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# The historical roots of systematic distinctions

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## Abstract

*My first explicit acquaintance with philosophy as a scholarly discipline followed from a question to my father about the slogan of the French Revolution – liberty, equality and fraternity. His answer and the books he advised me to read not only piqued my interest in philosophy but also generated many more questions. I was especially impressed that everything in our everyday experience actually function in all aspects of reality. But I was also wondering where these distinctions and insights originated from in the first place. Were these totally new insights or did they relate to the history of philosophy? It soon became clear that the distinction between aspects and entities and between various aspects indeed reflect earlier insights (“moments of truth”) found in the history of philosophy and also in the various special sciences. This then guided the current investigation into the historical roots of systematic distinctions. The pivotal role of the first four aspects of reality as distinguished by Dooyeweerd occupies a key position in this analysis. Although Greek philosophers did not develop a theory of modal aspects, they already wrestled with the meaning of number, space, movement and (physical) change. The development from Pythagoreanism to the philosophy of being of Parmenides explored important interrelations between number and space, followed by the ideas of Heraclitus regarding eternal flux which implicitly explore the meaning of the kinematic and physical aspects of reality. This awareness of constancy and change exerted an influence on the substance concept and it produced solid immanent criticism both*

*on historicism and reductionism. Modal abstraction appears to be a key element of the distinctiveness of scholarly thinking. Cassirer closely approximated key elements of the idea of a modal aspect where he argues that in order to avoid an infinite regress we have to accept certain “original functions” that cannot be derived from each other (it almost sounds like defending the biblically-informed idea of sphere-sovereignty). This insight at once opens the way to type laws and the legitimate role of experimentation (correctly emphasized by positivism). The last section of the article examines a case where an alleged “moment of truth” turns out to be a moment of “un-truth”. The biblical starting point of Christian scholarship results into a non-reductionist ontology which safeguards scientific thinking from theoretical distortions and antinomies.*

## **Opsomming**

### ***Die historiese wortels van sistematiese onderskeidings***

*My eerste eksplisiete kennismaking met filosofie as wetenskaplike dissipline het voortgevloei uit 'n vraag wat ek aan my vader oor die slagspreuk van die Franse Revolusie gevra het: “vryheid, gelykheid en broederskap”. Sy antwoord en die boeke wat hy vir my gegee het om te lees het nie alleen my belangstelling in die filosofie geprikkel nie, maar ook talle verdere vrae in my gemoed gegeneer. Ek was veral daardeur beïndruk dat die dinge van ons alledaagse ervaring in alle aspekte van die werklikheid funksioneer. Tog het ek gewonder waar hierdie onderskeidings en insigte in die eerste plek vandaan kom. Gaan dit oor totaal nuwe insigte of hou dit verband met die geskiedenis van die filosofie? Dit het spoedig duidelik geword dat die onderskeiding tussen aspekte en entiteite en die onderskeiding van verskillende aspekte inderdaad lank-verworwe insigte reflekteer (‘waarheidsmomente’) wat in die geskiedenis van die filosofie en die verskillende vakwetenskappe na vore getree het en wat rigting gee aan die huidige ondersoek na die historiese wortels van sistematiese onderskeidings. Die eerste vier aspekte wat Dooyeweerd onderskei vervul 'n belangrike rol in hierdie ontleding. Hoewel die Griekse denkers nie 'n teorie van modale aspekte ontwikkel het nie, het hulle daadwerklik geworstel met die sin van die aspekte van getal, ruimte, beweging en energie-werking (fisiese verandering). Die ontwikkelingsgang vanaf die Pythagoreïese skool na*

*Parmenides se besinning oor die syn het reeds belangrike verbande tussen getal en ruimte ondersoek. Dit is opgevolg deur Herakleitos se besinning rakende die ewige vloei van alle dinge wat implisiet die sin van die bewegings- en fisiese aspekte ontgin het. Dit handel oor die besef van duursaamheid en verandering wat die substansie-begrip beïnvloed het en wat stewige kritiek op beide die historisme en reduksionisme moontlik gemaak het. Dit het geblyk dat modale abstrahering 'n kern-element van die onderskeidende aard van wetenskaplike denke vorm. Cassirer het byna tot 'n insig in die idee van 'n modale aspek gekom waar hy argumenteer dat indien 'n oneindige terugredenering vermy wil word sekere "oorspronklike funksies" aanvaar moet word wat nie van mekaar afgelei kan word nie (dit klink amper na die Bybels-geïnspireerde idee van soewereiniteit-in-eie-kring). Hierdie insig het meteens die weg geopen om die regmatige plek van eksperimentering te erken (soos tereg deur die positivisme beklemtoon). Die laaste gedeelte van die artikel ondersoek 'n geval waar 'n vermeende "waarheidsmoment" in werklikheid 'n moment van "on-waarheid" is. Die Bybelse vertrekpunt van Christelik-wetenskaplike denke lei tot 'n nie-reduksionistiese ontologie wat wetenskaplike denke teen teoretiese skeeftrekkings en antinomieë beskerm.*

## 1. Orientation

Since philosophy is not generally available as a normal subject at school most people obtain the opportunity to study this only after they have completed their school education and commence studying at a tertiary academic institution. Nonetheless, the term "philosophy" did become part and parcel of our everyday language. When someone says something profound or slightly beyond the grasp of the listeners, his or her pronouncement is labeled as being *philosophical* in nature.

In my second last school year the history teacher instructed us about the French Revolution and amongst other things mentioned the well-known slogan of liberty, equality and fraternity. I was impressed with this slogan and on the same day relayed this to my father, who was knowledgeable in both philosophy and political philosophy. To my surprise he then told me that this slogan should be traced back to the political theories of John Locke and Jean-Jacques Rousseau. In his work, *Two Treatises on Civil Government* (1690) Locke made a plea for *freedom* in the context of his theory of the *social contract*. Rousseau emphasized public legal *equality* in his work,

*Contrat Social* (1762), and those with socialist views accentuated *fraternity*. By uniting these three foci in one slogan, the revolutionaries succeeded in uniting diverse sections of the population of France into one revolutionary movement.

My immediate reaction was to ask why this illuminating background was not provided by the history textbook. The answer was: because the historians as a rule are not trained in philosophy and political philosophy. My next question obviously was: so what is philosophy then? The explanation which I received at once introduced me to the distinction between philosophy and the special sciences. The criterion applied in this explanation employed the distinction between a *totality science* directed at the entire universe on the one hand and the *special sciences* restricting themselves to one or another angle of approach on the other.

I was intrigued by the idea of an angle of approach and asked for an example that can explain this. Then my father used a *chair* as an example.<sup>1</sup> A chair like any other entity functions in all aspects of reality, such as the numerical (how many chairs are there?), the spatial (how large is it?), the sensitive aspect (is it comfortable?), the economic (how expensive is it?), and so on. To my surprise my father explained that the chair also functions within the faith aspect of reality, because sitting on any chair requires the trust (confidence) that the chair is strong enough (its physical aspect) to bear one's weight.

Suddenly multiple new questions entered the scene. For example: how many aspects are there? Are they arbitrarily selected or do they display a specific order? What is the definition of an aspect? Can one define one aspect in terms of a different aspect and if not, why not? He first of all told me that analyzing the various aspects of a chair in this way represents a particular trend in philosophy, at the time known as the "Wijsbegeerte der Wetsidee" (*Philosophy of the Law-Idea*). Although he did start to discuss some of my questions he immediately realized that perhaps it is the opportune time to introduce an *Introduction to the Philosophy of the Cosmonomic Idea* (as this young school of thought became known since the 1950s). It was Spier's *Inleiding in der Wijsbegeerte der Wetsidee* (1950).

Reading this book added flesh to the skeleton of a brief overview of the various aspects of a chair. At the same time I was baffled to realize what appears to be so natural and almost self-evident was only contemplated in this particular way after about 2000 years of philosophical reflection?! It took

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1 Later on I shall mention a similar example used by Diemer – the multi-aspectual nature of a coin.

the genius of the Dutch philosopher Herman Dooyeweerd (and his brother-in-law, Dirk Vollenhoven) to envision this new theory of aspects, designated by Dooyeweerd as the theory of *modal law-spheres*. Yet Dooyeweerd emphasized that his theory did not drop from the sky because by means of multiple threads it is connected with the history of philosophy.

Does this mean that earlier philosophers developed a theory of modal aspects? Alternatively, did they already have insight into certain elements of this theory? Is the reality of various aspects something that is *undeniable* because it is so integral to our everyday experience of the world in which we live?

Let us consider these questions by restricting ourselves to the first four modal aspects of reality, namely numerical, spatial, kinematical and the physical and let us combine this investigation with the idea of “moments of truth” (*waarheidsmomente*). This angle of approach will require a brief explanation of the distinctive feature of scholarly thinking as well as a succinct account of the difference between aspects and entities in terms of the distinction between modal laws and type laws.

During my undergraduate studies this phrase was employed to capture the fact that thinkers from diverse backgrounds were able to “touch upon the truth”, to discover “moments of truth”. Intimately linked to this was the idea of undeniable *states of affairs*. In 1965 another Dutch philosopher, C.A. Van Peursen, discussed the problem of how a particular perspective on so-called *states of affairs* can communicate with other philosophers who are advocating diverse perspectives (see Van Peursen, 1965:163).

## **2. Human beings are living in the same world**

The underlying idea is certainly that all human beings live in the same world, that they are experiencing the same universe. Therefore, the systematic distinctions operative within alternative philosophical perspectives in one way or another will have to reflect what is experienced.

Particularly during my studies at the Free University in Amsterdam I consulted some of the works that featured most prominently in Dooyeweerd’s *magnum opus*, his *A New Critique of Theoretical Thought*, with the aim to see if any of Dooyeweerd’s systematic insights were present in the thought of those thinkers. This article will continue those initial investigations by focusing on what is shared and what is unique in respect of the theory of modal aspects. We have to restrict this scrutiny just to the four most basic aspects of reality.

Such an approach will have to consider relevant contours of the history of philosophy as well as developments within the various special sciences.

### 3. Historical connecting points for the theory of modal aspects

From the perspective of systematic distinctions, Greek philosophy displays a remarkable exploration of the first four aspects of reality as distinguished by Dooyeweerd. Consider the orientation of the Pythagorean school with its claim that everything is *number*, followed by the school of Parmenides which shifted the focus to *static being* – and compare these two stances with the struggle between constancy and change in the philosophy of Heraclitus.

#### (a) *Main contours of early Greek philosophy*

Greek philosophy not only reflected on the nature of number but also contemplated the most basic understanding of infinity as it flows from the succession of numbers. Numerical succession is “open-ended”, it provides us with the awareness of succession without an end (such as found in the row of natural numbers – although “one”, as the origin of numbers, was not itself a number). Succession without an end underscores the *endlessness* of number, its *infinity*. This appreciation of succession represents a lasting insight. Just consider the conviction of Russell in this regard. He holds that “greater and less are undefinable” and in addition he remarks that “progressions are the very essence of discreteness” (see Russell, 1956:194; see also pages 167, 299). In spite of the axiomatization of mathematics Hermann Weyl, who left the axiomatic formalist school for intuitionism, reacts to the idea that mathematics merely exists in making valid inferences from postulated axioms.<sup>2</sup>

What prevents mathematics from this fate, according to him, is the principle of mathematical induction which presupposes the indefinability of discreteness as it comes to expression in successions. He writes: “... from an intuitionistic standpoint complete induction safe-guards mathematics from collapsing into an enormous tautology”.<sup>3</sup>

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2 Since inferences are not true or untrue but merely valid or invalid and since the conventional meanings of axioms are left behind, Russell formulated his epigram: “Pure mathematics is the subject in which we do not know what we are talking about, or whether what we are saying is true” (quoted in Nagel & Newman, 1971:13).

3 “... erscheint vom intuitionistischen Standpunkt die vollständige Induktion als dasjenige, was die Mathematik davon bewahrt eine ungeheure Tautologie zu sein” (Weyl, 1966:86).

(b) *Cassirer approximates the idea of modal aspects*

Although all these insights underscore the discrete meaning of the numerical aspect, the idea of a modal aspect as such did not emerge from them. However, Cassirer came very close to identifying key elements of the idea of a modal aspect where he assesses the contribution of the Pythagoreans and reflects on the necessity of original, indefinable functions not reducible from others. He holds that a critical analysis of knowledge, when one does not want to accept an *infinite regress*, would have to stop with certain original functions, where a genuine derivation is not possible and is also not needed.<sup>4</sup>

Cassirer points out that the concept of number first of all helps us to appreciate the nature and value of concept formation as such. Unfortunately Pythagorean thinking overestimates the role of number by claiming that number constitutes the essence of every entity. But when this metaphysical perspective is left aside we were enabled, according to Cassirer, to realize that although number does not constitute the essence of things, it does provide the basis in which rational knowledge is rooted.<sup>5</sup>

Although every numerical relationship could be represented in a geometrical way, not every relationship between line-stretches could be represented numerically (by integers or fractions). As a result Euclid incorporated number in his geometry. This caused an interest in a new mode of being, space. Aristotle subsumed both number and space under the category *quantity* for he distinguishes between a discrete quantity and a continuous quantity. In following up ideas from earlier Greek philosophers Aristotle develops a clear insight into the “inward-turning” of infinity by distinguishing between infinity in respect of addition and infinite in respect of division (Aristotle, *Physica* 204a:3-4; Aristotle, 2001:260). Acknowledging the latter, namely infinite divisibility, requires a different angle of approach, a spatial one. Originally this was already done by Parmenides, who metaphysically explored the characteristics of space, portrayed as being (what IS) – in his identification of thinking and being (Diels-Kranz, 1959-60: B Fr. 3): “for it was not and will not be, for it is altogether present in the now as a whole, one, continuously cohering” (Diels-Kranz, 1959-60:B Fr. 8:3-6).

4 “Denn die kritische Analyse der Erkenntnis wird, wenn man nicht einen regressus in infinitum annehmen will, immer bei gewissen Urfunktionen Halt machen müssen, die einer eigentlichen ‘Ableitung’ weder fähig noch bedürftig sind” (Cassirer, 1957:73).

5 “Der Anspruch, in der Zahl die Substanz der Dinge zu erfassen, tritt freilich allmählich zurück; aber zugleich vertieft und verschärft sich die Einsicht, dass in ihr die Substanz der rationalen Erkenntnis wurzelt” (Cassirer, 1910:35).

(c) *Space as new mode of explanation in Greek philosophy*

What Aristotle did not realize was that “quantity” is a numerical feature and when it is encountered within the domain of space it therefore reminds one of its original numerical meaning. If this distinction is not made, the measure of spatial extension is identified with what is extended, resulting in the age-old mistaken legacy which defines a straight line as the (shortest) distance between two points. Mac Lane, for example still says: “The straight line is the shortest distance between two points” (Mac Lane, 1986:17). In the fourth of his famous 23 problems presented to the international mathematics conference (Paris, 1900), David Hilbert departs from this legacy by designating a line as the “shortest connection between two points” (Hilbert, 1970:302-304).

For the further development of philosophy, the attempt, launched by Parmenides (and Zeno), to get rid of multiplicity and movement (the flying arrow, Achilles and the tortoise) revealed another perennial philosophical problem. Heraclitus is famous for his emphasis on *change* (one cannot step into the *same* river twice), but Plato argued that change could only be detected on the basis of what endures (persists). This insight highlights the uniqueness and unbreakable coherence between the kinematical meaning of uniform flow and the physical aspect of dynamic changes. To prevent theoretical thought from surrendering to unlimited change, Plato postulated his eternal and static ontic forms which in the first place make possible what we can know.

#### **4. The substance concept: abusing the connection between constancy and change**

Throughout Greek and medieval philosophy Plato’s insight served a metaphysical substance concept, moulded in the form of the distinction between essence and appearance. This substance concept exerted an influence upon physics and biology and even on the medieval theological distinction between the two kinds of knowledge, namely between God’s self-knowledge (*theologia archetypa* directed towards God as He is “in Himself” – the “essence” of God) and the knowledge through which He reveals Himself to us (accommodated to creation – *theologia ectypa* – His “appearance”).<sup>6</sup>

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6 All of this flows from the substance concept. Moreover this distinction also pertains to so-called communicable and incommunicable properties of God. Bavinck explains that the *theologia archetypa* concerns the knowledge with which God knows himself and that the *theologia ectypa* is the knowledge of God as accommodated and ‘anthropomorphized’ to be suitable for the finite human consciousness (Bavinck, 1918-I:144).



In spite of widely differing views of reality, prominent philosophers throughout the history have revealed an insight into the foundational role of *persistence* (constancy) in respect of *change*. Immanuel Kant ascribes this not only to philosophers but primarily to a general understanding among laymen who all know that the substance of what persists is presupposed in what changes in the appearances: “in all changes in the world the substance persists while the properties change” (Kant, 1787:227).

In his *Science of Logic* Hegel continues this view by holding that a law (*Gesetz*) is *what remains the same in what changes* (Hegel, 1957-2:122).

An interesting wrestling with this issue is present in the *General Course in Linguistics* of Ferdinand de Saussure. His first approach is to refer to the “immutability and the mutability of the sign” (De Saussure, 1966:74). The editors of this work was not comfortable with this statement and immediately added an explanatory note: “It would be wrong to reproach F. de Saussure for being illogical or paradoxical in attributing two contradictory qualities to language. By opposing two striking terms, he wanted only to emphasize the fact that language changes in spite of the inability of speakers to change it. One can also say that it is intangible but not unchangeable. [Ed.]” Remarkably enough in the next paragraph De Saussure rephrases his point in such a way that a proper understanding of constancy (continuity) and change is articulated:

In the last analysis, the two facts are interdependent: the sign is exposed to alteration because it perpetuates itself. What predominates in all change is the persistence of the old substance; disregard for the past is only relative. That is why the principle of change is based on the principle of continuity (De Saussure, 1966:74).

## 5. The ontic basis of the relation between persistence and change: the rise of modern physics

On the basis of his theory of modal aspects Dooyeweerd realized that the ontic basis for this foundational relation requires a distinction between the kinematic aspect of uniform (rectilinear) motion and the physical aspect of energy-operation (see Dooyeweerd, 1997-II:99). This distinction at once opens up a penetrating understanding of the development of modern physics, because in its main tendency modern physics opted for a mechanistic approach (in which all movements are reversible). In 1910 Max Planck observes that it was the “irreversibility of natural processes” that confronted the “mechanistic conception of nature” with “insurmountable

problems” (Planck, 1973:55). In Einstein’s “Autobiographical Notes” he explicitly refers to Planck’s observation by pointing out that “all courses of events” in the “sense of thermodynamics, are ‘irreversible’” but that viewed from the “molecular-mechanical point of view however, all courses of events are reversible” (Einstein, 1959:42).

Max Planck sharply and correctly distinguishes between a “mechanical” and an “energetical” view of nature (Planck, 1973:65). Peter Janich defends an exact distinction between phoronomic (also designated as *kinematic* by him) and *dynamic* arguments, which he explains by means of an example. Modern physics has to employ a dynamic interpretation of the statement that a body can only alter its speed continuously. Given certain conditions, a body can never accelerate in a discontinuous way, that is to say, it cannot change its speed through an infinitely large acceleration, because this would require an infinite force.<sup>7</sup>

The most significant support for defending the foundational position of the kinematic aspect in relation to the physical aspect is derived from Galileo and Einstein. With the formulation of his law of inertia Galileo accepted motion as a *given*, as an *original mode of explanation*. He grasped the fact that one cannot ask about the cause of motion, but only about the cause of a *change* of motion (acceleration or deceleration). In his special theory of relativity Einstein ultimately developed a *kinematic theory* of constancy, for all movement is relative to the constancy of the vacuum-velocity of light. He actually in the first place developed a theory of *constancy*, not a theory of relativity.

More recently Janich once more underscored the limitations of the classical mechanics: “The familiar foundation of classical mechanics turned out to be insufficient both for electrodynamics and thermodynamics” (Janich, 2009:140).

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7 “Die Tragweite einer strengen Unterscheidung phoronomischer (im folgenden kinematisch genannt) und dynamischer Argumente möchte ich an einem Beispiel erläutern, das ... aus der Protophysik stammt. Die Aussage ‘ein Körper kann seine Geschwindigkeit nur stetig ändern’ kann von der modernen Physik nur dynamisch verstanden werden. Geschwindigkeitänderungen sind Beschleunigung, d.h. als Zweite Ableitung des Weges nach der Zeit definiert. Zeit wird von der Physik als ein Parameter behandelt, an dessen Erzeugung durch eine Parametermaschine (‘Uhr’) de facto bestimmte Homogenitätserwartungen geknüpft sind ... Bezogen auf den Gang einer angeblich so ausgewählten Parametermaschine kann eine Körper seine Geschwindigkeit deshalb nicht unstetig, d.h. mit unendlich große Beschleunigung ändern, weil dazu eine unendlich große Kraft erforderlich wäre” (Janich, 1975:68-69).

## 6. Different perspectives on a shared moment of truth

Clearly all the thinkers, discussed in connection with the connection between constancy and change, touched upon shared states of affairs even though they accounted for them in terms of alternative perspectives. Cassirer, for example assumes “ultimate logical invariants” which are unaffected by their changing material content. He writes of “identity and permanence” “at the basis of scientific laws” (Cassirer, 1953:325). He comes remarkably close to acknowledge the conditioning role of the first four modal aspects of reality regarding an articulation of the nature of natural laws: “There is no objectivity outside of the frame of number and magnitude, permanence and change, causality and interaction: all these determinations are only the ultimate invariants of experience itself, and thus of all reality, that can be established in it and by it” (Cassirer, 1953:309).<sup>8</sup>

Accepting the ontic status of the aspects of number, space, movement and the physical opens up the possibility explored by Dooyeweerd in his theory of modal aspects, namely to be sensitive to uniqueness and indefinability, accompanied by taking serious ontic irreducibility. Indefinability avoids an infinite regress – already realized by Aristotle (Aristotle, *Metaph.* 1006 a 5-12) and recently once more emphasized by Janich (see Janich, 2009:26).

This long-standing insight (state of affairs/moment of truth) is also particularly significant for the wide-spread effect of modern historicism (since the beginning of the 19<sup>th</sup> century). From a systematic perspective constancy (the core meaning of the kinematic aspect) underlies all change (the core meaning of the physical aspect). For example, being able to speak of legal history, economic history or art history presupposes the ontic constancy of these perspectives. If law (in its jural sense), economics and the aesthetic are all intrinsically historical they belong to the past. Only what is not of itself historical in nature can have a history – and if everything *is* history, as the historicist claims, then there is nothing left that can have a history (see Dooyeweerd, 1997-II:223).

The irony therefore is that the radical historicist achieves the opposite of what it aims for: if everything *is* history, there is nothing left that can *have* a history. Hans Jonas recognizes an element of constancy when he speaks of something *transhistoric* in his critique on historicism:

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<sup>8</sup> Dooyeweerd was acquainted with many of the works of Ernst Cassirer who belonged to the Marburg school of neo-Kantian philosophy.

In short, radical historicism leads to the negation of history and historicity. Actually, there is no paradox in this. For history itself no less than historiography is possible only in conjunction with a transhistoric element. To deny the transhistorical is to deny the historical as well (Jonas, 1974:242).<sup>9</sup>

Constancy and change are simply inseparable, also amply demonstrated in multiple phrases apparently aimed at underscoring *change* but nonetheless including a term which reflects persistence. Popper notes that according to the historicist the “whole field of interest is changing” for the “social scientist”: “There are no permanent entities in the social realm, where everything is under the sway of historical flux” (Popper, 1966:33). But then, on the same page, he immediately asks how we can study “government”. How could we identify government or diverse governmental institutions “without assuming that they have something *essentially* in common”? This formulation closely approximates the way in which Plato postulated the “auto to eidos” (the essential being) making change possible (see *Phaedo* 79 d – 80 b0 – edited by Hamilton & Huntington).

Saying that society changes constantly intends to emphasize *change*, but nevertheless at once also refers to an element of *constancy*. A similar situation is present when terms such as “ever”, “always”, and “never-ending” and “ceaseless” are employed – in phrases such as “the ever-changing scene of politics”, “things are always changing” and “ceaseless historical change”.

## 7. Rejecting reductionism

Of course the foundational coherence between historical constancy and historical change is founded in the role of the kinematic meaning of constancy (uniform rectilinear motion) with respect to physical change (dynamics).

Relating the terms constancy and change respectively to the kinematic and physical aspects of reality is informed by an ultimate commitment to a non-reductionist ontology – an expression of the biblical creation motive. Janich mentions that the reductionist program aims at reducing all the academic disciplines to the “formal sciences” (mathematics and physics) and to the “empirische Realwissenschaft Physik (mit Chemie als Teilgebiet)” [physics as the empirical science of the real world, including chemistry]. Popper and Goodfield are serious in their opposition to reductionism. Popper states

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<sup>9</sup> Karl Popper discusses the same issues of constancy and change in the context of his reflections on the implications of historicism for the social sciences (see Popper, 1966-1:33).

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categorically: “As a philosophy, reductionism is a failure” (Popper, 1974:269). In similar vein Goodfield remarks: “Reductionist methodology may have been extremely successful, but the history of science abounds with examples where forms of explanation, successful in one field, have turned out to be disastrous when imported into another” (Goodfield, 1974:86).

One of the important consequences of a non-reductionist ontology is given in the fact that it safe-guards the diversity of scientific disciplines. If all aspects of reality could be reduced to one or a few of them, the encyclopedic diversity of disciplines will collapse. Without irreducibility the distinctive criterion of scientific endeavours, namely modal abstraction, will also be rendered meaningless.

## 8. Implications for the philosophy of science

The familiar (but naive) slogan regarding the special sciences is found in the idea that a *knowing subject* studies a so-called *study object*. First of all it should be noted that the subject-object relation is found in non-scientific human experiences as well. Merely contemplate the human use of social objects (like furniture), technical objects (tools), economic objects (money), semiotic objects (books), aesthetic objects (paintings), ethical objects (engagement or wedding rings) or legal objects (property).

Entities may have subject-functions or object-functions within the various modal aspects. The special sciences abstract one or another aspect allowing access to all (natural and societal) entities because the latter in principle function in all aspects of reality. Special sciences differentiate not on the basis of the question: what is its study-object? But on the basis of the question: from which modal aspect is reality studied?

Suppose our scientific interest is in the *business enterprise*. Does this then mean that the business enterprise is our “study-object”? Not at all, because other academic disciplines exploring different modal points of entry (modes of explanation) may also be interested in the business enterprise. They may all focus on the business, albeit from different angles of approach. If the three disciplines of industrial psychology, industrial sociology and business economics all study the business, merely saying that the business is their study-object what will enable us to distinguish them from each other. In order to do that, one has to identify the specific angle of approach employed by each, i.e., the relevant modal aspect.

The sociologist Peter Berger strikingly touched upon the nature of modal abstraction, even though he did not develop a theory of modal aspects as Dooyeweerd did. He writes: “The sociologist finds his subject matter present in all human activities, but not all aspects of those activities constitute this subject matter. Social interaction is not some specialized sector of what men do with each other. It is rather a certain aspect of all these doings. Another way of putting this is by saying that the sociologist carries a special sort of abstraction” (Berger, 1982:39-40).

From a broader philosophical perspective Diemer comes just as close to an acknowledgment of this feature when he refers to an “aspect discipline”. It shows an awareness of the multi-aspectual nature of “objects” of everyday life, such as a coin (*Münze*), which can be something physical-chemical, historical, aesthetic, a means of payment and eventually even a cultic object (see Diemer, 1970:219).

## 9. From aspects to entities

The universal scope of each modal aspect of reality entails that modal laws also hold universally in an unspecified sense. The main laws of thermodynamics, such as the law of energy constancy, non-decreasing entropy and so on, apply to all possible classes of entities and they are discovered through what we have earlier designated as *modal abstraction*. Immanuel Kant approaches this state of affairs by asking how synthetic propositions a priori are possible – in mathematics, physics and metaphysics (Kant, 1787-B:19-22). According to him the thought categories of human understanding are not derived from nature, but instead prescribed to nature in an a priori way (Kant, 1783 § 36). Although misdirected by the rationalistic assumptions of his epistemology, Kant, in his search for the synthetic a priori, in fact wrestles with the nature of *modal universality*. The remarkable fact is, however, that Kant also recognized typical specificity. This trait relates to type laws holding for different types of entities and it opens the way to an understanding of natural and societal entities functioning in a typical way in all the aspects of reality. Within Greek and Medieval philosophy the speculative substance concept was employed, whereas the modern era increasingly reduced entities to functions. Nonetheless when Kant explicitly distinguishes between his (supposedly universally valid a priori) thought categories on the one hand and so-called *empirical laws* of nature on the other, he approximates the basic ontic distinction between aspects and entities:

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We rather have to distinguish empirical laws of nature, which always presuppose particular perceptions, from the pure or general natural laws, which, without having a foundation in particular perceptions, only contain the conditions of their necessary connection in an experience (Kant, 1783:320; § 36).

Turning our attention to the first part of the 20<sup>th</sup> century reminds us of the view of the mathematician Hermann Weyl who also implicitly distinguishes between modal universality and typicality with an appeal to experimentation: “But what is connected with the a priori construction is experience and an analysis of experience through the experiment” (Weyl, 1966:192). During the second half of the 20<sup>th</sup> century Stegmüller articulates this same “moment of truth” in his discussion of the nature of an a priori synthetic element in the “empirical sciences” (Stegmüller, 1969:316). It should be noted that this distinction represents the recognition of a legitimate element contained in the philosophy of positivism, for it realizes that the investigation of *type laws* has to use *empirical testing*. Type laws have their own *specified universality*. For example, the law for being an atom is universal in the sense that it holds for all atoms, but it is specified, for it applies to atoms only, not for everything.

## 10. A “moment of un-truth”

It stands to reason that assumed insights can also be flawed. This is the case with Dooyeweerd’s conception of the *Gegenstand*-relation. According to him theoretical thought is characterized by opposing the non-logical aspects to the logical aspect of the real act of thought. This formulation rests on the assumption that the opposed non-logical pole has not yet been conceptualized, for Dooyeweerd holds that we “must proceed from the logical antithesis to the theoretical synthesis between logical and non-logical aspects, if a logical concept of the non-logical ‘Gegenstand’ is to be possible” (Dooyeweerd, 1997-I:44). His argument is that the synthesis between the logical and non-logical aspects requires a supra-modal central point of orientation.

Dooyeweerd traces this opposition between the logical and non-logical back to the conviction of Parmenides that *like* is known only by *like*, which is based upon the assumed *identity* of thought and being. Dooyeweerd’s assessment is that this mode of thought does not take account of the theoretical *Gegenstand*-relation (see Dooyeweerd, 2012:94-95). Dooyeweerd’s view of the *Gegenstand*-relation is actually derived from the views of Kant and the two neo-Kantian schools – the Baden school and the Marburg school.

In his *Critique of Pure Reason* Kant commences by *isolating* sensibility from understanding and its concepts (Kant, 1787-B:36) and *separating* understanding both from what is empirical and what belongs to sensibility (Kant, 1787-B:89-90). This embodies an opposition between the logical and the non-logical, the two poles intended by Dooyeweerd in his account of the *Gegenstand*-relation. Dooyeweerd argues that if either of these two poles is chosen as starting point for the inter-modal synthesis the inevitable outcome will be an *ismic* orientation (such as psychologism, biologism, and historicism).

Heinrich Rickert, a representative of the Baden school of neo-Kantianism, also distinguishes between a logical and a non-logical part within the theoretical sphere in his discussion of the problem of number: "We therefore do not succeed in posing the problem of number as such without drawing a distinction between the logical and the a-logical *within* the theoretical sphere and consequently accordingly must determine the *purely* logical *part* of the theoretical (Rickert, 1924:9).

In his *Hoofddlijnen der Logica* Vollenhoven distinguishes between (logical) analytical and non-analytical: "Now in what is knowable the analytical is not only always present: in addition it is *one* of the two components, that constitutes the bi-unity of the method of every special science. This explains why here the analytical is fairly easily distinguishable from the other component, that is to say the investigated field. Just consider words such as "bio-logist", "psycho-logist", "socio-logist", and so on, where the first member designates the non-analytical and the second the analytical" (Vollenhoven, 1948:62).

The alternative chosen by Dooyeweerd, regarding uniting the logical and non-logical aspects, explored the way towards a *supra-modal point of orientation* – already contemplated by Paul Natorp. He actually mentioned this alternative without exploring it. It was Dooyeweerd who followed this option. The statement by Natorp reads as follows:

It is now not any longer possible to speak about a multiplicity of sensibility, which should synthetically be united by our thought in an act of knowledge performed only afterwards. How will it be possible for the multiplicity of our senses to be combined in the unity of a concept? In this case, the basic elements, unity and multiplicity, would not both have been thought-moments; consequently, also their combination would not have been performable within pure thought as such. Much rather, in order to achieve this synthetic unity, our understanding should first of all unite itself with something external to it, something foreign, 'sensibility'. Alternatively, there must be a third instance, transcending both sensibility and understanding, which can perform this synthesis. However, in



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reality this is not the case, since in one and the same thought-act multiplicity originates simultaneous with the consciousness of unity, as both thought-structured modes of determination which are in their thought-character strictly connected with each other (Natorp, 1921:48).

The “third instance” “transcending both sensibility and understanding” mentioned by Natorp was indeed explored by Dooyeweerd in his idea of the necessity of a supra-modal (central religious) starting point for the supposed inter-modal meaning-synthesis.

Unfortunately Dooyeweerd’s conception of the *Gegenstand*-relation is untenable, for the unanswered question is how is it possible to conceive an opposed *non-logical aspect* without (conceptually) knowing what is opposed to the logical aspect! Is this opposition possible without *identifying* and *distinguishing* what is opposed to the logical function of the real act of thought? But identifying amounts to forming a concept of something or some feature. Moreover, although Dooyeweerd intends to advance a strict distinction between the *Gegenstand*-relation and the subject-object relation, he contradicts himself in various places in this regard. His general intention to restrict the *Gegenstand* to the non-logical aspects is violated at places where he explicitly speaks of the modal structure of the logical aspect itself as being a *Gegenstand* of our “actual logical function” (“of theoretical analysis”) (see Dooyeweerd, 1997-I: 40, footnote 1, and 1997-II:463). Add to this that he sometimes also said that pre- and post-logical aspects of reality can be logically objectified (1997-II:390, 472).

Therefore the idea of a *Gegenstand*-relation turned out to be a distortion of the true states of affairs causing Dooyeweerd to assume an inconsistent position in this regard. The idea of a *Gegenstand*-relation is therefore not an undeniable “state of affairs” or a “moment of truth” shared beyond philosophical orientations.

## 11. Concluding remark

Our preceding analysis amply demonstrates the fact that the basic distinctions found in Dooyeweerd’s non-reductionist ontology are intrinsically related to “moments of truth” revealing themselves in undeniable states of affairs. The modal universality of the first four aspects presupposes the distinction between modal laws and type laws. Moreover, without explaining it in more detail, a proper understanding of these four modes of explanation can safeguard theoretical thinking from exploring one-sided *ismic* orientations which inevitably lead to theoretical antinomies. The biblical perspective on the unity

and goodness of God's creation in principle liberates theoretical thought from the dead alleys of antinomic thinking.

Just consider the following one-sided orientations generated by misrepresenting the uniqueness of and coherence between the first four aspects of reality. The opposition of individualism (atomism) and universalism (holism) is brought forth by over-emphasizing either the numerical or the spatial aspect as ultimate principles of explanation. Over-emphasizing universality at the cost of individuality (or vice versa) results in the opposition of rationalism and irrationalism still exploring basic traits of the first two aspects. The same applies to realism and nominalism, because a key element of these two *isms* also depends upon a particular configuration of the relationship between universality (inside the "human mind") and what is individual (outside the "human mind"). However twisted a particular theoretical orientation may be, it never succeeds in avoiding the incorporation of undeniable structural features of God's good creation.

A biblical-Christian starting point directs theoretical thought towards a non-reductionist ontology which may in fact still be a victim of sinful distortions even though in Christ we are in principle liberated from every reductionist stance.

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