IN DEFENSE OF EXTREME (FALLIBILISTIC) APRIORISM

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I shall presuppose as undefended background to what follows a position of scientific realism, a doctrine to the effect (i) that the world exists and (ii) that through the working out of ever more sophisticated theories our scientific picture of reality will approximate ever more closely to the world as it really is. Against this background consider, now, the following question:

I. Do the empirical theories with the help of which we seek to approximate a good or true picture of reality rest on any non-empirical assumptions?

One can answer this question with either a 'yes' or a 'no'. 'No' is the preferred answer of most contemporary methodologists — Murray Rothbard is one distinguished counterexample to this trend — who maintain that empirical theories are completely free of non-empirical ('a priori') admixtures and who see science as a matter of the gathering of pure 'data' obtained through simple observation. From such data, scientific propositions are then supposed to be somehow capable of being established.

It is one solid result of the philosophy of science that no conception of the way scientific knowledge is gained and scientific hypotheses are formulated can be acceptable. The philosophy of science has shown that certain categories (conceptions, hypotheses, assumptions) are necessarily presupposed if, for example, an empirical observation is to be scientifically usable. Every observation is in this sense 'theory-' or at least 'category-laden'. One cannot measure anything, and one can bring no results of measurement into correlation with one another, if one does not have prior concepts or categories of what one wants to measure.[1] To carry out experiments in meaningful and systematic fashion, to represent the results of these experiments theoretically, and to process these results, one needs assumptions, concepts, categories and other theoretical instruments. Logic and the theory of definition, as well as many branches of pure mathematics, belong to this pre-empirical foundation of the empirical sciences — 'pre-empirical' in the sense that it cannot be gained through induction or observation but rather makes induction and observation possible.

All scientists bring with them non-empirical presuppositions of different

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[1] See for example Karl Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge*, 4th ed. (London: Routledge, 1972), 187ff. A more powerful formulation of this same thesis is to be found already in the writings of Edmund Husserl's teacher Franz Brentano. See Franz Brentano, *Deskriptive Psychologie* (Hamburg: Meiner, 1982); English translation by B. Müller *Descriptive Psychology* (London: Routledge, 1995).

sorts, presuppositions which are usually tacit in nature, which will often seem trivial when made explicit, and which will therefore no less often lend sanction to the view that they are somehow empty or analytic — that they are all without exception derived from logic. Most twentieth-century philosophers of science have indeed assumed as a matter of course that scientific theories ought properly to consist entirely of empirical propositions (propositions amenable to empirical testing) built up on a foundation of strictly analytic propositions of logic and mathematics. This leads to the further question:

II. Are the propositions which express the pre-empirical assumptions of empirical science in every case analytic (tautological, lacking in content)?

'Yes', say the logical positivists. Logic, and all that one can derive from logic, together with conventional definitions, suffices in their view for the purposes of this non-empirical part of science. Many later analytic philosophers have also believed that this logical-positivist conception of the indispensable non-empirical foundation of science is the only one that can be seriously entertained. They have not, however, noticed that the corresponding analyses even of the simplest examples of non-empirical propositions have still to be provided. Indeed, too often they let the matter rest on programmatic declarations and did not care about providing examples of any sort.

Consider for example the law of the transitivity of the part-whole relation.[2] This law reads as follows:

[TRANS] If A is a part of B, and B a part of C, then A is also a part of C.

It may be that some of us may recognize a point in our lives when we first apprehended this law. But still, it is difficult seriously to entertain the thesis that our knowledge of the law is a result of empirical research, of observation and induction. The proposition in question is, however, clearly of extraordinary importance for every science and for every scientific experiment. Like many other laws pertaining to the simplest and most general relational categories, it is at the same time also entirely trivial. Now it is a common peculiarity of human beings that they like to turn away from trivial or elementary propositions of this sort and that they have a tendency to refuse to accept their peculiarities and their consequences: 'trop de vérité nous étonne', as Pascal once formulated the matter.[3] Who, after all, is interested in the fact that human action exists, that pleasure is different from greed, that triangles are different from squares, that warnings are different from congratulatings, that Julius Caesar is not a cardinal number. It is for this reason possible that both philosophers and scientists have often overlooked

[2] See Barry Smith, "Austrian Economics and Austrian Philosophy", in Wolfgang Grassl and Barry Smith, eds. *Austrian Economics: Historical and Philosophical Background* (New York: New York University Press, 1986; London and Sydney: Croom Helm, 1986), 1–36. See also Barry Smith, "Aristotle, Menger, Mises: An Essay in the Metaphysics of Economics", in B. Caldwell, ed., *Carl Menger and His Economic Legacy*, Annual Supplement to vol. 22, *History of Political Economy* (Durham and London: Duke University Press, 1990) 263–288, and Barry Smith, *Austrian Philosopy* (Chicago and LaSalle: Open Court, 1994).

[3] Blaise Pascal, *Oeuvres Complètes*, L. Lafuma, ed (Paris: Editions du Seuil, 1963), p. 527.

the fact that all normal human beings are in possession of a whole host of such items of knowledge or insight. And for this reason also the temptation very easily arises to want to devalue such propositions by classifying them as 'analytic' or 'tautological' or 'lacking in content'.

The law of the transitivity of the part-whole relation is however — for all its triviality — not analytic according to the standard reading of this notion. According to this standard reading we are to define 'analytic' as follows:

> A proposition is analytic if and only if it is either itself a law of deductive logic or it is capable of being transformed into such a law through the replacement of the defined terms it contains with corresponding definitions.

All bachelors are unmarried can be exhibited as analytic in this sense by substituting 'unmarried man' for 'bachelor' and noting that the result is an instance of the logical law *All A which are B are B*.

[TRANS], now, contains just one term which might come into question as 'defined', namely the relational term 'is a part of'. This expression is not a logical term; axioms governing the corresponding relation will be found in no standard logical textbook, and neither will [TRANS] itself. Unfortunately for the advocates of the logical positivist conception, however, it is also not definable. Rather it presents an example of one of those fundamental concepts with whose help the very process of defining scientific terms can sensibly begin.

According to the definition of 'analytic' that is standardly accepted by logical positivists and by analytic philosophers in general, then, the given law is synthetic. But might one not call into question the preferred definition of 'analytic'? Might one not, with Carnap and others, assert that the truth of a proposition such as [TRANS] is somehow a consequence of the rules of language?[4] [TRANS] would then be lacking in content in the sense that it would have nothing to do with the actual world but rather only with our language-use. Yet the given law would clearly still obtain even if no language or rules of language should ever have evolved; indeed it would clearly still obtain even in a world lacking all cognitive subjects. Even then it would still for example be true that, of three arbitrary parts of a stone, or of a planet, if the first is part of the second, and the second part of the third, then the first is also part of the third. To conceive the law of transitivity as 'lacking in content' in the suggested fashion is therefore at least a mite more problematic than the defenders of the corresponding theories have normally supposed.

For this reason I shall assume in what follows that at least some of those non-empirical assumptions or hypotheses which are presupposed by the various branches of science are not analytic. The question then arises:

[4] See for example Rudolph Carnap, *Meaning and Necessity. A Study in Semantics and Modal Logic* (Chicago and London: University of Chicago Press, 1947), pp. 222-229.

III. Do we have an infallible knowledge of all synthetic pre-empirical propositions which are presupposed by the various sciences in the different phases of their development?

Already for purely logical reasons it is impossible that one should answer 'yes' to this question. For such pre-empirical assumptions have not always remained the same through the course of scientific development, and successive assumptions have not always been consistent with one another. As is shown by the developments of the last one hundred years in the relations between geometry and physics, the results of empirical research sometimes seem to exercise a retroactive control over pre-empirical assumptions and lead to their elimination or modification. The realm of the pre-empirical thus provides no royal road to indubitable knowledge. Much rather is synthetic pre-empirical knowledge a hard-fought achievement, and those who seek such knowledge must be ready to face many detours and setbacks on the way.

For the same (logical) reasons we should have to deny the thesis that the synthetic pre-empirical propositions at the core of science might all be true. Even in the realm of the pre-empirical there is no infallible knowledge and no truth-guarantee. We are dealing here with 'assumptions' in a strict sense of the word, assumptions which may, even if only in isolated instances, turn out to be false. Interestingly, traces of this fallibilistic conception of the a priori are present in Husserl, and already Leibniz spoke of a *methodus conjecturalis a priori*, which proceeds with the aid of hypotheses: *[assumere] causas licet sine ulla probatione*.[5]

With this, however, there arises the following question:

IV. Could these assumptions be arbitrary?

Feyerabend has given a positive answer to this question, propounding what he calls an 'anarchistic theory of knowledge' and abandoning the scientific goal of truth in favour of a position of epistemological relativism. Feyerabend calls for a maximally broad and 'ever increasing ocean of mutually incompatible (and perhaps even incommensurable) alternatives' — of alternative counter-intuitive (and also 'counter-inductive') theories.[6] As soon, however, as we attempt to imagine in concrete fashion what it would mean to practice science (or anything else) consciously and consistently according to the policy of arbitrariness, then we recognize that Feyerabend's doctrine of 'anything goes' is entirely indefensible. For however large and important the role of serendipity in science may be, it is surely obvious that the idea that scientists could apply arbitrary assumptions is impracticable. Even those who hold falsification to be the primary motor of scientific development must insist that the falsification of arbitrary assumptions would

[5] For Edmund Husserl's fallibilism see for example his "Ideen zu einer reinen Phänomenologie und phänomenologischen Philosophie", *Jahrbuch für Philosophie und phänomenologische Forschung*, 1, (1913). (and as Husserliana III/1, III/2). On Leibniz, see H. Schepers, "A priori/A posteriori", *Historisches Wörterbuch der Philosophie*, vol. 1 (Basel/Stuttgart, 1971), p. 466.

[6] Paul Feyerabend, *Against Method* (London: New Left Books, 1975), p. 30.

be a fruitless enterprise.

This, however, implies that there must be some criteria of evaluation which the scientist applies, whether consciously or not, in working out his assumptions, or through which he allows himself to be guided in determining which assumptions are and which are not acceptable.

How, then, does this evaluation of scientific assumptions proceed? The answer to this question that is favoured by the positivists is in its simplest version as follows: we evaluate assumptions exclusively according to their consequences, i.e. according to the principle of expedience or predictive power. We establish in other words that certain assumptions yield assertions about the future which are empirically confirmed — or at least not easily falsified.

A position of this sort is defended for example by Milton Friedman, at least in his methodological writings.[7] Friedman maintains that assumptions can be completely arbitrary, that they can even be false, if they only enjoy a certain power to generate predictions. It might for example turn out that an economic theory was developed which correlated stock-market movements with sun-spot activity; and then, so long as this theory enjoyed predictive power, it would as theory be fully acceptable. For the positivists, science evolves by becoming ever more concentrated on assumptions with predictive power. Theories and hypotheses which prove unreliable will be slowly filtered out.

We have accepted already that there can in this sense be a control even of the pre-empirical assumptions adopted by the natural sciences. This can indeed be counted as a scientific commonplace. The corresponding process of filtering out however, whether it is understood according to the classical model of empirical confirmation or according to the Popperian model of falsification, because it is purely retrospective in nature, does not take us further with respect to the just-mentioned problem of arbitrariness. The question of criteria of *ex ante* evaluation remains to this extent open (a consequence which we could incidentally have predicted, if we had kept in mind the example of pure mathematics, in which pre- (or non-)empirical assumptions are equally necessary, but where talk of predictive power is clearly inappropriate).

For it is of course not the case that the scientist occupies himself with arbitrary assumptions in the hope — and to the extent that the relevant assumptions were truly arbitrary this would have to be a groundless hope — that they will manifest in unexpected fashion a high predictive power. No scientist would ever consciously rely on pure arbitrariness in this fashion. The search for assumptions on the part of the scientist is subject rather to a whole host of *ex ante* (or as we might also say: a priori) controls. For he seeks only those assumptions which will give him a justified expectation of predictive power. The sun-spot example fails to awaken such expectations precisely because we can find no intelligible reason why sun-spots should cause stock-exchange movements. Even if we were to accept such a correlation as a fact, we would still be unsatisfied with the corresponding hypothesis, because we would feel no certainty that this correlation might not at any moment cease to

[7] Milton Friedman, "The Methodology of Positive Economics", in *Essays on Positive Economics* (Chicago: University of Chicago Press, 1953).

obtain. Certainty of this sort is acquired only where we have some explanation as to *why* these and those stock-exchange phenomena are associated in a non-arbitrary fashion with these and those sun-spot phenomena.

What, then, are the criteria of *ex ante* evaluation which serve to temper arbitrariness? Here there is much that is to be said – for instance that our assumptions must in the normal case stand to other accepted assumptions in relations of logical consistency. For our present purposes however it will suffice to point out that these assumptions must, in general at least, be characterized by a certain plausibility. Scientists attempt to find assumptions in relation to which they can have a justified expectation that they be true.[8] This holds not least for the category of synthetic pre-empirical assumptions. Indeed we want to claim that with the development of science the relevant synthetic pre-empirical propositions must come to be characterized by such plausibility to an ever increasing degree.

Then, however, the question arises:

V. Might this sort of plausibility be always a contextual affair, so that an 'intrinsic' plausibility would be excluded?

It is commonly held that nothing is in itself plausible, that what one finds plausible depends always on one's presuppositions, perhaps also on certain background features of one's society or language, on the current state of the sciences, and so on. The thesis that all the pre-empirical propositions that are of interest to us here might enjoy only this sort of context-determined (perhaps we might call it 'hermeneutical') plausibility is, however, rather improbable. I cannot, for example, imagine what it would be like for the plausibility of [TRANS] to be context-dependent in the suggested sense. [TRANS] is clearly accepted by all scientists, and it is presupposed also, it seems, in many of the simplest and most common human activities in all cultures, and it seems to be associated with no specific types of scientific problem or subject-matter. Moreover, it would similarly be difficult to conceive of a purely context-dependent plausibility for propositions like *red is different from green* or *seeing is different from hearing*.

There are, it follows, intrinsically plausible pre-empirical assumptions which play an indispensable (if often trivial) role in the advance of science and knowledge. In the philosophical literature on the topic of the a priori it is usually only certain selected examples of such propositions which are treated of, so that it can easily appear as if they could each be shown in turn to be 'analytic' or 'tautological' by some manipulation of definitions.[9] The question however arises:

[8] Their eventual falsification might then teach us something important and essential. Cf. Karl Popper, *Objective Knowledge: An Evolutionary Approach* (Oxford: Clarendon Press, 1972), pp. 196f.

[9] Against this, see wojciech Zelaniec, "Fathers, Kings and Promises: Husserl and Reinach on the A Priori," *Husserl Studies*, 9, pp. 147–177.

VI. Whether the intrinsically plausible pre-empirical synthetic propositions which play an indispensable role in the sciences are truly given only individually, i.e., in such a way that there obtains no systematic relation between them?

Kant answered this question in the negative in that the whole of arithmetic and of physics are based in his eyes on synthetic pre-empirical presuppositions. In the last hundred years it has however come to be taken for granted in the literature that we have to deal here with only single, unconnected propositions. Thus for example the logical positivists, in their attempts to demonstrate the analyticity of all pre-empirical assumptions, have over and over again worked with the same few examples: the law of cause and effect, the proposition that nothing can be red and green all over – examples which, in their isolation, can be dismissed as being of at most curiosity interest and of negligible scientific import. A more careful investigation shows, however, that there are whole systems of such pre-empirical propositions, even leaving aside the examples to which Kant himself paid special attention. Not only is mereology a self-contained science of the laws of part and whole,[10] there are also other sciences — or 'pre-sciences' (*Vorwissenschaften*) as Husserl's teacher Stumpf called them[11] — which consist exclusively in intrinsically plausible pre-empirical principles. Stumpf himself offers as examples what he called 'phenomenology' (which he defined as the theory of sensible phenomena), 'eidology' (the theory of non-sensory 'formations' given in experience, including value- and Gestalt-formations), and the 'general theory of relations' (the theory of relational concepts such as 'similarity, equality, intensity, logical and real dependence, the relation of part and whole, and so on).[12] These pre-sciences are according to Stumpf:

> . . . the atrium and the organon of every other science insofar as the object of every science includes their object, since all research makes use of relational concepts and laws . . . In an ideal encyclopedia of knowledge everything which can be said about relations between arbitrary elements in general would have to come first.[13]

There are therefore, if Stumpf is right, whole systems of synthetic assumptions of a non-empirical sort, assumptions which enjoy an intrinsic plausibility and which play an important (even if easily overlooked) role in the sciences.

Husserl himself held that there were three a priori ontologies, three 'material a priori sciences' of thing, soul, and society: the pure science of nature, pure psychology and pure sociology, respectively. The ontology of things includes as branches the pure theory of space (geometry), pure time theory (chronometry), pure kinematics, and the pure disciplines of the possible deformations of spatial formations. The pure a priori science of the soul, initially called by Husserl 'descriptive psychology' and associated with

[10] See Peter M. Simons, *Parts. A Study in Ontology* (Oxford: Clarendon Press, 1987), ch 1.

[11] Carl Stumpf, "Zur Einteilung der Wissenschaften", *Abhandlungen der Königlichen Preussischen Akademie der Wissenschaften, phil.-hist.* 1907, *Kl.*, 4, pp. 39f.

[12] Stumpf, "Zur Einteilung", p. 37.

[13] Stumpf, "Zur Einteilung", p. 39.

the 'rational psychology' of Christian Wolff, has as its subject-matter the psychical experiences, perceptions, memories, imagination, expectations, decisions, choices, and so on, in other words thought experiences of every sort, as well as feelings and acts of will. The regional ontology of society, finally, concerns itself with cultural formations like state, law, custom, church and so on.[14]

Husserl's early followers in Munich, the so-called 'realist' phenomenologists, and above all Pfänder, Scheler and Reinach, embraced wholeheartedly the project of working out in systematic fashion the entire pantheon of such theories and sub-theories, both formal and material. There are, first of all, the formal a priori disciplines of ontology and mathematics, including arithmetic, set theory, topology, mereology, the 'theory of objects' in Meinong's sense, and many others. We then have a priori disciplines dealing with the three-dimensional world of space and time, and with the objects of nature, including the overlapping disciplines of rational mechanics,[15] naive or qualitative physics,[16] kinaesiology, stereology, geometry, chronometry, and so on. We then have the various sub-disciplines of aesthesiology (theories of secondary qualities[17]): colourology, the a priori science of tones, of feelings of warm and cold, textures and so on. There then follow logic and the various disciplines associated with logic, including the theory of evidence, apophantic logic, concept-theory, decision theory, the logic of truth, and so on. Next come various sciences of 'rational psychology,' sciences of beliefs and desires, feelings, values and valuings, including Scheler's material ethics, and formal axiology and deontic logic, the a priori theories of imperatives,[18] of norms, of will, a priori aesthetics, the ontology of art and art works developed by Roman Ingarden, and so on. We then have various a priori sciences pertaining to the domain of language and expression,[19] universal and categorial grammars, the a priori sciences of phonology, and the theory of speech acts or categorial pragmatics developed by Reinach[20] and later by Austin and Searle. In the same work Reinach

[14] Karl Schuhmann, "Husserl's Concept of Philosophy", *Journal of the British Society for Phenomenology*, 21 (1990): 274-283.

[15] Max Scheler, "Der Formalismus in der Ethik und die materiale Wertethik", *Jahrbuch für Philosophie und phänomenologische Forschung*, 1, (1913/1916): p. 449n. English translation by M. S. Frings and R. L. Funk as *Formalism in Ethics and Non-Formal Ethics of Value* (Evanston: Northwestern University Press, 1973).

[16] Patrick Hayes, "The Second Naive Physics Manifesto" in J. R. Hobbs, and R. C. Moore, eds., *Formal Theories of the Commonsense World* (Norwood, N. J.: Ablex Publishing Corporation, 1985); also, Barry Smith and Roberto Casati, "Naive Physics," *Philosophical Psychology*, 7/2 (1994), 225–244.

[17] Cf. Günter Witschel, "Edmund Husserls Lehre von den sekundären Qualitäten" (Ph. D. Dissertation, University of Bonn, 1961).

[18] Alexander Pfänder, "Imperativenlehre" (MS of 1909), in H. Spiegelberg and E. Avé-Lallemant eds., *Pfänder-Studien* (The Hague: Nijhoff,1982) 295-324.

[19] Elmar Holenstein, *Roman Jakobson's Approach to Language: Phenomenological Structuralism* (Bloomington and London: Indiana University Press, 1975).

[20] Adolf Reinach, "Die apriorischen Grundlagen des bürgerlichen Rechts," *Jahrbuch für Philosophie und phänomenologische Forschung*, 1 (1913): 685-847. English translation by J. Crosby as "The A Priori Foundations of the Civil Law", in *Aletheia*, 3 (1983), 1– 142. See also Kevin Mulligan, ed., *Speech Act and Sachverhalt. Reinach and the Foundations of Realist Phenomenology* (Dordrecht/Boston/Lancaster: Martinus Nijhoff, 1987).

conceived the project of a general a priori ontology of the entire domain of social interaction. Sub-branches of the latter might include praxeology, the a priori science of action, the a priori ontology of work, a priori economics, the a priori theory of institutions, of law, a priori politics,[21] the phenomenology of intersubjectivity, the a priori science of dialogue, a priori sociology, a priori geography, the a priori theory of the life world, eidetic history, a priori anthropology, and so on.

Of the non-formal disciplines on this list it is above all two whose principles and applications have been worked out in detail: the a priori theory of law worked out, again, by Reinach in his "The A Priori Foundations of the Civil Law"[22] and the a priori science of economics worked out by successive generations of so-called 'Austrian economists' from Menger to Rothbard and beyond. Few in the tradition of Austrian economics have however taken cognisance of the fact that, as Reinach puts it, the realm of the ontological a priori is "unsurveyably wide; whatever sorts of object we know, they all have their 'what', their 'essence', and of all essentialities essential laws hold."[23]

On the standard praxeological account of economic science shared by Mises and Rothbard and succinctly stated in the latter's "In Defense of 'Extreme Apriorism'"[24] there are held to be certain fundamental axioms of economics which are both true and such that their truth is grasped immediately. The theorems of economics are then established via logical deduction from these axioms. There is in consequence no need for empirical testing of these theorems, which is fortunate since, as Rothbard points out, empirical testing is in any case impossible in the sciences of human action:

> It is physics that knows or can know its "facts" and can test its conclusions against these facts, while being completely ignorant of its ultimate assumptions. In the sciences of human action, on the other hand, . . [t]here is no laboratory where facts can be isolated and controlled; the "facts" of human history are complex ones, resultants of many causes. These causes can only be isolated by theory, theory that is necessarily a priori to these historical (including statistical) facts.[25]

The only way to understand human behaviour, Mises and Rothbard hold, is by means of a priori categories which we are able to recognize in the complex and ever-changing warp and woof of history in virtue of the fact that we are ourselves historical agents who are ready-armed with an intimate knowledge of these categories through our own experience. In a similar way we are able to recognize the presence of instantiations of ethical categories in the warp and woof of history in virtue of the fact that as a result of our own experience as ethical subjects we have an intimate knowledge of ethical categories such as guilt, responsibility, obligation, and so on.

[21] See Karl Schuhmann, *Husserls Staatsphilosophie* (Freiburg/Munich: Karl Alber, 1988).

[22] Adolf Reinach, "The A Priori Foundations of the Civil Law."

[23] Adolf Reinach, "Concerning Phenomenology," *The Personalist*, 50, (1969), 194–211. (English translation by Dallas Willard of a lecture given in Marburg in 1914.) See also Adolf Reinach, *Sämtliche Werke*, K. Schuhmann and B. Smith, eds., 2 vols. (Munich and Vienna: Philosophia, 1989).

[24] Murray N. Rothbard, "In Defense of 'Extreme Apriorism,'" *Southern Economic Journal*, 23 (1957): 315–20.

[25] Rothbard, "In Defense," p. 315.

Rothbard draws a distinction between two approaches to the a priori as follows:

> Professor Mises, in the neo-Kantian tradition, considers [the law of human action] a law of thought and therefore a categorical truth a priori to all experience. My own epistemological position rests on Aristotle and St. Thomas rather than Kant, and hence I would interpret the proposition differently. I would consider the axiom a law of reality, rather than a law of thought.[26]

We are now in a position to understand what Rothbard means here by 'law of reality.' The definitive account of such laws is in fact to be found neither in Rothbard nor in Aristotle and St. Thomas but rather precisely in the writings of Reinach and the other realist phenomenologists.

How is synthetic a priori knowledge possible? For the members of the Reinach group, as also for Aristotle, Aquinas and Rothbard, there exists an ontological a priori, an a priori in reality. The a priori status of judgments, propositions, beliefs or 'laws of thought' that is so central to the Kantian approach then proves to be derivative of this more deep-lying a priori dimension on the side of the things themselves.

According to the Kantian conception, in contrast, science consists not so much in the attempt to construct a system of intrinsically intelligible assumptions, but rather in a 'coercion of nature' (*Nötigung der Natur*) of such a sort that the latter comes to be formed in conformity with prior principles. Consider the following passage from Kant's first *Critique*:

> When Galileo caused balls, the weights of which he had himself previously determined, to roll down an inclined plane . . ., a light broke upon all students of nature. They learned that reason has insight only into that which it produces after a plan of its own, and that it must not allow itself to be kept, as it were, in nature's leading-strings, but must itself show the way with principles of judgment based upon fixed laws, coercing nature to give answer to questions of reason's own determining. Accidental observations, made in observance to no previously thought-out plan, can never be made to yield a necessary law, which alone reason is concerned to discover.[27]

This passage expresses an important epistemological insight to the effect that scientists, if they seek systematic results in the form of scientific laws, must undertake systematic observations guided by relevant scientific assumptions. Kant and his followers have however drawn ontological conclusions from this insight. They claim in fact to have shown that the object-domain which is in each case grasped by the scientist must first have been pre-formed and pre-constituted in some peculiar ('transcendental') fashion. This doctrine is then introduced by the Kantians into their explanation of the peculiarity of a priori propositions: the latter are now held to acquire their truth from the fact that we ourselves have in King-Midas-fashion imposed them upon reality, have coerced reality to have it fit our prior prejudices.

Now however we must ask:

[26] Rothbard, "In Defense", p. 318.
[27] KrV., B XIII. Cf. Popper, *Conjectures and Refutations*, p. 189.

VII. Is it really true that, as the Kantians assert, intrinsically plausible or intelligible pre-empirical synthetic propositions are in some sense imposed upon the world by cognizing subjects?

That we have to answer 'no' to this question should be clear. Consider once again the example of the law of transitivity as this is applied to the parts of a stone or of a planet. This law would of course hold also in a world without thinking ('forming', 'constituting') subjects. It is thus impossible to conceive it as something subjective (a mere 'law of thought').

The thesis of the supposed subject-dependence of all laws of this kind — as originally formulated by Kant — is moreover not capable of being harmonized with the fact that pre-empirical assumptions are sometimes contradicted through retrospective empirical control. For the assertion that the given laws hold only because we have read them into the structure of the world, that the empirical world of what happens and is the case is itself a product of such reading in, surely excludes the possibility of conflict between such laws and empirical happenings.

The thesis that the world is 'transcendentally' formed leads further to the question why precisely these rather than those transcendental forms should be the ones through which the imposition of structure is effected. Once again, the problem of arbitrariness seems here to raise its ugly head. Many Kantians (and Popperians) are today content with an evolutionistic treatment of this problem. In their eyes those pre-scientific assumptions have come to dominate which enjoyed under the prevailing circumstances a greater capacity for survival or a greater adaptability than the available alternatives. But the proponents of this doctrine appeal in this connection to the results of a science — biology — which itself presupposes very many pre-scientific assumptions of its own. This means that they are precluded from extending their account to at least one important group of pre-scientific assumptions, since the assertion that a science which itself presupposes certain principles can itself serve to justify those principles contains an obvious vicious circle. The striving for a fully adequate picture of reality thus requires an answer to the question as to how pre-scientific assumptions arise and are justified that goes much deeper than the answer of the evolutionists. And as Husserl showed in the "Prolegomena" to his *Logical Investigations*,[28] the same holds of every attempt to account for such assumptions through appeals to an empirical science.

Our realistic conception of the empirical sciences tells us, however, how we are to formulate an answer of the required sort. The striving on the part of scientists for intelligible assumptions can be justified by appeal to the fact that the world itself possesses certain intelligible structures – structures of the sort which are captured for example in the laws of mereology or colourology. The world itself is in many of its traits in itself intelligible.

The general idea is well conveyed by the Munich phenomenologists, for example by Scheler in his great critique of formalism (and in particular of

[28] Edmund Husserl, *Logische Untersuchungen*, critical edition (Dordrecht: Nijhoff, 1975, 1984); English translation of 2nd ed. by J. N. Findlay as *Logical Investigations* (London: Routledge and Kegan Paul, 1970).

Kantianism) in ethics.[29] Scheler is there concerned to establish the basis of an ethical theory which is 'a priori' in the sense that, as he puts it, 'its propositions are evident and can neither be tested by something that has been found, prior to such testing, by observation and induction nor be refuted by observation and induction.'[30] Our knowledge of such a priori propositions is gained by means of what Scheler calls an 'intuition of essences' of the sort that is involved, for example, when we grasp the colour red and grasp that it is different from green or blue, or when we grasp the essential interconnection between red and visual extension. We do not have to observe and check and carry out inductions in order to grasp that red is different from green, or that jealousy is different from greed.

> Whenever we have such essences and such interconnections among them (which can be of different kinds, e.g., reciprocal, unilateral, conflicting, or, as in the case of values, ordered as higher and lower), the truth of propositions that find their fulfillment in such essences is totally independent of the entire sphere of observation and description, as well as of what is established in inductive experience . . . Hence the a priori is not dependent on propositions (or even on acts of judgment corresponding to them). It is not dependent, for example, on the form of such propositions and acts (i.e., on "forms of judgments," from which Kant developed his "categories" as "functional laws" of "thinking"). On the contrary, the a priori belongs wholly to the "given" and the sphere of facts. A proposition is only a priori true (or false) insofar as it finds its fulfillment in such "facts."[31]

A priori knowledge thus rests on experience, since

> . . . everything and anything that is given rests on "experience." He who wishes to call this "empiricism" may do so.[32] . . . It therefore is not experience and non-experience, or so-called presuppositions of all possible experience (which would be unexperienceable in every respect), with which we are concerned in the contrast between the a priori and a posteriori; rather, we are concerned with two kinds of experience.[33]

On the one hand is immediate intuitive experience of essences such as colours and shapes and their interrelations, and on the other hand is observational experience of what happens and is the case. Now however we have to consider the question:

[29] Scheler, "Der Formalismus."
[30] Scheler, "Der Formalismus," translation, pp. 47f.
[31] Scheler, "Der Formalismus," translation, p. 49.
[32] Compare Rothbard: 'I would consider the axiom [of action] a law of reality rather than a law of thought, and hence "empirical" rather than "a priori." But it should be obvious that this type of "empiricism" is so out of step with modern empiricism that I may just as well continue to call it a priori for present purposes.' Rothbard, "In Defense," p. 318
[33] Scheler, "Der Formalismus," translation, p. 52.

VIII. Might the intrinsically plausible pre-empirical synthetic propositions all be false?

Certainly it might be that in the course of scientific development pre-empirical assumptions arise which correspond to no structures in the world and have only a somehow purely pragmatic value. From the realistic standpoint, however, the proportion of true pre-empirical assumptions must be considerable in every phase of this development. For the doctrine of scientific realism asserts not only that the world exists, but also that it corresponds broadly to the ideas we have about it. What the view presented here adds to this doctrine of scientific realism (which is, the reader will remember, here presupposed without argument) is the result that the true picture of reality, broad strands of which are already in our possession, must consist not only of accidentally true propositions which picture the accidents of reality, but also of true, necessary and contentful propositions which picture certain intelligible structures.

Such propositions can also be called 'a priori'. Note again, however, that the conception of the a priori that is then yielded turns out to be a non-Kantian conception. It claims that, where Kant wanted always to have the a priori viewed as something subjective, something pertaining purely to knowledge, there is in fact such a thing as an a priori in the world.

We affirm simply that there are synthetic intrinsically plausible true propositions, and that science strives to accumulate ever more of these; we do not however affirm that we know (or much less that we have certain knowledge about) which of the available candidates for such propositions are true among those which at any given time play a role in the really existing sciences. The given intelligible structural traits of reality can be overlooked or misinterpreted. The recognition that there are a priori structural traits in the world yields, to repeat, no easy sort of indubitable evidence in relation to the corresponding propositions. This fallibilistic doctrine of a priori laws of reality does however yield a nice solution to one age-old problem facing all defenders of the a priori. How, as Caldwell puts it,[34] does one choose between rival systems all of which claim to rest on a priori foundations? On the non-fallibilistic conception it is difficult to make sense even of the possibility of rival systems of this sort. On the conception here defended, in contrast, the existence of such rival systems can be seen to be a perfectly natural and acceptable consequence of the just-mentioned difficulties we will often fact in coming to know even the intelligible traits of reality: one adjudicates between such systems in the same way in which one adjudicates between all rival scientific hypotheses, namely via a complex mixture of empirical and a priori considerations.

[34] Bruce Caldwell, "Praxeology and Its Critics: An Appraisal," *History of Political Economy*, 16 (1984), 363-379.

IX. Conclusion

We can summarize the main argument of this paper as follows:

Do the empirical theories with the help of which we seek to approximate a good or true picture of reality rest on any non-empirical presuppositions?

Yes — No (extreme empiricists)

Are the propositions which express these pre-empirical assumptions in every case analytic (tautological, lacking in content)?

Yes (logical positivists) — No

Do we have an infallible knowledge of all the synthetic pre-empirical propositions which are presupposed by the various sciences in the different phases of their development?

Yes (extreme Cartesians) — No

Could these assumptions, which are presupposed by the empirical sciences,be arbitrary?

Yes (Feyerabend) — No

The propositions in question must therefore be characterized by a certain plausibility. Is this plausibility always a contextual affair?

Yes (hermeneutic relativists) — No

There is therefore something like an intrinsic plausibility. Are the intrinsically plausible pre-empirical synthetic propositions which play an indispensable role in the sciences given only individually, so that we have only a few isolated examples thereof between which no systematic relations would obtain?

Yes — No

Is it really true, as the Kantians assert, that the intrinsically plausible or intelligible pre-empirical synthetic propositions here at issue are read into or imposed upon the world by us?

Yes (Kantians) — No

Might the intrinsically plausible pre-empirical synthetic propositions all be false?

Yes — No

Certain pre-empirical synthetic intrinsically plausible propositions thus require ontological correlates which are their truth-makers. Hence, there are intelligible structures in the world, which we could also call 'a priori structures'.