

THE NORMATIVE SENSE OF THE CONCEPT OF LAW PART II – SYSTEMATIC CONSIDERATIONS

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Abstract

Modern philosophy left us with an unbridgeable divide between factual reality and the domain of values (normativity). This article first of all analyzes modal norms, such as the principle of avoiding what is legally excessive. There are distinct but mutually cohering kinds of laws. The distinction between modal laws / norms and type laws / norms required an example from the domain of human society – John Locke and Adam Smith, whose ideas in practice gave birth to trade unionism and labour parties. The idea of an “invisible hand” (manifest in the “free market”) operates with exact (natural) laws, such as supply and demand. When modal norms are distinguished from type norms it becomes clear that states and a business enterprises can act uneconomically by wasting their money although they ought to function in a way that is guided by economic considerations of frugality. As an example the well-known natural law of energy-conservation is explained as the embodiment of an analogical link between the physical aspect and the kinematic aspect which should rather be designated as the law of energy-constancy. Finally the problem of normativity is related to the coherence between the logical-analytical aspect and its coherence with the aspects of number and space – focused on the principle of the excluded middle and its implications for diverging schools of thought within twentieth century mathematics. The last subsection concludes with reference to the norms guiding technological developments and with an assessment of the meaning of technology.

Keywords: Fact and value, normativity, modal norms, typical norms, supply and demand, frugality, natural laws, cultural norms, schools of thought, physics and mathematics

1. INTRODUCTION

In this article the interconnection between science, technology, engineering and mathematics will be elucidated by taking into consideration the perspective provided by a systematic account of the meaning of “law.” This will be done against the background of the history of the idea of law and its affinity with the idea of a world order (Strauss, 2012). The rise of the modern mathematical natural sciences exerted an immense influence upon technology and engineering (STEM). This influence emerged through a transition that took place during Ancient Greek and the Medieval period, one in which the concept of law eventually acquired a more restricted meaning. First of all it was directed towards an understanding of human society and the way in which it is normed.

But during the Renaissance early modernity overextended the natural scientific concept of law foremost exemplified in the concept of causality. However, this development turned into a threat of human freedom. As a result by and large modern philosophy adhered to a negative understanding of freedom: freedom was negatively conceived of as being free from causal determination. This article aims at developing an alternative view.

2. 'IS' AND 'OUGHT': ARE THEY SEPARATED BY AN UNBRIDGEABLE ABYSS?

Immanuel Kant realized that the deterministic understanding of causality of the modern science ideal eliminates human freedom. He therefore postulated two realms, corresponding to his distinction between “thing-in-itself” and “appearance”. This subtle but basic distinction used by Kant serves to secure a separate (super-sensory) domain for the human being as an autonomous ethical aim-in-itself (Zelbstzweck). Kant holds that the category of cause and effect can only be applied to appearances and not to things-in-themselves (such as the free will of the human soul, see his argument in Kant 1787-B:XVII-XVIII). This explains at once his aim, namely “to point out that since the thorough-going connection of all appearances, in a context of nature, is an inexorable law, the inevitable consequence of obstinately insisting on the reality of appearances is to destroy all freedom. Those who thus follow the common view have never been able to reconcile nature and freedom.” When this distinction collapses freedom also fails: “The common but fallacious presupposition of the absolute reality of appearances here manifests its injurious influence, to the confounding of reason. For if appearances are things in themselves, freedom cannot be upheld” (Kant, 1787-B: 564).

It was therefore Kant who laid the foundation for the general restriction of “science” to physics and mathematics. These disciplines advanced by claiming that they are “objective” and “neutral”. By contrast, “faith” was placed within the domain of practical reason (the domain of the ethical). The outcome of this legacy is given in the well-known opposition of “science” and “faith” – we merely have to recall Kant’s statement: “Therefore I had to restrict knowledge in order to make room for faith.”¹

This dualism between nature and freedom, which came to expression in the above-mentioned apparently innocent distinction, namely that between essence (thing-in-itself) and appearance, inspired Kant to proclaim the separate existence of two realms, each with its own law-giver. The latter is assumed to be a priori in nature. On the one hand we find human understanding which acts as a priori law-giver for nature as sensory object and for theoretical knowledge of nature in a possible experience. Reason on the other hand is the a priori law-giver for freedom (with its own causality). It concerns what is supra-sensory in the human subject – and it provides unconditional practical knowledge.

¹Ich mußte also das Wissen aufheben, um zum Glauben Platz zu bekommen” (Kant, 1787-B:xxx). [“I had to restrict knowledge in order to make room for faith.”]

The domain of the nature concept under the one and the domain of the freedom concept under the other legislation are mutually exclusive and cannot, according to its own laws, have an effect on each other. This is a consequence of the large split totally separating them – the divide between the supra-sensory and appearances. The freedom concept determines nothing in respect of theoretical knowledge of nature, just like the nature concept does not determine anything in respect of the practical laws of freedom: and in this regard it is impossible to bridge the two domains.²

Surely, the modern philosophical dualism between nature and freedom could not be phrased more aptly than Kant who underscores two separated law-givers, understanding and reason, attached to each domain. But already in the extensive quotation given in the previous footnote the assumed unbridgeable opposition of nature (causality) and freedom is not upheld, for we read of “freedom with its own causality” [“die Freiheit und ihre eigene Kausalität”].

This Kantian dualism between the (deterministic) sphere of natural causality (cause and effect) and the supra-sensory (ethical) sphere of ought-to-be was in neo-Kantianism transformed by their idea of values in the thought of Rickert, Windelband and Weber. What became known as the hermeneutical turn, with its emphasis on understanding (*verstehen*), convinced many scholars within the humanities to reject the concept of causality in the social sciences. But just as little as Kant succeeded in avoiding the notion of causality within the domain of “freedom” was it possible to pursue this epistemic maxim consistently within the humanities. It soon turned out that social scientists simply had to use terms which analogically reflect the meaning of the various natural aspects of reality. The inevitable effect of these connections was that it turned out to be impossible to avoid norming laws within the humanities, as well as within the natural sciences, technology and engineering (see paragraph 9 below).

3. BRIDGING THE GAP: INTER-MODAL CONNECTIONS

In 1942 the sociologist, R.M. Maclver, wrote a book with the title: *Social Causation*. In its physical meaning the term causality (cause and effect) indeed does not reveal any connotation related to normativity. Yet physical causes and physical effects may be contemplated in such a way that both determinism and indeterminism are avoided. Whatever happens is caused (granting an element of the claim of determinism), but what the outcome will be need not be fixed in advance (granting an element of the claim of indeterminism).

^{2a}Der Verstand ist a priori gesetzgebend für die Natur als Objekt der Sinne, zu einem theoretischen Erkenntnis derselben in einer möglichen Erfahrung. Die Vernunft ist a priori gesetzgebend für die Freiheit und ihre eigene Kausalität, als das Übersinnliche in dem Subjekte, zu einem unbedingt-praktischen Erkenntnis. Das Gebiet des Naturbegriffs, unter der einen, und das des Freiheitsbegriffs, unter der anderen Gesetzgebung, sind gegen allen wechselseitigen Einfluß, den sie für sich (ein jedes nach seinen Grundgesetzen) auf einander haben konnten, durch die große Kluft, welche das Übersinnliche von den Erscheinungen trennt, gänzlich abgesondert. Der Freiheitsbegriff bestimmt nichts in Ansehung der theoretischen Erkenntnis der Natur; der Naturbegriff eben sowohl nichts in Ansehung der praktischen Gesetze der Freiheit: und es ist in sofern nicht möglich, eine Brücke von einem Gebiete zu dem andern hinüberzuschlagen” (Kant, 1790:B LIII-LIV, § IX, Wissenschaftliche Buchgesellschaft B Edition, pages 270-271).

Speaking of social causes and social effects certainly analogically reflects the original physical meaning of causality. But since any genuine analogy is based upon similarities and differences, it is possible to show that social causality reveals in what is similar with physical causality the difference between these instances of causality: physical causality brings to expression a natural law, where social causality reveals the normativity of human social actions.

Within the social aspect of reality we may distinguish between a norm side and a factual side and we may then point out that certain social actions ought to cause certain effects. For example, when children are disrespecting their parents, the ensuing effect, namely being reprimanded, cannot be envisaged apart from social causality – these children ought to be reprimanded, showing that the relation between cause and effect is displayed on the law side of the social aspect, in strict correlation with the cause-effect relation at the factual side of this aspect.

In a more general sense the physical (causal) analogy on the norm-side of the social aspect is manifest in the (causal) validity with which social norms are in force within the social spheres (spatial analogy) in which these norms are given a positive historical shape by individuals or social organs who are competent to accomplish this. This remark requires that we take cogniscance of the difference between natural laws that hold (are valid) per se, and norms for human conduct that require human intervention since they have to be made valid. Various scholars refer to the application of a norm or principle as positivizing it.

Social causation therefore clearly illustrates that the assumed Kantian abyss between the domains of nature and freedom is bridged through analogies of causality within all the normative aspects of reality, such as the logical-analytical, cultural-historic, sign-mode, social aspect, economic, aesthetic, jural, moral and fiduciary (certitudinal) aspects. First of all we have to note that the normed character of these aspects are evinced in contraries like logical-illogical, historical-unhistorical, clear-confused, polite-impolite, frugal-wasteful, beautiful-ugly, legal illegal, moral-immoral, and certain-uncertain (confident/in doubt). Although we may have different views on what is (im-)polite or (il-)legal, these contraries unequivocally demonstrate the normativity of the social and jural aspects.

Let us briefly investigate another instance of an analogy of physical causation within another normative aspect by looking at jural causality. It is striking that in general the science of law employs the idea of causality in a negative sense, namely in the sense of a breach (causing a damaging effect). However, when a civil legal contract is concluded according to the applicable civil legal stipulations, such an event may fully conform to the applicable positive legal rules. Jural causality therefore leaves open the causing of changes in legal life that may or may not conform to legal rules.

In other words, a factual agreement concerns a legal ground and a legal effect – an instance of norm-conformative jural causality. The other side of the coin is found in an example where an antinormative action takes place. Implicit in this example will be the insight that analogies on the norm side of any normative aspect represent fundamental modal norms or principles.

Within legal life legal subjects are expected to pursue their own legal interests in a thrifty way, thus avoiding any legal excesses. Dooyeweerd gives the following example:

The driver of a car, who, when another car approaches from a side-street, continues driving on a road that gives the first-mentioned motorist the right of way, does not cause the subsequent accident when the same driver had no reason to expect that the other motorist would not yield. However, if the first motorist still continues to drive on, while having had the opportunity to stop in time after realizing that the other driver had disobeyed the traffic rules, then the loss-causing effect should also be imputed to the former's act since it is in conflict with the principle of jural economy and constitutes as such an excessive pursuit of one's own legal interest.

The jural implication is clear: “Every excessive, every unrestrained exploration of one's own legal interest, within legal life, is an interrupting causal intervention in the legal balance of interests against which the legal order reacts with restorative legal consequences” (Dooyeweerd, 1997:65).

The interconnection between the jural and economic modes of reality is here explained with reference to the causal analogy within the structure of the jural aspect as well. On the norm side of the jural aspect the economic analogy constitutes the legal principle according to which we ought to abstain from any legal excess in legal life. Avoiding legal excesses is a fundamental “inter-aspectual” modal principle. It is comparable to other modal principles such as the logical principles of identity and non-contradiction (confusing what is distinct – numerical analogy – thus overstepping the normative appeal of these two logical principles), the principle of thought-economy (Occam's “razor” – a forward-pointing economic analogy within the logical-analytical aspect), the principle of cultural-historical differentiation and integration (a biotic analogy within the cultural-historic aspect), the principle of aesthetic integrity (pointing towards the ethical), and so on.

In this context we ought to be reminded of what happened before and after the industrial revolution because this story is the outcome of confusing natural laws and normative principles. During the industrial revolution the excessive exploitation of machine technology gave rise to trade unionism and labour parties.

It was a reaction to the idea of Locke (*laissez-faire*, *laissez passer* – let them do as they wish) and to the view of the classical school in economics (Adam Smith and his successors) which subjected economic life to (assumed) exact laws of nature, such as the so-called law of supply and demand. The technicism of our age already caused Horkheimer to discern the “dialectic of the Enlightenment,” which is found in the negative effects of our control and domination of the natural environment, ultimately threatening the very conditions of life of humankind caused by the negative effects of our exploitation of nature (pollution of rivers, the air etc.).

The fact that antinormative human behaviour does affect our human environment calls for an understanding of the interconnections between the sphere of normativity guiding human life and the place of nature within this context. We proceed therefore with a more detailed account of the nature of norms and principles. It will turn out that even the genesis of tools and technology highlights the fact that within nature a point of connection is found for our awareness of normativity!

4. NORMS AND PRINCIPLES

From a purely historical perspective the origination and development of the concept of a norm interestingly also crosses the alleged abyss between nature and freedom (is and ought). Within the context of humankind's technical development the construction ruler (yardstick/ *regula*) emerged from nature itself. The only theoretician of architecture known from antiquity, Vitruvius, used the term *norma* for the tool known as a try-square. The German term is “Winkelmaß.” In 1548 W. Ryff introduced a subtle normative connotation attached to it by speaking of the justice of a Winkelmaß [“von der Gerechtigkeit des Winkelhaken”] (Hofmann, 1984:906). Cicero eventually appreciated nature as the norm for a law (“*natura, quae norma legis est*”). Already at this early stage law (*lex*) is equated with reason (*ratio*). Law is the highest ratio, impregnated in nature, ... the same ratio is law when it is confirmed and shaped within the human mind (Cicero, *De legibus*, I, 18)³. Ever since humans have associated the idea of a norm with a standard, measure or yardstick (reminiscent of the operation of a water level gauge), it was accompanied by an awareness of what is correct or incorrect, norm-conforming or antinormative.

Closely related to this legacy is the idea of a principle. Within Greek philosophy the term ἀρχή (*Archè*) was used to designate the first principles of the world. In the first part of his *Metaphysics* Aristotle even claims that pre-Socratic philosophy by and large was in search after such a first principle. But in his commentary on Aristotle Simplicius of Cilicia, one of the last neo-Platonists, implicitly denies that in general the early pre-Socratic philosophers employed the term *Archè* in a philosophical sense, because he mentions only Anaximander as someone who advanced such a philosophical idea.

³Quoted by Hofmann, 1984:906-907. [“... *lex est ratio summa, insita in natura ... eadem ratio cum est in hominis mente confirmata et confecta, lex est.*”]

According to him “Anaximander said that the infinite is the principle and the element of whatever there is (ἀρχὴν τε καὶ στοιχεῖον ... τῶν ὄντων) and he was the first to introduce the term Archè for this purpose” (Diels-Kranz, 1959-60-II, B. Fr. 1). However, there has been some controversy in this regard (see Aubenque, 1989:1336 and Kahn, 1964).

Plato advocates a harmonious coherence between the assumptions and conclusions of an argumentative process, because the consequences must be consistent (sumfonia; συμφωνία) with their point of departure (ἀρχή) (Plato, *Phaedo*, 101 d). Aristotle holds the view that the supreme science, “more authoritative than any ancillary science,” is philosophy, which has the task to investigate “the first principles and causes” (*Metaph.* 982 b 4-10). The principles are not solely physical in nature, since they encompass also logical principles, such as the principle of non-contradiction. In the Second Book, Chapter 19 of his *Posterior Analytics* Aristotle holds that “intuition will be the originative source of scientific knowledge” because “demonstration cannot be the originative source of demonstration.”

Thomas Hobbes continued the ambiguity in Aristotle's thought between the causes of existing things and the origin and cause (= principle) of knowledge (*principium et causam cognitionis*), namely when a proposition is expressed, such as the principle of non-contradiction (*De Corpore*, V, 12 – see Holzhey, 1989:1357-1358).

This reminds us of our earlier remark about contraries and the normed character of those aspects which reflect within their structure contraries analogous to the logical-illogical contrary – such as historical-unhistorical, clear-confused, polite-impolite, frugal-wasteful, beautiful-ugly, legal-illegal, moral-immoral, and certain-uncertain (confident/in doubt). These contraries reflect an underlying ontic normativity which is not constituted by the human subject, since the human subject is subjected to ontic principles or norms. From this perspective one may advance the idea that they are universally anchored in God's creational order. But they are merely given as the starting-point for human action and therefore not yet applied or given a positive shape or form. This view avoids the dual validity contained in modern theories of natural law according to which principles (norms) possess an a priori validity, implying that prior to any positive legal system there are universally valid legal rules founded in human “reason.”

5. DISTINCT BUT MUTUALLY COHERING KINDS OF LAWS

In the previous paragraphs we have explored the analogical connections between various aspects of reality in order to demonstrate the untenability of the dualistic understanding of the domains of “nature” and “freedom.” Not only are there causal (physical) analogies to be found within all the normative aspects, since on the norm side of these aspects every analogical structural element highlights a fundamental modal norm or principle.

Although it is meaningful to distinguish between natural norms and cultural norms, this distinction does not coincide with the opposition of what is universal and individual. Wilhelm Windelband, from the neo-Kantian Baden school, uses the expressions nomothetic and idiographic in order to classify scientific disciplines (the “natural” and the “cultural” sciences – Windelband, 1924:145). Heinrich Rickert from the same school distinguished between generalizing natural sciences and (only initially) individualizing cultural sciences. He makes this distinction dependent upon a shift in the logical point of view: when empirical reality is viewed from the logical perspective of what is universal it becomes nature, and when it is observed from the logical point of view of what is individual it turns into history (Rickert, 1913:224). However, since universality is found both on the law side (norm side) and factual side of reality, its opposition to what is individual cannot be used to distinguish between “nature” and “culture.”

What happened within the neo-Kantian Baden school of thought transformed the initial Kantian dualism between is and ought into the currently still widely accepted dualism between facts and values. Scholars from the field of sociology brought this dualism to expression in a peculiar way. They identified society with what is factual and subsumed all the elements of normativity under a broad concept of culture, which is supposed to embrace values, meanings, symbols and norms. Sorokin considers the super-organic domain as being constructed by human beings and as constituted by “meanings and values superimposed upon the biophysical properties of interacting persons” (Sorokin, 1962:47). A few pages further Sorokin argues that the sphere of socio-cultural interaction is constituted by “society as the totality of interacting personalities, with their socio-cultural relationships and processes,” as well as “culture as the totality of the meanings, values and norms possessed by the interacting persons and the totality of the vehicles which objectify, socialize, and convey these meanings” (Sorokin, 1962:63).

The division between culture (norm-side) and society (the factual side) is also present in the thought of Parsons. He distinguishes between them as follows:

The social-system focus is on the conditions involved in the interaction of actual human individuals who constitute concrete collectivities with determinate membership. The cultural-system focus, on the other hand, is on 'patterns' of meaning, e.g., of values, of norms, of organized knowledge and beliefs, of expressive 'form' (Parsons, 1961:34).

Once this prevailing dualism between “is” and “ought” is overcome the inherent normativity of the post-sensory modal aspects illustrated above could be related to special norming laws holding for different kinds of societal entities.

Anticipating the examples which we will discuss below, it may be pointed out here that fundamental modal norms as well as typical norms serve only as starting-points, as points of departure, for giving shape to principles, for norm-positivization. Something like the relation between social cause and social effect cannot be seen as something merely related to the factual-side of the social life. Due to the validity (i.e., being in force) of societal norms (correlated with social duties) we must point out that this validity demands (in a real normative way) that certain social events should occasion (i.e., cause) certain social effects.

In order to explore the dimension of typical normativity, i.e., of type laws, we first of all have to avoid the reduction of modal and typical laws to natural laws. This will be done by investigating two examples of a misunderstanding of the normative structural principle of the state in order to illustrate the normative meaning of a societal type law. The first one will briefly investigate how the absence of a delimited idea of the state may lead to a levelling of the difference between the state and other societal collectivities. The second one will briefly look at the whole-parts relation and then at the effect of subsuming economic life and the state to the law of supply and demand and to the physical idea of a general equilibrium already alluded to above.

5.1 Delimiting the state

A proper understanding of the nature of the state as a societal institution will have to take distance from the traditional separation of facts and values. In terms of our everyday experience of reality this basic dualism between fact (science) and value (faith), between nature and freedom, resulted in the untenable view that (scientific) knowing abstains from evaluating – which means that norms, principles and convictions are not intrinsic to theoretical endeavours. This conviction saw both science and technology as inherently “objective” and “neutral.” Yet, the history of Western civilization and of scholarly reflection on human society tells a different story.

Within Greek antiquity the prevalent view on human society is in the grip of the ideal to achieve form-perfection through education (Plato) and through an organic societal development (Aristotle). For this purpose both Plato and Aristotle extended the distinction of a whole and its parts beyond its limits, since they envisaged a society in which everything is subsumed to the state (polis) where humans are supposed to obtain their highest temporal perfection. The state was seen as a (totalitarian) whole encompassing all societal relationships. Aristotle proceeds from the family as germ-cell of society and ends with the city-state which will lead to moral perfection, with emphasis on the good citizen.

The Aristotelian-Thomistic tradition continued to exert its influence also within Protestant circles, especially in the thought of Abraham Kuyper who still advanced the idea of “an organic right to vote” (organisch kiesrecht).

This view accepts the Aristotelian understanding according to which the family, as we mentioned, is the germ-cell of society – the line of development runs from the family via the village-communities into the polis (state). An isolated individual, according to Aristotle, “is not self-sufficing” and “therefore he is like a part in relation to the whole” since “he who is unable to live in society, or who has no need because he is sufficient for himself, must be either a beast or a god: he is not part of a state” (*Politica* 1253 a 27-29; Aristotle, 2001:1130). This view is embedded in a teleological understanding of societal relationships, the telos (goal) precedes the parts.

The after-effect of this organological view in the thought of Kuyper is seen in his defense of the idea of an organic right to vote (“organisch kiesrecht”) – only the house-head is supposed to have the right to vote. The South African politician, Andries Treurnicht, who obtained a PhD on the thought of Kuyper, in an editorial of the newspaper *Hoofstad* (1969) discussed a tax issue in France. The question was whether or not the father should pay tax on behalf of self-supporting children still living at home. His proposal was that the father should pay tax on their behalf – “organic tax paying”!

However, if we apply the principle emphasized by Kuyper himself, namely that of sphere sovereignty, then it is clear that it is wrong to derive the function of a person in one particular societal entity from the role which such a person has in a different (sphere-sovereign) societal entity. Being a father is a role which belongs to the nuclear family and one cannot project this role onto the way in which co-determination and co-responsibility within the (democratic) state are structured.

Before the Second World War Europe witnessed the political consequences of similar misunderstandings which surfaced in what became known as syndicalism – a view also exploring the idea of an organic representation of the people. It resulted in a free structuring from bottom to top and in a fascistic (totalitarian) version from top to bottom. Surely, a Parliament constituted by the interests of societal collectivities that are in principle distinct from the state, is a recipe for anarchy, because the underlying pluralistic conception of the state dissolves the latter, as Dooyeweerd aptly remarks, into “a federation of essentially non-political societal collectivities lacking the mutual unity of a guideline typical of the state” (Dooyeweerd, 1935:109).

At this point it is necessary to delineate the field of operation of the state both in respect of its coherence with non-state societal entities and in terms of its own intrinsic structural principle, with special reference to some elements of the economic history of the past two centuries. Exploring this issue briefly will add another perspective on the norming laws regulating human life and will pave the way in avoiding the confusion of differently natured principles or of their reduction to natural scientific modes of explanation.

In particular we shall see that the two aspects delimiting the field of investigation of the discipline of mathematics, namely number and space, provided diverging views of human society with the boundary-leveling tools of atomism (individualism) and holism (universalism).

5.2 Economic life and the task of the government

Our preceding analysis first of all highlighted the fact that the apparent divide between natural laws and cultural norms cannot be maintained, because analogies from natural aspects within the normative aspects (such as the physical analogy in jural causality) point at intermodal connections between the domains of nature and (normed) freedom.

Reflections on the nature of human society constantly moved from one extreme to another: traditional atomistic or individualistic approaches reduced all human societal relationships to mere individuals-in-interaction (thus overextending the explanatory power of the numerical aspect as a mode of explanation), while long-standing holistic or universalistic views always elevated one or another societal collectivity or community to become the all-encompassing whole of which human beings are mere parts (thus overextending the explanatory power of the spatial whole-parts relation as mode of explanation).

A closer analysis immediately reveals the fact that both these theoretical approaches, namely an atomistic and a holistic one, actually merely explore the two most basic modes of explanation of the universe, traditionally related to the one-and-the-many and to a whole-with-its-parts. Unity and multiplicity are derived from the numerical aspect, while the whole-parts relation is first found within the spatial aspect of our experiential world. Clearly, there is no social form of life that is not co-constituted by the “one-in-the-many” and which is not bound together into a societal whole embracing its members as parts of this whole. Therefore each distinctly differentiated societal entity first of all can be characterized as a societal unity. The perspective of the spatial analogy in addition enables one to say that the unity of such a social life-form can be seen as a social whole or social totality. By adding the kinematical analogy the awareness of the social continuity (persistence over time) of such a life-form provides the basis for acknowledging social changes taking place within it (the physical analogy). The dynamic changes occurring in the on-going functioning of a social form of life allow individual members to come and go, without affecting the relative identity of the life-form concerned, thus demonstrating within the structure of the social aspect an analogy of thermodynamically open systems. The persistence and social development, social growth, of social entities require competent social organs capable of structuring societal relationships while exercising their social ordering will in such a way that the internal functioning of the life-form concerned could bring to expression an integrated social solidarity and social awareness (the perspective of the sensitive-psychical analogy within the social aspect).

This brief analysis shows that every aspect of nature, normally primarily experienced in connection with material things, plants and animals, denies a rift between “nature” and “freedom,” because these aspects provide the constitutive analogical links inherent to the structure of the social aspect.

The traditional science ideal consistently elevated one of the aspects of nature to become the exclusive mode of explanation of the entire universe. In addition to the one-sidedness of atomism and holism mentioned above, physicalism enthroned the law of causality, accompanied by the continued presence of vitalistic and psychological trends of thought.

Although Hume launched a severe attack on the physical law of causality, this law continued to play a crucial role in the development of modern philosophy. The 18th philosopher, Immanuel Kant, is famous for his observation that he was always intrigued by the starry sky above which is governed by the universal law of causality and by the moral law within me.⁴

The classical school in economics (Adam Smith and his followers), advanced the idea of an “Invisible Hand” regulating economic affairs according to exact (natural) laws, such as the law of supply and demand. The assumption of this idea is that the law-conformative nature of economic systems will cause a tendency towards a true physical equilibrium. This idea obtained such a dominant place in the economic thought of the classical school that the latter also became known as the general equilibrium approach. This trend of thought in addition gave birth to the fictitious idea of an individual acting in a purely rational-economic way, the homo economicus, guided by nothing else but the greed and self-interest of every individual. What Mandeville called the “Fable of the Bees,” conjectured on this basis that when every person would pursue its own interest optimally, greater peace, harmony and wealth would emerge for all.

The modern science ideal continued to exert its influence in economic theorizing, both in the mentioned idea of “exact” economic laws (such as the law of supply and demand) and in a physicalistic understanding of an equilibrium within a closed system. The philosophically versed German economist and sociologist, Othmar Spann, first of all rejects every individualistic approach to human society because he advanced a consistent universalist stance⁵. He also rejects the views of the theory of marginal utility in favour of “equilibrium or equivalence” (Spann, 1930:281). For Spann the idea of equilibrium is even more important than that of supply and demand.

⁴“Der bestimmte Himmel über mir, und das moralische Gesetz in mir” – Kant, 1790, A:289.

⁵Spann criticizes individualism extensively in his work *Gesellschaftslehre* (Spann, 1950:65-92) and explains his universalist approach subsequently (Spann, 1950:92-184).

He writes: "For price does not arise out of the encounter of subjective estimates of value in the market, nor yet out of the encounter of supply and demand (Menger, Cassel), but out of the relations of magnitude in the articulated structure of an economy, price being the expression of these relations in accordance with the principle of equilibrium" (Spann, 1930:281-282; Spann, 1935:186 ff.).

A contemporary of Spann, the well-known social-economic thinker, Vilfredo Pareto, appreciates the actions of individual human beings as the molecules constituting a social system (Pareto, 1963, cf. par.2080). For him society is therefore a system in equilibrium with a number of inter-dependent elements which, with the aid of the mathematical concept of function, must be studied in quantitative terms. When society offers resistance to internal and external forces, the outcome will be a recovery of the previous situation: "A society where this occurs can therefore be considered as being in a state of equilibrium, and of stable equilibrium" (Course d'Economie Politique (1896), par.585, translated by Finer, 1966:104). Although D'Alembert's mechanics allows for the study of the dynamical condition of a system, both economics and sociology must, according to Pareto, "consider a series of static equilibria rather than the dynamic equilibrium" (Finer, 1966:104).

It should be remembered that John Locke, with his idea that the state should leave room for a free inter-play of forces within civil society, endorsed the basic convictions of the classical school in economics. The effect of this marriage is captured in the slogan, *laissez-faire, laissez-passer*, which aimed at less governmental interference and more civil freedom. Locke appealed to the idea of the public good (*salus publica*): "*Salus populi suprema lex* is certainly so just and fundamental a rule, that he who sincerely follows it cannot dangerously err" (Locke, 1690, § 58, page 197). The question is whether the "public good" is identical to the will of the majority? How does one count the majority? Through the property owned by individuals? Since Locke does not give an answer to these questions, his political theory, which actually is nothing but a continuation of the state of nature endowed with a coercive power, could equally terminate in state-nihilism or, alternatively, in state absolutism and totalitarianism.

The first extreme of this dilemma left the economic interests of workers within the new factories unprotected. The only consolation the workers had was that the (exact) law of supply and demand will determine what happens. In practical terms the views of Smith and Locke turned things around for the workers in England. The protection of the workers by the English Government dates back to the seventeenth century when it even prescribed a minimum wage and as late as 1756 we saw the enactment of a law empowering the British courts to establish wages for piece-work. However, the events following this legacy soon revealed the absence of a concern for the destiny of the economic interests of the workers.

Herman Strauss points out that from the very next year (1757) the English government started to repeal legislation protecting the workers in England. When, in 1776, a protest was raised against the “spinning jenny,” the Lower House would not receive a petition from the workers: “The British Parliament would no longer support a labour policy which protected the worker against extortion and reduced ('sub-minimal') wages – that was a job which could safely be left to the operative economic 'laws'. ... In 1799 this 'hands-off' policy reaches its zenith in the legal prohibition of all workers' associations in England. In the era shortly to dawn, the wage-earner of the nineteenth century was to appear upon the stage with new, more powerful weapons than the loosely organized and relatively uncoordinated associations of his wage-earning ancestor.” (Strauss, 1970:7).

These developments embodied the overall effect of the theoretical guidance of the classical liberal idea of the state (John Locke) and the classical school of economics (Adam Smith) in England (and Western Europe). Perhaps the slogan *laissez-faire*, *laissez-passer* captures this effect in the best way. The newly emerging industrial societies refrained from protecting the economic legal interests of their workers. This neglect gave rise to the labour movements which eventually radically changed the political scene. Labour Parties now directed themselves at the sectional interests of labourers. To this end also trade unions emerged. The Labour Parties thus “served” the genesis of the prominent totalitarian régimes of the early 20th century (with their universalist ideologies – in the Italy of Mussolini and the Germany of Hitler). This finally led to the Second World War. Clearly, modes of explanation exploring an overextended employment of natural scientific perspectives have had immense practical consequences in economic and political life.

Apart from the misunderstanding of economic life within a differentiated society, the Smith-Locke legacy in addition operated with an idea of the state that cannot account for its inner sphere of competence and intrinsic limits. Yet once the jural aspect of the state is recognized as the guiding perspective within its structural principle, it is immediately clear that the state has to balance and harmonize a multiplicity of legal interests within its territory by binding them together in one public legal order. Economic life differentiates into “productive units” known as firms or business enterprises on the one hand and the free market on the other (lacking a relation of super- and subordination). The moment the state is stripped of its normative task to bind together the legal interests of its citizens, it may leave open the non-state spheres of life to be exploited, for example by large industries. While governments did not protect the economic legal interests of workers, Western societies witnessed the rise of trade unions and also of labour parties, which had a substantial share in the political history of Europe during the 20th century.

6. THE DISTINCTION BETWEEN MODAL LAWS AND TYPE LAWS

At this point the idea of a norming law (normativity) requires a closer analysis. Both a firm and the state function within the economic aspect of reality. In respect of both, it is meaningful occasionally to identify economically sound and un-economic actions. This contrary, however, has a general scope, without any typicality. The economic aspect, just as every other aspect, displays its modal universality in the fact that whatever there is functions within all aspects of reality – and therefore also within the economic aspect. Modal laws and modal norms hold for all kinds of entities. But the law for being a state or being a firm no longer displays this unrestricted universality present in modal universality. States and firms are distinct in the sense that they are determined and delimited by specific type laws. Type laws only hold for a limited class of entities, namely those belonging to that specific type. The universality of type laws is therefore restricted (specified): the law for being a state or being a firm is universal in the sense that it holds for all states and all firms, but since not everything in the universe is a state or a firm their respective type laws are limited to a specific class of entities, namely those belonging to its peculiar type. It is therefore imperative to distinguish between modal laws (with an unspecified universality) and type laws (with a specified universality).

One implication of the distinction between modal laws and type laws is the insight that the business enterprise and the state function within the economic aspect according to their respective type laws.

When the general structure of the economic aspect is abstracted the typical differences between states and firms are left aside. Likewise, thermodynamics as a general functional physical discipline abstracts from the typicality of physical entities – it is not interested in the gaseous, solid, or fluid state as such. Both a state and a business enterprise can waste their money (and thus act uneconomically) and both ought to function in a way that is guided by economic considerations of frugality. Yet this can only be said in view of the modal universality of the economic aspect, while disregarding the typical nature of the business and the state.

Traditionally it was foremost biology that explored a typological mode of thinking. Initially (already in the thought of Aristotle) it was done through the distinction between genera and species (a genus proximum and differentia specifica), and eventually in terms of the well-known biological classification commencing at the level of species and from there proceeds, by successively lifting out more general features, up the ladder of genera, families, orders, classes and phyla (within one or another realm).

In order to acquire scientific knowledge of the type law of specific kinds of entities, an empirical investigation is needed, involving, in the case of the natural sciences, empirical testing through experimentation – the relative merit of positivism! Already Kant had to distinguish between the supposedly universally valid a priori thought categories on the one hand and so-called empirical laws of nature on the other:

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. In respect of the latter nature and possible experience are entirely the same; and since within these the law-conformity of the necessary connection of appearances in an experience (without which we are totally incapable of knowing any object of the world of the sense), actually is based upon the original laws of the understanding, so it initially does sound strange, but it is nonetheless certain, when I state with respect to the latter: understanding creates its laws (a priori) not out of nature, but prescribes them to nature (Kant, 1783:320; § 36).⁶

This distinction clearly runs parallel to the above-mentioned distinction between modal laws and typical laws (type laws). Whereas Kant ought to receive credit for wrestling with the dimension of modal universality, positivism and neo-positivism, as mentioned above, ought to be acknowledged for their emphasis on experimental testing (not the same as: verifying!). Only by studying the orderliness or law-conformity of entities is it possible to arrive at an understanding of the type laws holding for the limited class of entities that are subject to their respective type laws.

In the light of our preceding analysis the general perspective is clear: temporal reality as we know it displays a rich variety of modal aspects and concrete (natural and social) entities, delimited and determined by (unspecified) universal modal laws and (specified) type laws – differentiated into natural laws (which are valid) and cultural norms or principles, dependent upon human intervention to attain a positive shape.⁷

We have used the example of avoiding legal excesses, which exhibited an instance of an intermodal connection on the norm side of the jural aspect. The economic analogy within the structure of the jural aspect serves as the basis for this general legal principle: avoid all legal excesses.

⁶The logician, Christoph Sigwart, captured this insight by distinguishing between an "empirically universal judgment and that which is unconditionally universal" (Sigwart, 1895:160).

⁷Windelband, who contributed substantially to the distinction between natural laws and norms, still continued the original Kantian approach which rooted universal natural laws in human understanding. Windelband does not accept the ontic status of normativity. He rather falls back into the dualism of fact and value, because according to him natural laws belong to the judging reason whereas norms belong to the evaluating reason (Windelband, 1924a:67; compare also Windelband, 1924).

7. NATURAL LAWS EXEMPLIFYING INTER-MODAL CONNECTIONS

It should be noted that modal laws exemplifying inter-modal connections are also found in nature. Consider the irreducible meaning of the physical aspect, which presupposes those aspects foundational to it, namely number, space and the kinematic aspect of movement. The core meaning of the kinematic aspect comes to expression in uniform (rectilinear) motion. Another term that captures this core meaning is constancy. Therefore, within the modal structure of the physical aspect, we discern a structural moment that reminds us of what persists or endures over time. Within the physical aspect constancy appears as a structural reminder of the meaning of uniform motion. In terms of the inter-modal connections between aspects, we may say that, in the configuration of energy constancy, we find an analogy of the kinematic aspect on the law side of the physical aspect. This argumentation enables us to arrive at a (more) precise formulation of the meaning of the first law. Whereas the accepted physical wording of this law may carry (against its true intention) an element of energy input (one connotation of the term maintaining / conservation), the designation energy constancy makes it plain that this law holds for nothing more and nothing less than the mere continuation of whatever 'amount' of energy there is. The continued existence of energy does not need any "holding on to" – it simply persists in the sense of remaining constant.

On the basis of a broader philosophical perspective, the well-known Dutch philosopher of technology, Egbert Schuurman, developed extensive and detailed analyses of technology, culture and society – situated within a penetrating understanding of the normativity involved and the meaning of technology (see Schuurman, 1993, 1995, 2005, 2009). We conclude our investigation by briefly looking at logic and mathematics.

8. LOGICAL PRINCIPLES AND MATHEMATICS

Scholarship in all fields (the natural sciences and the humanities) are dependent upon an understanding and application of logical principles. We are used to the suffix "logy" in expressions such as "bio-logy," "psycho-logy," "socio-logy," "theo-logy" and so on. However, what we do not always realize is that the normative meaning of logical principles has its foundation in the inter-modal connections between the logical-analytical aspect and the various aspects of nature. Logical analysis is always concerned with identification and distinguishing. In our brief analysis of energy-constancy we actually identified constancy as the pre-condition of change, thus highlighting that change can only be established on the basis of something constant. This shows that the practice of (mathematical) logic to speak of constants and variables relies upon the coherence between the logical-analytical aspect and the core meaning of the kinematic and physical aspects.

When someone makes any kind of tool or when an engineer designs any technological device, such a person has to be able to identify and distinguish properly. But this is impossible apart from the interconnections between the logical-analytical aspect and the aspects of number and space – those aspects which delimit the field of investigation of the discipline of mathematics.

Our awareness of identity in the first place relates to a discrete quantity which makes it possible to distinguish whatever has been identified. From the quantitative perspective a mathematician holds that x is different from y ($x \neq y$). In addition to this combination of the meaning of analysis and that of (numerical) discreteness the primitive meaning of space, namely continuous extension (which is synonymous with the notion of a totality and the accompanying relation between a whole and its parts), is also present since in order to identify and distinguish entails subdivisions within a given domain, field, or totality.

On the norm side of the analytical aspect the presence of a logical unity and multiplicity ultimately serves as the foundation for the logical principles of identity and non-contradiction – whatever is distinctly identified is identical to itself. And the logical principle of non-contradiction demands that whatever is distinct is not identical. This means that the numerical analogy on the norm side of the analytical aspect constitutes the two sides of unity and multiplicity. This analogy therefore serves as the basis of the two most basic logical principles guiding every act of identification and distinguishing.

Human beings have the freedom to identify and distinguish properly or improperly. When our identification and distinguishing conform to the logical principles of identity and non-contradiction, the former is achieved, while the latter prevails when the normative appeal of these principles is violated. The unity and diversity within reality thus make possible all identification and distinguishing – guided by the normative demand to identify A with A and to distinguish A from non- A .

Shaping tools and designing the devices needed by engineers will collapse if these logical principles are not properly observed. Even within the field of mathematics alternative accounts of the inter-modal coherence between the logical-analytical aspect and the aspects of number and space caused a divergence – owing to its peculiar approach intuitionist mathematics rejects crucial parts of classical mathematics while reaching results without a counter-part in classical mathematics.

Within mathematical logic intuitionism rejects the universal applicability of the principle of the excluded middle because it does not allow for infinite totalities. If no (infinite) totality is given, no clear-cut division of a whole is possible implying that in the case of division no third possibility is given.

Therefore, if the infinite is merely understood as something without an end, that is, endless in the sense of the potential infinite or the successive infinite, then the principle of the excluded middle cannot be unaccepted. But when infinite totalities are accepted, the principle of the excluded middle holds in the case of the actual infinite or the at once infinite. In the latter case a strict either/or is possible.

Within the numerical aspect the spatial whole-parts relation is imitated, for example in the notion of fractions (“whole” and “broken” numbers). But since a (spatial) whole is given at once the idea of the at once infinite is based upon a forward-pointing analogy of space on the law-side of the numerical aspect (real numbers imitate spatial continuity).

However, in order to ensure the universal applicability of this logical principle, which also applies to the infinite, the (irreducible) meaning of the at once infinite must be acknowledged since the latter in itself is completely dependent on the irreducibility of the spatial order of simultaneity with its implied correlate, the whole-parts relation.

The numerical analogy within the structure of the logical-analytical aspect obtains a deepened meaning under the anticipatory guidance of the idea of the at once infinite. Therefore in this case we are justified in accepting the universal applicability principle of the excluded middle also within the domain of the infinite as well.

Mathematics, therefore, benefits from an understanding of the meaning of the principle of the excluded middle in terms of an analysis of the coherence between the logical-analytical aspect and the aspects of number and space. Mediated by

the (retrociatory) analogy of number within the structure of analysis, this principle finds its ultimate foundation in the numerical anticipation to the meaning of space. This justifies the claim that the ontical status of the principle of the excluded middle is found in the fact that it is a retrocipation to an anticipation! In other words, the meaning of the principle of the excluded middle is given in a retrocipation from the logical-analytical mode to the arithmetical mode, which in turn anticipates the factual spatial whole-parts relation in subjection to and determined by the spatial time order of simultaneity (see Strauss, 2009:306).

The effects of rejecting both the principle of the excluded middle and the at once infinite is captured in the following significant remark of the intuitionist mathematician, Brouwer:

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).

9. SCIENCE AND TECHNOLOGY: THE HISTORICAL CONTEXT

The earliest phases of human history are usually captured by referring to soft cultures, the stone age (with various subdivisions), the bronze age and the iron age. Eventually the meaning of history was deepened through an awareness of what is historically significant – captured in inscriptions, monuments, written histories, and so on. The cultural differentiation of distinct societal spheres of life was always supported by the accompanying characteristic technological products of particular eras.

Accompanying the differentiation of society technological developments followed a corresponding historical differentiation. More recently we witness an amazing integration taking place, particularly exemplified in the multifunctional electronic device known as the cell-phone. The original meaning of the biotic aspect comes to expression in growth, embracing both differentiation and integration. All the post-biological aspects of reality analogically reflect these biotic features. Therefore historical differentiation and integration represent distinct historical principles, just as historical continuity (and discontinuity) represent peculiar historical norms (based upon the coherence between the historical aspect and the aspect of space. Tools and technological devices are both founded in the cultural-historical aspect and qualified by this aspect, because tools and technological devices are made (historical foundation) in order to make something else (historical qualification).

Schuurman discusses the significance of other norming principles in his analysis of the meaning of modern technology. He pays attention to the (lingual) norm of information, the economic implications of efficiency and stewardship, the norm of harmony, justice, care and love, and trust (Schuurman, 1995:96-99).

When these norms are observed the meaning of technology blossoms:

Technology can alleviate in part the bind in which humankind naturally finds itself. Technology can increase life's possibilities, decrease physical burdens and difficulties at work, and free people from routine activities while opening the door to all kinds of mental and creative labor. Natural disasters can be averted, illnesses overcome, and, in a certain sense, with the aid of electronics and microprocessors, the deaf can hear again, the blind see, and the lame can walk again. Technological development can provide houses and food, supply a degree of social security, and increase available information so as to extend and deepen communication. Greater harmony between technology and nature is possible. Through all of this the responsibility of humankind grows as well. Material prosperity will not have a stranglehold or gain the upper hand, if it keeps in step with mental and spiritual well-being. The many gifts and diverse qualities of individuals and peoples will have a chance within technology and by its means. When it is situated within the perspective of an integral frame-work of norms that holds for all cultural activity and its hazards are kept within bounds, technology will make room for recreative activities and a rich cultural involvement that are in balance with a conscientious stewardship of nature (Schuurman, 1995:102).

10. CONCLUDING REMARK

In conclusion we may briefly summarize the overall perspective. The primary meaning of the idea of law from its inception had a universal cosmic scope. Yet dialectical conceptions challenged the integral unity embracing the diversity of laws. Already in ancient Greece the idea of an origin or point of departure (Archè) emerged. The idea of an eternal (moral) law (lex aeterna) was kept alive in Medieval Scholasticism until modern Humanism started to dominate the scene during and after the Renaissance. The new basic motive of nature and freedom guided modern philosophy towards the position eventually assumed by Immanuel Kant with his (dualistic) separation of nature (causality) and freedom. From a systematic perspective the acknowledgment of ontic normativity made it possible to pursue an alternative path, one in which the interconnections between the domains of nature and culture are accounted for in structural terms. It turned out that both within nature and within human society we have to distinguish between modal laws / norms and typical laws / norms.

Examples from everyday life, from the history of Western civilization and from certain theoretical disciplines, served to illustrate the practical implications of these distinctions. The last subsection focuses on (physical) science and (the logic of) mathematics and it concludes with reference to the norms guiding technological developments and with an assessment of the meaning of technology.

Thus the concern of the Journal for New Generations Sciences, namely to reflect on the context of science, technology, engineering and mathematics (STEM), was met. The ultimate perspective is rooted in the ideal of avoiding the deification of anything or aspect within creation, but explaining how this ideal follows from a non-reductionist ontology exceeds the confines of the present article.

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