What is Life?

The Originality, Irreducibility, and Value of Life

Josef Seifert

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EDITORIAL FOREWORD

Josef Seifert's *What Is Life?* is the first contribution to the *Central-European Value Studies* from the International Academy for Philosophy in the Principality of Liechtenstein, one of the co-sponsoring organizations of the CEVS special series. Professor Seifert is also on the Board of Editors of the special series. Thus, I would like to take this opportunity to welcome Professor Seifert and his book to CEVS.

Seifert argues with scholarly depth against scientific reductionism in our understanding of life, and he challenges the reader in an examination of the grounds for recognizing the dignity of life. These are important and worthy topics which repay reflection. I am certain that Seifert's contributions in this work hold out considerable potentiality for learned dialogue on the topics he addresses. We look forward to seeing further books from Seifert and from his colleagues in Liechtenstein.

H. G. Callaway
Editor, CEVS

PREFACE

Josef Seifert takes up the classic question, "What is Life?," in critical reflection upon the lectures that were published in English under this title in 1944 by the Austrian Nobel Laureate in physics, Erwin Schrödinger. Schrödinger's groundbreaking efforts to connect the leading edges of the physical and biological sciences in his little book were the culminating work that I had to study in my final college course on the Natural Sciences at the University of Chicago in 1955. But Schrödinger's approach to the question of life remained that of the scientist. Fifty years later, Seifert shows with subtle care that the very question is a philosophical one, and therefore it must be treated by the methods and distinctions of philosophical study.

Life, philosophically questioned, calls for understanding of its irreducible essence. A biological or physical approach that seeks to explain living organisms in terms of mechanism and matter misses the very life of life. Seifert turns upon the question his lifetime of familiarity with the grand traditions of philosophy. Centuries of thought are brought to life in this study of the central question of life. In the spirit of philosophical dialogue, Seifert's closing chapter takes the agreeable format of question and answer. This groundbreaking contribution is a scholarly yet spirited defense of the dignity of life.

Robert Ginsberg
Executive Editor

ACKNOWLEDGEMENTS

I wish to acknowledge the support I have received, in completing the final version of this book, through a grant of the Swiss National Foundation for the Sciences (*Schweizerischer Nationalfonds*) which supported a research project under my direction on the philosophical aspects of the concept of health.[1] This research into the philosophic dimensions of the concept of physical and mental health led to many improvements of this book on life. The philosophy of life here presented, which I had completed in earlier drafts before undertaking the health project, proved useful for the completion of the tasks of the research project on health.

My gratitude extends to the Pontifical Academy of the Sciences, in particular to Mons. Ing. Renato Dardozzi, whose invitation to participate as an expert in the Plenary Session of the Academy on "The Emergence of Complexity in Mathematics, Physics, Chemistry, and Biology," and to speak on the irreducibility of life to chaotic and non-chaotic physical systems became the origin of this book. I would probably never have written it without his invitation. I wish to express my cordial thanks to those scientists and illustrious members of the Academy who participated in the discussion following the presentation of my paper, for having posed the questions contained in Chapter Five of this book and for having given me valuable critical suggestions.[2]

My thankfulness addresses itself as well to those who have read carefully different versions of the manuscript of this book and have made helpful comments on them. I think here in particular of two distinguished philosophers and friends, Roderick Chisholm and Rocco Buttiglione, and of Alejandro Serani, professor of medicine. The philosopher Dr. John White, my dear friend, collaborator, and former student, made significant stylistic and philosophic comments on the present book for which I thank him cordially. I am grateful to Dmitry Atlas, who has examined the text from the perspective of a philosopher and of a physicist. In addition to his careful critical reading of the text, I owe to him more precise elaborations on the laws of physics which I touch in this book. Benefits of like nature I have also received from his brother Valery Atlas to whom I am especially indebted for his having directed my attention, through his paper, "On the Principle of Complementarity," to the contributions of Niels Bohr on the nature and irreducibility of life.[3] My gratitude extends likewise to Dr. med. Paulina Taboada who has examined scrupulously many biological aspects of the present work, to Dr. Kateryna Fedoryka and to Patricia Donohue-White who have made many helpful philosophical suggestions regarding the problem "What is life?" during our joint research work on the philosophical concept of health.

I thank also the Executive Editor of this series, Robert Ginsberg, for accepting this work, for his many helpful suggestions, and for the discrete and

generous way with which he applied to my text his strict editorial prescriptions regarding style, especially the elimination of so-called "sexist" language (for example, the elimination of the English "man" in the sense of human being (*Mensch*) or the introduction of "he or she" as personal pronoun for "person"). I had informed him rather rudely of the fact that I regard a so-called "non-sexist style" as a misunderstanding of the trans-gender-meaning of these terms and as a linguistic barbarism that affects the substance of language and philosophical thought by eliminating central notions as, for example, man/*Mensch* or the non-gender-related use of masculine and feminine pronouns, as well as simple (uncomplicated) pronouns for persons and human beings, and introduces instead the "he or she" or the horrible *s/he*. He not only received my objections calmly and patiently but applied his principles in such a subtle and generously easy-going way that I have to admit that they became almost natural to me. This does not prevent me from preferring the classical use of language and from thinking that it has nothing to do with "sexism." Just as no German will take the pronoun "*sie*" ("she") for *Person* as a sign that persons are considered feminine and men are excluded in German, no normal user of the English pronoun "he" for persons will have a "sexist" meaning in mind. Instead, Thomas of Erfurt (or Duns Scotus) seem to be right here in distinguishing in the *Grammatica speculativa* four kinds of gender, insisting on the "inclusive" or "common" one where masculine or feminine forms and pronouns include both male and female members. Besides the *masculinum*, *femininum*, and *neutrum*, according to them, a fourth "common" gender (*sexus commune*) occurs, namely, as the author of the *Grammatica speculativa* points out quite well (and to recognize this would in my opinion avoid the sexist interpretation of male or female inclusive pronouns), there is a special *discretio sexus*, the *genus commune*. In its linguistic form the *genus commune* is either masculine or feminine (*quod nec differt a masculino nec a feminino*) but in its meaning comprises both sexes within itself, as, for example, in *homo* (man) when this term signifies human persons as such.[4]

I am grateful to Hofrat Dr. Eberhard Tiefenthaler, a pioneer librarian who died too young from cancer, for having created a wonderful place and atmosphere in form of the *Landesbibliothek Vorarlberg* in Bregenz, in whose *Kuppelsaal* I completed large portions and the final redaction of my book, drawing from the extraordinary beauty and rich historical and spiritual atmosphere of this place in which more than 2,000 years of European culture come to life. Mindful of these benefits and of bonds of friendship between his family and mine, I feel that this book, the first one I completed in this library, belongs especially to his memory and to his family.

I wish to thank especially Mrs. Veronika Albicker for the care which she invested in typesetting and preparing this manuscript for publication.

Finally, I thank heartily my wife, who has given me much human and moral support in my work, and my entire family for their patience with my using too much precious time which should have belonged to them, for the completion of this book.

The book is dedicated to my dear brother-in-law and sister-in-law and friends Dr. Roy Heyne, Jr., and Liz (Elizabeth) Heyne who are deeply committed to their medical work and at the same time intensely interested in questions of philosophy, particularly in those which regard the nature and value of human life.

25 January 1997

Introduction

EMPIRICAL KNOWLEDGE AND PHILOSOPHY FACE TO FACE WITH LIFE: A FRESH START, 50 YEARS AFTER SCHRÖDINGER

Some fifty years ago, the Austrian physicist and Nobel Laureate Erwin Schrödinger wrote a groundbreaking book, entitled *What Is Life?*,[1] which influenced significantly theoretical discoveries in biology and might even have given rise to the ensuing developments in the life-sciences that culminated in the discovery by James Dewey Watson and Francis Harry Compton Crick, in 1953, of the double helix of the chromosomes as bearers of genetic information.[2]

Schrödinger's book is outstanding from a scientific point of view and because of its position in the history of science, but also in view of its philosophical contributions, introducing striking concepts and terms as, for example, "negative entropy" to get at the irreducible newness of life, and suggesting innovative ideas – which were verified empirically only later – such as that precise "genetic information" lies hidden at the origins of the development of organisms.

The search for something like genetic codes had its roots not only in some suggestions of twentieth-century scientists but also in twentieth-century philosophy of life. For instance, Conrad-Martius has presented an outstanding defense of a new version of "preformism" that is much akin to the idea of genetic codes.[3] The basic ideas which inspired the search for a genetic code are much older, however, and go back to the Presocratics, to Aristotle, to Clemens of Alexandria's "*spermata tou logou*" and to Augustine's "seminal reasons," as well as to "preformists" and some "epigeneticists" who participated in the philosophical debates regarding biology from the eighteenth to the twentieth century.

In putting Schrödinger's work into perspective and taking from it an absolutely singular historical role as the origin of crucial insights about life, I do not deny its extraordinary significance in the field of philosophy and theory of life. Schrödinger's work contains many strikingly original ideas which became seminal for diverse future developments. For instance, Ludwig von Bertalanffy speaks of the "irreversible entropy" in the physical universe in contrast to the "negentropy" or "reversible thermodynamics" characteristic of life.[4] Using the term "negentropy," he is implying that the second law of thermodynamics, which asserts the tendency, within a closed system, to reach a state of highest

probability which is also a state of greatest disorder, is here replaced by its opposite: negentropy. In other words, the tendency toward supreme disorganization, and thus a fundamental law of the life-less physical universe, is reversed in living organisms where we find a tendency to higher order, greater complexity, and higher forms of energy and organization. Bertalanffy likewise applied these concepts in his original theory of life, which remains significant to this day, under the name of "The General Systems Theory."[5]

Similar ideas, however, are found also in Schrödinger who came across many of his theses and insights by philosophical reflections which he pursued as a physicist who was struck by the apparent physical inexplicability of life and who explored the possibilities of physicalistic explanations of the phenomenon of life and their limits. He approached the question of life from his viewpoint as the leading quantum physicist of the time. Yet he did not reflect mainly on the possibilities and limits of specific quantum mechanical explanations of biological data and on hidden physical properties of the phenomena observed in organisms, but he reflected instead on the basic facts of life known to everyone.

Remarkably enough, few, if any, comparably significant recent books on the question "What is life?" written by a biologist or a philosopher appear to exist – with exceptions such as Plessner's *Stufen des Organischen und der Mensch* and some of Conrad-Martius's works.[6] These are undoubtedly in many respects more important books on life than Schrödinger's work. To them I shall frequently refer. They also have the advantage of making reference to more recent developments in biology. Some of them, moreover, explore the question "What is Life?" quite extensively and philosophically.[7]

Classical sources also exist, as, for example, Aristotle's writings on the essence of life, *De Anima,* Immanuel Kant's *Critique of Judgment,* and others, which contain perennial contributions to a philosophy of nature and of life and which I regard as much more important works than Schrödinger's book. Yet these classical writings presuppose an entirely outdated biology and, for this reason, cannot be – in their entirety – the basis of a sufficient contemporary philosophy of life. For while philosophical methods of essential analysis do not depend in their content or method on the results of the empirical sciences, they are related to them and inspired by them, especially when they treat such a "substantially interdisciplinary" or "multidisciplinary" issue as life.

Some might think that Hans Jonas's *The Phenomenon of Life* is another exception to my judgment of the singular importance of Schrödinger's book. But one can argue against this thesis. For Jonas's work is a collection of essays that do not exclusively relate to the theme of life and do not pursue this topic at great systematic length or depth. Besides, the most remarkable insights of his book refer to points other than the essence of life, for example, to the historical reversal, which, in recent centuries, regards not living things but dead

matter as primary phenomenon and as preceding life. Jonas shows brilliantly that much of modern thought on life stands under the verdict and "climate of a universal ontology of death."[8] Yet all of these insights refer to other problems than that of the nature of life. Many other notable insights of Jonas refer to the lived body and sense perception rather than to the central question of Schrödinger's book, namely, "What is life?".[9] Furthermore, while Jonas's book contains more specifically philosophical thoughts than Schrödinger's, and while it conveys striking philosophical insights, it appears a less important work on life than Schrödinger's book, for it is less rigorously argued yet more rhetorical, and for this reason leaves the reader dissatisfied, especially when seeking an answer to the question of what life is.

I am not concerned here, however, with judgments about historical figures and the rank of their work but with the question "What is life?" itself. Thus, it is proper for me as philosopher to follow the great physicist's lead and ask myself fifty years later with equal seriousness: "What is life?"[10] Although it may have been the physicist Schrödinger who has asked "What is life?" with greater intensity than any other thinker in our century, this is a question whose answer concerns the biologist more than the physicist, and the philosopher even more than the biologist, for it is a philosophical question.

This philosophical question deserves a better answer than the one Schrödinger's book provides, even if a philosophically speaking better book than his will probably have less influence on the development of science than Schrödinger's work exerted – paradoxically – partly through its worst philosophical element: its reductionism. Saying this, I do not wish to deny that the remarks made by him, rather casually, on the idea of genetic information were quite influential too, and have nothing to do with reductionism.

Both philosophical discoveries and philosophical errors can inspire empirical scientific findings, for manifold and complicated mutual relationships exist between philosophical and empirical knowledge. The complex and dialectical relationships between philosophy and science forbid us also to assume that the scientific success of some theories, such as that of evolution or that of the relativity of time, automatically guarantees the truth of the philosophic assumptions underlying a given scientific theory. For example, the success of non-Euclidean geometry in modern physics or the success of a theory of physics based on the concept of the relativity of time do not prove the truth of the philosophical transition from Hendrik Antoon Lorentz to Albert Einstein or of Einstein's purely philosophical thesis that time itself is relative. Lorentz could explain the same phenomena with his non-relative theory of time as Einstein did with relativity. He distinguished, on the basis of similar empirical observations as those Einstein made, "apparent" from "real" time. Einstein later identified what Lorentz (for good philosophical reasons) had called *apparent* time with real time and proclaimed the relativity of real time. But these are pure

philosophical theses and philosophical *interpretations* of empirical data. Consequently, the truth of Einstein's philosophical conceptions in the light of which he interpreted his influential scientific discoveries and theories is in no way guaranteed by the practical success and universal acceptance of his relativity theory in the scientific world. The same is true of Charles Darwin's theory of evolution. Ditto applies also to Werner Heisenberg's philosophical theses connected with the uncertainty relation that led him mistakenly to deny much supremely evident metaphysical as well as epistemological evidence: for example, the absolute validity of the principles of excluded middle and of causality and the determinate essence of each real thing. Neither success nor consensus is identical with truth or guarantees it.

Even ideological or clearly false philosophical ideas, if we try to prove them by means of science, often lead to positive scientific discoveries. For example, a radical materialist reductionism that believes in the possibility of producing life from non-living chemical substances, or even of human beings from animals, a reductionism that I will refute by philosophical arguments, led to many experiments and important discoveries, in Russia and elsewhere.

In view of this possibility that false philosophical ideas play a positive role in the acquisition of empirical discoveries, the purely philosophical aspects of a reductionist and materialist theory of life, and specifically of the theory of evolution (inasmuch as this theory assumes an immanent development leading from pure matter to humanity), cannot be justified simply by reference to their fruitfulness for empirical research. While Darwin's theory of evolution as well as modern versions of it led to many scientific discoveries of similarities among species, of hereditary laws, etc., this fact alone does not justify the belief that the philosophical ideas of Darwin are true, even though he derived them in some fashion from observational evidence or more precisely, in spite of the fact that he used them successfully in the interpretation of empirical facts.[11]

Incidentally, the history of the theory of evolution and of its various stages and degrees of radicality is far from simple. Darwin himself did not use the term "evolution" except in the later versions of his *The Origin of Species.* It was mainly Herbert Spencer and later Ernst Haeckel who introduced the kind of evolutionary religion that dominated the philosophy of life of the nineteenth and twentieth centuries. Moreover, the hereditary laws were discovered chiefly, as is generally known, by a great scientist who was in no way a reductionist or materialist, the priest Gregor Johann Mendel.

Even the most radical metaphysical versions of the theory of evolution may lead, however, in spite of their falsity, to significant scientific discoveries. Teilhard de Chardin defended the evolutionary thesis in the radical sense of a continuous development from life-less matter through all forms of life up to the "cosmic Christ" (*le Christique*), which involves a kind of evolution of the

world into God. In a less radical form, Grichka and Igor Bogdanov defend an evolutionary concept of life within which any essential difference between living and life-less beings is overlooked. Their view also involves a reductionism according to which life is only characterized by a higher degree of order and complexity, as well as of information, when compared with life-less substances. Undoubtedly, their philosophical ideas may have led them to scientific discoveries, but this does not prove in any way the truth of their philosophical opinions.

As clearest proof of the possibility that false philosophical assumptions occasionally lead to the success of experimental science note that even Adolf Hitler's grotesque and vicious racism and the criminal medical experiments performed on Jewish women in Ravensbrück based on this racism may have led to discoveries in medicine regarding biological racial differences or surgical techniques and infectious diseases.

At the same time, we must remain conscious of the fact that false philosophical ideas frequently and logically lead to serious impediments of empirical discoveries. As was demonstrated by one of the greatest human embryologists of our century, Erich Blechschmidt of the University of Göttingen, the evolutionism of Darwin, Spencer, and Haeckel and their ideas about individual morphogenesis and ontogenesis repeating within the human embryonic development phylogenesis led to serious prejudices and false assumptions regarding human embryology and other empirical matters. Blechschmidt created an important center for the study of human embryos and the largest library of photos and other representations of human embryos in the world, at the University of Göttingen. He proved that the phenomena which were taken to be human gills by many scholars, from Ernst Haeckel until today, are in reality *Beugefalten* (folds) and were mistakenly thought to be gills for ideological reasons.[12] The ideology of evolution led to other errors as well, such as the failure to take note of "missing links" between species.

A similarly ambiguous relationship between experimental science and philosophy could be shown regarding philosophical materialism, which led to many empirical discoveries but also to serious prejudices that barred the progress of experimental science. Especially in the area of empirical brain-mind research, countless empirical findings were ignored or brushed aside by materialists and determinists. In contrast, scientists who overcame the error of the negation of freedom, such as Sir John Eccles, rediscovered ignored evidence for the power of subjectivity and voluntary action on the brain, or even conducted for the first time the experiments necessary to obtain the evidence.

In contrast to philosophical errors, which can have both good and bad results for empirical science, philosophical truths *per se* can never lead to scientific regress. Only their one-sided and therefore false interpretation can lead to regress, as, for example, the exaggerated role assigned to the knowledge of

vice versa, the need arises today more forcefully than before for philosophers not to ignore the great discoveries of science. Each scientific question has philosophical sides. Any isolation that imprisons members of single disciplines in their own compartmentalized fields of study will easily lead to reductionistic explanations and to errors. Such isolation and the errors ensuing therefrom have become more fateful today than they have ever been in the past. For incredibly fast and radical developments have taken place in the interdisciplinary fields of theory and investigation. Many new questions, definitions of life and death, and many other theoretical elements and new modes of praxis emerged in medicine and other fields of research and practical life, and they touch the whole of humanity – both the private and the political life of every human person.

Many significant scientific discoveries, as, for example, Darwin's theory of evolution and Einstein's theory of relativity, as well as the errors that are frequently linked to them, affect our *Weltanschauung* and our very lives. Simultaneously, they involve inevitably ethical and other philosophical questions and positions. This is particularly obvious in medicine and issues of medical ethics. What is true of medicine is true also of the basic concepts of the life-sciences, and even more so of sociology or of psychology, and of the humanities. Therefore, I hope to make not only a contribution to philosophy but also one which will turn out significant for the representatives in the empirical life-sciences and for all of us, members of a humanity which profits from a better understanding of life, and in particular of human life. Human life is gravely threatened not only by the horrors of abuses of the empirical knowledge and techniques of the life-sciences but also by the philosophical errors and misconceptions which lie at the bottom of these abuses.

In this context, special significance must be assigned not only to a general philosophical analysis of life *per se*, and of biological life, but also to the entirely new and deeper phenomenon of specifically *human* life and to an investigation of its higher value and dignity. Ultimately, only in the light of these forms and sources of the dignity of life can an ethics of experimentation and of the application of empirical research in society be judged. Precisely in this area the philosopher can make the most decisive contribution to the understanding of life and to the banishing of those evil spirits which a misguided and unphilosophical empirical science almost necessarily, though unwittingly, unleashes. The investigations into the new essence and dignity of human life are presented in Chapters Three and Four. Chapter Five then has a synoptic character and confronts a number of objections raised by scientists to the defense of the irreducibility of life to chaotic and non-chaotic physical systems.

One

ON THE METAPHYSICAL ESSENCE AND ABSOLUTE IRREDUCIBILITY OF LIFE: THE MANY MEANINGS OF LIFE – AND A BRIEF DISCOURSE ON METHOD

1. Introductory Remarks on the Essence of Life as *Bios* and *Zoee*

In his *Metaphysics*, Aristotle observes that we speak of being in many senses,[1] and he is certainly right in this. It is no less correct to say, "Of life we speak in many senses."

Some of the many meanings of life which will not be treated here include the purely "sensitive" life of animals (in contradistinction to that of plants), but also the difference between the actualized mental life – as opposed to its dormant state – as well as many further actualization within the actualized mental life, as, for example, a given degree of vitality, of mental dynamism, of a properly rational life that involves a right use of intellect and will, of human spiritual life (as opposed to spiritual death), etc.

Instead, I will chiefly investigate the object of the two Greek terms *zoee* and *bios*. These terms suggest at least two of the many meanings of "life," and in the present work I will clarify the meanings of these two terms and above all the things to which they refer. Both of these terms have many meanings in Greek, some of which will be excluded from the following considerations. What, then, are we to understand under these terms?

Under *bios* we should understand the organic life of plants, but also of animals and of human beings, and thus a life which is inseparable from a body. *Zoee*, on the other hand, refers to all kinds of life, both to the most universal essence of life and to the supreme real or even thinkable forms of it. My interpretation of *bios* in its distinction from *zoee* is arbitrary in a purely linguistic respect. For "*bios*" can also refer, not to the opposite of death (as *zoee*) but to a "form of life," in relation to "ethos" or political life.[2] But I will use *bios* as a technical term referring to the (biological) life of organisms as it is inseparable from the body. In this sense of the term, *bios* stands in contrast to the immortal life of a soul separated from the body, as Plato defends it in the *Phaedo*.[3] Hans Jonas seems to regard this kind of *bios*-life as the only one in the human being as well. This is probably also the reason why Jonas – besides the "eternal im-

age of the self" and some form of "eternal fame" – does not recognize any real life after death.[4] Later I will give a more complete list of the properties of biological life and get at the very essence of it.

2. "Being in Itself" and "Self-Motion" as Universal Properties of All Life – The Analogous Meaning of Self-Motion and Freedom

The terms *bios* and *zoee* have some elements in common which should be explored. Both *bios* and *zoee* in their strict sense refer to that actuality and dynamism which only real beings can possess. Fictions, irreal or abstract objects can never possess life, but only beings that are real in the full sense of the term, as Hans Jonas points out well:

> The abstractions themselves do not live ....[5]

While fictitious objects or pure intentional objects of consciousness may be *given to us* as living objects and may *appear to live*, purely intentional objects *can never actually* live.[6] The first ontological condition of life is the autonomous being in itself of an object. Only *things in themselves can* live, never appearances that can only appear to live. For this reason, not only Immanuel Kant's negation of the possibility of knowing things in themselves but also Edmund Husserl's position according to which we can only reach intentional objects and *noemata* of consciousness cuts off a real way to the knowledge of life. This can only be provided by a realist philosophy which recognizes the transcendence of the human person in knowledge that allows him or her access to beings in themselves.[7] Husserl, after his turn to the transcendental phenomenological standpoint, in *Cartesian Meditations* and other works, lays emphasis on the idea of life, insisting on the life of this *ego.* But this either constitutes a contradiction to his position which denies of the transcendental ego the concrete, individual reality which is necessarily presupposed for life, or it asserts an intrinsic impossibility, which is precisely what Jonas rejects in the above passage: namely, that a non-real, non-individual entity lives. Not only autonomous reality and being are required for a being to live, as we shall see, but also the possession of a real principle of soul or *entelechy.*

What, besides an autonomous being in itself, are the essential characteristics of life in all its forms? Plato saw one of the most prominent marks of life in self-motion, in a motility which has its source in the living being itself and not outside of it. Plato writes about this essential feature of life:

> ... we shall not be disgraced if we declare that this ... self motion is the essence, the very definition of the soul. For every body that is moved

> from without is soulless; and every body that derives its motion from within itself has a soul, since that is indeed the soul's nature.[8]

Plato bases an argument for the immortality and eternity of the soul on this feature of self-motion.[9] While he insists that the soul possesses self-motion, he does not imply that the soul is in some form of "physical motion." Aristotle adds with greater precision that life and soul are what originates movement but not what is itself in motion. He rejects the respective Presocratic views of life and soul:

> This implies the view that the soul is identical with what produces movement in animals. That is why, further, they regard respiration as the characteristic mark of life.[10]

Aristotle rejects the materialist interpretation of soul in relationship to self-movement; the soul is not itself in motion but a transcendent cause of self-motion *in living things*:

> for, doubtless, not only is it false that the essence of soul is correctly described by those who say that it is what moves (or is capable of moving) itself, but it is an impossibility that movement should be even an attribute of it.
>
> We have already pointed out that there is no necessity that what originates movement should itself be moved.[11]

However, this observation can only refer to physical motion which must not be attributed to the living soul itself. In another sense, as we shall see, self-motion can certainly be attributed to life itself, especially to the free living subject. Thomas Aquinas also held the view that life is essentially characterized by bestowing the ability of self-motion to living things:

> We say then that an animal begins to live when it begins to move of itself: and as long as such motion appears in it, so long is it considered to be alive. When it has no longer any movement of itself, but is only moved by another power, then its life is said to fail, and the animal to be dead. Whereby it is clear that those things are properly called living that move themselves by some kind of motion .... Accordingly all things are said to be alive that determine themselves to motion or operation of any kind: whereas those things that cannot by their nature do so, cannot be called living, unless by a similitude.[12]

The modern term "endogen motility" has a similar, although more limited, meaning and is intended to distinguish the organism not only from inorganic matter moved from an external source, but also from the type of self-movement found in the sub-atomic structure or in the motor. Max Scheler also recognizes this essential mark of life but extends it beyond self-motion and

calls the objective essential phenomena of life: self-motion, self-formation, self-differentiation, and self-limitation. When we think of this kind of self-motion in dead matter, we recognize need to resolve the following difficulty: What, if anything, distinguishes the self-motion characteristic of life, from phenomena of auto-motion in the purely physical universe?[13] In order to do justice to the new phenomenon of the self-movement of the living being, Max Scheler declares that a necessary essential law is that the movement of living beings which is specific for life is always the consequence of a vital tendency.[14] He adds that the vital movement does not fall under some of the laws of the inanimate physical universe, as, for example, the law of inertia; instead, this movement is the immediate consequence of an inner force and activity of the living being.[15] Scheler brilliantly observes that the law of inertia can only dominate completely a world in which there would be no life. He offers fascinating analyses of the changes of states specific to living beings and of the animal movements dominated by instincts. He sees the principle "live is what moves itself" culminate in freedom.[16]

The self-movement, more precisely the originating of a dynamism or movement from within oneself, which is an essential mark of life, must be distinguished from the purely material "self-movement" of sub-atomic particles, pendulums, or planets. The closest to self-movement in physical reality is the motion of sub-atomic particles, in particular, Brawns movement, which exists even at around the temperature of absolute zero and which, in principle, cannot be stopped. These forms of self-motion cannot be regarded as forms of self-movement in the proper sense of the word. They depend on the laws of the sub-atomic world or on the laws of mechanics and on other material events in bodies, and lack the true origin from a vital tendency or a spontaneous and living center in the being that moves itself in the way of living things. "Self-motion" applied to both of these phenomena is a merely analogous and even a misleading use of terms.

In view of the essentially different form of "self-motion" characteristic of all living things, Plato, Augustine, Descartes, Kant, and many other philosophers see the highest forms of life linked to freedom. When Kant says: "For all life rests on the inner faculty to determine oneself at will,"[17] he seems to have in mind already the highest form of this self-movement and thus of efficient causality, namely, freedom. Freedom allows for a spontaneous and rational self-determination and for a movement which has its source in the agent and not outside of the subject of free acts. This free life, Kant emphasizes, embodies life preeminently.

It would be interesting to compare the texts from Plato's *Phaedrus* and from Kant's discussion of life in *Träume eines Geistersehers* and elsewhere with Augustine's discussion of the order of efficient causes in *The City of God*, where Augustine sees in the "making without being made" the highest

which shows Jonas's statement that "pure consciousness is as little alive as the pure matter standing over against it ..."[27] to be quite false if it does not only refer to abstractions but excludes any life which is not bound to corporeity.[28]

Thus we attain a new insight: This self-motion which is characteristic of life is not restricted to *bios* but characterizes all forms of *zoee*, even in their supreme form. This is expressed with clarity by Thomas Aquinas:

> Hence a more perfect degree of life is that of intelligent beings; for their power of self-movement is more perfect .... Wherefore that being whose act of understanding is its very nature, and which, in what it naturally possesses, is not determined by another, must have life in the most perfect degree. Such is God; and hence in Him principally is life. From this the Philosopher concludes (*Metaph.* XII 51), after showing God to be intelligent, that God has life most perfect and eternal, since His intellect is most perfect and always in act.[29]

As Thomas says, Aristotle clearly ascribes *zoee* to God, saying, for example:

> Moreover, life belongs to God. For the actuality of thought is life (*zoee*), and God is that actuality (*energeia*); and the essential actuality of God is life most good and eternal. We hold, then, that God is a living being, eternal, most good; and therefore life and a continuous eternal existence belong to God; for that is what God is.[30]

3. Can Life be Sufficiently Identified by Means of Self-Motion or Intrinsic Teleology, etc.? On the Character of Life as an *Urphenomenon*

But are self-motion and freedom adequate or sufficient categories to capture the essence of life? They seem to contain too much and too little at the same time to be properly regarded as essential features of all life. Certainly, not all living beings are free, and Jonas uses this term quite ambiguously, or at least analogously, when he attributes some freedom to all living things. Yet, many beings live that are not free. Besides, even free beings do not only live *inasmuch as they are free.* The vegetative life of plants, the sensitive life of animals, and the higher mental life of human beings can in no way be reduced to the notion of self-motion which culminates in freedom. Mental life includes many forms of affective experiences and emotions which are not free, and it includes the cognitive life which is completely misconstrued if conceived as a self-motion or spontaneous active synthesis, or a *Tathandlung* of the mind, as Johann Gottlieb Fichte conceives intellectual intuition. Instead, cognition is

characterized by a "receptive transcendence," that is, by a mental discovery of what is the case and by a conscious "taking in" and possessing objects and states of affairs as they are independently of the act of knowing.[31] But inasmuch as a rational subject lives just as much in knowing as in acting freely, life cannot correctly and sufficiently be characterized simply in terms of self-motion or of freedom as its supreme form. *Zoee* in the broad sense of life as such includes a unique and irreducible dynamism of being which manifests itself in the human being just as much in knowledge or in the affective life as in freedom. Therefore, it cannot be reduced to self-motion in any sense of this term.

If we recognize that life cannot be simply reduced to self-motion nor be defined in terms of it, we could ask: Can it be defined in terms of another property distinct from life itself? When we ponder the answer to this question, we see that life cannot be defined exhaustively by means of any other property either. Life is an ultimate and irreducible datum. That life is, ultimately, undefinable, is not due to a weakness of our minds but to the originality and irreducible simplicity that are characteristic of all first principles and pure perfections, as well as of many other essences. The term of "simple" (or ultimate) simplicity, of the *simpliciter simplex*, introduced by Duns Scotus to designate the "pure perfections," could be applied to all fundamental and ultimate (irreducible) data as, for example, red or blue, numbers, being, knowledge, etc.

The widespread opinion that what is absolutely undefinable is also unknowable is completely mistaken. On the contrary, the intelligibility of the first undefinable essences and principles is the supreme intelligibility which is already presupposed for the derivative intelligibility of essences defined in terms of more primary elements. But undefinability through something else does not mean that we cannot analyze essential characteristics and thus arrive at something like a non-reductive "essential definition." This is overlooked by George Edward Moore who concludes[32] from his excellent analysis of the impossibility of defining the "good" in terms of something else that we cannot say more than "the good is the good."[33]

We should also not say that Plato fails in his definitions of knowledge, friendship, etc. but that he arrives at the recognition of the impossibility of defining them in terms of something else. Also Aristotle does not fail to define the soul and life, but he recognizes, even though without sufficient clarity, their irreducibility.[34] In the passages from *Posterior Analytics* quoted in the following notes, Aristotle provides an excellent theoretical explanation for the superior knowledge we possess with regard to undefinable and irreducible data when compared with definable data.

Phenomenological realism has shown that Aristotle's notion of these irreducible data is far too limited and that he – as later Kant with his twelve categories – impoverished the *a priori*. The first and most abstract principles –

as, for example, being – and many more specific ones (such as love, hope, despair, knowledge, sight) have their own irreducible essences. These essences are intelligible and their elements are analyzable, although they are not reducible to anything else. Moreover, intuitions of first principles are not unreliable or vague but most reliable and rational. Besides, what is given in them can often be formulated with utmost clarity, as, for example, the principle of contradiction both in its metaphysical and its logical sense, as Aristotle and, more clearly Husserl in his *Logical Investigations*, have shown. The individual colors likewise cannot be defined in terms of anything else. Aristotle has well shown that the quest to define everything through something else is just as irrational as the desire to prove everything. For all definitions and all syllogisms rest on foundations that are prior to them and cannot be defined or proven but must be understood in their own right and by means of some immediate understanding or perception. The experience and knowledge in which these undefinable and irreducible data are given to us are in no way irrational. On the contrary, the supreme form of reason and rational knowledge consists precisely in the rational intuition into these arch-phenomena, a fact on which Aristotle insisted.[35] This truth is also a central point of any phenomenological method.[36]

Let me explain this further. Life is one of those ultimate data, like being or the good, which are undefinable through something else, and our labor is doomed to failure if we undertake an effort to define these data in terms of other known entities, as Moore and Dietrich von Hildebrand have shown so convincingly for the good and for value.[37] Any definition and explanation of this kind is impossible and inadequate with respect to the first principles and first things, as, for example, being, as Aristotle noted, or value, or life. Any attempt to define everything in terms of something else or of other elements is just as circular as any effort to prove everything. For as each definition requires first undefinable essences, so each argument presupposes first premises and laws of correct inference that cannot be further proven without falling into circular argument or begging the question.

Any effort to define irreducible essences through their parts, or by proximate genus and specific difference, already presupposes preceding notions of other essences that cannot be endlessly defined. It also requires the notion itself which we are seeking to explain. What is more important, any attempt at a definition in terms of something else is inadequate with reference to each original essence. Aristotle conceives original and undefinable elements and essences in terms of a few first principles and categories (*archai*), but in reality these "first principles" comprise an enormous variety of irreducible arch-data. This is not to deny that Aristotle's practice, especially in his ethics, contradicts this restriction, nor that the Aristotelian notion of immediately known propositions spreads much more widely than it does in the theories of many of his

professed followers. In fact, the epistemological features of irreducible propositions according to Aristotle presuppose many irreducibilia.

The irreducible character of life, which resists its reduction to other notions (even if these are so closely related to life as self-motion) – and the irreducibility of similar phenomena – was seen clearly by Johann Wolfgang von Goethe in his *Farbenlehre*. Goethe insists that when we encounter an ultimate *Urphenomenon*, we must not seek to explain it any further by other things. Instead, we have important work to do in clarifying and elucidating these arch-phenomena. He complains that authors normally fail to do just that; and hence, they distort these phenomena by their futile attempts at reductionist explanations. Thus, he writes:

> Even if one were to encounter such an *Urphenomenon*, there remains the evil that one does not want to acknowledge it as such, and that one is looking behind it and above it for some other thing, whereas we should confess here that we have reached the endpoint of such looking.[38]

And elsewhere he adds:

> The highest thing at which man can arrive ... is the sense of wonder, and when an *Urphenomenon* provokes wonder in him, he should be content; for it cannot accord him anything higher than that, and he should not look for anything higher behind it; for here is the limit. But to humans the sight of an *Urphenomenon* is normally not sufficient, they think, one has to go farther than that, and they resemble children, who, when they have looked into the mirror, turn it right away around, in order so see what is on the other side.[39]

The formulation of the character of arch-phenomena (*Urphänomene*), which cannot be explained by anything outside themselves, which the scientist "should allow to stand there in their eternal tranquillity and glory," and "which the philosopher should let enter into his region,"[40] makes Goethe a forerunner of the phenomenological method of returning to things themselves.[41] In writing the following things, he sets up for us a high ideal of a philosophy that is faithful to ultimate data, as, for example, life, without attempting to reduce the irreducible phenomenon to anything else:

> We believe to deserve the thankfulness of the philosopher for having attempted to pursue the phenomena up till their original sources (*Urquellen*), up till the point where they do nothing but manifest themselves and are, and where it is impossible to explain anything beyond in them ...[42]
>
> He [the philosopher] ought to form for himself a method which is adequate to intuition (*eine Methode, die dem Anschauen gemäß ist*); he should avoid carefully to transform the intuition into concepts, and the

concept into words, and then to operate with these words as if they were things ... (no. 720).

If on the other hand the physicist is able to arrive at the cognition of that which we have called an *Urphenomenon* (*Urphänomen*), he is well sheltered [as it were, he has arrived at home] and the philosopher is sheltered with him ... the philosopher accepts from the physicist's hands some last thing which with him now becomes a first thing.[43]

Elsewhere in his *Theory of Colors*,[44] Goethe speaks of the *Urphänomene*, saying that they reveal themselves only to an intuitive knowledge and that "nothing on the order of their [self-]appearing lies above them."[45] To use a felicitous expression in Heidegger's *Being and Time*, § 7, we may say that they can only "show themselves from themselves." It becomes quickly clear that – in spite of the magnificent things Goethe says about the arch-phenomena that lend themselves to philosophical analysis – for Goethe many phenomena in nature, as, for example, the *Granit* or the *magnet*, are arch-phenomena which in the strict philosophical sense of necessary intelligible essences are not irreducible arch-phenomena.[46]

But Goethe also insists on the same fundamental feature of the phenomenological method upon which Adolf Reinach insists: hardly anything is a greater labor than to elucidate these arch-phenomena such as life, without reducing them to something else. And it is hard work to identify the essential marks of these irreducible phenomena.[47]

In the spirit of these texts of Goethe, some phenomenologists and philosophers in our century, as, for example, Moore, have pointed out the irreducible character of value, of the good, of being, of promises, of love, and of countless other irreducible data.

Life, both as *zoee* and as *bios*, is an irreducible datum, which Goethe also designates as something "incommensurable" that cannot be captured by mathematical formulas and ratios.[48] He says that many explanations of it risk "to transform the living into something dead,"[49] "covering it up and obscuring it," instead of "elucidating it and bringing it closer to us."[50] Not by accident Goethe refers to a famous passage in Kant's *Critique of Pure Reason* on the "*anschauende Urteilskraft*" (the intuitive power of judgment), where Kant speaks of the possibility of an intuitive knowledge of essences which he denies to humans. Even less of an accident is that Goethe sees precisely those passages in which Kant speaks of an *intellectus archetypicus* who would be capable of intuitive knowledge of essences, as exemplifying what also, at least to some extent, a human person is capable of: to intuit irreducible essences and forms.[51]

Some other philosophers, as, for example, Plessner, have attempted to combine an anti-reductionism which insists on the character of life as an irreducible phenomenon with a reductionism. Plessner holds that life and its mo-

be better to be than not to be, and not be better to possess than not to possess (as contradicting another pure perfection). (3) All pure perfections "can be infinite in something" and are only fully themselves when they are infinite. Any limit of life, for example, implies that a being does not fully possess the *ratio* and the *logos* of life and is in some ways half-living or deprived of the fullness of life. The same is true of goodness, knowledge, justice, being, wisdom, mercy, freedom, and all pure perfections: they all are not fully themselves when they are limited. (4) Pure perfections are all irreducibly simple and consequently not composite, deducible, or derived from something else – and thus in a sense undefinable through something else. This irreducible originality as a characteristic of pure perfections is also found in the irreducible essence of life. (5) All pure perfections are communicable to more than one subject. Therefore, it is a pure perfection to be a person, but the incommunicable existence of "being me" rather than "being you" can never be an absolute perfection.[61]

The last two characteristics Scotus lists are also found in many mixed perfections. Irreducibility, for instance, belongs to irreducible data as color, prime colors, motion, the mathematical point or line, as well as to guilt and contingency, which are not pure perfections. The same applies to the communicability to more than one subject which is also found in all universals that belong to the order of mixed perfections, for example, in human nature or animal species. Of the two last characteristics of pure perfections it is more difficult to show that they belong to pure perfections than to show that they are characteristics of mixed ones.

With respect to the first through the third of these characteristics, pure perfections differ from mixed perfections or from those perfections which are good only from a certain point of view and in comparison with lower beings. These characteristics which are good in many respects but include essential limitations, such as being a lion or a human being, can be surpassed by higher perfections, are not compatible with all pure perfections, and cannot be infinite.

Pure perfections encompass three distinct classes:

1. Being itself and all those properties which are coextensive with it are *eo ipso* pure perfections because they evidently are the ontic condition of the possibility of any perfection whatsoever, and nothing, including the absolute being, can be without them. These absolutely universal transcendentals include, besides being itself, *res* (essence), being *something* (*aliquid*) in the sense of distinctness and in that of being something rather than nothing, having some unity (*unum*), being intelligible (*verum*), and also goodness (*bonum*) and beauty (*pulchrum*) of which no being whatsoever can be entirely deprived.

2. Some other pure perfections, as, for example, being alive or being a person, are pure perfections yet are not found in all entities but only in some

This book argues for several bold claims: Life is an ultimate datum, open to philosophical analysis and irreducible to physical reality. All life presupposes "soul." The concept of life is analogical, and the most direct access to life in its irreducibility is gained through consciousness. All life possesses an objective and intrinsic value that needs to be respected, and human life possesses beyond this an inviolable dignity. The dialogue form of the closing chapter defends the methods and results of philosophy as distinct from those of the empirical life sciences.

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