BETWEEN POSTMODERNISM, POSITIVISM AND (NEW) ATHEISM

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The Renaissance introduced the autonomy of being human which in turn resulted in promoting the position of human understanding as the formal law-giver of nature. Twentieth century philosophy of science acknowledged the necessity of a theoretical frame of reference (paradigm) as well as ultimate (more-than-rational) commitments. Historicism and the linguistic turn, however, relativized the objectivity and neutrality of scientific reason (with its universality) and co-influenced the rise of postmodernism. After discussing the distinction between linear and non-linear thinking it is shown that Derrida does accept universality outside the human mind. The denial of ontic universality influenced the nominalistic orientation of modern biology, particularly since Darwin's Origin of Species, consistently denying the reality of type laws. Under the spell of Leibniz's slogan that nature does not make leaps, as natural selection merely exemplifies the overriding law of continuity. Darwin was in two minds about accepting his biological idea of non-progression and his socio-cultural conservatism in which progress was dominant. More recently new atheism divinized natural laws, identified them with human reason, while Hawking even claims that the law of gravity would create the universe out of nothing. Finally physicalism is subjected to immanent criticism, the pretence that mathematics is exact is questioned and some recent problems facing neo-Darwinism are highlighted. [1]

Keywords: autonomy, law-giver, historicism, paradigm, ultimate commitment, atheism, epigenetic information, out of nowhere origination

Die Renaissance-waardering van die mense se outonomie het uitgeloop op die verheffing van die menslike verstand as die formele wetgewer van die natuur. Nogtans sou die wetenskapsfilosofie van die twintigste eeu erkenning verleen aan die noodsaaklikheid van 'n teoretiese verwysingsraamwerk (paradigma) en 'n diepste (meer-as-rasionele) grondoortuiging. Die historisme en die taalwending het die idee van 'n objektief-neutrale rede gerelativeer en bygedra tot die ontstaan van die postmodernisme. Na 'n bespreking van die onderskeiding tussen liniêre en nie- liniêre denke is aangetoon dat Derrida universaliteit buite die menslike gees erken. Die ontkenning van ontiese universaliteit het die nominalistiese oriëntasie van die moderne biologie, veral sedert Darwin se Origin of Species beïnvloed – wat konsekwent die realiteit van tipe-wette misken het. Betower deur die slagspreuk van Leibniz dat die natuur nie spronge maak nie sien Darwin natuurlike seleksie bloot as 'n beliggaming van die oorkoepelende wet van kontinuïteit. Darwin was in twee verdeel tussen sy biologies-non-progressionistiese benadering en sy sosiaal-kulturele konserwatisme waarin die idee van vooruitgang dominant was. Meer onlangs sou die nuwe ateïsme natuurwette goddelik ag en met die menslike rede vereenselwig, met Hawking wat selfs beweer dat die swaartekragwet uit niks die heelal sal skep. Ten slotte is die fisikalisme aan immanente kritiek onderwerp, is die aanspraak dat die wiskunde eksak is bevraagteken en is saaklik aandag geskenk aan enkele resente probleme waarmee die neo-Darwinisme worstel.

Sleutelwoorde: outonomie, wetgewer, historisme, paradigm, grondoortuiging, ateïsme, epigenetiese informasie, van nêrens af ontstaan

1 An earlier version of this article was presented as a Stoker-Lecture at the University of North West, September 2013.

1 KEY ELEMENTS OF MODERNITY

Since the Renaissance the deification of reason, already found in Greek culture, has experienced a new secularized revitalization. What it left behind is the Greek-Medieval realistic metaphysics which used the concept of being to generate a hierarchical view of reality. The human being is no longer understood as being part of an objective order of being. For Descartes even certainty about the existence of God is now obtained only on the basis of clear and distinct thinking. Von Weizsäcker points out that the world no longer guarantees my existence since the world now solely appears as the object of my self-assured thinking. In a subtle way this self-assured thinking is elevated to the rank of what is divine. Therefore it should not be surprising that the new motive of logical creation soon inspired Immanuel Kant to elevate human understanding to become the formal law-giver of nature. More recently the desire to be liberated from "supra-natural" Gods led atheists (or rather: anti-theists) to the identification of God with the laws of nature, forgetting that Nietzsche already realized that laws are distinct from a Law-giver. In support of the cause of atheism, Nietzsche therefore prefers not to speak of laws but rather of necessities (see Strauss, 2009:408). The fusion of human rationality and natural law culminates in Hawking's recent idea that the law of gravity on its own could well create the universe.

2 BEYOND POSITIVISM: THE IDEAL OF AN OBJECTIVE AND NEUTRAL SCIENCE CHALLENGED

Kant's view of understanding as formal law-giver of nature consolidated the preceding natural science ideal of modern humanism and provided the platform for the ideal of an objective and neutral science advanced by positivism – from Auguste Comte up to the Vienna Circle. However, as one of the key figures in the mid-twentieth century philosophy of science, Karl Popper claimed the fame to have "killed" positivism (see Popper, 1974:69). Kuhn challenged the positivist appeal to "facts" (identified with sense data) for it turned out that the interpretation of facts is embedded in theoretical frameworks (designated as paradigms), captured in the slogan the facts are "theory-laden." In addition, prominent figures within the domain of the philosophy of science of the twentieth century acknowledged that scholarly activities are embedded in intellectual communities and in the final analysis directed by more-than-theoretical (i.e. supra-theoretical) commitments, as emphasized by Popper and Stegmüller. Karl Popper stated that the faith in the rationality of reason is not itself rational – he speaks about "an irrational faith in reason" (Popper, 1966-II:231). Stegmüller holds the view that there is not a single area in which self-assured of human thinking is possible – one already has to believe in something, in order to justify something else (Stegmüller, 1969:314)

Yet, in spite of all these developments, most special scientists working within the natural sciences and the humanities are still victims of a kind of "naïve positivism", still adhering to the modernist idea of the objectivity and neutrality of science. The remarkable exception in this regard is the well-known neo-Darwinian biologist Stephen Gould (initial field: palaeontology) who updated himself with what happened in the philosophy of science of the previous century. He remarks: "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" (Gould 2002:762).

If the deified human understanding assumed the role of judge, even regarding the existence of God, then the authority assigned to it not only gives it the power to decide what will count as divine, but also endows it with the power to deny any divinity whatsoever – the ultimate position of contemporary atheism. Many of these atheists justified their stance with reference to atrocities committed in the name of "religion" (such as 9/11). Already during the Enlightenment Kant advocated an elevated position for human reason:

> Our age is, in every sense of the word, the age of criticism and everything must submit to it. Religion, on the strength of its sanctity, and law on the strength of its majesty, try to withdraw themselves from it; but by doing so they arouse just suspicions, and cannot claim that sincere respect which reason pays to those only who have been able to stand its free and open examination (Kant, 1781:A-12 – translation F.M. Müller – see Müller, 1961:21).

3 RELATIVIZING HUMAN REASON: HISTORICISM AND 20TH CENTURY PHILOSOPHY OF SCIENCE

Of course closer scrutiny soon reveals that neither the (persistent) positivism nor the new atheism represents a sound position. In particular the pervasive influence of historicism during the nineteenth and early twentieth century relativized the certainties of modernity. In the "linguistic turn" historicism found a strong ally, for with language as horizon alternative interpretations surfaced prominently.

As noted briefly above, these lines of thought served as points of departure for developments within the philosophy of science of the twentieth century. It appeared to be inevitable to use theoretical frameworks (paradigms) which themselves are in the grip of ultimate commitments. Interestingly these developments within twentieth century philosophy of science were anticipated by Dooyeweerd. It prompted Van Peursen to say that Dooyeweerd's philosophy is today more relevant than ever and he added the remark that many books written within the domain of philosophy of science should not have been written, had the authors first read what Dooyeweerd had written (see Van Peursen 1995).

4 POSTMODERNISM: THE RELATIVITY OF INTERPRETATION

The combined effect of historical relativity and alternative interpretations in turn gave rise to postmodernism according to which every so-called meta-narrative is questioned, owing to the fact that everyone of us only disposes over our own particular stories. The new kind of knowledge emerging within the postmodern mode of thought apparently challenged long-

standing conceptions. Amidst the introduction of themes and entities, such as fractals (somewhere in between one and two dimensions) and chaos theory, it is claimed that modernist thinking is linear and postmodern thinking is non-linear. Lyotard mentions "incommensurabilities" and the fact that "the continuous differentiable function is losing its pre-eminence as a paradigm of knowledge and prediction" and then continues: "Postmodern science – by concerning itself with such things as undecidables, the limits of precise control, conflicts characterized by incomplete information, 'fracta,' catastrophes, and pragmatic paradoxes – is theorizing its own evolution as discontinuous, catastrophic, nonrectifiable, and paradoxical" (Lyotard, 1987:60).

5 IS POSTMODERNISM CHARACTERIZED BY NON-LINEAR THINKING?

Without properly specifying in which sense they speak of linear thinking postmodern thinkers pursue the ideal of non-linear thinking. Mathematicians speak of linear equations when, for example, there are two variables that are related in a specific way. Co-ordinate geometry says that points whose co-ordinates satisfy an equation of the first degree, such as y = ax + b (with a and b as constants), are lying on a straight line. An equation such as y = x2 is therefore non-linear. Postmodern authors want to distance themselves from the rationalistic trait of "modern science" with its reductionism and faith in numbers. In opposition to this "out-dated" mode of thinking such postmodern thinkers advocate a non-linear mode of thinking, apparently built upon a methodology of intuition and of subjective observation, exceeding human rationality. Sokal and Bricmont mention the words of a postmodern thinker, Robert Markley, who claims that "quantum physics, the bootstrap theory, the theory of complex numbers, and chaos theory share the basic assumption that reality cannot be described in linear concepts, that non-linear – and non-solvable – equations provide the only possible means to describe a complex, chaotic and non-deterministic reality" (Sokal & Bricmont 1999:166, note 26).

On the same page they highlight the fact that many postmodern authors interpret chaos theory as a revolution directed against Newton's mechanics, with quantum theory as an example of non-linear thinking. Unfortunately Newton's "linear thinking" contains equations which are fully non-linear. In reality many examples of chaos theory derive from Newton's mechanics, which means that chaos research is in fact nothing but a Renaissance of Newton's mechanics. Even more embarrassing is the fact that while quantum physics is currently represented as a prime example of "postmodern science," it is not realized that the basic equation of quantum physics, the well-known Schrödinger equation, is absolutely linear (Sokal & Bricmont 1999:166-167). Moreover, there are very difficult linear problems and quite simple non-linear problems. Contrary to a widespread misunderstanding a non-linear system is not necessarily chaotic.

6 IS DERRIDA A POSTMODERN THINKER?

Postmodern thinkers tend to shy away from universality by emphasizing what is particular or singular. Caputo mentioned to Derrida that in connection with justice and care in Derrida's writings he discerns a resonation of the biblical concern for singularity. This is opposed to the "philosophical notion where justice is defined in terms of universality" (Derrida 997:20). Remarkably Derrida's reaction was immediately to emphasize the unbreakable co-existence of universality and singularity: "I would not oppose, as you did, universality and singularity. I would try to keep the two together" (Derrida 1997:22). According to Derrida faith is universal, it displays a universal structure and for this reason it should be distinguished from "religion." Actually, for him there is "no such thing as 'religion.'" There are only singular religions, such as Judaism, Christianity, Islam and so on. This distinction between (universal) faith and (particular) religions runs parallel with his distinction between messianicity and messianism (Derrida 1997:21) and it explains his mode of speech where he declares: "So this faith is not religious, strictly speaking; at least it cannot be totally determined by a given religion. That is why this faith is absolutely universal. This attention to what is the singularity is not opposed to universality" (Derrida 1997:22).

Derrida here undoubtedly explores the ontic universality of "faith," of "messianicity" and so on – which disqualifies him, strictly speaking, from being a postmodernist thinker, for postmodernism generally attempts to shy away from universality. Since the era of Enlightenment the trust in universal (conceptual) knowledge guided the idea of rational progress. One way to define rationalism is actually to see it as a reification of conceptual knowledge. Likewise, irrationalism can then be defined as a deification of concept-transcending knowledge (idea-knowledge), focused on what is unique, individual or singular.

7 THE NOMINALISTIC RESTRICTION OF UNIVERSALITY: LAW AND REGULARITIES

The decisive role played by nominalism in modern philosophy since the Renaissance is seen in its denial of universality outside the human mind: universality is only and solely acknowledged within the human "mind". That we actually have to account for two kinds of universality is often concealed behind interchangeably employing expressions such as law, law for, order for, orderliness of, lawfulness of, law-conformity, regularities and so on. Whatever meets the order for its existence behaves in an orderly fashion, manifested in its own orderliness or law-conformity. An order for and the orderliness of is equivalent to the conditions for the existence of something and meeting those conditions. In general there is a strict correlation between law and what is factually subjected to it. But when reality (the ontic) is stripped of its universality, then it is at once deprived of its order for side as well as the orderliness of reality conforming to this order. What is lost sight of is the fact that denying universality "outside the human mind" did not succeed in getting rid of universality because the feature of being individual universally holds for whatever is individual.

In spite of his sharp critical analysis of the ideas of Hawking,

John Lennox still does not properly distinguish between law and regularity: "Newton's laws describe the regularities, the pattern, to which motion in the universe conforms under certain initial conditions. It was God, however, and not Newton who created the universe with those regularities and patterns" (Lennox 2011a:35). Law-conformity is a feature of what is subjected to laws and the only way to understand physical laws is to study the regularities evinced in their behaviour. It would therefore be better to say that Newton's laws are human formulations of the God-given laws for nature, making possible all the regularities we can observe and describe. God did not create the regularities, for what has been created function in an orderly way, providing scholars with those regularities pointing at the God-given creational laws.

8 TYPE-LAWS AND MODAL LAWS VERSUS NOMINALISTIC CLASSIFICATION

This entails that we have to acknowledge the universality of different types of entities, because our experience is not populated by just one kind of entity, whatever it may be. No one would defend the view that everything is an x – where x could be filled in by: "a quark", "an atom", "a cell" or whatever. The diversity of entities within the horizon of human experience straightforwardly necessitates the acknowledgement of a multiplicity of types or kinds. The ontic reality is that the correlation between law and factuality cannot avoid the idea of type-laws. Yet since the dominant nominalistic assumption of modern philosophy denies universality outside the human mind, the entire system of biological classification is reduced to a functionalistic (physicalistic) perspective. Simpson categorically states that organisms are not types and do not have types (Simpson 1969:8-9). This view continues the conviction of Darwin that "no line of demarcation can be drawn between species" (Darwin 1859:443) which entails that according to Darwin "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" (Darwin 1859:456).

The discreteness (discontinuities) marking the currently existing diversity of plants and animals as well as the dominant theme of palaeontology (stasis/constancy: a type abruptly appears, remains constant over millions of years and then suddenly disappears) squarely contradicts Darwin's core scientific belief that there must have been an infinitesimal, incremental and continuous development stretched over millions of years. A contemporary neo-Darwinist, Jerry Coyne, openly struggles with the tension between discreteness and continuity. He advances the view that species are discrete clusters of living entities: "And at first sight, their existence looks like a problem for evolutionary theory. Evolution is, after all, a continuous process, so how can it produce groups of animals and plants that are discrete and discontinuous, separated from others by gaps in appearance and behavior?" (Coyne 2009:184). He also designates a species as "a discrete cluster of sexually reproducing organisms" and then on the same page he continues in a realistic fashion by maintaining that the discontinuities of nature are "not arbitrary, but an objective fact" (Coyne 2009:184). Whereas Darwin therefore advocated a nominalistic position regarding living entities, Coyne reverts to a realistic idea of living entities.

9 THE LEVELLING TENDENCY IN THE POSTULATE THAT NATURE DOES NOT MAKE LEAPS

Within modern philosophy the emphasis soon shifted to functional relations which, particularly in the thought of Leibniz, resulted in his famous lex continui (law of continuity) according to which nature does not make any leaps (natura non facit saltus). Dooyeweerd characterized this view as the continuity postulate of humanistic philosophy and Gould argues that this postulate assumed in Darwin's thought even a more central position than natural selection. He calls upon the physicist and historian of science, Silvan S. Scheber when he claims: "In fact, I would advance the even stronger claim that the theory of natural selection is, in essence, Adam Smith's economics transferred to nature" (Gould 2002:122). And gradualism precedes in importance natural selection. Gould relates Darwin's position here to a confusion of the different senses of gradualism, for example the validity of natural selection and the acceptance of slow and continuous flux: "This conflation came easily (and probably unconsciously) to Darwin, in large part because gradualism stood prior to natural selection in the core of his beliefs about the nature of things. Natural selection exemplified gradualism, not vice versa – and the various forms of gradualism converged to a single, coordinated view of life that extended its compass far beyond natural selection and even evolution itself" (Gould 2002:154-155).

10 CHANCE VERSUS PROGRESS: INCONSISTENCIES ON OPPOSING SIDES OF THE DEBATE

Yet in spite of his achievements as a radical intellectual, advocating a theory without any claims to progress, Gould notes that Darwin considered it as his greatest failure that he did not succeed in reconciling his intellectual rejection of progress with his acceptance of a cultural context in which progress was one of the characteristics of the Victorian culture to which he belonged (see Gould 2002:467). Darwin holds that his greatest improvement compared to other evolutionary theories is given in banishing inherent progress. Gould writes: "Moreover, Darwin regarded the banishment of inherent progress as perhaps his greatest conceptual advance over previous evolutionary theories." And to this he adds the words of Darwin, formulated in reaction to the progressionist palaeontologist Alpheus Hyatt (on December 4, 1872): "After long reflection I cannot avoid the conviction that no innate tendency to progressive development exists" (Gould 2002:468). Ironically, close to the end of The Origin of Species, we read: "And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection" (Darwin 1859:459). Since Aristotle vitalistic theories in biology assumed that goal-directedness (finality/purpose) is inherent to living entities, something rejected by Darwin in the words just quoted. Theistic evolutionists of our day deem it possible to accept Darwin's views (on random variation and natural

selection) and at the same time advance the (contradictory) view that God guided the process of evolution all the way.

Sometimes emergent-evolutionism, which wants to have it both ways – continuity in descent and discontinuity in existence – also surfaces in the thought of theistic evolutionists. The theologian Wentzel Van Huyssteen on the one hand holds that our universe and "all it contains is in principle explicable by the natural sciences" (Van Huyssteen, 1998:75). But a bit further in this work he alleges the opposite when he warns that we should not overextend rationality "to explain everything in our world in the name of natural science" (Van Huyssteen 1998:115). Later on he believes that cultural evolution (including the evolution of ideas, scientific theories, and religious worldviews) cannot be reduced to biological evolution (Van Huyssteen 2006:86-87). On the basis of his emergent-evolutionistic view Klapwijk also attempts to combine neo-Darwinian chance with purpose (see Klapwijk 2008 and 2009).

Gould explains that within the fossil record there is no clear signal of progress:

> I believe that the most knowledgeable students of life's history have always sensed the failure of the fossil record to supply the most desired ingredient of Western comfort: a clear signal of progress measured as some form of steadily increasing complexity for life as a whole through time. The basic evidence cannot support such a view, for simple forms still predominate in most environments, as they always have. Faced with this undeniable fact, supporters of progress (that is, nearly all of us throughout the history of evolutionary thought) have shifted criteria and ended up grasping at straws (Gould 1996:166-167).

The idea of type-laws, briefly alluded to above, containing an acknowledgement of different types of living entities constituted by a limited number of them falling within each "type-category," is eliminated in the nominalistic classification of neo-Darwinism with its claim that "organisms" are not types and do not have types (Simpson). The popular contemporary reference to "bio-diversity" is actually stripped of meaningful content, because if the classification of living entities is merely the result of arbitrary and artificial thought constructions, lacking an ontic foundation (in the reality "out there"), then the intended diversity (reflecting typical differences determined by distinct type-laws) collapses into a structureless continuum. The speculative continuity postulate still rules the day!

11 BIO-DIVERSITY AND THE ONTIC DIVERSITY OF UNIVERSAL MODAL ASPECTS

The denial of the specified universality entailed in type-laws finds its foundation in a more basic misunderstanding, which is given in denying the "ontic diversity" of functional (modal) aspects. It is the merit of reformational philosophy that it subjected the multiple functions or modal aspects of our experiential world to a transcendental-empirical analysis. The key idea is that the ontic universality of each one of these aspects, from the numerical up to the certitudinal aspect, co-determines whatever there is. Every concrete (natural and societal) entity functions within all these aspects which not only serve as modes of being and modes of experience but also as modes of explanation. When particular modes of explanation are over-emphasized at the cost of other modes of explanation – just recall the words of Van Huyssteen that our universe and all it contains "is in principle explicable by the natural sciences" – a reductionist approach surfaces, denying the ontic diversity of modal aspects.

12 THE IMPASSE OF CONTEMPORARY PHYSICALISTIC MATERIALISM

The physicalistic or materialistic orientation of neo-Darwinism and of the new atheists has currently succeeded in establishing a firm hold on scholarly journals and the public media. Their ultimate reductionist claim is that "everything is material". Such a materialistic view in the final analysis believes, as Roy Clouser phrases it, "that reality is ultimately physical, so that everything is either matter or dependent upon matter". Clouser also mentions Paul Ziff who once remarked that he is not certain why he is a materialist: "It's not because of the arguments. I guess I'd just have to say that reality looks irresistibly physical to me" (Clouser 2005:38).

Apart from trying to give an answer to the difficult question: "What is matter?" the basic statement that everything is material is self-defeating. Merely contemplate the status of laws holding for material things. They are not themselves material, just as little as the conditions (laws) for being an atom is itself an atom. But if the conditions (laws) for being material are not themselves material, then the claim that everything is material does not hold, because the physical laws for matter are not material. In addition the statement that everything is material is presented as being true. But truth is a matter of epistemology and logic, not a physical one. Moreover, the statement is formulated in a sentence, showing that we have to distinguish between the logical-analytical aspect (the basic statement) and the lingual aspect of the utterance (the sentence formulated). That is to say, the basic conviction of physicalism (materialism) could be approximated from different modes of experience. However, as long as "laws of nature" are accepted, the atheist will constantly be haunted by the quest for the Creator of such laws, the search for the Law-Giver.

13 ASSIGNING CREATIONAL POWER TO A CREATURE: PHYSICAL LAWS DIVINIZED

Therefore the last step in the attempt to get rid of the Creator is, as Lennox phrases it, to confer "creatorial powers on something that is not in itself capable of doing any creating" (Lennox 2011:52). This something may be scientific theories or even the laws addressed in such theories. According to Lennox for these scientists and philosophers "the term 'God' has become a synonym for the laws of nature" (Lennox 2011a:22). In order to get rid of God Stephen Hawking settled for the law of gravity as the substitute ultimate origin of the universe. In his book, The

Grand Design (co-author is the physicist Leonard Mlodinow) we read:

> Because there is a law such as gravity, the universe can and will create itself from nothing. Spontaneous creation is the reason there is something rather than nothing, why the universe exists, why we exist.

The law of gravity now replaces God – forgetting that it is merely a God-given creational law. Hawking also forgets that every physical law is always related to what is subjected to it and correlated with it. Lennox aptly remarks that laws create nothing in any world for they can only "act on something that is already there" (Lennox 2011:71). Ironically enough, no single physical law could be explained in a purely physical way because the physical aspect of reality does not exist in isolation from the other aspects of reality. Newton's formulation of the law of gravitation contains the term force (F), the gravitational constant (G), two mass-points (m1 an m2), and the distance between m1 and m2 (r). The gravitational force between m1 and m2 is directly proportional to the product of their masses and indirectly proportional to the square of the distance between them. But mass is a physical quantity (highlighting the fundamental connection between the physical aspect and the numerical aspect). Distance, in turn, pre-supposes the meaning of (physical) space, whereas the idea of a constant reveals the coherence between the meaning of the physical aspect and a uniform [constant] motion. From this it appears that the formulation of the law of gravitation is made possible in the first place by the coherence of the physical aspect with three foundational non-physical aspects (namely number, space, and movement). These non-physical aspects serve as the foundation for the meaning of the physical aspect. Formulated in terms of the theory of modal aspects, the law of energy-constancy, for example, analogically reflects the kinematic meaning of constancy on the law-side of the physical aspect.

Given these conditions and interconnectedness one may well ask: how could these non-physical aspects (and, for that matter, the universe itself) then merely emerge from the physical aspect of creation or originate from a physical law? Hawking attempts to pull himself up with the bag in which he positioned himself – something clearly seen by Lennox. Of course the law of gravity is something implying that if the universe is created by this law the starting-point is something (the law of gravity) and not "nothing." The statement "the universe can and will create itself from nothing" is self-contradictory: "If I say 'X creates Y', this presupposes the existence of X" (Lennox 2011a:32). Materialism simply entangles itself in unsolvable antinomies – the "reward" for not respecting the God-given creational laws in their uniqueness and unbreakable coherence distinguishing between God and God's law.

14 LAW AND LAW-CONFORMITY

The only way in which we can approximate the laws for physical entities is through an investigation of their orderliness, law-conformity or regularities. The above-mentioned example used by Derrida concerning the universal structure of faith (messianicity) and particular ("singular") religions, implicitly alludes to the universality of the certitudinal aspect of reality. Particularly in respect of the conviction (!) of the new atheists that they do not have faith at all, the modal universality of the faith aspect implies the opposite. But we have noticed that if one does not accept God as Creator, the only alternative is to find a substitute within creation – and in the case of contemporary atheism this substitute for God is most of the time found in matter. The ultimate commitment of the new Atheists is therefore justly characterized as materialistic or physicalistic – and it is inevitably caught up in the above-mentioned inconsistencies.

15 "FAITH AND REASON"

Materialism over-emphasizes a single mode of explanation, namely the physical. However, such an orientation embodies a more-than-theoretical commitment – just recall the remark of Paul Ziff who said "that reality looks irresistibly physical to" him. No reason is given, just an underlying trust in (physical) reason! It represents therefore a particular faith in reason, namely the trust in the rational reliability of physical reasoning. The onto-diversity of modal aspects is challenged from the outset.

From this state of affairs we can conclude that "faith" ("trust") inherently belongs to the practice of the natural sciences. What is more is that "rationality" (or: "reason") is connected to faith in the sense of intellectual trust. Yet in the course of the historical development of Western philosophy "reason and faith" eventually appeared in opposition to each other, as if each on its own is an entity in its own right. Quite recently this is still done by Pope John Paul II in his Encyclical Letter Fides et Ratio (1998). In this letter he portrays both as entity-like, inter-dependent realities. He claims that faith does not fear reason but trust it: "Faith therefore has no fear of reason, but seeks it out and has trust in it" (John Paul 1998). Of course thinking ("reason") and believing ("faith") are concrete acts of human beings which, like every concrete (natural and social) structure or event, in principle function within all the aspects of reality. The latter, namely the dimension of aspects, provides a universal modal order co-determining concrete events and processes. In an ontic sense they lie at the foundation of our experience of entities and their functions. Therefore the first level of investigating the interconnections between "faith" and "reason" should commence with an analysis of the meaning of the logical-analytical aspect and the meaning of the certitudinal aspect, abstracting for the moment from the fact that every concrete act of faith at once functions in the logical-analytical aspect and that every concrete thought-act also functions within the faith aspect.

The terms trust or certainty may be used to capture the core meaning of the faith aspect. The inter-modal coherence between the various ontic aspects entails that the terms trust and certainty will also appear within other aspects in an analogical way, normally captured in compound phrases such as legal trust, social trust, moral trust and economic trust (credit). Given the order relation between the logical and certitudinal aspects an expression such as intellectual trust highlights a forward-pointing connection between the logical and faith aspects, in technical philosophical parlance also designated as

a certitudinal anticipatory analogy between these two aspects. Likewise configurations such as legal trust, social trust, moral trust and economic trust reveal anticipations from the legal, social, modal and economic aspects to the faith aspect.

In the same way the faith aspect reveals its unique meaning only in coherence with all the other aspects of reality, including the logical-analytical aspect. The core meaning of the logical aspect is found in analysis (identification and distinguishing). When we therefore lack faith distinctions in our trusting and do not identify the core elements of our faith we will end up with a "blind faith". Therefore it should be acknowledged that there also exists an intrinsic connection between the faith aspect and the logical-analytical aspect, manifest in faith distinctions and identifying what is crucial to faith convictions.

"Reason" and "faith" surely are not "strangers" because human acts qualified either by the logical aspect or the certitudinal aspect structurally display an internal coherence with the non-qualifying aspects of acts like these.

16 TRUST IN REASON

In respect of the nature of intellectual trust this insight is acknowledged in his own way by the philosopher of science, Wolfgang Stegmüller, where he explains that one first has to believe in something in order to justify something else (Stegmüller 1969:314). Nonetheless an uncritical adherence to what we have earlier designated as a "naïve positivism" is still widespread. Special scientists and laymen think that the ultimate judge of truth is "science" – the assumed anonymous (rational) power supposedly capable of solving all our problems. The scope of "science" is restricted to mathematics, physics and (the physical or molecular foundations) of biology. This modernist over-estimation of "science" up to the present implicitly continues the modern natural science ideal of objectivity and neutrality.

17 POSITIVISM AND THE HISTORY OF THE CONCEPT OF MATTER

In the case of positivism the criterion of sense perception matches the (internally antinomic) reductionism found in materialism because it cannot account for the epistemic status of descriptive terms derived from what we have called the onto-diversity of modal aspects. Once something has been observed (sensed) it is in need of a scientific description and every description has to employ specific terms. However, the history of the concept of matter shows that alternative modes of explanation have been chosen. It commenced with the Pythagorean belief that everything essentially is number, then it continues with the switch within Greek mathematics to geometry (after die discovery of incommensurability – the fact that it is not possible to describe all spatial relationships merely in terms of fractions), then, after the Renaissance, the choice for (reversible) motion as basic denominator, and finally reaching the current state of physics which had to acknowledge that (irreversible) energy-operation characterizes the uniqueness of this aspect.

Clearly, during the history of physics different modal ponts of entry were used in describing material entities, namely the numerical, the spatial, the kinematic and the physical. But since these functional modes of reality are not concrete entities or events themselves, they are not open to the senses as such. One cannot weigh, smell, hear, feel or see anyone of these aspects, simply because they are not belonging to the entitative dimensions of reality.

The classical positivist neutrality postulate had to face other objections as well. Perhaps the most important of these objections are related to the history of every academic discipline, which relativizes any temporarily (assumed) "up-to-date" theoretical stance. Whatever is currently appreciated as the "generally accepted" standpoint within the discipline differs from what the case fifty, hundred or more years ago was, apart from the fact that the majority is not a yardstick for truth (as correctly identified in text books on logic where one of the informal fallacies is designated as the majority fallacy; see Bowell and Kemp, 2005:131 ff.). And within the forthcoming decades and millennia the emphasis may shift again and again.

18 HOW "EXACT" IS SCIENCE?

This explains why not even the "exact" discipline of mathematics succeeded in avoiding concurrent and successive alternative theoretical stances. The remarkable historical fact is that the three main sub-divisions of Kant's Critique of Pure Reason (1781) provided the starting-point for the three main schools of thought found in twentieth-century mathematics: intuitionistic mathematics explored the transcendental aesthetics (Brouwer & Weyl), logicism, the transcendental analytic (Russell & Gödel) and axiomatic formalism, the transcendental dialectics (Hilbert & his followers).

Regarding the mathematical status of intuitionism Beth writes: "It is clear that intuitionistic mathematics is not merely that part of classical mathematics which would remain if one removed certain methods not acceptable to the intuitionists. On the contrary, intuitionistic mathematics replaces the methods by other ones that lead to results which find no counterpart in classical mathematics" (Beth 1965:89). But listen to what Brouwer himself has to say. He believes that "classical analysis … has less mathematical truth than intuitionistic analysis" (Brouwer 1964:78) – to which he adds in respect of the differences between intuitionism and formalism:

> As a matter of course also the languages of the two mathematical schools diverge. And even in those mathematical theories which are covered by a neutral language, i.e. by a language understandable on both sides, either school operates with mathematical entities not recognized by the other one: there are intuitionist structures which cannot be fitted into any classical logical frame, and there are classical arguments not applying to any introspective image. Likewise, in the theories mentioned, mathematical entities recognized by both parties on each side are found satisfying theorems which for the other school are either false, or senseless, or even in a way contradictory. In particular, theorems holding

> in intuitionism, but not in classical mathematics, often originate from the circumstance that for mathematical entities belonging to a certain species, the possession of a certain property imposes a special character on their way of development from the basic intuition, and that from this special character of their way of development from the basic intuition, properties ensue which for classical mathematics are false. A striking example is the intuitionist theorem that a full function of the unity continuum, i.e. a function assigning a real number to every non-negative real number not exceeding unity, is necessarily uniformly continuous (Brouwer 1964:79).

Beth elaborates this divergence in a broader context by mentioning multiple other orientations informed by distinct philosophical positions and he even questions the appreciation of axiomatic set theory as the ultimate foundation of mathematics (Beth 1965:161-203). Differences such as these prompted the mathematician Kline to come up with a pretty negative assessment of the situation within mathematics:

> The developments in the foundations of mathematics since 1900 are bewildering, and the present state of mathematics is anomalous and deplorable. The light of truth no longer illuminates the road to follow. In place of the unique, universally admired and universally accepted body of mathematics whose proofs, though sometimes requiring emendation, were regarded as the acme of sound reasoning, we now have conflicting approaches to mathematics. Beyond the logicist, intuitionist, and formalist bases, the approach through set theory alone gives many options. Some divergent and even conflicting positions are possible even within the other schools. Thus the constructivist movement within the intuitionist philosophy has many splinter groups. Within formalism there are choices to be made about what principles of metamathematics may be employed. Non-standard analysis, though not a doctrine of any one school, permits an alternative approach to analysis which may also lead to conflicting views. At the very least what was considered to be illogical and to be banished is now accepted by some schools as logically sound (Kline 1980:275-276).

The topicality of these diverging orientations is currently still reflected in the encompassing Oxford Handbook published by Oxford University Press in 2005 on philosophy, mathematics and logic – with Shapiro as Editor (833 pages). This work inter alia contains contributions on empiricism and logical positivism (1), on logicism (3), on Wittgenstein (1), on formalism (1), on intuitionism (3), on naturalism (2), on nominalism (2) and on structuralism (2).

An article on "non-denumerability" which appeared in the Journal Koers shows that alternative philosophical assumptions regarding the nature of the infinite lead to mutually opposing interpretations (see Strauss 2011). Interestingly, the editor of an accredited journal refused to publish this article because one of the reviewers objected by stating that it might mislead the youth to think that mathematics is not "an exact science"!

In addition to the extensive quote from Brouwer given above, we may challenge the idea of an exact science by briefly looking at the impasse of arithmeticism, such as the argumentation of Grünbaum published in 1952 aimed at to explaining the continuous extension of a straight line as being constituted by non-extended elements. This circularity is only apparent when it is realized that whereas our awareness of succession (and discreteness) originally belongs to the irreducible core meaning of number, the awareness of a totality (a whole with its parts) originally belongs to the core meaning of the spatial aspect. Once this is seen, it is clear that the idea of infinite totalities merely represents an anticipatory analogy pointing from the numerical aspect to the spatial aspect. However, the idea of an infinite totality presupposes the idea of the at once infinite (traditionally known as the actual infinite), which stands and falls with the deepening or disclosure of the meaning of number under the guidance of the meaning of space. For this reason the at once infinite in principle differs from the primitive meaning of infinity in the literal sense of one, another one, yet another one, and so on (traditionally known as the potential infinite but preferably designated as the successive infinite – endlessness). The decisive point in the argument pursued by Grünbaum is given in the employment of the at once infinite which is needed in Cantor's proof of the non-denumerability of the real numbers. If the real numbers cannot be enumerated, they cannot be added – apparently providing an opening for degenerate intervals to constitute a measure larger than zero (practically boiling down to adding zeros in order to exceed zero, apparently justified by the fact the addition is not defined in the case of non-denumerable infinity). Grünbaum writes explicitly: "The consistency of the metrical analysis which I have given depends crucially on the non-denumerability of the infinite point-sets constituting the intervals on the line" (Grünbaum 1952:302). Therefore the entire arithmeticistic argument begs the question. The attempted arithmetization crucially depends upon the use of the idea of infinite totalities, which needs the at once infinite, and which finally presupposes the irreducible meaning of the spatial order of at once and the (correlated) spatial whole-parts relation.

19 RECENT CHALLENGES TO NEO-DARWINISM

The perspective which we have advanced thus far challenged the idea of "an exact science." But since biology is oftentimes incorporated in the restricted notion of "science" we now briefly highlight some of the increasing problems facing neo-Darwinism with its law-like mechanism of random mutation and natural selection (of course, accepting the constancy of this mechanism contradicts the neo-Darwinian claim that "everything changes").

In the Prologue of his recent book, Darwin's Doubt (2013), Stephen Meyer states the following in connection with the assumed origination of the first living entities: "The type of information present in living cells – that is, 'specified' information in which the sequence of characters matters to the function of the sequence as a whole – has generated an acute mystery. No undirected physical or chemical process has demonstrated the capacity to produce specified information starting 'from purely

physical or chemical' precursors. For this reason, chemical evolutionary theories have failed to solve the mystery of the origin of first life – a claim that few mainstream evolutionary theorists now dispute" [This book is dedicated to the mystery of the Cambrian explosion (initially estimated to have occurred within a time-span of 20 to 40 million years, but now reduced to 5–6 million years (Meyer 2013: 72).]

Although neo-Darwinians therefore have to concede that the origination of the first living entity is a mystery, they still BELIEVE that it did happen "spontaneously", through purely material processes. However, apart from the extreme improbability of such a process, there are no clues as to how the information found in living entities came into being – the "hardware" (material) does not explain the "software" (such as ordered DNS sequences, epigenetic information or complex proteins).

The equally mysterious appearance of new animal phyla during the Cambrian explosion is now attributed to information not stored in genes, namely epigenetic information. Add to this that similar information sequences do not affirm common ancestor genes. The reality that genes with information-rich sequences cannot be derived from common ancestral genes, is underscored by recent "genomic studies which reveal that hundreds of thousands of genes in many diverse organisms exhibit no significant similarity in sequence to any other known gene" (Meyer 2013:215). In addition Meyer mentions that these ORFfan genes (derived from "open reading frames of unknown origin") have "turned up in every major group of organisms, including plants and animals as well as both eukaryotic and prokaryotic one-celled living entities. In some organisms, as much as one-half of the entire genome comprises ORFan genes" (Meyer 2013: 216). While having no homologs ORFans cannot be related to a common ancestral gene, a "fact tacitly acknowledged by the increasing number of evolutionary biologists who attempt to 'explain' the origin of such genes through de novo ('out of nowhere') origination" (Meyer 2013:216). Clearly, questions concerning origins increasingly recede into the mystical realm of "coming from nowhere" (which is synonymous with: ultimately we do not know and approximating the possibility of creation)!

Likewise, the Cambrian expert, Douglas Erwin (trained at the University of California), in collaboration with Eric Davidson, "have now ruled out standard neo-Darwinian theory" because it "gives rise to lethal errors", to which Erwin and Davidson add that no current theory of evolution explains the origin of the de novo body plans found in the Cambrian explosion (see Meyer 2013:356). On the same page Meyer mentions Erwin saying that establishing these novel body plans does not have "any parallel to currently observed biological processes" because he insists that the events of the past were fundamentally different. Meyer summarizes this succinctly: "the cause responsible for generating the new animal forms, whatever it was, must have been unlike any observed biological process operating in actual living populations today" (Meyer 2013:356). When the principle of uniformity is challenged the door is opened for speculating about origination phenomena which are indeed unlike any biotical processes observed in currently living populations.

How can anyone come to terms with the uncertainties and speculation increasingly surrounding (and even rejecting) the neo-Darwinian mechanism of random mutation and natural selection? Reverting to "out of nowhere" and a "fundamentally different past" underscore the mystery surrounding the unique origination of living entities, including the evidence of the Cambrian explosion which, according to Erwin and Davidson (2002), is not accounted for by any known (micro or macro) theory of evolution.

20 CONCLUDING REMARK

In conclusion, it should be mentioned that implicit in our entire preceding analysis of the shortcomings in and problems of postmodernism, positivism and atheism one can discern key elements of a non-reductionist ontology motivated by the supra-theoretical ultimate commitment to accepting God as Creator of the universe in Whom all things hang together. The idea of type-laws (with their specified universality) and the idea of universal (unspecified) modal laws occupy a key position in such a non-reductionist ontology. We are indebted to the founders of this philosophical legacy who developed their crucial insights during the first half of the previous century.

Among them also Stoker articulated his own assessment of what those who are involved in scholarship should acknowledge. He did this within the perspective of Christianizing all of life (Stoker 1967:65) which for him entailed the idea of God's law-order (Stoker 1967:52) on the basis of explicitly promoting the ideal of a non-reductionist ontology (Stoker 1967:61).

It is a privilege to be able to make a humble contribution to the further development of this philosophical legacy at an institution where Professor Stoker spent his fruitful academic career.

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