disorders corresponding, according to Kretschmer, with the athletic body type, i.e., epilepsy and similar disorders, are omitted here by Dooyeweerd.]

2 Kretschmer also has paid attention to types of perception and representation. He sees these types as primarily determined by the various types of temperament (*op. cit.,* p. 289).

3 Kretschmer, *Körperbau und Charakter. Untersuchungen zum Konstitutionen-problem und zur Lehre von den Temperamenten* (15th and 16th ed. Berlin, 1942), p. 287.

influences: corporal influences, psychical education, and "experiential traces."

As Kretschmer says, the concept of character therefore abstracts from the "corporal correlates," whereas it comprises the exogenous factors, especially the results of education and environment, as important components, although these factors in essence are foreign to the concept of constitution.[1] Thus he again opposes the "soul" in the traditional sense of the complex of psychical and post-psychical functions to the "body" in the sense of the complex of the pre-psychical functions.

"Temperament," which, by the way, practically takes up the entire place of the "character" in Kretschmer's investigations, functions as a mediator between the "purely psychical" character and the "body." Temperaments he understands to be "that part of the psychical which, also along humoral pathways,"[2] is in correlation with the body build, and intervenes in the "driving gear of the psychical apparatuses" by giving sensory nuances, inhibiting, and prompting. According to him, the temperament finds its "corporal correlate" in the apparatus of the cerebral glands.

The real act-structure of character as a true corporal individuality-structure is therefore not seen here because the traditional dualistic view of "body" and "soul" prevents this. And what holds for the view of character here also holds for the entire anthropology in which that view is embedded.

1 *Ibid*., p. 288.

2 [That is, via the bloodstream by means of hormones for example.]

CHAPTER 4[1]

Creation and the Genesis of man

Creation and genesis in relation to time

In the foregoing, I have only wished to demonstrate that Reformational Philosophy must also lead to a reformation of philosophic thinking in the area of anthropology. This is because it maintains the Scriptural basic ground-theme without compromises with the dialectic themes of unscriptural thinking. This reformation will obviously also have to be carried through where the *genetic* ground-problem of anthropology, the *genesis* of a person starting from the divine act of creation, is brought under discussion.

In his interesting and thorough study on the evolution of man, Jacobus Kalma was of the opinion that Reformational Philosophy, for which he has a great scientific appreciation, by the way, actually can have nothing to say about this fundamental problem.[2] The reason, according to him, is that this philosophy's conception of reality is completely "static," and in addition it abandons the sovereignty of thought in its own domain by binding science to the divine Word-revelation. Apparently, the story of creation in the book of Genesis is the stumbling block for the writer here.

There is a radical misunderstanding at issue here, mainly caused by the peculiar logical-evolutionistic starting point of the learned writer. By virtue of the religious Scriptural starting point from which its scientific view is directed, Reformational Philosophy has a *dynamic* view of temporal reality also with regard to individuality-structures. All of reality is seen in its dynamic process of disclosing, which at no time can come to a rigid closing. Temporal reality is indeed an ongoing *realization*, and in that sense is ongoing *genesis.* But this temporal genesis is only possible within constant structures as set for it by the divine creation order. These structures are contained in a *temporal order,* which encloses the entire temporal reality in all its modal and individuality-structures. As a temporal *order*, time only manifests itself according to its *law-side*. Accord-

1 [Cf. this chapter with Doooyeweerd's review article "Schepping en evolutie," *Phil. Ref.* 24 (1959): 113-59.]

2 J. Kalma, *De mensch*: *een evolutiebeeld*, 2 vols. (Haarlem, 1938-41), 2:120 ff.

ing to its *subject-side*, it manifests itself as individual duration, which is different for every creature.

The question about the *temporal genesis* of a person is the question about the realization *in time* of the human body structure as it has been placed in the divine creation order in an unbreakable coherence with the human soul or spirit. The creation of a person as it is revealed to us in the first chapters of the book of Genesis, however, comprises a person *with soul and body* in an integral unity, a person with a supra-temporal spiritual center and with a bodily individuality-structure within the temporal order. This unfathomable creative act of God is the *foundation* of all temporal corporal genesis as its *condition* and *absolute beginning*.

Time itself is created by God, not as an independent creature but in and with the entire creation, which has been subjected to time. The work of creation as such is therefore not a genesis in time but is "in the beginning," i.e., it *underlies* all temporal genesis as its divine *principle*.[1]

Greek religious consciousness could not grasp this notion of creation. Within the framework of the form-matter theme there could only be the question of a *genesis* of things *in time*, and in this respect, it was rightly posited that *nothing can arise from nothing*. Scripture, however, has revealed God's work of creation to us as the *absolute* beginning of all things, including every temporal genetic process.

For this reason, we must hold on to the truth, already seen by Augustine, that God's work of creation did not occur *in* time but rather is the *absolute beginning of time*.[2] If the acts of creation were in time they would be *subject* to the *temporal order* as a divine ordi-

1 In his magnificent rectorial oration *Evolution* (1897), Dr. A. Kuyper has rightly called the confusion of creation and temporal genesis as hardly corresponding to Scriptures. He wrote "that the creation record in Scripture excludes the *dramatic* appearance of new beings rather than recommends it. It is written that '*the earth yielded* fresh growth, plants bearing seed according to their kind,' and also that '*the earth brought forth* cattle and reptiles,' not that they were put on the earth by God like pieces on the chess board." In connection with Gen. 1:27 and Gen. 2:7, a clear distinction between the creation of a person and that person's temporal corporal formation is indicated.

2 *De Civitate Dei* 11.6: "Undoubtedly, the world has not been created *in* time but *along with* time." However, Augustine does not maintain this correct thought because right after this he, nevertheless, describes the six days of creation as given with the movement of the world.

nance. In that case, they themselves would be of a creaturely nature and not sovereign *creative* acts. But the absolute sovereignty of God as revealed to us in Holy Scripture does not tolerate an erasure of the boundary between Creator and creature. God is not subject to a single law, and his acts cannot be measured according to time although they also realize themselves *in time* in the genesis process.

However, this should not be understood in the sense that the divine acts of creation would be of *infinite duration*. This misconception, which is in absolute conflict with the divine Word-revelation concerning creation,[1] unintentionally subjects God's acts of creation again to time. For an *infinite duration* is also a subjective figure of time, which is only distinguished from a finite duration of time in that it has no certain starting point and final point *in* time. In this sense Aristotle assumed an "eternal" existence of the world of material forms.

"Matter" as the principle of "eternal genesis" is, according to him, inseparably connected with time but it is as such "undetermined," also in duration of time. He derived this view from Heraclitus, who held that the cosmos in its "eternal flow" always has been, always is, and always will be, and has not been created by any one of the gods or men.[2] It fundamentally excluded the notion of creation.

God's work of creation, however, as the accomplishment of his eternal counsel, however, is *entirely completed,* and therefore has no duration without beginning or end. *In* time there is no *absolute* beginning and no *absolute* completion. Every point of beginning and ending is *relative* here. But every act of creation by God is at the same time an *absolute beginning*, an "in the beginning," and an *absolute finish*, a *completion*. But for temporal human comprehension this is beyond understanding. It is an eternal truth, which is accepted only in faith.

The days of creation

Of course, at this point the question concerning the significance of the "days of creation" arises immediately both for Christian philosophy and for Scriptural theology. This question can never be answered satisfactorily without having thoroughly taken into ac-

1 According to Scripture (Gen. 1:1 and Gen. 2:1), creation is in the *beginning* and at the same time entirely *completed*.

2 Diels-Kranz, *Fragmente der Vorsokratiker*, vol. I, 5th ed. (1934), B fragm. 30.

count the entire problem of time. I have published a separate study about this problem in *Philosophia Reformata*[1] in which I have emphatically warned against the identification of *cosmic time*, embracing temporal reality in all its aspects, with an *objective measure of time* derived from celestial motion. Every measure of time presupposes time, is a *temporal* measure, and can therefore never measure full cosmic time itself.

In this article I also opposed the existence of an absolute so-called mathematical time, which is supposed to pass completely evenly in moments, independent of things. This theory of so-called absolute time had been introduced into classical physics by Newton but has been fundamentally rejected by modern physics since Einstein. In opposition to this, I established three points which may be called characteristic for the view of time of Reformational Philosophy:

1. Full (cosmic) time in its inseparable correlation of temporal *order* and subjective (or objective, as the case may be) *duration* displays as many aspects as temporal reality itself does;[2] it assumes a special modal sense and law character in each of these aspects.
2. Cosmic time differentiates itself equally *in the individuality-structures of reality*, and only in these individuality-structures displays a *concrete* duration.
3. An objective "measure of time," which serves to measure time, should never be confused with cosmic time. Such a "measure of time" can never exist in itself either, but only in the structural *subject-object relation to possible measurement by a person*. Before the appearance of the human being in the temporal process of genesis there was no objective "measure of time" in the actual sense.

We need all these insights in order to be able properly to pose the problem raised above regarding the real meaning of the days of

1 [H. Dooyeweerd, "Het tijdsprobleem in de wijsbegeerte der Wetsidee," *Phil. Ref*. 5 (1940): 160-82, 193-234.]

2 Kalma, *De mensch: een evolutiebeeld*, 2:11 ff., identifies "duration" with the abstract duration of *motion*, which serves as an objective measure of time. For that reason he can write that "duration" in reality does not exist but is merely a fictitious abstraction of thought. His entire view of time is determined by this false premise.

creation. God's revelation of creation has been adapted to our temporal consciousness because one always does remain bound to time in the religious concentration of one's consciousness upon the supra-temporal. Divine Word-revelation directs itself primarily to the "heart," the "spirit" of a person. But it is not *purely* spiritual; it enters time, and in our temporal existence becomes the norm for faith.

Faith has its own temporal aspect. In this aspect cosmic time assumes the modal sense of *pistis*,[1] just as it assumes the physical sense of movement in the kinematic aspect, the biotic sense of organic life in the biotic aspect, the psychical sense of feeling in the sensitive aspect, in the logical aspect that of logical analysis, in the historical aspect that of history, etc. Now it is characteristic of *pistic time* that, in the boundary aspect of our temporal existence, it points us towards the order that transcends time. In this way the majestic "in the beginning" of the book of Genesis has been posited specifically in pistic time. Faith is within time, but it points towards the *supra-temporal* things which are revealed to us in faith.

Similarly the relationship of regeneration and conversion can only be grasped in pistic time. Reformed theology teaches that regeneration *precedes* conversion although regeneration, as God's work in the heart of the sinner, cannot be a *temporal* event; of course it can therefore neither be *everlasting* or preceding birth in the *temporal* sense. No one can say *when* he was "regenerated": "The wind blows where it wishes, and you hear the sound of it, but you cannot tell where it comes from and where it goes. So is everyone who is born of the Spirit," says our Savior.[2] Like Paul on the road to Damascus, however, it is [sometimes] possible to pinpoint one's "conversion" as the *termporal manifestation* of one's palingeneisis.[3]

In the same way the "consummation of all things" is a temporal figure in *pistic time* and not for example, in physical, biotic, psychical or "historical" time. This "consummation" is the absolute end of the time of genesis, an end which, just as the "in the beginning," transcends cosmic time.

1 [*Pistis* is Greek for "faith."]

2 [John 3:8.]

3 [That is, rebirth or regeneration; the Greek word is from Titus 3:5.]

The revelation concerning the creation of heaven and earth makes known in a similar way the coherence of God's creative acts in *pistic* time. For this it utilizes the scheme of the six days with the express purpose of relating the order in the divine creative activity to human working days and giving the commandment to work six days not a merely "ethical" but a truly *central, religious* basis in the "working days of God." In the same way God's revelation makes his eternal sabbatical rest, after the completion from the creative work, the basis of the commandment to rest of one's labor on the seventh day. It was therefore God's expressed intention that his people would keep their mind's eye on their own six working days when considering the six days of creation, and in faith would see these working days as irradiated by the eternal light of God's own creative activity.

The days of creation may therefore not be viewed as "purely symbolic" and "purely spiritual." In that case they would lose their proper sense. The creation record speaks concretely of six working days and the sabbath day adaptation to the human measuring of time. But it places these days within *pistic time*, and in this way raises them *above* time into the light of eternity. Even after the creation of sun, moon, and stars, "to divide the day from the night,"[1] they do have "evening and morning" but no "night." God's light of eternity never goes down.[2] In all this there is not a trace of natural scientific theory to be found.

God's creation order is worked out in the temporal process of genesis, which is only made possible because of this order. Scripture does not give us a mythological "cosmogony" concerning this process of genesis but a revelation of God's acts of *creation*, which do not have a real temporal duration as does the genetic process of the creatures. For God, a thousand years are as one day,[3] i.e., God's acts of creation as such are not subject to time, although they are worked out in time through the creature.

1 [Genesis 1:15.]

2 By the way, we may well bear in mind that our ideas of "day" and "night" are codetermined by our position on earth. At the polar circle they have an entirely different "duration" than that which we reckon with in our daily life.

3 [Psalm 90:4; 2 Peter 3:8.]

Time measurement

It was therefore a great mistake when people began to measure the six days of creation with the objective time measure derived from the twin movements of the earth around its axis and around the sun, without taking into account that we are dealing here with "working days in pistic time."

The measure of human time calculation is based on making the subjective concrete time duration of the revolution of the earth around its axis into a sensory object. This concrete time duration is a time of a certain individuality-structure, which is of a *typically physical* qualification. It is a *typically physical time flow*, which as such can neither comprise nor contain the subjective biotic genesis nor the subjective genetic processes of psychical and post-psychical qualification. For cosmic time assumes a particular individuality-structure for each "kingdom" of temporal creatures, just as it displays itself in a particular modality and a particular law-sphere in every aspect of reality. Only physico-chemically qualified processes can proceed *in* a physically qualified time flow. But even with an organic-biotic process this cannot be the case because the organic-biotic development as such is not a motion in the original physical sense.[1]

Our objective measure of time is nothing but a numbered, sensorially perceivable duration of motion. And with it, in truth, we measure nothing but objective-sensory movements. In addition, we here ignore the inner individual nature of the duration of motion we wish to measure. "Measurement" is always quantitative, merely related to the order of number and space. This is the reason for the strictly *external* character of all time measurement with respect to a concrete duration of time, especially of that which occurs in an individuality-structure of a *non*-physical qualification,

1 Cf. the very instructive remarks by B. Bavink, *Ergebnisse und Probleme der Naturwissenschaften*, pp. 343 ff., who, however, in my opinion, goes too far in his assertion that the individual biotic process has no distinct point of beginning and ending in time. The question when a living individual is born is not an insoluble "doctor's question" as he believes; it can only be answered in the biotic order of time: when the individual begins to "live" independently, i.e., detached from the body of the mother. For the rest it can be admitted that the phases of the duration of life do not allow for a strict fixation within our measure of time.

such as a subjective duration of life, a subjective duration of feeling, etc. In these instances we actually do not measure the duration of life or of feeling itself but merely the sensory objectification of the duration of time of the physical motions in which the typical duration of life or of feeling objective-sensorially expresses itself. And even here we do not take into account the individuality of the motions.

An experimentally usable time measure must be objective-sensorially (objective-psychically) perceivable and necessarily contains an objective-sensory motion image in a spatial image equipped with a numbered division of distances. This modal sensory object-function of the time measure is made concrete through the individuality-structure of the latter.

What does this mean? As modern Westerners we measure "time" (read: the sensorially objectified duration of *movement*) in everyday life with the aid of a clock, while we derive the division in days and years from the time duration of the revolution of the earth around its axis and around the sun. With this time measure we construct our *chronology*, in which not the time measure itself but only the act of freely and mathematically operating with it bears an exact, and at the same time abstract, mathematical character. With this we simply follow the temporal order in the modal sense of number, to which the subdivision of the motion images are assigned within the spatial image of the clock dial. This is the origin of our modern *clock time*. The various clocks are regulated as a particular time measure according to the more universal time measure of the chronometer; the latter is regulated by the most universal time measure: the so-called sidereal day, which is based on astronomical observations.

It is clear that this clock time has been formed by someone in history because of the needs of human society. We use it in practice as a universal, objective scheme of ordering, by which we orient all events and actions in past, present and future, according to their simultaneity or succession, respectively. But this we cannot do, however, without calendar time, in which chronology acquires relative points of orientation in the historical order of time (for example, the foundation of Rome or the birth of Christ.)

In Greek and Roman antiquity the regulation of the calendar was an affair of pronounced *sacral* character, and in the Middle Ages it was a task of the *church*. This artificial objective time measure is our historically founded objective "social time," normatively qualified by the demands of human social life. And yet, also with this time measure, we can only really measure *the duration of physical motion* in sensory objectification.

Full cosmic time cannot be measured with an objective measure, and the identification of this time with a "motion measure" is the gravest error that has been made in the philosophy of time. *Time* is not the measure of motion, or the "numbered motion," as Thomistic scholasticism taught in the footsteps of Aristotle, for every time measure has time as its condition and is included *in* time.

In addition, an objective time measure as such (i.e., in its objectivity) has only existed in the *subject-object relation to possible subjective measurement by a person*. Neo-Thomistic scholasticism also clung to the thesis that time as a "numbering of motion," i.e., as an "objective time measure," bears an *absolute* character, and in that sense would be fundamentally independent of possible subjective measurement.[1] But this thesis is merely the consequence of a metaphysics which misunderstands the structure of the subject-object relation and imputes an "existence by itself" to the "object."

Every *time measure* is therefore relative in the subject-object relation of *time*, and *time* itself is relative to *eternity*. And therefore the temporal process of creaturely genesis also unilaterally depends on God's supra-temporal creative activity.

Geology wishes to calculate the physical duration of terrestrial genesis according to the various strata which contain traces of life. To this end it uses a physical measure of time but cannot thereby ignore the individuality-structure of this genetic process. Therefore it introduces a series of periods, which it actually derives from *paleontology*, i.e., the science of the genesis of living organisms in "prehistoric time." In this way it distinguishes three large periods in the development of the earth: the *Paleozoic*, the *Mesozoic* and the *Caenozoic* period. These large periods in turn are subdivided into eleven *formations*, which it identifies, with all their various elements, by means of specific petrifications, the so-called "index fossils." The duration of each of these periods and formations is calcu-

1 For this compare my essay cited earlier, "Het tijdsprobleem in de Wijsbegeerte der Wetsidee," at pp. 229 ff.

lated with the aid of the objective physical time measure (the mathematically subdivided sensorially objectified duration of the terrestrial motion).

The methods of this calculation are indeed exact, and yield results that approximate one another reciprocally. They all converge in a calculated duration of genesis of one or two billion years. When considering these astronomical figures we must remember that this entire calculation is based upon a time measure of a *relative* and *abstract* character, and that science therefore transgresses its boundaries when it assigns an *absolute* character to the results of its calculations.

Again: the days of creation

Now when theology, in its interpretation of the days of creation, goes by the same natural-scientific time concept, and therefore – in conflict with the Scriptural text itself – in fact *explains creation* as a *temporal physico-biotic genetic process with a duration of six solar days*, the conflict between theology and natural science is obviously inevitable. If it did not simply *ignore* the scientifically established facts concerning the duration of this process of genesis, theology could again follow the pathway of *accommodation* by interpreting the days of creation as "geological periods."[1] But this interpretation would not be much better than trifling work and violate the text of Scripture. Scripture emphatically speaks of *days* with evening and morning, and relates these days to the *working days of the human being* in the Decalogue. And this *relationship* of God's creative days to human time measure demonstrates that human working time is indeed religiously centered towards the supra-temporal order of God's work of creation. For God rested "on the seventh day," i.e., "God's eternal sabbath," and obviously not, as Augustine already noted,[2] the seventh solar day which follows the human working days. If then the seventh day, which follows the six days of creation in the time order of faith, cannot be understood in a physico-temporal sense, how can we interpret the first

1 This idea, by the way, was not of theological origin. It was introduced by the Scottish geologist Hugh Miller in 1852. Cf. Arthur Neuberg, *Urentwicklung des Menschen* (Gütersloh, 1928), p. 354.

2 *De Civitate Dei* 11.8.

six days as "solar days" or as "geological periods" without committing extreme arbitrariness in the exegesis of Scripture?

A fundamental conflict between the *divine Word-revelation* concerning creation and *modern natural science* only occurs when the latter, ignoring the creative acts of God, seeks the firm foundation for temporal reality in the genetic process itself, understood in the natural-scientific way. In that sense "evolutionism" is really an anti-scriptural "natural philosophy," rooted in the idolatrous starting point of the humanistic ideal of science. But in choosing to oppose this ideal of science, theology has to ask whether it can itself do justice to the divine work of creation in the Scriptural sense when it erases the fundamental boundary between *creation* and *physical genesis*, and forgets that faith has its *own peculiar order of time*, which simply cannot be approached by means of the physical concept of kinematic time.

In the final chapter of Volume II of this work on the relation between theology and philosophy,[1] I have dealt more extensively with this entire complex of problems connected with the peculiar nature of the pistic aspect.

The Augustinian and Thomistic view of creation and time

In Greek philosophy the view of time was entirely dominated by the form-matter theme. The matter principle is the principle of *genesis*, which in itself is chaotic and is merely limited by the form principle, and time is inseparably connected with this matter principle as a quantitative measure of alteration or motion.

In modern humanistic philosophy the concept of time was entirely dominated by the ground-theme of nature and freedom, or the ideals of science and of personality, respectively. Time is alternately identified here with the objective measure of physical motion and with the subjective-psychical (sensitive) duration or historical development.

In an intrinsically Christian, Scriptural philosophy of time, the influence of these unscriptural ground-themes has to be thoroughly rooted out. On the basis of the Scriptural view of creation, universal cosmic time must be viewed in its many aspects and indi-

1 [This chapter was published as an article entitled "De verhouding tussen wijsbegeerte en theologie en de strijd der faculteiten," *Phil. Ref.* 23 (1958): 1-21, 49-84.]

viduality-structures and *above all in its central religious dependence upon the eternity in God's creative wisdom*.

The fact that God's creative acts are not *within* time obviously does not in the least mean that what is created would be eternal. On the contrary, God has placed the temporal creature *in time* from the beginning.

Augustine saw very well that the cosmos is not created *in* time. Yet he momentarily confused the *act* of creation with its creaturely *result* when he concluded from the finitude and temporal limitation of the cosmos that God's days of creation had a temporal character.[1] We should not forget here that the great church father, in his view of creation as a creation *out of nothing*, did not altogether manage to detach himself from the neo-Platonic view of this "nothing" as the "pure matter principle," "deprived of form," and therefore deprived of real *being* (matter as *non-being*). For the rest, Augustine also knew that creation should not be viewed as something excluded from temporal development. Conforming to the neo-Platonic and Stoic view, he taught that the germ forms of things had been placed in "primeval matter" and had to develop from it. But here again creation was connected with the Greek matter-principle.

Thomas Aquinas, with his deep insight, has, at least in the question of time, fathomed the fundamental difference between *creation* and temporal *genesis* more deeply than Augustine. But within the Aristotelian frame of thought, with its form-matter theme, he could do no other than eliminate *activity* in its proper sense from the divine act of creation. And so he had to classify creation under the Aristotelian category of timeless *relation*. From a *philosophical point of view* he therefore *could* not see any objection against the Aristotelian thesis of the "eternity of the world" in the sense of the absence of a *beginning* and an *end* of its temporal existence, and called the "finitude" of the world a "supernatural" revelational truth. According to him, creation could philosophically very well be "thought of" without a temporal beginning of the cosmos, because this cosmos would still always remain in a causal creational relationship to the transcendant God. And so Sertillanges, the

1 *De Civitate Dei* 11.6 (concl.).

well-known Thomas commentator, could summarize Thomas' standpoint as follows:

> We must think of the world in its causal relationship to God in such a way that this relationship has neither any *duration* nor any *measure* for, on the contrary, every duration and every measure of what is relative (i.e., created) is included in that which is created, which in this way places it in a transcendental relationship to God. Because it has God himself as its first point of relationship, this relationship is just as incomprehensible as God. Its apparent clarity is due only to our anthropomorphic concepts.[1]

Creation, however, is viewed here in the framework of the Aristotelian causal relationship, i.e., *fundamentally denatured.* The "first unmoved Cause" of the Aristotelian form-matter world does not "work" but only "attracts" matter through its "form-perfection." But creation as it has been revealed to us in Scripture is fully *divine activity*. That is incompatible with the Aristotelian view of the "eternity" of the world, for it includes the "in the beginning," the absolute beginning of time. And precisely this "absolute beginning" is fundamentally excluded by the Aristotelian matter-principle in its autonomy, as opposed to the divine form-principle.

The task of science as to the genesis of the human being

The revelation of God's acts of creation, however, does not include authentic information concerning the duration, as measured according to a physical yardstick, of the *temporal genetic process* of the creatures. This process could only commence because of creation. Nor does it contain information about the factual course of this process according to Gos's creational ordinances. It is the task of science to shed light on this. But if science believes it can carry out its investigation in an "autonomous" way, without the divine Word-revelation, it places itself in fact under the guidance of an *unscriptural ground-theme*. This occurs because theoretic thought is of a fundamentally religious determination, as we have brought to light before. And thus science necessarily falls into the most fundamental errors, also in a scientific sense.

The question, What is man and what is his origin and destiny?" can never be autonomously answered by science. Only the divine

1 A. G. Sertillanges, *Der heilige Thomas von Aquin*, German trans. by Robert Grosche (Berlin, 1940), pp. 382 f.

Word-revelation can disclose to us the absolute truth about this. However, the question as to how the divine act of creation, which first called the human being into existence, was worked out *in the temporal genetic process of corporal development*, has been given to Christian *science* for investigation. And as a matter of principle this science should not neglect any discovery that has been scientifically established if it does not wish to become unfaithful to the truth in its absolute religious sense. For God's Word-revelation cannot contradict his revelation in the entire "nature of created things," in all the works of his hands. When a certain interpretation of the creation record, which erases the fundamental boundary between creation and temporal genesis, and thereby between Creator and creature, leads to such contradiction, then this is the best proof that this view must be fundamentally incorrect.

Our statement on this point must not be misinterpreted as if we would yet assign to science, operating "by the light of natural reason," once more autonomous authority in opposition to the divine Word-revelation. This misinterpretation could only arise within the framework of the Roman Catholic ground-theme of "nature and grace." On the contrary, from the beginning we have rejected the so-called autonomy of natural reason.

A truly *Christian* scholarly reflection can only investigate the temporal process of genesis of the human being by the light of the divine Word-revelation. The latter is always *primary* because only this revelation is able to supply the Christian foundations to scientific activity. God's revelation "in nature" can therefore only be understood by the light of that "Word-revelation." But precisely because of this relationship between the two modes of divine revelation a mutual contradiction cannot be accepted on any point.

Scripture does not toss the solution of intrinsically scientific problems in the lap of any scientific investigator. Nowhere does it call a "halt" to scientific inquiry, provided this inquiry moves within the inherent boundaries of science. On the contrary, it stimulates it to carry this investigation through to the ultimate boundaries of human ability because it has also placed science in the etermal light of the divine calling. To fearfully ignore facts that have been scientifically established, out of fear of letting go of the

Scriptures on certain points, can therefore never stem from a Scriptural attitude of faith but merely from a false view of the Holy Scriptures.

Paleontological arguments for the evolution of man

However, we must not confuse here the factual discoveries of geology and paleontology with the scientific theories which try to bring these discoveries, under certain aspects, into a systematically comprehensible coherence. For instance, it is simply not possible to explain away the fact that fossilized parts of human skeletons have been found in the mid- or at least the oldest of the late-diluvial (Quaternary or Pleistocene) earth strata in large numbers together with the fossilized remains of the typical fauna of this period. We are dealing here with an extinct human race, the so-called Neanderthal race. Certain morphological characteristics (negative chin; "receding" forehead, i.e., directed backwards; protruding bone ridge above the eye orbit) have given rise to all kinds of evolutionistic speculations. The fossil finds of supposed human origin from the so-called Tertiary (preceding the diluvium), the period of the main development of all mammals, are all dubious.

The "Tertiary Man" remains no more than hypothetical for the time being. But the diluvial human of the mid- or the beginning of the late-glacial period is no hypothesis. This existence has been scientifically established, just as that of the later diluvial races (the so-called Aurignac and Cro-Magnon race) from the end of the glacial period.

It is equally certain already that in the Neanderthal man, we are dealing with a real human being, and not with some sort of transitional form between the human being and an anthropoid monkey such as the so-called *Pithecanthropus erectus*.[1] He was gifted with culture (hammered tools of stone, the so-called celts), a sense of beauty (the beautiful form of the blade of the so-called Acheulien axes) and feelings of respect towards the dead (burial of the dead),

1 [*Pithecanthropus erectus* is now called *Homo erectus* and is no longer considered by anyone to be a "transitional form between the human being and anthropoid monkey". The fact that Dooyeweerd so easily introduces the term "transitional form" here seems to contradict his warning against "hypotheses" woven around the "facts."]

which on their part point towards pistic notions concerning the continued existence after death.

The purely geological chronology is also insufficient here, and one has to avail oneself of historico-cultural time in order to place objectively the development of the tools in certain periods (Paleolithicum or Old Stone Age, itself in turn subdivided into the so-called pre-Chellien, Acheulien and Mousterien, late Paleolithicum [Aurignacien-Magnolien] Mesolithicum, Neolithicum, etc.). It will not do either to dispute the considerable age of this race (at least between 50,000 and 100,000 years) established in connection with the age of the diluvial strata in which the fossils have been found. Geology has indeed exact methods at its disposal to approximate the age of the earth strata. We therefore are confronted with *facts* here.

However, the theorists immediately descended on these discoveries and wove their hypotheses and constructions around them.[1] They asserted that these primitive human beings did not yet possess articulated speech for lack of a protruding chin; that they did not yet have an entirely erect posture but were to propel themselves with bent knees and with their trunk and skull bent forward. Here we enter the territory of hypothesis, where the scientific world itself is internally divided. For both hypotheses in turn have been sharply attacked from other sides, but the latter one particularly by investigators of the rank of Klaatsch,[2] Dawkins, Boule, and Mollison.

Meanwhile, even the single fact of the discovery of real transitional *forms* between the human being and animals, i.e., of fossil remnants of beings which *morphologically* display characteristics that are half animal, half human, without being classifiable unambiguously under the real *human form-type*, posits to Christian schol-

1 [It is striking that Dooyeweerd draws such a sharp boundary-line between "facts" and "hypotheses" whereas any dating method, for example, is itself embedded in a heavily theoretical framework.]

2 Klaatsch made the pronouncement: "Among the many non-sensical statements which gained considerable attention in the discussion of the Moustier find (viz.of the Neanderthal skeleton discovered in 1900 by Otto Hauser) the assertion that Neanderthal man did not possess the upright posture played an important role in German newspapers." Neuberg, *op. cit*., p. 245.

arship a problem concerning the temporal process of the genesis of human beings that cannot be explained away.[1]

One has to think here of various fossil finds, which lately have become increasingly numerous, for example, those of the so-called *Pithecanthropus erectus* (discovered in 1891 in the vicinity of the village of Trinil on Java by Dubois), the discoveries of the so-called *Sinanthropus pekinesis* (discovered between 1922 and 1930 in the vicinity of Peking by Black), the find of the famous Heidelberger lower jaw (found by Otto Schoetensack in l907 in a sandpit near Mauer), not to mention other finds. All these finds are of considerably older origin than those of the Neanderthal man, *Pithecanthropus erectus* and *Sinanthropus pekinesis* belonging to the oldest part of the glacial period, the earliest diluvium.

It was especially remarkable that, through continued digging in the area of the Peking find, indubitable documents of primitive culture have been established (bone tools and fire). This made the problem still more complicated because the so-called cephalization coefficient, i.e., the relation between the weight of the brain and that of the body, amounts to only one half (in *Sinanthropus* a little more) of the human cephalization coefficient (also established for the Neanderthal Man), both in the case of *Pithecanthropus erectus* and *Sinanthropus*, who by the way displayed more hominid characteristics, whereas this coefficient is only one quarter for the anthropoid apes. In any case, with *Sinanthropus* we are no longer dealing with an animal creature.

The shape of the skull of *Pithecanthropus* and *Sinanthropus* is of the primitive Neanderthal type, but the weight of the brain is only one half, or slightly higher, respectively, than that of the Neanderthal race. The most recent find known to me, the one by Von Koenigswald on Java,[2] was a fragment of the maxilla (January, 1939) of *Picanthropus*, which still displays the protruding eye tooth and a striking open space between the eye tooth and the second incisor.

1 [We leave the following pages as they are, for reasons of curiosity, although nowadays neither adherents nor opponents of the idea of a descent of humans from ape-like ancestors will be satisfied with Dooyeweerd's dated arguments.]

2 Described in *Nature*, Dec. 2, 1939, No. 3657. Cf. Kalma, *op. cit*., 2:298 ff.

This is something that does not yet occur in orthognathic person but is characteristic for the teeth of the anthropoids ("man"-apes).

The question: gibbon or human? occupied the learned world for a considerable period of time. Today, however, people generally speak of *prehominids* because the cephalization coefficient is considered to be of conclusive significance, and a human type cannot yet be assigned to an adult brain capacity of about 900 cm^3. Some investigators do report that human cranial contents of 833 cm^3 have been known,[1] but we cannot choose pathological cases of adult human brain capacity as a yardstick.

Anatomic and other arguments

To these paleontological discoveries are added those of comparative anatomy and embryology which, just like the fossil finds, are of general significance as information for the genetic process of all living organisms. For example, comparative anatomy has brought to light both the specialization and the atrophy of various organs from a certain as yet undifferentiated basic type. The phenomenon of atrophy makes the strongest impression. In this case the reduction (i.e., the loss of function) of the organs concerned takes place today before our very eyes, so to say, during embryonal development. For instance, in the human embryo, as in all the higher vertebrates, the branchial clefts of the fish embryo initially arise during the development of the circulatory system. Humans also retain the coccyx in their adult stage as the rudiment of a tail. In the embryonic stage, whale calves exhibit a normal original arrangement of teeth in the maxilla, which however disappears before birth. The embryos of our vipers show rudiments of hind legs, which finally also disappear altogether, whereas adult giant snakes still retain some rudiments. And so on.

Finally, we also have to take into account the results of modern serology, or the investigation of blood serum. Blood of an animal reacts chemically with that of related individuals. These blood reactions ("biological" or "protein reactions") appear as a precipitate, which forms in the blood when it is mixed with blood of a related animal, whereas this reaction does not occur when this rela-

1 Cf. Kalma, *op. cit*., p. 296.

tionship is lacking. The reaction becomes weaker in proportion as the relationship is more remote. The method through which these blood reactions are established briefly comes down to this: from animal A one withdraws some serum, i.e., the clear fluid formed when we leave blood standing in a container and after the blood corpuscles have sunk to the bottom. This serum is injected into another animal B, whose serum is thereby altered. Now if we mix the serum of this animal B with the blood serum of animal A, a precipitate results when both are zoologically related and not otherwise.

According to this method the mutual relationship between blood of humans and blood of anthropoid apes was investigated. In general the same reaction of the blood serum of the experimental animal and human was found after injecting an animal with human blood as that which occurred after injecting with blood from these anthropoids. A direct proof of blood relationship between humans and anthropoids was, of course, not given in this manner; merely a similar chemical composition was demonstrated. Yet, the results of these investigations cannot be ignored.

Weaknesses of evolutionistic theories: the biogenetic basic-law

Of course, in the present context we can merely touch on the discoveries of paleontology, comparative anatomy, embryology and serology. However, if we indeed examine them seriously to their full extent, they form an impressive body of evidence, through which the *problem of evolution* inevitably urges itself upon Christian anthropology. Yet by no means should we confuse the *problem of evolution* in anthropology to the "solution" which the *evolutionistic theory*, as derived from Darwin's theory concerning the struggle for survival and natural selection, has given to this extremely important problem.

When Kuyper held his impressive rectorial oration on *Evolution*, evolution*ism* reigned supreme. In the footsteps of Haeckel, it had developed into a monistic-mechanistic philosophical system, which placed the *dogma of evolution* in opposition to the *Scriptural faith in creation* as an irreconcilable either-or. It believed it could give a conclusive mechanistic explanation of the "origin of species" and construed its "genealogical pedigrees," in which the development of the entire world of organisms was ordered in a continuous

genetic series from the so-called "protists" or unicellular beings, up to the "hominids."[1]

Its principle of evolution was related to the so-called *biogenetic law*, as first formulated by F. Müller and given its poignant form by Haeckel, in which it was initially accepted as the key formula for the solution to the problem of development. This formula ran as follows: "The developmental course of the organisms splits up into two closely related and connected branches: the ontogeny or developmental history of organic individuals, and the phylogeny or developmental history of the organic phyla. Ontogeny is the brief and rapid recapitulation of phylogeny, determined by the physiological functions of heredity (propagation) and adaption. During the brief and rapid course of its individual development, the organic individual repeats the most important of those form alterations which its ancestors have gone through during the slow and long-lasting course of their paleontological development according to the laws of heredity and adaption." Thus, ontogeny is an abbreviated repetition of phylogeny.

Now, according to Haeckel, phylogeny is the mechanically operating cause of the development of the individual, and the famous Weismann concurred with this view.[2] Starting from biology, this mechanistically understood principle of evolution made its triumphal march through all of Western thinking. It conquered sociology, the theory of human society, ethnology (or cultural anthropology), and the domains of the normative special sciences. Under the impression of that triumphal march, Dr. Kuyper wrote the opening sentence of his oration on *Evolution*: "The nineteenth century is dying away under the hypnosis of the evolution dogma."

Since then, much has changed. Monistic evolutionism is in retreat across the entire front. The "biogenetic basic-law" is at most still accepted as an undoubtedly important rule, but with many exceptions. Some investigators, such as O. H. Hertwig and J. H. F. Kohlbrugge, reject it out of hand. Others, such as Sedgwick, Franz, and Sewertzoff, even turn it upside-down in the sense that they assign no value to the recapitulation theory, and rather deem the

1 Human were supposed to descend directly from the apeman, the *Pithecanthropus* [Greek for "ape-man."] and the latter from the anthropoid or man-ape.

2 See Kalma, *op. cit*., 2:187.

phylogeny to be determined by ontogeny.[1] As a mechanistic natural law it is no longer accepted by any scientific investigator, and in any case it does not offer an immediate support for the doctrine of evolution. Its actual indisputable content is summarized by Gavin De Beer in his study *Embryology and Evolution*, in the following modest formula: "There is a *repetition* of ontogenetic events; that is the germ of truth in the theory of recapitulation. What is not true is the assertion that the repeated ontogenetic features represent adult ancestral characters."[2] At most we can say that the branchial clefts occuring in a certain stage of development of the breathing system in the *human embryo* resemble those of the *fish embryo*, for the resemblance indeed goes no further. It ceases with the adult state of the fish.

Nowadays the genealogies by Haeckel are classified even by convinced adherents of the evolution theory, such as K. Guenther, as quite "fantastic."[3] No less than one-third of the thirty phyla which Haeckel proposed in his final phylogenetic conception in 1908 were purely hypothetical; he had been unable to give any proof for their real existence.[4]

In the footsteps of Mendel the investigation of heredity developed into Johannsen's theory of the so-called "pure lines" and Haeckel's phenogenetics. Initially it led to results that were diametrically opposed to the evolutionistic theory with its doctrine of the "variability of the species."[5] The so-called "genotype" of the hereditary make-up turned out to be constant instead of changing through natural selection, i.e., the causative factor through which Darwin, and the functional adaptation to the environment through which Lamarck, wanted to explain the variability of the species.

1 Cf. Fritz Lenz, *Das sogenannte biogenetische Grundgesetz und seine Bedeutung in der modernen Biologie,* quoted by Kalma, *op. cit*., 2:188.

2 G. R. de Beer, *Embryology and Evolution* (Oxford, 1930), p. 58.

3 Konrad Guenther, *Vom Urtier zum Menschen* (Stuttgart, 1909).

4 Neuberg, *op. cit.*, p. 47.

5 The famous Danish biologist understands the "pure line" as the "inclusion of all individuals which descend from one single, absolutely self-fertilizing homozygotic means "racially pure," or arisen from identical gametes (as opposed to "heterozygotic").

Only the *theory of mutation*, introduced by our compatriot Hugo De Vries, with its theory of hereditary "saltational variations" [mutations] was capable of salvaging the basic concept of the transition of the species. But the dogmatic-mechanistic concept of continuity, which had formed the basis for the traditional evolutionistic theories of Lamarck and Darwin, had to be abandoned. For an insight into the causes of a mutation, i.e., the alteration of a gene or hereditary factor, is as yet lacking. It may be true that we should not *a priori* rule out the possibility that an inperceptibly continuous series of so-called premutations in the germ plasm precedes a "saltational mutation."[1] Yet, at least in the visible form which the earlier theory only took into account, a mutation signifies a leap. And because of the mutation-experiments with the aid of x-rays, scientists today strongly lean towards accepting a *discontinuity*. This would also correspond best with modern physics, which in its quantum theory similarly abandoned the earlier view concerning the continuity of energy emission.

But even after this correction of the earlier concept of continuity, the greatest possible disagreement remains among the adherents of the evolutionistic theory concerning the question of *in what way* and *by what causes* the species originated. And the results of embryology on the one hand, of evolutionistic systematics on the other hand, and of paleontology in the third place often radically contradict one another concerning the phylogenetic series.[2]

The entire doctrine of phylogenesis, which was not based on experimental investigation but rather on an a prioristic-theoretic basis, has nowadays undoubtedly receded into the background with regard to the experimental investigation concerning *ontogeny*. The so-called "developmental mechanics," as practiced by the school of Wilhelm Roux, Hans Spemann *et al*., directs all its attention to the way in which the individual organism develops from the fertilized ovum. Genetic investigation has great reserve towards the evolutionistic theory of phylogenesis, although it must be admitted that some among the geneticists, such as Baur, find the Darwinistic theory, supplemented by the theory of mutation, con-

1 Thus e.g. Ludwig Plate, *Allgemeine Zoologie und Abstammungslehre*, 2 vols. (Berlin, 1930), 2:771, as well as De Vries himself.

2 Cf. Bavink, *op. cit.*, p. 430.

firmed by genetic investigation. The renowned Danish biologist Wilhelm Johanssen declared: "In reality the problem of evolution is actually altogether an open question," and "the genetic transitions in developmental history are only found in the fantasy of the researchers of museums for natural history."[1] According to him genetic investigation has yielded nothing to explain the origin of the "species." The view that the "species" is a fundamentally constant "principle of life and form, determined from within" (Dacque) or a "supra-individual organism" (Uexküll) is gaining ground.

Scholars such as the Dutch geneticist Lotsy[2] and Radl are again openly approaching the view that the species, in its sense of a genotype deepened and defined more precisely by genetic investigation, is constant, though Lotsy and his school defend at the same time the possibility of the formation of new genes through crossbreeding between species.

The neo-Lamarckian Oscar Hertwig shifts evolution from phylogenesis towards ontogenesis. He explicitly rejects the biogenetic basic-law and only acknowledges an "ontogenetic law of causality," i.e., the relation of dependence between the constitution of the egg on the one side and the end result of ontogenesis on the other side.[3] And he assumes the existence of as many mutually and radically differing kinds of cells as there are species of plants and animals. In other words, the various cells already distinguish themselves in the species.

Other weaknesses: paleontology

Paleontology has not yielded indubitable proofs for real *transitions from species to species* either. Walther especially has spoken out against the evolutionistic theory from this aspect. According to him, the species were constant at all times: "The gradual transitions called for by Darwin are absent, and one is not entitled to explain the emergence of new species through unlimited variability and addition of minute, imperceptible transitions."[4]

In our country J. H. F. Kohlbrugge in particular has submitted the entire theory of evolution to sharp criticism. His conclusion is

1 Quoted by Neuberg, *op.cit.*, p. 146.

2 J. P. Lotsy, *Vorlesungen über Deszendenztheorie* (from 1896 to 1903).

3 O. Hertwig, *Allgemeine Biologie*, 3rd ed. (Jena, 1923), p. 766.

4 J. Walther, *Allgemeine Paläontologie*, 4 vols. (Berlin, 1919-27).

that all the facts (also those of paleontology) plead against the evolution theory and instead plead for direct creations, repeated time after time.[1]

The following examples of the evolutionistic theory from the area of paleontology have often been paraded: the Tertiary snails of Steinheim (*Planorbis multiformis*) with their great multitude of forms as put in a certain developmental order by Franz Martin Hilgendorf in 1866;[2] the paludines (fresh water snails) of the Tertiary strata in West Slavonia, and especially the famous series of horses of the American Museum, which construed the entire development of the horse, beginning with the five-toed Eohippus (the size of our house cat) from the first Tertiary period (the so-called Eocene) to the diluvial one-hoofed Neohippus.

All these examples have been submitted to serious criticism in more recent times.[3] Concerning the first two examples, investigators such as Hermann Klöhn, Johannes Walther, and Edgar Dacque, only see phenotypical adaptions, determined by environment and location, in the great varieties of form.

As to the series of horses, it has already been noted repeatedly that the various forms, just as those of *Planorbis multiformis* by the way, have nowhere been found in earth strata that are superimposed upon one another but have been collected from all over North America and have only been put together in a series on the basis of the concept of evolution. Furthermore the development of the teeth of the fossil horses does not fit into the proposed series. Moreover, between Epihippus and Mesohippus (i.e., the third and fourth of the series) a hiatus still remains so large that O. Abel does not view the latter as a descendant of the former but as a species that migrated from Asia.

Indeed, in many respects paleontology demonstrates to us the opposite of the evolutionistic hypothesis. It has brought to light, for example, an entire series of so-called "persistent forms," especially of marine organisms which have maintained themselves with remarkable constancy throughout all geological periods and there-

1 J. H. F. Kohlbrugge, *Critiek der descendentietheorie* (Groningen, 1936), p. 111.

2 This order already was criticized in 1875 by F. Sandberger and in 1884 by F. A. Quenstedt.

3 Cf. Neuberg, *op. cit.*, pp. 141 ff.

fore apparently have not gone through any philogenetic development at all.[1] The very continued existence of unicellular organisms such as amoebae and so many others is hard to reconcile with the evolutionistic theory. At the meeting of the Berlin Anthropological Society in 1919, the well-known Berlin zoologist Paul Matschie spoke out in a decidedly anti-evolutionistic sense during the discussion regarding the descent of humans, and gained concurrence in this regard from the anthropologist Hans Virchow. The latter declared:[2]

> Much has already been written about whether humans and apes are related, and whether we must assume an evolution of humans from ape-like creatures, or of both from a common earlier form.
>
> Whoever has worked in a large collection of mammals and has compared them can only answer these questions in the negative. One finds not a single transition between various kinds of mammals; one realizes that every narrow group of blood-related families that contain large numbers – regardless of whether one calls them species, sub-species, race or even more closely defined – possesses fixed, unchanging characteristics. In all these instances where a mammal shows a combination of two forms, and where on superficial examination one believes one sees a transition, a careful testing will readily prove that one is dealing with a hybrid. Such hybrids occur in areas in which the territory of two species overlap. But they never produce a new species. The search for proof of the rise of one species of mammal from another is futile.

The Darwinian and Lamarckian theories of evolution construed the entire course of development in a continually ascending series, and viewed all that was primary as primitive. This merely reflected the optimistic faith of the humanistic science-ideal in a steady progression of development. Meanwhile, one has become much more attentive today to the phenomena of what is called *devolution* and those of *retardation* or slowing-down in the process of body development.

It has been established, for example, that the Tertiary apes displayed a much greater resemblance in form to humans than the gibbon, gorilla or orang of today. As Neuberg rightly remarked, this is a devolution as seen from the standpoint of human beings,

1 *Ibid*., pp. 142 ff.

2 Quoted in *ibid*., pp. 143 f.

but according to the nature of apes it is an evolution, because they have become more and more what they had to be, i.e., apes. Similarily, it has been observed that the excessive body development of the dinosaurs of the Cretaceous (the last period of the Mesozoicum) points to a degeneration which predestined them for extinction. Scholars like Michelis, Snell, Dohrn, Westenhofer, and especially Dacqué,[1] even went so far as to declare humans to be the prototype of creation, from which animals have originated through degeneration.

The Dutch anatomist Louis Bolk explains the development of the form of humans, which he sharply distinguishes from the question of *descent,* through a retardation or slowing-down in the process of body development which was to result in a "fetalization" of the form. Kalma, in his often quoted work, has discussed this matter in a very readable way.

Especially important in this regard, however, we deem to be the relationship between the increase in brain volume and the further corporal development of humans. While the latter displays the line of a decreasing specialization and retardation as compared with the animals, the increase in brain volume on the other hand shows a strongly ascending line. There is a demonstrable connection between these two lines of development. The tremendous specialization and increase in human brain volume was necessary in order that the unfolding of the act-structure of the human body, as the corporal expression of the human spirit, take place long before the body has reached the adult stage according to its three earlier individuality-structures. Cornelis Ariëns Kappers points out that, of the normal human's average brain weight of 1450 grams, the first 1350 grams develop prior to the seventh year.[2]

In his book *New Discoveries*[3] Arthur Keith gave a table of the average increase in brain volume up to the twentieth year in the European, who possesses an average brain volume of 330 cubic centimeters at time of

1 Edgar Dacqué, *Urwelt, Sage und Menschheit* (Munich, 1924) and *Natur und Seele* (Munich, 1926.

2 C. U. Ariens Kappers, *Zielsinzicht en levensopbouw* (Amsterdam, 1922), p. 202, quoted by Kalma op. cit., p. 771.

3 Arthur Keith, *New Discoveries Relating to the Antiquity of Man* (London, 1931).

birth. If the brain were to grow at a regular rate,[1] humans would, at age 15, still not have reached the brain capacity which they now have as a five-year-old. In that case a human would still be a *child* spiritually when his body has reached *adulthood*. Only through a slowing-down of the body development of humans could the earlier corporal individuality-structures be *bound* and *directed* by the act-structure shortly after birth, a process which is characteristic for the body developmemt of human beings.

According to Bolk, the protruding human chin is the immediate result of the development of the human teeth, and this development in turn appears to be the result of the retardation in the speed of human body development. We can also fully admit that the typically prominent shape of the human chin is in turn connected with the development of the ability to speak. Yet I would not like to subscribe to Kalma's premature conclusion that the Neanderthal "man" cannot have had articulated speech because this shape was still lacking. For against this conclusion, even the simple fact that some animals, too, such as parrots and ravens, are capable of imitating articulated human words must put us on our guard. The protruding chin appears to be no *conditio sine qua non* for this capacity.

After all, language is not bound to words but can equally express itself in *gestures*. The entire evolutionistic view of the Neanderthal "human being" as a "brute and fighting animal" as yet devoid of spiritual capacities is simply an unscientific speculation on the basis of external morphological peculiarities, which is entirely contradicted by the cultural findings. A being that had such a sense of beauty as comes to expression in the Acheulien axes, and that buried his dead with so much respect and must therefore have understood the symbolic meaning of burial, can in no way have been devoid of the *lingual* ability, although, because of a lack of data, we obviously should not fall into the reverse error of taking an already developed *word*-language of the Neanderthal "human being" for granted. In scientific matters we should learn finally not to want to jump higher than the reach of our pole, and where data material is absent, to profess honestly our ignorance.

The foregoing may suffice to demonstrate that since Kuyper's oration on *Evolution* very much has changed in the scientific atti-

1 [I.e., at the same rate as the rest of the body.]

tude towards the question of evolution. Monistic evolutionism in the sense of Haeckel has been overtaken all across the board by the results of later scientific investigations. It may be called a "vanquished standpoint" since people began to investigate the development of primitive nations according to a critical cultural-historical method.[1]

On the other hand, it must be admitted that the evolutionistic theory may certainly not be qualified as a "vanquished standpoint" in the area of *biology*. The vast majority of independently working biologists, anatomists, and other investigators of living nature, still hold to the evolution concept, at least in principle. In contrast with this, the number of emphatic opponents, such as Fleischmann, is infinitesimally small. The problem of evolution itself has therefore not disappeared from the scientific program, and at least the basic thought of Lamarck's and Darwin's theory of evolution is still very much alive in *biology*.

Psycho-creatianism[2]

What does the young Reformational Philosophy have to say about the foundational aspect of this problem?

In the foregoing I gave some guidelines for a reformational philosophical anthropology, which thereby obviously opens up a tremendous field of enquiry. This anthropology will have to be conscious of the boundaries of scientific knowledge. It will, for example, not be able to offer us a scientific theory about the so-called intermediary condition of the human soul after its separation from the body. By contrast, the scholastics, in their doctrine of substance, explored a wide range of constructions stretched out here, for example, concerning the nature of the activity of feeling and knowing of the *anima separata* (the soul separated from the body.) In my study concerning Kuyper's philosophy of science[3] I have already made the necessary remarks on this point.

Kuyper, himself a theologian, recognized that Scripture has not revealed anything to us about this in a positive sense, and he re-

1 Cf. for more elaboration my *New Critiqe of Theoretical Thought*, 3:346-76.

2 [See on this subject Chapter VII in Vol. II of this work, and also Dooyeweerd's articles: "De idee der inividualiteitstruktuur en het Thomistisch substantiebegrip II," *Phil. Ref.* 9 (1944), at p. 29, and "Schepping en evolutie," *Phil. Ref.* 24 (1959), at p. 115.]

3 [See "Kuyper's wetenschapsleer," *Phil. Ref.* 4 (1939): 193-232.]

jected the philosophical speculations on this "profound problem". And justly so. For theology, which has to investigate the anthropopogical questions from the perspective of the *faith-aspect* of the Word-revelation, remains irrevocably bound to this Word-revelation in its scientific examination of the truths of faith. It can therefore not provide us with knowledge, which in divine wisdom, has been withheld from us for this temporal life by Scripture.

Therefore we can call the equally speculative theory about the "sleep of the soul"[1] unscriptural with the same justification as the speculative theory about a knowledge of the separated soul only from divine enlightenment. The question of what activity can "accompany/abide with" the soul after death is entirely unscriptural. For this question is altogether inspired by the view of the soul as a "theoretical abstraction" from temporal reality, and fundamentally misjudges its *integral* character, which cannot be found precisely in what is temporal.

The same holds in my opinion for the "profound" question of how we must scientifically view the joining of soul and body at human birth. It is striking that the entire theological battle fought on this point between so-called *traducianism* and *psycho-creatianism* arose on the basis of the Greek dualistic form-matter theme. According to the older traducianism, the soul was transferred along with the seed on to the child by the parents. It could therefore bring the reproach of "materialism" upon itself. For that reason Thomas Acquinas even felt he had to brand it as an "overt heresy." On the other hand, psycho-creatianism, which adduced the "rational soul" as the form-giving principle every time to a special creative act of God, found itself confronted with an insoluble problem in the matter of "original sin."

Would it not be timely, also for dogmatic theology insofar as it wishes to cling to the reformational Scriptural standpoint, to cut off at their root such false ways of posing problems? Should one not rather humbly admit that the question of how God in his wisdom

1 [The theological doctrine of psychopannychia: a person's temporal death is "complete"; there is no "surviving" soul between death and resurrection, according to this doctrine.]

as Creator has integrally united soul and body is an unfathomable mystery for our thinking, bound as it is to time? The human soul as the supra-temporal center of a person's existence does not originate and perish *in* time, although in its integral bond with the temporal body it is a creature of God.

It must not be thought that this view of the supra-temporal character of the human soul would lead to the Platonic and early Aristotellan view concerning a *pre-existence* of the soul prior to body. The doctrine of pre-existence was merely the result of a speculative-metaphysical way of thinking, which attempted to transgress the boundary of the order of time through theoretical thinking itself. Thinking, however, can do no more than to establish the fact that the human "soul" is the *condition* or the *presupposition* for the human body. In this statement the admission that theoretical thinking is *not self-sufficient* is entailed.

The creative act of God itself never occurs in time, as time itself belongs to what is *created*. This holds for the creation of both a person's soul and body. But when creation is completed, this creation is worked out, in the corporal existence of a person, in time, through which the body comes to its development. For spiritual existence, on the other hand, creation is worked out in a spiritual, religious order, which transcends time. Now the human soul is of this latter order. One can say that it can only actually manifest itself in the body as soon as the act-structure has developed in the latter. But in the process of corporal generation, the generation of the soul itself cannot be enclosed. Therefore, is psycho-creatianism right after all? No, because Scripture nowhere teaches us that God "creates from the outside" a separate soul "into" the body at every human birth in time. The argument that people believe can be derived from Genesis 2:7 is inspired by the Greek view of the soul. The same holds for the theory's appeal to Ecclesiastes 12:7 where it is said that the spirit returns to God who has given it.[1]

What scripture explicitly teaches us is the religious radical community and solidarity of the human race in creation and fall,

1 In Aristotelian scholasticism this text was a *locus classicus* used to defend the view of the *anima rationalis* as separable from the material body. Cf. Thomas Acquinas, *Summa Theol*. 1, q. 75, 6. It hardly needs saying that this text can only be used as a proof that the Greek view of the soul is Scriptural if one starts out by interpreting the word "spirit" in this sense.

whereby the doctrine of original sin is guaranteed its Scriptural basis and at the same time the psycho-creatianistic doctrine is implicitly condemned. This religious radical community manifests itself *in the order of time* in the corporal genesis of humankind from one "blood."[1]

The creation of a person is not a separate creation of a "body" and of a "soul," but is one *integral* act of God. But it can only be grasped by human thinking in the order of time, i.e., according to its corporal aspect, though only on the basis of an idea of the soul as the spiritual point of concentration of the body.

After the creation of a person, the development of the human race occurs *in the line of generation*, which is instituted in the creation order. This generation itself has its *spiritual* and its *corporal* aspect in this creation order. As we know from the Word-revelation, the spiritual order as *natural* order has been replaced since the fall by the *new spiritual* order of regeneration, which however presupposes the natural order: natural person (*anthropos psychikos*) comes first, then the spiritual person (*anthropos pneumatikos*) in the sense of a person renewed by rebirth.[2]

Neither the natural order of spiritual generation from the first head of the human race, in whose fall all his descendants share, nor the new order of regeneration from the Holy Spirit, however, occurs in cosmic time.[3] And in this way both are elevated beyond any conceptualization in their spiritual sense. Only the Spirit of God can, in faith, direct our temporal knowledge of the corporal genesis towards the mystery of spiritual generation. But temporal thought finds its non-transgressible boundary here.

Every attempt to transcend beyond the order of time in our temporal thinking and to climb up to the "purely spiritual" necessarily ensnares us in insoluble antinomies. For this attempt comes down to this that one tries to pull the *supra*-temporal *down into* time. And

1 [Acts 17:26.]

2 [1 Cor.15:46; cf. 2:14,15.]

3 Neither does it occur in eternity, of course, as in the sense in which it applies to God only and in which the generation of the Son by the Father occurs. At least the natural generation remains, also according to its sprirtual aspect, within the *natural order*.

this has been the ever-flowing wellspring of all heresies in theology because in this way the "Spirit," who alone can lead our thinking towards the truth, is quenched.[1]

1 [Cf. John 16:13; 1 Thess. 5:19.]

CHAPTER 5

The Place of Man in the Cosmos: A Central Anthropological Problem

From the foregoing, one thing must now have become clear to us: in all the types of individuality-structures dealt with up until now we were able to indicate a leading or *qualifying* function of reality. And this function at the same time meant a *limitation* in the sense of a *lack of central cosmic significance*. Things of a pre-normative qualification, such as plants and animals, but just as much things of a normative qualification, all turned out to be *limited* in their cosmic position by the cosmic principle of sphere-sovereignty. At the same time they manifested a strictly transitory character. They are under the jurisdiction of the discontinuous boundary line of cosmic law.

What is relative in the cosmos can possess no eternal value. No matter how high one ascends into the spheres of qualifying functions, one remains under the ban of the relative. Neither the logical nor the moral, the aesthetic nor the pistic function of reality is, as a *qualifying* function, capable of guaranteeing more than a perishable thing-structure. In this way we see ourselves confronted by the immense problem concerning the place of man in cosmic reality. Does man also possess a thing-structure, and if so what then distinguishes man from the other things?

Scheler's *Die Stellung des Menschen im Kosmos*, addresses the problem once more with particular acuity, and the remarkable solution which this thinker offers belongs in my opinion to the highest which humanistic philosophy has given up till now concerning this question.

Two approaches in anthropology

We can place the dominant theories concerning the being of a person in two large categories: the *metaphysical* category and the so-called *positivistic* or *naturalistic* one. In all these theories the essential difference between humans and animals occupies the center of interest. The fact that an immensely varied realm of normative thing-structures exists beyond the realm of inorganic and organic nature apparently plays no role in the anthropological deliberations. The basic criterion of classical metaphysical theories was:

man, in distinction from the animal, a *rational-moral* being. At the same time the rational-moral functions were reified into the essential form or substance of man (unless a radical pantheism was adopted). Apparently, the entirety of the normative subject-functions, also commonly alluded to as *spiritual* functions, was intended here.

The entire problem was then muddled, however, by reducing the normative subject-functions, as functions of human reality, to psychical functions ("psychologization"). For if we could bring all these functions under the common denominator *psyche* we would end up with enormous difficulties, for at the same time the distinction between humans and animals, which one wished to establish as a metaphysical absolute, had to be relativized again into a *gradual* difference.

In this way one begins to understand Descartes's rigorous mechanization of all of natural reality, his view of the animal as an instinctive mechanism, and his denial of the psychical function in the animal. Only a person was supposed to possess a psyche. But because of the metaphysical dualism between natural things and what is human the psyche was not supposed to possess any point of contact with the world of extended things.[1] That was indeed the polar opposite of the Aristotelian-scholastic psychology with its trifold scheme of *anima vegitativa*, *sensitiva* and *intellectualis*. Typical for the rationalist tenor of Cartesianism, *cogitatio* or intellect was considered the soul-substance.

Confronting this entire psychologistic-metaphysical view of the human being, the positivistic-naturalistic line, in an advantageous position not to be underestimated, only wished to accept a gradual difference between personal and natural being. Dogmatic metaphysics of the classical view tore the unity of the cosmos into absolutely separated substances because of the prejudice about a personality idea. In opposition to this, the positivistic-naturalistic view could appeal to ongoing scientific understanding based on an impressive body of data. It had raised intellect and choice to be the qualifying functions of a person's being, once Descartes' denial of the existence of animal psychical life had to be abandoned as conflicting with empirical scientific evidence.

1 [I.e., material things: those which take up space (*res extensa*).]

However, on the basis of experimental investigation, the evolutionists of the schools of Darwin and Lamarck concluded that intelligence can not be denied to the higher animal species either. The experiments of W. Köhler conducted with chimpanzees especially appear to be convincing on this point. It seems that we should not just ascribe memory and instinct to animals, according to the old prejudice concerning them, but that we must also accept a certain measure of intelligence in their activity in the case of at least the higher developed animals. In these experiments, increasingly complex detours were placed between the animal and the object of its satisfaction (for example, a fruit). These could be obstacles, objects that could serve as possible "tools" (boxes, sticks, ropes, various poles that could be fitted together as telescopes). Observations were then made as to how and with what presumable psychical functions the animal would try to reach its goal.

Scheler's view of the intellect

Of course, in the interpretation of these experiments the following question arises immediately: what does one understand by intelligence, by thinking? If intelligence is viewed as a complex a-normative psychical function, it seems indeed presumptuous to assert that such a function would only be found in a person. Max Scheler who, with Darwin, Schwalbe, and Köhler, contends the opposite, sees the intellect as the fourth stage in psychical life, in which the first is formed by the ecstatic sensitive urge also present in plants, the second by instinct, and the third by associative memory (*mneme*). Now, according to Scheler,

> seen psychically, the intellect is a sudden *insight* into a coherent condition of facts and values in the environment which is neither directly observable now, nor was observed before as amenable to reproduction. To put it positively, intelligence is *insight* into a state of affairs on the basis of a set of relations whose basic elements are partly given in experience, and partly *anticipated* in a concept, for example, in the case of certain visual intuitions.[1]

In other words thinking, as a psychical function, is characterized by its productive character, by the *anticipation* (used here in the Kantian sense, not in the sense we use it) of a new complex of facts not experienced before (*prudentia*, *providentia*, cunning). The difference with associative memory is clear. The situation that we must

1 *Op. cit*., p. 40.

take into practical account in examining behavior is not only new and a-typical for the *species*, but above all new for the *individual*. In addition, such objective, meaningful behavior takes place all of a sudden and prior to new trials, and independent of the number of previous trials.

If, as said before, we view the intellect in this sense as a *psychical* function not yet even *anticipating* the normative functions, it does indeed remain under the jurisdiction of the restrictive, psychical sense. It must then be viewed as a psychical meaning-individuality of a restricted character in the sense we have indicated earlier. The qualifying function of the animal thing-structure then indeed remains the psychical one.

However, as soon as we view the intellect in the normative-logical sense of reflective analysis, the experimental method, commonly used for establishing the presence or absence of this intellect in the animal, leaves us entirely in the lurch, if only because the animal cannot *express* the meaning of its subjective behavior. All speech presupposes the possibility of normative-logical reflection. That is why we attach little importance to the heated discussion that broke out in the Prussian Academy of Science following the publication of the results of Köhler's experiments, which saw psychologists debating whether it could be scientifically justified to deny post-psychical normative functions to the animal. Dogmatic naturalism does not accept an essential difference between norms and natural laws and reduces the norm to species-bound habits in the approach to life. It is only this naturalism that can expect clarification on this critical point from experimental animal psychology.

Various views of spirit

The metaphysical view of man seems to be able, therefore, simply to withdraw behind the normative borderline in opposing the bold insistence of experimental animal psychology. Kant had already declared that this normative borderline was inaccessible to natural-scientific investigation. Such is also essentially the viewpoint of Max Scheler in his aforementioned treatise.

Scheler assumes in the cosmos the existence of three fundamentally distinct areas: inorganic nature, life, and spirit. In doing so, Scheler stamps the traditional distinction between the biotic and psychical areas as merely *phenomenal*. The biotic and the psychical

are not essentially different but are rather the phenomenally external and internal side of the same life process, respectively, which Scheler thinks of in a metaphysical sense, just as much as he also reifies the "force" of the inorganic world.

The qualifying principle that stamps a person as a person cannot be sought in life with its internal psychical and external biotic side. Rather, it must be sought in the "spirit" (called *nous* by the Greeks), which is in fundamental contrast with life and as such can therefore never be reduced to the natural evolution of life. What does Scheler understand spirit to be? He rightly points to the multiplicity of meaning in this concept. In the Christian world of thought the word is used in a trans-cosmic, religious sense. "God is Spirit." "The Spirit lusts against the flesh."[1]

Ludwig Klages, and in his footsteps researchers like Edgar Dacqué, Leo Frobenius, Carl Jung, Hans Prinzhorn, Theodor Lessing, and in a certain sense also Oswald Spengler, actually use the word in the sense of intelligence and choice. They thereby assume an original hositility between spirit taken in this sense on the one hand and life and psyche on the other hand. This results in a progressive annihilation of the latter by spirit, a process viewed as being pathological.

Rickert views spirit on the one hand as identical with culture, as a "reality to which a meaning is attached," and on the other hand as a "content of meaning that is conceptually abstracted from reality." Dilthey sees spirit as the inner content of a psychical condition of totality, which cannot logically be understood but only grasped by "experiencing it." Among the sciences of the spirit (*Geisteswissenschaften*) he counts history, economics, the science of law and political science, the science of religion and the study of literature, poetry, and music, philosophical systems of psychology.

In the speculative-idealistic systems of German philosophy, especially in Hegel's philosophy of identity, the word "spirit" is viewed dialectically as the idea of reason with its stages, cancelling each other dialectically and in turn leading to a higher synthesis, *die Vernunft an sich, für sich, und an und für sich*: Reason by itself, for itself, and by and for itself. In this view the concept of spirit embraces the

1 [John 4:24; Gal. 5:17. These texts, however, refer to the Holy Spirit; texts that refer to the human spirit in its emphatic religious sense are, for example, Eccl. 12:7; John 19:30; Acts 7:59; James 2:26.]

entire cosmos in its metaphysical-logical side, in its natural side as well as in its post-logical normative side, but under the pan-logistic denominator of the intellect that knows of itself (*die sich selbst* wissende *Vernunft*).

Scheler's view of spirit

In his view of spirit Scheler shows himself above all to be a humanist:

> If we put a special function of knowing at the head of the spirit concept, a kind of knowing which only *it* (i.e., spirit) can provide, then the fundamental characteristic of a spiritual being is its *essential liberation*—that which constitutes its existential *center*—from the bondage and pressure of life, from its dependence on everything that belongs to life, including its own intellect that is subject to its own drives.
>
> Such a "spiritual" being is no longer subject to its drives and its environment, but is *free* of it, and is, as we shall call it, *open to the world*. Such a being has a "world." It is capable of raising into "objects" the centers of resistance and reaction to the outside world which it too receives from the outset (but in which the animal loses itself ecstatically) because it can fundamentally comprehend these objects for what they are without the limitation imposed on this objective world—or its given meaning—by the system of vital drives and the functions and organs for meaning presented to it.[1]

The center of activity in which the spirit appears within the finite spheres of reality is called *person* by Scheler. He distinguishes this sharply from all functional *vital* centers which, viewed internally, are also called *psychical* centers. Even from this description of the concept of "spirit" it is clear that it comprises nothing like the entirety of the normative functions of reality according to our sense, but amounts to reification of a trans-cosmic being that for Scheler is therefore no longer subject [to its environment].

Viewed in this way, the "concept" of spirit becomes quite multivocal. One would ask immediately for the comparative denominator under which so very many highly differentiated normative functions of reality can be brought, in order to grasp their deeper cosmic identity. For we know from our previous expositions that without a cosmological comparative denominator no cosmological conceptualization is possible. All conceptualization, be it in a special science or in cosmology, is based upon "idealizing" (*Ideierung*) in the sense of identification.

1 *Ibid.*, p. 48.

Scheler's rejection of cosmological concepts for his view of the spirit can at most be valid for the narrow view he holds of the cosmos. And that holds, of course, only for such categories as the substance concept and the form-matter concept, which, in his opinion, only relate to the inorganic and organic reality in nature. According to Scheler, the spirit cannot be made into an object (*Gegenstand*) because it is pure actuality, i.e., it has its being only in the free exercise of its activity. But Scheler himself calls this activity "determined by its essence" (*wesenhaftbestimmt*), by which he obviously admits that it can be defined in a concept.

In the further development of his discourse it becomes clear that for Scheler the comparative denominator is the normative-logical one. In other words, it is a normative functional quality of meaning, which, as we saw in Chapter II, paragraph VI,[1] can be described as *reflective-analytical*. In the reflective-analytical lawsphere the problem of the *Gegenstand* emerges for the first time. It consists of this: reflective-analytical thinking freely and normatively *confronts* the world, although the reflective-analytical logos-function, just as all other functions of reality, is only given *in* the organism of the cosmos.

Does Scheler indeed hypostasize the normative subject-functions?

Those who know Scheler's earlier writings, especially his important standard work on *Formalism in Ethics*[2] will remember his vehement opposition to transcendental logicism in its Kantian form; his view of the personality, entirely focused on the *individuality*, his fight against the *norm concept* instead of ethical systems based on objective value; his raising of the personality *above* the subject-function, etc. They will initially ask themselves with surprise whether we have not completely misunderstood Scheler by viewing his concept of the spirit as a reification of the normative subject-functions under a normative-logical comparative denominator. In our defense the following answer may suffice for the time being.

1 [It cannot be made out what this refers to because there is no division into chapters and paragraphs in Dooyeweerd's manuscript.]

2 Max Scheler, *Der Formalismus in der Ethik und die materiale Wertethik*, 3rd ed. (Halle an der Saale, 1927).

1. Scheler's battle against transcendental logicism only concerns the absolutizing of a logos concept from which the reflective-actual element of intuition has been banished. It therefore lacks logical *meaning*. In other words, Scheler only combats *positivism* in the logos-reification. In doing so, Scheler completely follows the course of Husserl's phenomenology, the focus of which can be called metalogical only insofar as we misjudge the contemplative-intuitive element – the "*idealizing*" *in* the logical activity along positivistic lines.

   Husserl's phenomenology is not a positivistic but an *eidetic* logicism, based upon the logical law of identity in a material sense.[1] When, therefore, Scheler wants his concept of spirit to include not just thought acts but also a contemplation of essence (*Wesensschau*) and a certain class of emotional and volitional acts such as love, hatred, remorse, etc., then in this way the sphere-sovereignty of the qualities of meaning is definitely not respected. Instead, in the line of phenomenology, he only attempts to include *logical-eidetic* distinctions of meaning. The concept of spirit remains characterized by a "special function of knowing, a kind of knowing which it alone can provide." This also explains the rehabilitation of the individuality in the concept of personality, and spirit in contrast with the absolutization of what is "generally valid" in critical philosophy. Because of its *material-eidetic* attitude, phenomenology can also include again in its investigation the logical functions of individuality, the individual essentials (*Wesenheiten*). This was *a priori* impossible for formalistic positivism because of its starting point. The emphasis on value which, especially with Scheler, is given to individuality, is founded in a deeper sense in his personalism. This initially also drove him towards a "theistic" view of God, which, by the way, had nothing to do with the Christian view. However, eidetics can never give a real religious-organic view of individuality, which grasps the religious coherence of unity beyond its functions (in this case the logical-eidetical ones).

2. Scheler grounds all norms in "values" (*Werte*) and, in connection with this, he elevates the spirit above the logical-norma-

1 Cf. also Walter Ehrlich, *Kant und Husserl* (Halle, 1923).

tive subject-function in our sense. This is but the inevitable consequence of his reification of the spirit, which tears the cosmos apart. It remains in the line of Greek speculative philosophy, which does not ground the norm in God's sovereign will but in its rational objective value. Therefore, it must adopt the idea of what is good, true, beautiful, etc., "in itself" (*an sich*). In his "*Ideen*" Husserl has expressed this old pagan thought once more in this form that God can alter nothing in the truths of mathematics because they possess an absolute existence!

3. In order to see Scheler's philosophy of spirit in its true form it is essential, in the first place, to clear the road of terminological misunderstandings concerning the concepts *logos*, *subject*, *I-ness*, *norm*, etc. We deny in no way that Scheler, in the course of his development, has displayed a "capacity for change" that borders on perfidy, according to Sauer. We therefore only review the philosophy of spirit as it has been presented in his last writings. If we penetrate to the *meaning* of Scheler's expositions, we look in vain for a comparative denominator for the reified spiritual functions other than the logic-reflective one.

4. The choice of a logical-eidetic comparative denominator in metaphysics definitely does not prevent an irrationalistic-personalistic basic attitude. Actually, only the logos-reification as focused upon *general validity* is rationalistic. An eidetics, which places the emphasis on individual "essentials" (*Wesenheiten*), is of necessity imbedded in irrationalism. The identification of *logos* and *ratio* has already effectively been combated by Nicolai Hartmann. One may compare Scheler's own exposition with the following:

> The *spiritual act*, such as a person can perform, in contrast to the simple response of the animal's corporal model and its "contents," is essentially linked to a *second* dimension and stage of the *reflex-act* [ital. mine, H.D.]. We will combine this act and its goal, and the goal of this combined consciousness of the spiritual act-center we call *self-consciousness*.[1]

The animal also has consciousness, in contrast to the plant, but no *self*-consciousness, as Leibniz already saw. It does not possess itself, nor control itself – and hence is not conscious of itself. Combining self-consciousness and the ability to objectivize, as well as the

1 *Ibid*., p. 49.

capacity to *suppress* original drives, also make up a *unique*, unbreakable structure, which is peculiar only to man.

With this gaining of self-consciousness, with this *new* retrospection and centering of its existence, which only spirit makes possible, comes also the *second* characteristic of human existence: human beings not only can expand their "'environment' into the dimension of the world and objectivize resistance, but also, and this is most remarkable, they are able to objectify their own physiological and psychical *make-up* and every single psychical experience. Only for that reason are persons able to throw their lives away freely."

And a little earlier Scheler writes:

> One might say that the animal exists from and within its biotic reality, which corresponds to its organic conditions, without ever grasping them as objects. . . . To stand in the Gegenstand relation is thus the most formal category of the logical side of spirit.[1]
>
> . . . Only human beings—to the extent that they are persons—are able to rise above themselves as organisms and transform, as it were from a center beyond the world of space and time, everything, including themselves, into objects of their knowledge . . .
>
> This center, however, from which persons carry out the acts by which they objectivize the world, their bodies *and* their psyche, cannot itself be a "part" of this world. Nor can it be located in space or in time: it can *only* be located in the ultimate *Ground of Being. Thus persons are those beings who transcend themselves and the world."*[2]

Scheler's phenomenological background

With Scheler, cosmic reality in our sense therefore remains limited to a physico-psychical one in the traditional way. The normative functions of reality as subject-functions are reified as "spirit" into a trans-cosmic being, elevated above cosmic time, but only after they first have been logicized. In a thinker such as Scheler, who starts out with Husserl's phenomenology, this transition towards a reifying metaphysics should not surprise us.

In his so-called eidetic method or method of the contemplation of essence (*Wesensschau*) Husserl has sought a *phenomenological* (not *metaphysical*) Archimedian point, viewing the cosmos as the intentional correlate of meaning-giving consciousness (the *cogito* in a

1 *Ibid*., pp. 50-51.

2 *Ibid*., p. 58.

Cartesian sense). This Archimedian point was then found through a progressing *epochē* or suspension of all judgments of reality and evaluating judgments belonging to the natural attitude towards the world. These judgments are not eliminated in the strict sense, but in the phenomenological reduction or *epochē* they are not utilized: they are placed between brackets as it were.

What remains after this methodical phenomenological annihilation of the cosmos is the absolute, "pure" or transcendental consciousness:

> Immanent being is therefore undoubtedly absolute being in the sense that it fundamentally *nulla "re" indiget ad existendum*.[1] On the other hand, the world of the transcendent *res* is wholly dependent on consciousness, i.e., not logically invented but actual consciousness.[2]

Scheler elevates the reflective activity to the qualifying characteristic of his concept of spirit. Similarly Husserl sees in this activity the fundamental peculiarity of the activity of the "pure" or transcendentally purified I, or consciousness.[3] Through this peculiarity, this pure "I" can freely direct its gaze towards its own "experiences" and grasp them in a contemplation of the essence. In the reflective analysis, that which is "given as an object" (*das gegenständlich gegebene*) can be adequately grasped!

The transition to metaphysics which took place in Scheler was already contained in embryo in this phenomenological viewpoint. Husserl emphatically rejected an absolutization of the natural world of things, and in this way actually reified the "pure consciousness" as an immanent being which fundamentally *nulla "re" indiget ad existendum*. Scheler only draws the consequence from this reifying when he, moving into the channels of metaphysics, relates Husserl's *epochē* not only to the natural *judgment* of reality but to the *moment* of reality itself. In the "act of idealizing" (*Akt der Ideierung*) spirit supposedly can grasp *a priori* the essential forms of the cosmos with essential necessity, independent of the number of empirical observations and the inductive conclusions drawn from them. In this act, Scheler sees the peculiarity of the activity of spirit,

1 [... it fundamentally does not need any "thing" in order to exist.]

2 Edmund Husserl, *Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie*, p. 92.

3 *Ibid*., p. 144.

which is only assigned to a person and makes that person partake of the divine spirit.

To "idealize" the world (*ideieren*) means "to *un*-realize the world" (*die Welt entwirklichen*). It means cancelling out the *biotic urge* in relation to which the world appears above all as "resistance" and which at the same time is the *condition* for all sensory perception of the accidental "now-here-so."

In this entire reification of the spirit under the basic denominator of the *logos* no new thought has been expressed as yet. In Greek ancient philosophy, the normative subject-functions of a person have been reified as *nous* and, as is evident from the entire history of the doctrine of ideas, is at the same time logicized by the Greeks.

Only Kant has really introduced a completely new element into this *nous* reification by transferring the primacy of the theoretic logical function to the practical-moral function. Meanwhile, the relation which Scheler assumes to exist between spirit, life and the inorganic power of nature is novel and very original. At the same time it gives the proof positive for its strictly anti-Christian character.

The classical and the negative theory

The peculiarity of Scheler's view best comes into view when we compare it with two other views concerning the relation between spirit and the physico-psychical areas. Scheler himself calls the first one the *classical* theory of man. It assigns to spirit not only energy and activity but the greatest measure of force and strength. Scheler views it as a component of a life- and world-view which sees the world (cosmos) built up in such a way that the higher forms of being, from the deity to *materia bruta*, are always the more powerful and therefore *causative* modes of being, respectively. The pinnacle in such a world is then, of course, the God who is omnipotent precisely *because* he is spirit.

In this *classical* theory, which is indeed of Greek pagan origin, Scheler, of course, also places the Christian view of the spirit. In doing so he becomes the victim of a fundamental misunderstanding, as we shall presently see. This misunderstanding can only be explained through the compromise that Christian scholasticism has made with Greek philosophy.

Scheler calls the second, opposite view the *negative* theory of man. It defends the opinion that spirit itself, at least all of man's

culturally creative activity, and therefore also all moral, logical, aesthetically contemplating and artistically formative activity, arises exclusively by saying "no" to reality in its natural existence.[1]

This view is held in very different forms, both in Buddhistic philosophy and in Schopenhauer's theory of the self-negation of the will to live. It has been extended by Schopenhauer's disciple Alsberg, in his remarkable book *The Riddle of Mankind*, into the thesis that the "principle of humanity" consists exclusively in man's capacity to release his *organs* from the biotic struggle for the maintenance of the individual and the species in favor of developing tools, language and concepts. Finally it also appears in the later theory of Freud, especially in his *Beyond the Pleasure Principle*, in which all specificity of human nature, its capacity for cultural formation, is reduced to repression or *sublimation* of the lower drives, to the kind of repression, however, which also explains neuroses.

Scheler sees the basic error of every *negative* theory of a person in the fact that it has no answer whatever for the following questions: *What* then is it in man that negates? What then says "no" to the will to live? What represses drives, and *what* in the final analysis explains why a repressed energy in one case leads to neurosis, in another case is sublimated into cultural-formative activity? Finally: *to what purpose* does a person repress, sublimate, negate the will to live – for what ultimate values and ultimate ends? The negative theory only allows spirit to be born from the repression of the biotic drive, but in doing so it puts things upside down. For that which it wishes to explain, it must already presuppose, namely reason, spirit, with its own autonomous laws and the partial identity of its *principia* with those of being.

It is precisely *spirit* that initiates the repression of the biotic drive because the will, guided by ideas and values, [represses] all biotic impulses which are in conflict with those ideas, the representations which [lead] to instinctual activity (*Triebhandlung*) . . .[2]

At this point Scheler introduces a cosmological concept by which he sharply delimits his own standpoint, particularly against the classical theory man. This concept reminds us in many respects of the concept of "leading function," introduced by us. Whereas on

1 *Ibid*., p. 70.

2 *Ibid*., pp. 72 f. [The text is suddenly interrupted here in mid-sentence; the verbs have been supplied by us. The subsequent text seems, however, to fit in rather well with the preceding text.]

the one hand the spirit represses biotic impulses that are hostile to its values, it on the other hand coordinates the biotic impulses in such a way that they carry out the project of the will as designed by the spirit. Scheler calls this fundamental process of the spirit "steering" (*Lenkung*). It consists of an "inhibiting" or "unleashing" of "driving impulses" (*Triebimpulsen*), whereas the process of presenting ideas and values to life Scheler calls "guidance" (*Leitung*). What the spirit cannot do, however, is this: to create or cancel biotic energy *itself*. In other words, spirit itself does not possess any creative energy but merely a leading and guiding function with respect to life and the inorganic forces. With this, the classical theory of man collapses. It finds its origin in the doctrine of the autonomy of the idea in the Greek doctrine of the *nous*, and through this Greek view it has become a basic view in the greater part of Western European thinking.[1]

This classical theory occurs especially in two main forms: in the doctrine of the spiritual soul substance of a person (Thomas Aquinas and others), and in those theories according to which only a single spirit exists of which all particular spirits are merely *modi* (Averroes, Spinoza, Hegel). The doctrine of the soul as a substance is based on an entirely unjustified application [to the soul] of the external thing-category, or – in its older form of the metaphysical categories of matter and form – to the relationship between body and soul. Both applications of cosmological categories to man's central being are untenable. The person of an individual is not a substance but merely a "*monarchic hierarchy* of acts, one of which always leads and guides."[2]

The basic error of the classical theory, however, is the doctrine that the higher forms of being are the *cause* of the lower ones. The current of forces which alone is capable of bringing about "existence" (*Dasein*) and accidental "being-thus" (*Sosein*) does not run from above downwards in the world we inhabit, but from below upwards. "Originally, the lowest forms are the most powerful, and the highest the most powerless."[3] Every higher form of being is relatively powerless with respect to the lower ones, and it does not *realize* itself through its own powers but through the powers of the

1 *Ibid.*, p. 74.

2 *Ibid.*, p. 75.

3 *Ibid.*, p. 76.

lower forms. With this, the *theistic* metaphysics, adhered to earlier by Scheler, also collapses insofar as it starts out from a creation of the world by a divine spirit.

Philosophical anthropology must demonstrate the origin of all specifically human monopolies and activities from the basic spiritual structure of man. To these belong language, conscience, tools, weapons, ideas of justice and injustice, state, art, myth, religion, science, history and social life.

Scheler's view of religion

Finally, how does Scheler see the relation of man to the absolute Ground of all things after having abandoned his theistic-metaphysical viewpoint in the light of his view of the basic structure of human nature as set out above? Individuals have become *human* through consciousness of the world and themselves as well as through objectification (*Vergegenständlichung*) of their own psycho-physical nature, both of which are specific characteristics through which *spirit* manifests itself! As soon as this has occurred they must, with intrinsic necessity, also accept the most formal idea of a transcendent, infinite and absolute *Being*. They can no longer really say: "We are part of the world and enclosed by it," for the actual being of their spirit and of their person is elevated beyond even the *forms* of being of this "world" in space and time.[1]

A strict *essential necessity* exists in the correlation between a person's consciousness of the world, of the self, and the formal consciousness of *God*. God is only taken here as a "Being by himself," provided with the predicate "holy," a concept of God that can be given a very diverse content. However, according to Scheler, this sphere of an "absolute Being," regardless of whether it is accessible to experience or knowledge, belongs to the essence of man as a *constituent* just as much as his self-consciousness and his world-consciousness.[2]

And now follows Scheler's remarkable and very characteristic exposition concerning the relationship between religion and metaphysics. In this exposition, the science ideal[3] ultimately retains the

1 *Ibid*., p. 102.

2 *Ibid*.

3 The ideal of science is not intended here in a natural-scientific but in a metaphysical sense.

upper hand all across the board. We have already noticed this ideal of science in the characterization of the spirit as pure actuality "idealizing" everything (outside itself) and reflecting it.

After man has discovered the nucleus of his being as transcendent to the world, he could take up two positions. In the first place he could marvel at it and put his knowing *spirit* in motion in order to grasp the Absolute and become conscious of his participation in it (*sich in es einzugliedern*). That is the origin of *metaphysics* in all its manifestations. Only very late in history did it make its appearance, and only among a few nations.

However, man could also populate this absolute sphere of being with arbitrary figures in order to find *shelter* in their power through cult and ritual. This desire grows out of the irrepressible longing for shelter and security, not only for one's individual existence but in the first place for the entire species. This longing is based on and aided by the immense *surplus of fantasy* with which man has been equipped from the outset, in contrast to the animal. Such a longing is explained by the fact that human beings, through the basic activity of their spirit (their alienation from nature and their objectification of nature), seemed to fall back into pure "nothingness." Such is the origin of *religion* in its various forms. They are *primarily* religions of groups and tribes, and only later, concurrent with the origin of the state, they become religions characterized by *founders*:

> The world is certainly given to us first of all in our lives as resistance to our practical life, before it becomes a Gegenstand for our knowledge. It is equally certain that such products of our thinking and imagining about those newly discovered spheres yield strength to man to maintain himself in the world. Such aid first came from myths, later from religion freed of myths. In the course of history all these attempts preceded the many forms of truth-seeking knowledge found in metaphysics.[1]

The monotheism of the Jewish religion is rejected by Scheler as "childish." He also rejects the monotheism of the Christian religion, of a higher conception through the idea of the incarnation of God but equally clinging to faith in a spiritual God, who in his spirituality is omnipotent and personal.

In contrast to this monotheism, the fundamental relationship between humankind and the Ground of the cosmos consists for Scheler in the fact that the deity becomes immediately conscious of itself in humanity and realizes itself in it. For a person as both a

1 *Ibid.*, p. 109

spiritual and and organic being is only a partial spiritual center and an urge of something existing through itself. This is the ancient thought of Spinoza, Hegel, and many others:

> . . . primeval Being becomes conscious of itself inside a person in the very act by which that person becomes aware that he is grounded in this Being. We must now transform this thought, thus far presented too one-sidedly, in such a way that this knowledge – of being so grounded – is a result both of our active commitment to the ideal command of the Deity and of our endeavor to fulfill this command and in this fulfillment to ultimately bring forth from this primeval Being the emerging "God" in a process whereby spirit and drive increasingly interpenetrate.[1]

In the final analysis, however, one should never look for theoretical certainties which would precede this active commitment. Only by putting one's person on the line can one come to "know" this *Being* "by itself."[2]

From these statements just quoted we can see how the ideal of personality is openly confessed here as the woof of the metaphysical ideal of science.

We have reproduced Scheler's reasoning about the essential structure of a person so elaborately here for a number of reasons. His ideas on these matters have gained an enormous influence in a short period of time. His philosophy has to a certain extent caught on also in Christian circles; possibly because of his earlier theistic standpoint in metaphysics? His system provides an extremely consistent example of humanistic anthropology. And finally, it lends itself very well to countering it with an opposing system, in order to place our own views in a sharper light.

Scheler's reification of the functional-relative

First of all we will now deal for a moment with the reification which we have already demonstrated in Scheler's view of spirit. In an earlier chapter, while examining Hume's psychologism,[3] we have already remarked that reifying does not necessarily mean *substantializing*. Therefore, the reproach of reification that we direct against Scheler's concept of spirit can certainly not be disproved by

1 *Ibid*., p. 111.

2 *Ibid*., p. 113.

3 [This chapter is not found in the extant manuscript.]

a simple reference to his statement that the cosmological substance concept cannot be applied to spirit as "clean, pure actuality."

Earlier we recognized the essence of reification to lie in the *absolutization* of that which is *functional-relative*, that which is consigned to below the boundary of the cosmic law-order.

With Scheler, just as with Heidegger, Litt, Hoffmann, and other phenomenologists influenced by Dilthey, the entire complex of the normative subject-functions was reified under the denominator of *logical actuality*, which itself can no longer be made into a *Gegenstand*.

Here again we face the problem of the fully actual, so-called "pure I" (what Scheler calls "person"). The neo-Kantian and modern phenomenological schools in philosophy in particular try to find their absolute Archimedian point for philosophic thinking in this "pure I." With Scheler, this has assumed a different character only insofar as he, in in keeping with his personalism, views this pure actuality in an *individual* fashion.

In itself there is something extremely tempting in the thesis of a "transcendentally purified" consciousness as a starting point. I will now for a moment leave alone the obvious argument that such a starting point can never be an Archimedian point for philosophy, since an essentially necessary law-conforming *correlation* exists between the reflecting activity of the so-called "pure consciousness" and its *Gegenstand*. For this reason Husserl's thesis that the "immanent being" as a fundamental *nulla re indigens ad existendum* would imply an absolute "being" is clearly incorrect. A starting point which from essential necessity requires a *correlate* cannot be absolute.

But I will now demonstrate that in the attribute of "actuality" in itself nothing is to be found that belongs *above* all the others to a specific subject-function such as the logical-reflecting one.

In truth, actuality belongs to every subject-function. We will be able to understand the full import of this thought only when we will deal with the epistemological problem in particular, especially with the question regarding the logical "grasping" of *meaning* about which we have already given some introductory remarks in the previous chapter.[1] In this context we merely note that without

1 [These remarks could not be traced.]

an ultimate nucleus of actuality not a single subject-function can exist.

This truth was only lost when humanism began to take nature one-sidedly as an *object* for knowledge, and reserved the concept of subject in an equally one-sided way for knowing and normatively acting subjectivity. At least in an epistemological sense, *Gegenstand* only becomes a subject-function in a cosmological actual relationship between the subject-function of the *Gegenstand* sphere and its objectification in the logos.[1] For the logical grasping of the meaning of a *Gegenstand* sphere always demands a synthesis between actualization and objectification of that meaning. Such a synthesis is only possible because persons also possess the *subject-function* of the *Gegenstand* sphere in themselves *realiter*, i.e., in actuality. However, this objectification and, with it, the epistemological "making into a *Gegenstand*" (*Vergegenständlichung*) can never cancel the actuality of the subject-function concerned. In other words, every subject-function is *qua talis* actual – the physical, the biotical and the psychical as much as the logical-reflective.

Now the following question arises: Can logical reflection itself, as actuality—that is, on our view in its character of subjectivity—be made into a *Gegenstand*? Undoubtedly, the reflective *actuality* of the logical subject-function as such cannot again be *logically* objectified. It can only be subjectified in the sense of being actualized. But similar things can be said, for example, of the psychical activity of the subject.

1 *Editorial note* (DFMS): Dooyeweerd correctly argues that any act of objectification is the result of the activity of a subject manifested in a *subject-function*. However, the sentence starting with "At least in" and ending with "in the logos" is ambiguous, for it speaks of a *Gegenstand* becoming a "subject-function" while holding at the same time that this happens through "its *objectification* in the logos" (emph. added). Although Dooyeweerd intended to draw a sharp distinction between the subject-object relation and the *Gegenstand*-relation (with the latter restricted to the non-logical aspects), he did not accomplish this consistently, for sometimes he speaks of the logical aspect itself as being a *Gegenstand* of our "actual logical function" ("of theoretical analysis") (respectively Dooyeweerd, NC-I: 40, footnote 1, and NC-II: 463). Occasionally he also states that the pre- and post-logical aspects of reality can be logically objectified (cf. *NC*, 1:40n and 2:463). A brief overview of the problems is found in my *Philosophy*: *Discipline of the Disciplines* (Grand Rapids: Paideia, 2009), pp. 361-68.

A psychical experience cannot be psychically objectified but only be actualized, be it by submerging oneself again in a psychical act once experienced, or in a totally new experience. But the logical activity as actuality most certainly can be objectified by the post-logical normative subject-functions, for example, the moral or pistic function. Although this does not give rise to a *Gegenstand* relation in an *epistemological* sense, it does so in a *practical-normative* sense. Conversely, a post-logical actuality, for example, the juridical, social, or moral one, can in its turn be made into a perfectly logical object, and in this way is amenable to being made into a *Gegenstand* if a normative science is to be possible. Nicolai Hartmann has already pointed this out entirely correctly in his critique of Scheler's theory of personality and activity.[1]

Scheler's thesis that "acts are no *Gegenstands* at all" holds therefore, in its character of *subjectivity*, for all actuality, not merely for that of "spirit." On the other hand, "purely" reflective actuality exists no more than any other subject-function "by itself."

A prejudice is contained therefore in the exceptional position which, in phenomenological circles, is assigned to the actuality of logical-eidetic reflection, i.e., to its lack of *Gegenstandsfähigkeit* (ability to be made into a *Gegenstand*). This prejudice goes back historically to Descartes' founding of philosophy in the function of the *cogito*. In particular Fichte has already shown this in its full acuity in his *Wissenschaftslehre* of 1797.

By reifying the normative subject-functions under a logical-eidetic denominator, as occurs in Scheler's concept of the spirit, he has obviously misunderstood the law in in its character as boundary. By this the *speculative* road in philosophy, already condemned long ago, is entered again. The essential law-conformities discovered by logical reflection are uncritically detached from their foundation in the cosmic law-order, and proclaimed to be truths by themselves (*an sich*) for every possible cosmic coherence. And so the road is again clear for metaphysical speculations detached from a revelation about God and the world of angels, as we can encounter them in Scheler's writings. The consequence is the dynamic pantheism in Scheler's final publication.

1 Nicolai Hartmann, *Ethik* (Berlin, 1926), pp. 207 ff.

Highly characteristic for the hypostatic foundation of Scheler's concept of spirit is the way in which he tried to arrive at an idea of a spirit *free* from the body in his work, *On the Eternal in Man*.[1] This occurs through a consideration of the human spirit in the direction of a gradually *decreasing* dependence upon the body. This consideration leads to the *boundary* concept of a "spirit free from the body" (*leibfreier Geist*). In this way Scheler even arrives at a hierarchic ordering of the ideas of possible kinds of spirits.

At least on this point we can subscribe to the sharp-witted way in which Theodor Litt criticises this concept of spirit in his work on *Individual and the Community*.[2]

> There is nothing against trying to incorporate beings that are pure spirit; and nothing prohibits assigning them an exaggerated perection that makes a mockery of the spirits of all earthllings. But it would in no way be permissible, for the sake of retaining "pure" spirit, to gain a picture of these beings by *depriving* them of that through which spiritual life is familiar to us, i.e., its *body*. In that case the body is eliminated, canceling any participation in a perceivable reality. The conditions that lead to the appearance of a truly "spiritual" life are eliminated at the same time. All expressions by the "essence" of spirit which we can make include communion with the corporal world. If one wishes to brand this an "anthropological" contamination of structural doctrine, this amounts to a piece of anthropology from which the phenomenology of consciousness cannot, nor should it, free itself, since actually the body enters into meaningful experiences as the building motif.[3]

Scheler's concept of "leading"

Indeed this hypostatic concept of spirit, gained through *logical abstraction* from the full cosmic reality of humanity, stands in an irreconcilable antithesis to the Christian religious view of the spirit. In spite of all liberation from the cosmic in the narrow physico-psychical in which Scheler takes it, his philosophy *degrades* a person's being by reifying the spiritual functions. And here we touch on the critical point of the "leading function" in the essential structure of

1 Max Scheler, *Vom Ewigen im Menschen* (Leipzig, 1921), 1:468.

2 Theodor Litt, *Individuum und Gemeinschaft*, 3rd ed. (Leipzig, 1926).

3 *Ibid*., pp. 167-68 (ital. mine, HD). Of course we adopt Litt's criticism only insofar as it directs itself against Scheler's reified concept of spirit.

human nature, whereby the unbridgeable difference between Scheler's view of this concept and our view of it sharply comes to the fore.

According to Scheler, the spirit is not capable of creating but merely of directing or steering and guiding the physical and psychical energy. If this view were correct, the trans-cosmic root of a person's being would, for its enfolding, necessarily be bound to our cosmos (in Scheler's view to the spatial-temporal, physico-psychical functions of reality). In that case, the religious fullness of a person's being, the supra-temporal unity and integration of all cosmic functions of reality, is not located in this root, but is merely a superstructure resting on a cosmic substratum existing in proud independence.

The question as to where the deeper unity of a person's *cosmic* structure lies can then no longer be answered. Between matter, life and "spirit" there is no deeper unifying link through which they are all grounded as functions of one trans-cosmic root (in our view the *religious* creaturely unity, "the human being"). Instead, "cosmos" and "spirit" stand in a relation of tension opposite one another as independent entities. Spirit, in itself powerless, must "lead" the cosmos, the source of all power.

Now we know from our earlier expositions that the concept of "leading," taken as a cosmological concept, leads to endless relativity. The question as to *where* such leading of the cosmos brings us cannot be answered by means of any cosmic function, nor by means of the *totality* of the so-called spiritual functions. It is precisely because these *functions* are as such *relative* that they are not capable of directing or "leading" to an ultimate goal.

As we saw, all things that possess a "leading function" are thereby characterized as cosmic-perishable, as "limited to the temporal." Plants as well as animals, the state as well as the church,[1] the enterprise as well as the work of art possess a "leading function." Only human beings do not possess it *as such* because they have not been created for this world but for eternity.

In a person's religious root the entire cosmos in all its functions has been brought into an immediate relationship to the absolute

1 [Dooyeweerd speaks here of the church in its temporal appearance, not in its supra-temporal fullness and unity.]

end-goal of creation: the glorification of God. Only from here does the light of eternity play across this world, not from a reified "spirit" which, in spite of all attempts at absolutizing, does not transcend the boundaries of sphere-sovereign modal aspects.

When carried through consistently, Scheler's reification of the spirit necessarily lapses into pantheistic relativism, to which, as he frankly admits in the foreword of the third edition of his *Formalism in Ethics*, the foundations of his system *had* to lead. In fact this relativism is connected with the deeper metaphysical tendency in the humanistic personality ideal. In earlier works of Scheler, especially in his major work just mentioned, it was only curtailed by the theistic foundation of all values in the existence of an absolute infinite personal divine spirit.[1]

As soon as this theistic standpoint was abandoned Scheler's essentially dynamic concept of person and spirit no longer had an absolute basis. Not one of the functions reified in the concept of spirit is as such absolute. Also, the logical-reflective function of the spirit, which as we have seen served Scheler as the metaphysical comparative denominator of the spiritual functions as essences (*Wesenheiten*), bears altogether the dynamic character of actuality; it is not a *being* resting in itself but demands its correlate.

In his still theistically conceived major work on ethics, Scheler presented a schematic axiology. Here the chain of values with respect to the "holy" was placed above the spiritual values: aesthetic values, the values of justice and injustice, those of the "pure recognition of truth." This chain of the holy was then to be grasped in an original (apparently religious) spiritual activity of love, part of whose nature is that it can only be related to persons.

In his final treatise, *Die Stellung des Menschen im Kosmos*, however, the system of this axiology appears to have been shattered by the fact that religion is degraded to a merely historical preliminary stage of the "forms of truth-seeking knowledge found in metaphysics."[2]

Deification of spirit

Meanwhile, the "active commitment of our center of being to the ideal command of deity" is postulated even now as the basis for

1 Scheler, *Der Formalismus in der Ethik*, p. 412.

2 *Ibid.*, p. 109.

this metaphysics; and the one-sidedly intellectualistic view of Spinoza, Hegel and others is denounced. With growing urgency we ask: What then *is* this "center of being" (*Seinzentrum*) of our personality, this apparently Archimedian point in the dynamic concept of personality? Clearly it is not the *logos* itself, even though this served as the metaphysical comparative denominator for the spiritual functions. Scheler's characterization of the human personality as a "monarchic hierarchy of acts, one of which always leads and guides," even sounds completely relativistic.

The solution to the problem which Scheler confronts us with lies in the religious *core* of his humanistic personality ideal, the deification of the personality as such, which is undoubtedly a religious attitude. It is the "devotion of the person to the deity" which lies at the foundation of Scheler's entire metaphysics. The person in all the relativity of its cosmic spiritual functions is deified in Scheler's religious-humanistic attitude; *that* is the core of his dynamic pantheism!

> In our view, the birth of man and the birth of God rely on each other from the outset. Human beings cannot reach their destiny without recognizing themselves as members of both those attributes of the highest Being [i.e., drive and spirit] and as themselves living within this Being—no more than that this "Being in itself" can reach its destiny without the cooperation of man's spirit and drive, the two attributes of being. Neither man nor God can reach his destiny without their mutual interpenetration.[1]

Finally:

> Absolute Being does not exist to support man or to complement his weakness and needs, which time and again desire to make this Being into an object (Gegenstand). It does, however, provide us with a "crutch," namely the support provided by the concerted labor of value-realization in past world history to the extent that this labor has already achieved the making of the "deity" into a "God."[2]

And so, in a religious final reification, the cosmic relativity of the "leading spiritual functions" in their functional relation to the natural functions are together elevated to the spirit's process of becoming God! The deification of the human personality, the nucleus of the humanistic personality-ideal, has unmasked itself as an

1 *Ibid.*, pp. 113 f.

2 *Ibid.*, p. 115.

absolutization of the cosmic-relative. But, in its deification, the personality is at the same time *degraded* to the cosmic-relative, to the area of the "leading functions." With this we touch for the last time on Scheler's metaphysical concept of "leading." According to him, spiritual functions possess no energy of their own; they can do nothing but give "steering and guidance" (*Lenkung und Leitung*) to the physical and psychical functions.

We too assigned a *leading function* to the cosmic-normative subject-function with regard to the a-normative functions. We too opposed the view that the higher (cosmic) form of being as "essential form" is to be the functional "cause" of the lower ones. But with that we do not deny the "sphere-causality" to the normative functions, which Scheler indeed does. When someone *seduces* another person into an immoral action, this "seducing" in its moral side has to be understood in an ethical-causal sense, i.e., as the moral effect of the one ethical subject-function (as function of the will) on the other. It is not a mere "guiding" of someone else's natural functions in an a-moral sense.[1]

Scheler's view of spirit as an entity that *only* leads and guides becomes more fatal still because he reifies the spirit's activity into a trans-cosmic one. As a result, the religious root of a person's being becomes something that is "powerless" in itself: it too is made subject to the concept of steering in Scheler's sense. Obviously this is in absolute conflict with the Christian life- and world-view. In its Christian religious sense, spirit is the opposite of a reified thing. As a *human* spirit it is the root of a person's being, transformed by God's spirit. From it alone issue *all* cosmic subject-functions of a person. It is impossible to subsume this relationship under the cosmological concept of "leading function." Not a single cosmic function possesses independence vis à vis the religious root. To use the earlier applied symbol once more, they are merely "refractions of the unbroken light."

The human spirit in the religious sense is of course not the *creator* of the cosmic functions. Instead, the relationship between the spirit and its functions in our cosmos is itself a creaturely relationship, founded in a divine act of creation. Only God is the Creator, who has called our cosmos into being through the Word of His Power.

1 [The ms. has "immoral" but "amoral" seems to be what is meant.]

Speculative Greek idealism, both in its radical Platonic form and in its moderate Aristotelian form, has in fact never grasped the Christian notion of creation. It remained caught in a dualistic metaphysics, in which matter, be it as the *mē on* or as the *dunamei on*, retained its independence over against the *nous*. Therefore, the form-matter scheme of Thomistic scholasticism is not in the least Christian as Scheler suggests; it arose, rather, from the Greek reification of the *nous*. Christianity has never taught the "idea as a power in and by itself" (*die Selbstmacht der Idee*) but rather has also related human reason with its world of ideas to an act of divine creation. For this reason the idea of God as "pure form" (*actus purus*) is un-Christian to the core.

Conclusion

In our elaborate refutation of Scheler's theory concerning the being of a person, it became apparent that we *deny* the existence of a specifically leading or qualifying function in the cosmic structure of being human. For to accept such a leading function would necessarily introduce a functional limitation and relativization of man. This could not be reconciled with the eternal value of man .

One can undoubtedly say that all normative subject-functions together depend on human activity for their actualization and realization. We can conclude from this that all thing-structures of a normative qualification are as such *dependent* individuality-structures. *If need be*, one can even call all the normative subject-functions together typically human. But with the *complex* of these normative functions one can still distinguish the human being from nature with its vegetative and animal kingdom only in a *relative* way. I say relative because all cosmic functions exist in an inseparable coherence of cosmic *relativity*.

The failure to grasp this truth is the weakness of all metaphysical theories about man based upon a reification. Whoever wishes to understand the altogether unique position of man in our cosmos must abandon functional distinctions such as those of the classical theory with its qualification of man as a "rational-moral" being. The unity in cosmic things is based in cosmic law, and is as such perishable and relative. At the same time the unity of man is found-

ed in *trans-cosmic* fashion in the religious root of the human personality, which is either directed towards God or turned away from God.[1]

Man's fall into sin was not a functional transgression of some norm but apostasy from God in the trans-cosmic, religious root of man. Therefore, it fundamentally touched *all* spheres of the cosmos *without a single exception*. In man alone our entire creation stood in a covenant relationship with God. With man that entire creation came under the curse because the entire cosmos possesses its religious unity in man. Outside this religious foundation no unity can be discovered in the cosmos.

Under the influence of sin in the religious root of our creation the cosmic process of the disclosure of the anticipatory spheres leads to continuous collision and painful disharmony. Even nature must suffer under that. Man was given the task to carry this process of disclosure in nature up to the ultimate anticipatory sphere in order that everything would be subservient to the glorification of God. Only in this way could complete harmony reign in the refraction of sphere-sovereignty, and could the religious unity of creation trans-illuminate the refracting boundary line.

However, when man wished to be like God and began to look for meaning within himself, the absolute ultimate purpose of the process of disclosure disappeared from his view. The absolutization of the relative, which definitely did not just make itself felt in the theoretical domain, but rather was based in a *life-directing attitude*, disturbed the harmonious development in creation. By turns, man was pressed down to nature (*naturalism*) or, conversely, nature was seen as evil (*asceticism*), or else spirit and nature were placed in opposition to one another as independent substances. To speak with Spranger, the "life form" of the person of power, the person of science, the aesthetic person, etc., made his appearance, all pointing towards making what is functional and temporal into the absolute and the divine.

Nature had to suffer under this. For nature is no "thing in itself"(*Ding an sich*) outside all connection with the religious root of humankind, outside all connection also with the normative func-

1 Calvin wrote in a similar vein in his *Institutes* 1.3.3 (last paragraph).

tions of the human personality. In its normative object-functions it waits for its disclosure, which alone [...][1]

1 [Unfortunately, this is where the manuscript ends abruptly in mid-sentence. After Dooyeweerd remarks on the central-religious, transcendent, radical meaning of the fall, one would have expected similar remarks on redemption and consummation in Christ. Cf. e.g. *NC*, 1: 60 ff., 175, 506, 522; 2: 32 ff., 294 ff., 299-307, 337, 364, 418, 549, 564; 3: 29, 537, 561.]

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