Science and Scholarship in Historical Perspective

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Abstract

The "making" of the modern world cannot be divorced from the all-permeating influence of the modern natural sciences. Although the Renaissance spirit, aimed at exploring the possibilities of human rationality in an unrestricted way, initially proceeded from the conviction that the human personality ought to be appreciated as both *free* and autonomous (in the sense of being a law-unto-itself), the successes of the natural sciences ruled the day for quite some time. During the Age of Enlightenment (the 18th century) Immanuel Kant established the influential separation of "science" and "faith" later on known in the form of the opposition between *facts* and *values*. The dominance of positivism and neo-positivism during the first half of the 20th century continued the legacy of the natural science ideal but slowly but certainly it had to give way to the emerging dominant trends of the second half of the 20th century particularly the post World War two existentialism, language philosophy, neo-Marxism, the hermeneutical tradition up to the most recent "grand" claims of the postmodernism against "grand met narratives". A brief analysis of the relationship between culture and civilization (with special reference to the views of MacIver) terminates in some systematic perspective on the meaning and the future task of science and scholarship.
Keywords: Science / scholarships

1. Orientation

After the so-called "dark Middle Ages" gave way for the adventurous and explorative spirit of the Renaissance during the 14th and 15th centuries, Western Europe was increasingly astonished by remarkable and many times mind-boggling developments, particularly within the natural sciences. The authority of Plato and Aristotle as well as the position of power occupied by the Roman Catholic Church disintegrated under the attack from a radical new orientation.

The Renaissance is first of all supposed to be a reaching back to Greek antiquity, but in fact it embodies the enthronement of the human being. Traditional cultures merged into "mother nature" many times did not appreciate the cultural calling of humankind something explicitly done by the cultural orientations of ancient Greece and Rome as well as by India and China. In these cultures humankind explored an awareness of the fact that it is not merely an extension of nature and that it has to *transform* nature into *culture*.

2. Early modern rationalism and the successes of the mathematical natural sciences

The Renaissance spirit moved a step ahead, for it gave birth to the modern deification of the human being as such. Not in nature and also not within the domain of culture the ultimate anchor could be found. When Descartes launched his *methodical doubt* in order to arrive at the conviction "I think, hence I am" it was built on an underlying new *certainty* the *trust* in the (infallibility) of *human reason*. The new discoveries of the rising natural sciences Galileo, [1] Kepler and particularly those of Newton underscored this unbridled adoration of human rationality. Although contemporaries of Newton, like Leibniz and Huygens, question his newly found "law of gravity" (according to which the force of gravity equals the product of the masses of two bodies divided by the square of the distance between them), because they did not know how to imagine the effects of a "force" without an intermediate *mechanical device*. But the subsequent history testified to an exploration of the scope of Newton's formulation of the law of gravity that confirmed the incredibly powerful insights entailed in it. One only has to recall the story about the discovery of Neptune.

With the aid of his newly designed powerful telescope W. Herschel discovered the planet Uranus in 1781. The problem was that the path of this planet did not obey the predictions made for it. Alexander Bouvard conjectured that this deviation was the effect of another yet unknown planet. Various attempts were made to observe or calculate the possible size and path of this unknown planet. In 1845 a young student from Cambridge, J.C.

[1] Maier discovered that the formulation of the law of *inertia* was anticipated by scholars from the transitional period between the Middel Ages and the Renaissance (see Maier, 1964)

Adams, on the basis of Newton's law of gravity, calculated a highly accurate estimate of the mass, position and path of this unknown planet and sent his calculations to sir George Airy at the "Royal Astronomical Observatory" in Greenwich. The latter failed to appreciate the significance of these calculations which gave another student, the Frenchman J.J. Leverrier, the chance independently to come up with approximately the same calculations. He communicated his findings to the German astronomer, Johann Galle. Galle received them on September 23, 1846 and he discovered Neptune that same evening with a deviation of only 55 minutes off the path as predicted by Leverrier. Kline is certainly justified in asking the question how one can doubt the predictive power of a mathematical-astronomical theory that manages to make predictions accurate up to one ten thousandth of a percentage point. And this additional historical perspective may also help to come to a better appreciation of the assessment of Alexander Pope, who wrote:

"Nature and Nature's laws lay hid in night:
God said: Let Newton be! and all was light."

3. The Enlightenment ideal "Progress" the culmination-point of modern rationalism

Whereas the 17th century intellectually belonged to its two genial personalities, Leibniz and Newton, the 18th century is overshadowed by the great German philosophy Immanuel Kant. At the age of 57 (in 1781) he published his influential and famous *Critique of Pure Reason* (CPR). This work sets out to regain human freedom that got lost during the preceding success story of the mathematical natural sciences. Kant realized that this process actually proceeded *from* and was rooted *in* the ideal of the Renaissance, namely to proclaim the *autonomous freedom* of humankind. In the *Preface* to the second edition of this work it is plainly stated that all of life ought to be subjected to the scrutiny of *human reason.* "Our age is the genuine age of criticism to which everything should be subjected. Religion through its sanctity, and legislation through its majesty, may want to exempt themselves from it. But they then awaken just suspicion, and cannot claim sincere respect which reason only confers to that which has been able to sustain the scrutiny of free and open examination" (Kant, 1781-A:xii). Yet, when reality in its totality is *reduced* to and subsumed under general natural scientific categories, such as the relation between *cause* and *effect* (causality), then this original freedom ideal is seriously threatened. The way in which Kant attempted to overcome this threat was to fall back on a classical distinction which he

employed in service of his aim to safe-guard human freedom one again.

By employing the classical Greek distinction between *essence* and *appearance* (*substance* and *accidents*) Kant *restricted* the science ideal to the chaotic sensory impressions (the *appearances* or *phenomena*) which meant that the natural sciences cannot encompass the practical (moral) freedom of the human personality as a supersensory "thing-in-itself" (*noumenal* "Ding an sich"). [2] The personality ideal of autonomous freedom was accommodated within the domain of "practical reason" also giving shelter to "faith". His famous statement is: "I have therefore found it necessary to deny knowledge, in order to make room for faith". [3] Later in the 19th century Ernst Haeckel provided the equivalent of this Kantian claim with his view that *science* commences where *faith* terminates.

4. The idol of the "scientific method" the limitations of "verification"

By and large the effect of this mixed tradition was that it passed on to the 20th century a dialectical tension between the *natural sciences* and the *humanities*. *Positivism* (Ernst Mach) and *neo-positivism* (the Vienna Circle thinkers such as Neurath, Hahn, Carnap, Feigl, Reichenbach and Ayer) continued Kant's emphasis on sensory impressions by claiming that all reliable knowledge is based upon sense experience. The concept of a chair is then merely viewed as a *logical construction* from sense-data, and even the concept of the "a logical construction out of individual people" (Ayer, 1967:63). Particularly influential was the positivistic emphasis on the so-called "scientific method". According to it scientific investigations always start with *observations*, proceed to the formulation of *conjectures* (hypotheses) and their testing ("empirical verification") which may result if the test against "sense data" is successful in *verified* hypotheses or *scientific theories*.

The initial idea of empirical verification within the *Vienna Circle* was, as explained by Hempel, "that a sentence was said to have empirical meaning if it was capable, at least in principle, of complete verification by observational evidence; i.e., if observational evidence could be described which, if actually obtained, would conclusively establish the truth of the sentence" (Hempel, 1959:110).[4]
The crucial question, of course, is whether a mere *generalization* (also known

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[2] "The common but fallacious presupposition of the *absolute reality* of appearances here manifests its injurious influence, to the confounding reason *For if appearances are things in themselves, freedom cannot be upheld*" (my italics in the last sentence D S ; 564; "Denn, sind Erscheinungen Dinge an sich selbst, so ist Freiheit nicht zu retten") At the same time Kant elevated human understanding (with its categories) to be the *formal law-giver of nature* (see Strauss, 1982)

[3] ; 'Ich musste also dat *Wissen* aufheben, um zum *Glauben* Platz zu bekommen,' (1787, B,xxx
Another formulation given bby Hempel reads: "A sentence has empirical meaning if and only if it is not analytic and follows logically from some finite and logically consistent class of observation sentences" (Hempel, 1959:111)

as *induction*) could provide a *foundation* for the alleged *universal validity* of (natural) laws? Empirical verification, after all, can do nothing more but check a *limited number* of instances without providing any support for the *universality* (unlimited validity) of the derived law. Ayer mentions the example of the natural law: *all bodies expand when they are heated*. A certain limited number of physical bodies could be investigated empirically, but it is an impossible task even to begin testing *all* physical bodies. What then serves as the basis for the *universality* of the claim that all bodies expand when they are heated? Do we have any certainty that after a thousand or after a million tests we would not encounter a non-conforming body? Ayer is simply showing intellectual honesty when he concedes that no so-called empirical statement could ever be verified in a *conclusive* way. Empirical verification at most can render laws probable (Ayer, 1967:37).

With this approach Ayer actually distances himself from classical logical positivism and moves closer to the position taken by logical empiricists such as Carnap, Hempel and Nagel. The second foreword of Ayer's work from 1946 is preceded by stating the empiricist criteria for knowledge acquisition which Hempel formulated already in 1942. The term *confirmation* substituted the term *verification* in the subsequent developments. In the Journal *Mind* Hempel published an article on *Studies in the Logic of Confirmation* and in the same year, together with Oppenheim, Hempel published an article on "A Definition of Degree of Confirmation" in the *Journal: Philosophy of Science* (cf. Passmore, 1966:419, 589-590). The meaning in which logical empiricism employs terms such as 'verification', 'falsification' and 'confirmation' is better explained in an article published by Hempel in 1950: *The Empiricist Criterion of Meaning* (Vol.4: *Revue Internationale de Philosophie*) (cf. also Hempel, 1959:111 note 6). In this article Hempel points out that the so-called "verification principle" has "several serious defects: The verifiability requirement rules out all sentences of universal form and thus all statements purporting to express general laws; for these cannot be conclusively verified by any finite set of observational data. And since sentences of this type constitute an integral part of scientific theories, the verifiability requirement must be regarded as overly restrictive in this respect. Similarly, the criterion disqualifies all sentences such as "For any substance there exists some solvent," which contain both universal and existential quantifiers (i.e., occurrences of the terms "all" and "some" or their equivalents); for no sentences of this kind can be logically deduced from any finite set of observation sentences (Hempel, 1959:112).[5]

5.　　From induction to falsification: Karl Popper

As critical neopositivist Karl Popper grasped the opportunity to draw further devastating consequences. According to him there is no such a thing as induction accept in the science of mathematics. The new criterion posed by Popper is given in the demand that every scientific statement should in principle be open to falsification. In order to ascertain the falsity of a statement one only has to check one instance. Over against verification Popper formulates the requirement of falsification. Popper is even convinced that if we don't want to invalidate many natural scientific disciplines, we have to accept that every discipline employs many concepts which cannot be verified empirically (Popper, 1968:40 ff.).

With an astute critical edge Popper attacks the mistaken naturalistic scientism which tries to impress a natural scientific methodology upon all sciences. He criticizes the prevalent problems hampering sociological methodology as follows: There exists, for example, the wrong and ill-informed methodological naturalism or scientism requiring that the social sciences have to learn from the natural sciences what scientific method is. This mistaken naturalism posits requirements such as: Start with observations and measurements; then proceed inductively to generalizations and theory formation. Along this road you will reach the ideal of scientific objectivity, in so far as this is indeed possible in the social sciences. This should be accompanied with a clear awareness that it is much more difficult to attain objectivity in the social sciences (if attainable at all) than in the natural sciences; for objectivity means freedom from values and the social scientist can only in the rarest of instances free himself to such an extent from the valuations of his own society that he is only slightly capable of achieving a freedom from values and slightly capable of reaching objectivity. According to me, so Popper proceeds, every one of these statements, ascribed by me to the wrong-headed naturalism, is ultimately false. They are based upon a misunderstanding of the nature of the natural scientific method. It is directly founded in a myth a myth which unfortunately appears too frequently, namely the influential myth of the inductive character of the scientific method and of the nature of scientific objectivity.[6]

It should be kept in mind that Popper "sought to overcome the gap the *Wiener Kreis* had opened between science and philosophy" (Hacohen, 2002:195). The positivist claim that "science" is independent from philosophy in is

[5]　Remarks made by the author in 1958 in respect of this article states: "The remaining arguments mentioned in section 2 of my article seems to me fully sufficient, however, to disqualify both complete verifiability and complete falsifiability as criteria of cognitive significance" (Hempel, 1959:128)

[6]　Popper, 1970:107 See in this context also the treatment of the scientific method in sociology as explained by PH Mann (1968:13 ff)

nothing but a comprehensive *philosophical statement*!

The crucial question, of course, is whether a mere generalization (also known as *induction*) could provide a foundation for the alleged *universal validity* of (natural) laws?

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6.   Neo-Marxism

Harbermas, coming from the so-called Frankfurt school of neo-Marxism,[8] nonetheless holds that there are still positivistic leftovers present in Popper's methodology. He points out that Popper wants to subjugate the accepted view of observation, reflection and transition as the origin of theories to his new method of *testing*, the method of *falsification*. Popper brings all knowledge back to the level of mere opinions which should constantly be tested anew. Even successful hypotheses at most provide us with a good conjecture but never with *certain* and *proven knowledge*. In addition to this, Habermas claims, we do encounter another source of knowledge serving as a foundation of Popper's method of falsification, namely the *critically testing tradition*. Tradition, in the final analysis, is the *independent variable* upon which both thought and observation as well as the procedure of testing depends. Habermas is convinced that Popper uncritically trusts the autonomy of experience organized in the procedure of testing. This hides the deeply rooted positivistic prejudice which Popper, in spite of everything else, still shares: He presupposes the epistemological independence of the facts with regard to the theories aiming at a descriptive understanding of these facts and their relationships. Testing, therefore, measures theories against the yardstick of 'independent' facts. This thesis is the weak spot in the problematical *positivistic residue* in Popper's thought (Habermas, 1970:241, cf. 239 ff.).

Although the Frankfurt school affirms Popper's reaction against a *naturalistic positivism*, it remains critical of his own positive position. Adorno declares that methods are not dependent upon a methodological ideal but much rather upon *that which is investigated* (Adorno, 1970:130). Popper implicitly accounts for this with the prominence he gives to the *problem*. This emphasis directs scientific labor towards the importance of problems thus actually criticizing the numerous sociological investigations which try to assign primacy to sociological method in stead of acknowledging the primacy of that which is investigated. This primacy of method in the social sciences may be rooted in the desire to develop method for the sake of method, or even in order to select data for study in such a way that it could be studied with the available methods (Adorno, 1970:130).

Whereas for Popper a problem is something purely theoretical, Adorno wants to see a problem as something practical referring to a problematical state of affairs in reality (1970:129). This shift highlights the peculiar inclination of neo-Marxism. It is not satisfied with a distanced registration of facts: "Whoever hands himself over to the data to be studied, does not reveal anything of himself and, in the final analysis, equates himself with a registering apparatus" (Adorno, 1970:131). Whoever upholds this attitude in empirical research frequently comes to unconvincing and irrelevant results:
It also entails that the assertions of empirical social research frequently have an inconclusive or peripheral character, or merely represent information for administrative purposes; and because of this, from the very outset they are not suitable for incorporation in relevantly posed theoretical problems. Unmistakable is the danger of mere data manipulation as busy work, such as ascertained by Robert S. Lynd in his book *Knowledge for What?* (*Sociology and Empirical Social Research*, in Adorno and Horkheimer, 1973:121).

Given his practical concern, Adorno gives the following twist to Popper's conception of formulating problems: "Only for those who can imagine a society different from the actually existing one society becomes, in Popper's word, a problem; only through that what it is not society is unveiled as what it is" (Adorno, 1970:132). For Adorno, therefore, sociology means *criticism* (Adorno, 1970:132): "critical sociology is, if its concepts are to be true, according to its own design necessarily at once societal criticism" (Adorno, 1970:135). Also Habermas declares that an analysis of the coherence between knowledge and interests confirms the opinion that epistemological criticism is only possible as a *theory of society* (Habermas, 1970a:9).

For Adorno criticism does not merely entail that theses contradicting each other should be reformulated for the sake of the unanimity of a scientific context (Adorno, 1970:136). It is possible that the apparent *contradiction* resides in the field of investigation itself and that it would not be possible to rectify it through additional knowledge or clearer formulations (Adorno, 1970:129). Precisely due to the societal engagement of neo-Marxism a revolutionary implication is associated with it we only have to think about the student revolts of the sixties inspired by neo-Marxism.

7.   The "melting pot" of the mid twentieth century

During the period in which the positivist philosophy of science dominated the scene Europe experienced two world wars and a general move away from the

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[8]   This school includes M Horkheimer, T Adorno and up to a certain level also H Marcuse

Enlightenment trust in human reason. The pessimist tone of existentialist philosophy Kierkegaard (already from the 19th century) Jaspers, Heidegger, and Sartre was in the grip of an irrationalism that inspired Spengler to publish in 1918 his well-known "The Decline of the West" (*Der Untergang des Abendlandes*). This entire development transcended the scope (and limitations) of (neo-)positivism and within the Anglo-Saxon world is was accompanied by the growing influence of Wittgenstein, particularly his later philosophy as it was (posthumously) published in his *Philosophische Untersuchungen* (Philosophical Investigations"). Another concurrent movement took shape in the rise of a radically new philosophy of science, mainly inspired by Kuhn's work on *Scientific Revolutions*. Add to this the newly emerging prominence of the hermeneutical tradition (Dilthey, Gadamer) and on top of that the reinforced relativism introduced by postmodernism in its affirmation both of *historical relativity* and the *interpretative ambiguities* of language and of understanding, and the picture of a complex mix is completed.

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

The current intellectual climate of the West finds itself confronted with the consequences of a process of spiritual uprooting that actually started during the Renaissance but that only demonstrated its disintegrating effects in the

basic tenets of postmodernism and the claim that the days of the "grand meta-narratives" are bygone of course with the one ("last") exception: the *grand story* that the grand stories are gone![9]

These developments does not entail that the entire academic world succumbed to the relativistic consequences of the mentioned developments, because amazingly enough the classical rationalistic scientism and its spiritual child, technicism continued to capture the spirit of many special scientists. It seems as if the most recent developments did not succeed in liberating themselves from the integral and directing power of the basic motive of nature and freedom (science ideal and personality ideal).

8.   Culture and civilization

The dominance of modern humanism since the 15th century eroded the trust in (and acceptance of) *ontic laws* and *ontic normativity*. We have briefly mentioned that Kant even view human understanding as the formal law-giver of nature. The dialectical split between nature and freedom eventually ("is" and "ought to be" / "Sein" and "Sollen") particularly in the thought of the neo-Kantian Baden school of philosophy established the opposition of "facts" and "values". In 1896 Wilhelm Windelband presented his influential rectoral oration: *Geschichte und Naturwissenschaft* (see Windelband, 1924) in which a modern account is given of natural law and cultural norms. The latter domain is embedded in a new *philosophy of values* (Wertphilosophie). Windelband distinguishes between two different *types* of science: *nomothetic* and *idiographic* (the former sets out to grasp what is *universal* and the latter aims to understand the *unique* and *individual*). Rickert argues that we can subsume the 'world' under two different logical points of view: if we view it from the perspective of the universal it becomes nature (studied by the "generalizing natural sciences"); if we view it from the perspective of the unique and individual it becomes history (studied by the "individualizing cultural sciences" Rickert, 1913[2]:224).

In following Rickert and closely related to the distinctions used by Sorokin, MacIver differentiates between the "Physical Realm, The Realm of Organic Being" and "The Realm of Conscious Being" (MacIver, 1942:272). Within the latter he furthermore distinguishes between the *cultural order*, the *technological order* and the *social order* (1942:273).[10]

[9]   This reminds one of the humorous remark of Gadamer of the prejudice of Enlightenment against prejudices (cf Gadamer, 1998:276)

[10]   Schuurman considers the *technicism* of our time to be more fundamental than *scientism* or *economism* (see Schuurman, 1995:137 ff and Dijsterhuis, 1961)

In the 1965-edition of the text book written by MacIver and Page this threefold distinction reappears in the form of a bifurcation between *civilization* and *culture* (MacIver, 1965:498 ff. the exposition below refers to this section of MacIver's work). Finally, within civilization a subdivision is made between the realms of the *basic technology* and the *social technology*.

A closer analysis of these distinctions will pave the way for introducing basic systematic distinctions intended to point the way in the direction of transcending the threat of scientific nihilism and relativism.

The *basic technology* of MacIver is directed towards human *control* over natural phenomena. It is the area of the engineer and the mechanic. This definition indeed captures the original meaning of the relation between the human being as *subject* and whatever is objectified through human cultural activities. Implicit in this remark is the assumption of *functional modes of reality*, that is to say, of universal conditions making possible the human experience of the *how* of processes and natural and social entities. Human culturally formative actions concerns a peculiar functional mode of reality, best designated as the *cultural-historical aspect*. However, since the Renaissance it was believed that humankind *constructs* the cultural world, without accepting any longer any *given* points of departure (starting-points). Such starting-points, best known as *principles*, ultimately *condition* human action in the sense that human endeavours are made possible by the various ontically given spheres of functional principles. Although such given (ontic/creational) principles are not *valid per se*, since they are dependent upon *human intervention* for being *made valid*, they are not themselves the *product* of human actions.

The cultural task of humankind is always guided by *universal* historical norms or principles such as the principles of *historical continuity* (where disobedience leads to *reactionary* or *revolutionary* trends in history), *historical differentiation* and *historical integration.* In subjection to these (and other) historical principles we find the *factual historical subject-object relation.* This relation concerns the *factual control* (*power*) over things (and events) in nature.

These distinctions prompt us to ask: What is included in MacIver's "social technology"? MacIver states that the *social technology* points at the *techniques* directed to the regulation of the behaviour of human beings. Clearly MacIver here embarks upon the *control over human beings*. This phenomenon requires a distinction between subject-object relations and

subject-subject relations. Only the latter entails *control* in the sense of *power over fellow human beings* and it is always tied to a specific *office*. Only *office bearers*, due to the *competence* enclosed within the offices ccupied by them, possess the *authority* to control and regulate the activities of members of a particular societal totality. It is unfortunate that MacIver here introduces the domains of economics and politics as subdivisions of the *social order* thus introducing the problematic *whole-parts scheme* in his theorizing about human society.

However, when MacIver proceeds with his treatment of the difference between *civilization* and *culture*, he uses the *means-end* scheme as decisive criterion. Subsequently, this yardstick is then specified in terms of the *inner/outer* distinction finally ending up within the domain of *values*. A typing machine (and computers nowadays DFMS), for example, belong(s) to the basic technological order, but the novel produced by it belongs to a *different* order. Similar things, so MacIver argues, are created because it is their direct function to provide something to us that we need. They are not to be seen as merely mediated since they are meant to be expressions of ourselves. They respond to a necessity *within* us, not to an *outer* necessity. They belong to the realm of *culture* the the realm of *values*, of *styles*, of *emotional attachments*, of *intellectual adventures* and s oon. *Culture*, then, is supposed to be the *antithesis* of *civilization*. It is the expression of our nature in our modes of living and of thinking, in our everyday intercourse, in art, in literature, in religion, in recreation and enjoyment (MacIver, 1965:499). Whenever an object exists for the sole purpose of directly satisfying an existential function of human beings, it belongs to the domain of *culture*, and when it merely exists in service of something else that we desire, it belongs to the sphere of *civilization*.

These distinctions harbour fundamental problems. First of all, one cannot account for the peculiar nature of *tools* in terms of them. Human tools always display an inherent *structural qualification*. Their so-called *foundational function* is only to be found in the above-mentioned *cultural-historical aspect*[11] since they are *formed* by human beings under the guidance of their creatively free formative fantasy. However, they are also *cultural-historically qualified*, since they are made in order to *produce something else.* Therefore both Van Riessen and Schuurman characterizes human tools as having both a historical foundational and qualifying function). The latter remarks: All technical objects are exceptional in the sense that both their foundational and qualifying function are cultural or technical in nature (Schuurman, 1980:9 ff.; cf. Van Riessen, 1948:509).

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[11] Schuurman prefers to speak of the *cultural function*, since he regards 'history as the expression of the meaning-coherence of all modal aspects' (1980:379)

The archeologist Narr emphasizes that the *human formative fantasy* must be able to *invent* something *different* from what is present to the senses which requires that truly human tools must be made with the aid of (formed or unformed) *tools*. Even the making of simple *stone tools* as such requires "tool-making tools" ("das Werkzeug zum Werkzeugherstellen"): "In this we see a trait transcending the known and expected behaviour of animals: It presupposes possibilities and achievements which we may view as essentially and specifically human in nature" (Narr, 1973:62).

From the *cultural-historical qualifying function* of tools, it follows that the formation of *technical objects* immediately corresponds to the *formative desire* of human beings. In terms of MacIver's distinction, this would entail that also *technical objects* should be seen as belonging to the realm of culture *instead* of to the realm of civilization!

The structural principle of any cultural object is characterized by these two functions: a foundational function and a qualifying function, but only technical objects are qualified by the cultural-historical aspect all other types of objects are qualified by some other normative aspect. The use of any cultural object could only proceed in one of the following two possible ways: (i) actualizing the internal structural destination of the object;[12] (ii) using the object for a differently qualified purpose thus leaving its internal destination intact, unactualized. When a book is utilized to block the door, it is used for a different purpose, leaving its internal destination *undisclosed* (ii).[13] The same perspective applies to *technical tools*: they could be used according to their *internal qualifying function*, namely to *make* something else, or they could be used without actualizing their internal cultural-historical qualifying function for example when they are bought or sold (economically qualified objectification).

Every cultural object may therefore be used according to its internal nature or as a means in service of a differently qualified end. But then it is *impossible* to classify certain cultural objects exclusively as means, namely those belonging to the 'basic technology', while all other objects are considered to fall within the privileged category of being both an end in themselves (then belonging to culture) and a means to an end (then belonging to civilization). This analysis shows that the criteria used by MacIver are not sufficient to account for the empirically observable subject-object relations in reality.

If the nature of the universal cultural historical mode is accepted, *culture* is the

outcome of subject-object relations, whereas *civilization* concerns the disclosure of human subject functions as well as the interplay between human subject-subject relaitons and subject object realtion. For example, lingual communication between two subjects is mediated by objective *lingual signs*. All human subject-subject relations are *founded* in subject-object relations.

The pitfall of an anchorless relativism is only transcended when ontic normativity making possible all human subjectivity is accepted. This acknowledgement at once entails that science ought to be appreciated as one of the core powers of our civilization, but only when its normative confines are observed within the context of our human cultural task to disclose the possiblities of God's creation intellectually may we hope to witness a fruitful scholarly and scientific development for the generations to come.

9. Literature

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[12] When a *book* is *read*, or when *painting* is *appreciated in an aesthetic sense*, and so on

[13] Another example: If you would use a coin to buy something, it is used according to its internal economical qualifying function If it is used as an ornament it is socially objectified without opening up its internal qualifying function

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