# A STUDY OF KANT'S METHOD IN THE CRITIQUE OF PURE REASON: HYPOTHETICAL AND TRANSCENDENTAL PROOFS

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# A STUDY OF KANT'S METHOD IN THE CRITIQUE OF PURE REASON

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# INTRODUCTION

This essay is intended as a general study of the transcendental method employed by Immanuel Kant in his Critique of Pure Reason. Norman Kemp Smith's views on its relation to the hypothetico-experimental method of the natural sciences will receive special attention in this study. In the "Second Preface" to the Critique, Kant himself maintains that philosophy must emulate the method of the sciences if it is to become successful. One of our main tasks must therefore be to ascertain Kant's estimation of the extent to which transcendental philosophy is indebted to the scientific method in general and to the method of the natural sciences in particular. While Kemp Smith contends that the methods employed in Kant's philosophy and in the natural sciences are fundamentally akin, we would like to show that, despite some important similarities, there are also radical discrepancies between the two. Kemp Smith's case will be briefly summarized in Chapter 1.

In Chapter 2, a close look at several passages in the "Second Preface" will do much to shed light on these issues. First, it should aid us in understanding what Kant believes can be gained by emulating the sciences. Secondly, such a study should make it possible to isolate the characteristics of the sciences which may be profitably emulated

by philosophy. As we shall see, Kemp Smith suggests that only the natural sciences offer a useful example to be followed by philosophy. An examination of the "Second Preface", thirdly, should enable us to assess this view; it should enable us to determine whether or not the other disciplines which Kant regards as sciences have something additional to offer to philosophy.

Concerning the natural sciences, I would like to show that Kant regards Francis Bacon as the primary exponent of the hypothetico-experimental method and, thus, as a seminal influence on his own work. Clear indications of this, I shall argue, are given in his epigraph to the Critique, in a key reference in the "Second Preface" and in some crucial passages appended to the "Introduction". While this issue - as well as our interpretation of the 'Copernican analogy' - will be discussed in Chapter 2, our final comments on these matters will appear in Chapter 4.

The Transcendental method of proof will be the topic of Chapter 3. A large portion of that chapter is devoted to reconstructing the "Second Analogy of Experience" - Kant's attempt to prove the principle of causation. We believe this to be a paradigm of a transcendental proof, for three main reasons: First, because, once understood, it is relatively simple. Second, because the "Second Analogy" contains at least one transcendental disproof, which is convenient for our purposes. Third, because, at the end of the section on the "Analogies" as a whole,

Kant himself shows that he is unmistakeably pleased with the success of his proof. Our reconstruction of Kant's proof is contrasted with a brief account of Hume's views on causation, in order to further highlight Kant's novel approach. In this chapter then, we have deemed it useful to present an exemplar of the transcendental method of proof. This will be done particularly in order to discuss Kant's notion of "possible experience", though also so that we may have a concrete basis from which to educe some general observations about transcendental proofs.

In Chapter 4 conclusions will be drawn concerning the extent and limitations of the debt of the transcendental method to the method of the natural sciences. This, as we stated above, involves finalizing our arguments concerning Kant's references to Bacon and Copernicus. Once that has been done, we shall turn our attention back to Norman Kemp Smith's views on the relationship between the two methods and contrast them with our own findings.

Throughout our study we shall have to offer brief accounts of what amount to some very controversial notions in Kantian scholarship. To mention but a few: terms like "critique", "transcendental logic", "synthetic" and "analytic", "a priori" and even "transcendental" itself, must weave in and out of our discussion without the benefit of a fully adequate definition - if such a thing is possible. However, as careful analyses of terms like these would not permit us to carry on with our

study, we shall have to make do with summary definitions.

A brief "Afterword" has been added to this essay. Its purpose is to qualify our treatment of Norman Kemp Smith and to suggest areas for further study.

# CHAPTER 1

## KEMP SMITH'S CASE

The overall aim of these studies, as stated in our "Introduction", is to assess the adequacy of Norman Kemp Smith's views about the nature of transcendental proofs. The central contention which, in my estimation, calls for scrutiny, is that Kant's "transcendental method, rightly understood, does not differ in essential nature from the hypothetical method of the natural sciences";[1] or, put differently, that "the 'transcendental method' ... is really identical in general character with the hypothetical method of the natural sciences". (p. xxxvii)[2] Our task in this chapter will be to determine what sort of evidence Kemp Smith presents in order to justify such an understanding of the nature of the transcendental method.

Kemp Smith repeatedly turns the reader's attention to Kant's claim that metaphysics must attain certainty and completeness, or else

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[1]Norman Kemp Smith, A Commentary to Kant's 'Critique of Pure Reason', Second Edition, (London: Macmillan & Co., 1923), p. 239. All quotations attributed to Kemp Smith refer to this book and will be followed by a parenthetical page reference to this edition.

[2]See also Ibid., p. 36, for another variant on this claim.

nothing at all.[3] The realization of this programme is intrinsically connected with Kant's creation of a new kind of logic - transcendental logic.[4] Kemp Smith writes:

> There are two logics for Kant, that of discursive or analytical reasoning, and that of synthetic interpretation. The one is formal; the other is transcendental. The one was created by Aristotle,[5] complete at a stroke; Kant professes to have formulated the other in an equally complete and final manner. (p. 34)

Transcendental logic is therefore closely bound up with Kant's quest for certainty in philosophical matters.

According to Kemp Smith, Kant teaches that experience "can be analyzed into an endlessly variable material and a fixed set of relational

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[3]See Kemp Smith's Commentary, p. 10, pp. 34-35 & p. 543. In a footnote on p. 543, Kemp Smith cites Kant's Reflexionen ii, 1451 where he says that "In metaphysics there can be no such thing as uncertainty". He also cites passages from the Prefaces to the Critique where Kant makes his case about completeness. For instance:

> Pure reason is, indeed, so perfect a unity that if its principle were insufficient for the solution of even a single one of all the questions to which it itself gives birth,... we should have no alternative but to reject the principle. (A xiii)

Also:

> Metaphysics has to deal only with principles, and with the limits of their employment as determined by these principles themselves, and it can therefore finish its work and bequeath it to posterity as a capital to which no addition can be made. Since it is a fundamental science, it is under obligation to achieve this completeness. (B xxiv)

[4]A succinct account of Kant's notion of a transcendental logic will be presented in Ch. 3 below.

[5]"Needless to say, this 'Aristotelian' logic, in the traditional form in which Kant was acquainted with it, diverges very widely from Aristotle's actual teaching." (Commentary, p. 34 n.)

elements". (p. xxxiv) The innovative character of Kant's philosophy is evinced in his contention that these formal or relational elements are of a synthetic nature. In this regard, Kemp Smith points out, Kant is indebted to David Hume, who taught that the causal axiom is not self-evident, i. e. that it is not verifiable merely by an analysis of the concepts it contains.[6] Unlike Hume, who thought them contingent due to their synthetic nature, for Kant the principles which are prescribed by reason must be necessary. However, in concurrence with Hume, Kant recognizes that qua synthetic, they are not intrinsically or rationally verifiable as the Rationalists understood them to be. For Kant, then, the necessity of the principles contributed by reason "is always for us extrinsic; they can be postulated only if, and so long as, we are assuming the occurrence of human sense-experience". (p. xxxv) Hence the need for a method of proof that will replace the deductive method of the Rationalists and the inductive method of the Empiricists, neither of which can "any longer be regarded as correctly describing the actual processes of scientific proof". (p. xxxvii)

Kemp Smith holds that for Kant "facts cannot be established apart from principles, nor principles apart from facts" due to the inextricable relation that Kant sees as abiding between the rational

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[6] A brief account of David Hume's teachings on this matter will be presented in Chapter 3 below.

and the experientially 'given' components which must both be present to enable the possibility of experience. Therefore, there is a reciprocal relationship of validation obtaining between principle and fact:

> The proof of a principle is its adequacy to the interpretation of all those appearances that can be shown to be in any respect relevant to it, while the test of an asserted fact, i. e. of our description of a given appearance, is its conformity to the principles that make insight possible. (p. xxxvii)

The claim that Kant's method of proof "is really identical in general character with the hypothetical method of the natural sciences" is made at this point in Kemp Smith's analysis of "Kant's Contribution to the Science of Logic" (as he entitles the section where he raises these points). Kemp Smith gives a reason in support of his general equation of these methods of proof: namely, that the transcendental method "proceeds by enquiring what conditions must be postulated in order that the admittedly given may be explained and accounted for", as is presumably the case with hypothetical proofs; that is, "Starting from the given, it also submits its conclusions to confirmation by the given". (p. xxxvii)

Immediately after his discussion of these issues, Kemp Smith goes on to argue that Kant's doctrine of judgment - which is obviously related to the issue of proof method - explicitly formulates the fundamental thesis of the Coherence theory of truth. His views on this connection are re-stated later on in the Commentary, where he also repeats

his contention that any transcendental proof, or rather that "all proof conforms in general type to the hypothetical method of the natural sciences". (p. 36) Although we are not primarily concerned with his views regarding this alleged connection, we should not exclude it from our reconstruction of Kemp Smith's argument, lest we do it injustice. That is to say, our account of Kemp Smith's argument will include at lease a brief look at his views about the connection between the proof method and the Coherence theory of truth, in order that we may have before us a full reconstruction of his case.

The view that the fundamental principles of experience are synthetic for Kant is again raised as being of paramount importance. Kemp Smith holds that Kant's recognition of the synthetic nature of these principles presented him "with the task of establishing rationalism upon a new and altogether novel basis". (p. 36) Kemp Smith appears to regard Kant as a neo-Rationalist because of his penchant for certainty, as we saw above, or as he puts it here, because he regards necessary principles as indispensable to philosophy. Rationalism requires a new basis for Kant according to Kemp Smith, because of Hume's conclusions about the lack of self-evidence of experiential principles, which he accepts wholesale. In sum, while philosophical proofs can appeal neither to empirical facts nor to intuitive self-evidence, Kant refuses to abandon the possibility of necessary principles. Consequently, Kemp Smith argues, Kant must face the problem of finding a proof method in the

absence of previously established means of proof which are adequate to the task.[7] Kant's intended solution to this problem ranks him, in Kemp Smith's estimation, as "the real founder of the Coherence theory of truth". (p. 36) Although he concedes that Kant never used the term, and that "he constantly adopts positions which are more in harmony with a Correspondence view of the nature and conditions of knowledge", Kemp Smith nonetheless holds his ground. He intends to corroborate his view with the following comments, which echo those we have seen previously:

> ... [For Kant] principles and facts mutually establish one another, the former proving themselves by their capacity to account for the relevant phenomena, and the latter distinguishing themselves from irrelevant accompaniments by their conformity to the principles which make insight possible. In other words, all proof conforms in general type to the hypothetical method of the natural sciences. Kant's so-called transcendental method, the method by which he establishes the validity of the categories, is itself, as we have already observed, of this character. (p. 36)

There is a third and final section in the Commentary where Kemp Smith forwards the view we have been discussing. These passages use a different line of approach which issues from within a larger argument about the subjective Deduction. As we shall see, this excerpt will be particular useful for understanding his viewpoint insofar

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7"And how can we make even a beginning of demonstration, if our very principles have themselves to be established?" (p. 36)

as he explicitly mentions some features which are at issue in his general equation of transcendental proofs and hypothetical proofs in natural science.

Kemp Smith asserts that the subjective deduction is psychological in character as it seeks to establish "the subjective conditions which are required to render knowledge possible". (p. 236) This psychology is not empirical, as its aim and method must be in keeping with the Critical enquiry. Rather, it is a psychology which, "for convenience, and on the lines of Kant's own employment of terms, may be named transcendental" and which:

> ...will deal, not with the temporal development of the concrete and varied aspects of consciousness, but with the more fundamental question of the generative conditions indispensably necessary to consciousness as such, i. e. to consciousness in each and every one of its possible embodiments. (p. 237)

Kemp Smith argues that though the results of this psychological approach "may be highly schematic in conception and extremely conjectural in detail, they are none the less required to supplement the results of the more purely logical analysis", i. e. of the objective Deduction. (p. 237) Since the conclusions of this transcendental psychology are indispensable to the proof of the purportedly logical Deduction according to Kemp Smith, he argues that Kant is amiss in suppressing the subjective deduction in the second edition. The crucial premise in Kemp Smith's argument with respect to the Deductions is essentially

that Kant is operating with a strained scheme consisting of "a hard and fast distinction, very difficult of acceptance, between transcendental and empirical activities of the mind". (p. 267) This distinction reveals the bias on Kant's part towards "the Leibnizian rationalism from which he is breaking away". (p. 239) Kemp Smith contends that the radical distinction Kant posits between the transcendental and the empirical conflicts with the actual modus operandi of the Critical inquiry, which he interprets as follows:

> The very essence of his transcendental method consists in the establishment of a priori elements through proof of their connection with factual experience ... His a priori cannot establish itself save in virtue of hypothetical reasoning. His transcendental method, rightly understood, does not differ in essential nature from the hypothetical method of the natural sciences; it does so only in the nature of its starting point, and in the character of the analyses which that starting point prescribes ... The sole question is as to whether the hypotheses conform to the logical requirements and so raise themselves to a different level from more opinion and conjecture ... From the experience in view of which they are postulated they receive at once the proof of their actuality and the material for their specification. (p. 238)

This passage contains the useful mention of some rather specific features which are at issue in Kemp Smith's general equation referred to above. In other words, here he appears to explicate his general identification of the transcendental and hypothetical methods. Moreover, because it is based solely on the two features mentioned here, we may surmise that it is in virtue of these features that we find Kemp Smith arguing for an equation "in general character", and not for a complete

identification of the methods of proof for science and for philosophy. The equation is merely "general", then, as it is limited by the variance in: (a) the nature of the starting point of each method of proof and (b) the character of the analyses prescribed by these starting points. Therefore, the transcendental method of proof is presumably unique only insofar as it has a different starting point and because this starting point prescribes different kinds of analyses, according to Kemp Smith. Unfortunately, these criteria are merely, as we put it above, "rather" specific. Kemp Smith never elaborates on the nature of these differentia in these passages. Our study will therefore have to try to ascertain what Kemp Smith could possibly mean by these differences in "starting-point" and the analyses it prescribes.

The above is a reconstruction of the essence and much of the detail of Kemp Smith's view of the relationship between Kant's transcendental method of proof and the hypothetical method of the natural sciences. It is formulated in the context of three discussions: on Kant's contribution of a transcendental logic; on Kant's recognition of the synthetic nature of philosophical principles; and finally, in connection with Kemp Smith's argument concerning the empirical underpinnings of the Transcendental Deductions. As far as possible we shall treat the contention about the general equation between the methods of proof in isolation, i.e. abstracted from the contexts within which it is presented. We will turn back to treat Kemp Smith's view only after dealing with

some relevant material which Kant presents in the opening sections of the Critique and once we have come to some understanding of the nature of the transcendental method of proof.

# CHAPTER 2

## THE "SECOND PREFACE": METAPHYSICS AND SCIENCE

### I. The Scientific Metaphysics

The aim of this chapter, as stated in the "Introduction", will be to examine Kant's conception of science with specific reference to the first Critique. An analysis of this conception will shed needed light on Kant's declared intention to give metaphysics a scientific foundation. This, then, will provide a useful framework within which the transcendental method of proof can be clearly understood.

Kant devotes roughly the first half of the "Second Preface" of the Critique to a discussion of what he regards as science properly speaking. That is, these passages contain Kant's discussion of the features in virtue of which he regards certain intellectual disciplines as rightly having this status. His intention to make metaphysics scientific can best be understood by extracting from the "Second Preface" what Kant has to say about the essential features of science.

In this Preface Kant makes it clear that he will attempt to change the procedure of metaphysics by emulating that followed in the sciences. For instance, he declares he will:

> . . . attempt to alter the procedure which has hitherto prevailed in metaphysics, by completely revolutionizing it in

> accordance with the example set by the geometers and physicists, [which] forms indeed the main purpose of this critique of pure speculative reason.[1]

Also, the success of these disciplines - which he regards as sciences, as we shall see below - seems, to Kant:

> ... sufficiently remarkable to suggest our considering what may have been the essential features in the changed point of view by which they have so greatly benefitted. Their success should incline us, at least by way of experiment, to imitate their procedure, so far as the analogy which, as species of rational knowledge, they bear to metaphysics may permit. (22, B xvi)

Kant argues that such a change is required in metaphysics for the following two reasons: First, because metaphysicians have hitherto spent much time retracing "steps, as not leading us in the direction in which we desire to go" (21, B xiv); that is, they are constantly searching new lines of approach, as there is no agreement about a common plan of procedure.[2] Second, success has not been attained insofar as there is no unanimity about any metaphysical contention.[3]

The issue of whether or not Kant ultimately succeeds in the

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[1] I. Kant, Critique of Pure Reason, trans. by N. K. Smith (London: Macmillan & Co., 1964), p. 25 (B xxii). Henceforth, unless otherwise indicated, all quotations attributed to Kant are taken from this edition of the Critique. Both indented quotations and those in our text will be followed by a parenthetical page reference to this edition and a reference to the Schmidt edition of Kant's first ("A") and/or second ("B") editions of the Critique. Thus, the above would appear as: (25, B xxii).

[2] See Ibid., p. 17 (B vii).

[3] See Ibid., p. 21 (B xiv).

attempt to put metaphysics ôn the footing of a science is not within the scope of the forthcoming discussion. Rather, our immediate concern is to establish how Kant conceives the nature of such a transformation and to educe how this transformation is meant to have an affinity with the disciplines Kant regards as scientific. Regarding the first of these issues, although we shall have a great deal of pertinent specifics to bring up as this paper unfolds, for the moment we may point out that Kant conceives the intended change as being definitely beneficial, or a matter of "good fortune". (21, B xiv) Such a projected change would improve the procedure of metaphysics, or raise it, from a state of "random groping", marred by the two characteristics mentioned above, to a "sure road" of the scientific procedure of inquiry, which is presumably free of such hindrances. Putting metaphysical inquiry on the secure path of a science would therefore essentially constitute "rendering a service to reason". (17, B vii) Regarding the second issue, Kant intends to attempt this transformation in procedure by way of analogy. We saw above that the sciences' success is the feature which ought to be emulated; moreover, it "should incline us ... to imitate their procedure" as far as possible. (22, B xvi) A characteristic that all the sciences have in common, according to Kant, is that they came to acquire such rank in virtue of a change in their methods of procedure. Thus, a like change or "revolution" in the procedure of metaphysics must be sought for if it is ever to acquire the success concomitant with

this rank. Such a change could be possible if "the essential features in the changed point of view by which" certain intellectual endeavours became sciences could be isolated and then applied to metaphysical inquiry. (Ibid.)

So far, we have established that Kant regards a change in procedure, analogous to that which previously occurred in the sciences, as necessary if metaphysics is to become a science, and hence, successful. We have also alluded to his view that metaphysics can imitate scientific procedure only "so far as the analogy which, as species of rational knowledge, they [i.e., the sciences] bear to metaphysics may permit". (Ibid.) That is, although the procedure employed in the sciences may be adaptable to metaphysical inquiry, Kant points out that the analogy being borne has limitations. This is attributed to the variences between the nature of metaphysics and the nature of each of the three sciences Kant acknowledges as veritable: logic, mathematics and natural science. The detail of these supposed variances are not our main concern at present, though some comment will be offered on the matter later on in this paper. We are primarily interested in the "Second Preface" insofar as it yields the common features which give certain disciplines the status of science. We shall now examine why Kant regards these three as the only disciplines having such rank in order to retrace Kant's steps and isolate the feature or features that he contends must be emulated by metaphysics if it is to become a science.

Kant maintains that logic is an intellectual discipline which has been a science since the time of Aristotle. Other than for minor modifications which have no bearing on its certainty, he regards logic as "a closed and completed body of doctrine". (17, B viii) It is the only science which he does not regard as having undergone a revolution in procedure. Its success, as well as the absence of a need for such a revolution, seems to be attributed entirely to the narrow parameters delimiting its scope: its task is to deal with the understanding and its form, in complete abstraction from all knowledge of objects. As cognitions about objects are outside of its domain, Kant says that logic is merely "a propadeutic . . . only the vestibule of the sciences"; logic is presupposed in specific cognitions and only the disciplines which furnish these can be classed as "the sciences properly and objectively so called". (18, B ix)[4] Mathematics and the natural sciences are the only sciences that yield theoretical knowledge for Kant, and it is only by way of "revolutions" in their methods that they came to have this status.

The mathematics according to Kant became a science in the Ancient Greek period; prior to that, with the Egyptians, it had been "in the groping state". Indeed, as far as we know,[5] the geometry of the

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[4]Which is not to say that logic is not required in any cognition whatsoever for Kant, however unscientific it may be.

[5]The main source for my comments in this paragraph is: B. L. Van der Waerden, Science Awakening, trans. Arnold Dresden (New York: Oxford University Press, 1961).

Babylonians and the Egyptians was an empirical discipline. The Greeks named it geometry (Gk. geo → earth; metron → measure) precisely because the Egyptians had used it to measure the area of land flooded by the Nile. As such, the geometry of the Egyptians was inexact: their calculations of the area of figures like the circle and the triangle furnished merely approximate results. Thus, Kant seems to be right in maintaining that this branch of the mathematics did not yield certainty while at this stage in its development.

Both mathematics and the natural sciences are, for Kant, sciences where reason has to determine its object a priori; that is, the claims to knowledge that these disciplines make must refer to their respective objects with necessity and universality. While physics, at least in part, must deal "with sources of knowledge other than reason", the mathematics furnish theoretical knowledge in a pure or non-empirical manner. (19, B x) Kant claims that the "revolution" which raised mathematics to the rank of science was effected by a change in Thales's method of approach when he first demonstrated or deduced:

> ... the properties of the isosceles triangle. The true method, so he found, was not to inspect what he discerned either in the figure, or in the bare concept of it, and from this, as it were, to read off its properties; but to bring out what was necessarily implied in the concepts that he had himself formed a priori and had put into the figure in the construction by which he presented it to himself. If he is to know anything with a priori certainty he must not ascribe to the figure anything save what necessarily follows from what he has himself set into it in accordance with his concept. (19, B xi)

The method of procedure was therefore presumably altered substantially when geometry became a science. Rather than analyzing a figure which had been generated ultimately from an empirical source, the thinker referred to in the above quotation is claimed to have constructed a figure on the basis of concepts generated entirely a priori. This change enabled the possibility of a scientific geometry, in Kant's estimation. This possibility was actualized when thought about the figure yielded knowledge that had been deduced from the concepts which the thinker had generated a priori. Thus, the "revolution" in mathematics involved a fundamental methodological change; it involved the kind of procedure which sought knowledge by deducing from judgements containing a priori concepts about geometric figures. According to Kant, these judgements engender certainty precisely because they contain such concepts. We shall turn our attention to these comments later on in this section.

## II. Bacon and the Method of Natural Science

Kant's discussion of the "revolution" in natural science is far more detailed and considerably more complex, in connection with the proposed "revolution" for metaphysics, than the foregoing material. The discussion centers on Francis Bacon, whom Kant regards as a significant contributor to the "revolution" in modern natural science. The discussion, he points out, has to do with "natural science only in so far

as it is founded on empirical principles". (20, B xii) Before attempting to interpret these important passages, we ought first to sketch out the central features of Bacon's contribution to the formulation of empirical principles in modern science.

The attempt to encapsulate Bacon's contribution to modern natural science with reference to the programme Kant sets for himself is perhaps begun most appropriately by turning to a reference by Kant on this contribution. Scant attention has been paid to Kant's addition of an epigraph citing Bacon in the second edition of his Critique of Pure Reason. This epigraph contains an excerpt from the "Preface" to Bacon's The Great Instauration. The following is an English translation of parts culled from this excerpt:

> ... in behalf of the business which is in hand I entreat men to believe that it is not an opinion to be held, but a work to be done; and to be well assured that I am labouring to lay the foundation, not of any sect or doctrine, but of human utility and power. Next I ask them ... to join in consultation for the common good ... Moreover, to be of good hope, nor to imagine that this Instauration of mine is a thing infinite and beyond the power of man, when it is in fact the true end and termination of infinite error ...[6]

This excerpt from Kant's dedication echoes some of the points already made in the above discussion of Kant's programme for metaphysics. It also anticipates some issues we shall be discussing later. At this

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[6]F. Bacon, The Great Instauration, in The New Organon and Related Writings, ed. by Fulton H. Anderson (Indianapolis: Bobbs-Merrill, Library of Liberal Arts, 1960), p. 16. Kant's rendition is in Latin. (4, B ii) See also Kemp Smith, op. cit., p. 4.

point, however, we can already see that Bacon's concern not to advance mere opinions and to terminate error - presumably by making claims which rank as knowledge - has an obvious affinity with Kant's own conception of the task which lies before him in the Critique. That is, he wants to produce an indubitable body of knowledge about the employment of reason. Moreover, Bacon's stress on the fact that his colleagues and their progeny must "join in consultation" can also be seen as akin to Kant's statements about the unanimity which is peculiar to any scientific endeavour.[7] Such unanimity not only signifies that the inquirers have common goals before them, but also presupposes that they must have a common plan of procedure after which their studies proceed. Although these policies about inquiry may seem like statements of the obvious to the modern reader - namely, concerning the scientist's production of knowledge and not mere opinion, about his working in collaboration with his peers and about the need for methodological concensus - they must be seen in contrast with the Ancient and Mediaeval conception of inquiry. A brief look at Bacon's work will bring out at least a cursory account of how he understood this contrast.

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[7] Aside from the issue of not having a common plan of procedure, at p. 21 (B xiv) Kant holds that:

> So far, too, are the students of metaphysics from exhibiting any kind of unanimity in their contentions, that metaphysics has rather to be regarded as a battle-ground ... in which no participant has ever yet succeeded in gaining even so much as an inch of territory, not at least in such manner as to secure him in its permanent possession.

Bacon rejected Mediaeval methods of formulating first principles about physics on the grounds that they had been affirmed and subsequently espoused with scant regard for empirical substantiation. Moreover, he protested the derivation of further claims to knowledge about the workings of nature from these inadequately corroborated first principles.[8] He claims that this makes physics out to be a merely technical exercise that largely disregards empirical evidence, which Bacon holds to be essential. It was Aristotle and the Scholastics who "framed the art" in this manner, according to Bacon. The study of nature consisted in merely adapting the evidence of experience to a set of principles which were by and large treated as foregone conclusions. He denigrates the natural science of his day in his wry comment that for them "the constellation of Lyra rises by edict"; in these studies, Bacon argues, "authority is taken for truth, not truth for authority".[9]

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[8] See, for instance, F. Bacon, The New Organon in op. cit., p. 114 f. [Bk. I, aphorism #125]:

> ... the form of inquiry and discovery that was in use among the ancients ... was simply this. From a few examples and particulars (with the addition of common notions and perhaps of some portion of the received opinions which have been most popular) they flew at once to the most general conclusions or first principles of science. Taking the truth of these as fixed and immovable, they proceeded by means of intermediate propositions to educe and prove from them the inferior conclusions; and out of these they framed the art.

[9] F. Bacon, Natural and Experimental History for the Foundation of Philosophy, edited by F. H. Anderson in F. Bacon, op. cit., p. xiv.

He wants to:

> . . . entreat men again and again to discard, or at least set apart for a while, those volatile and preposterous philosophies, which have preferred theses to hypotheses, and which thereby led experience captive . . . Instead, the scientist must approach with humility and veneration to unroll the volume of Creation, to linger and meditate therein, and with minds washed clean from opinions to study it in purity and integrity.[10]

He advocates what he regards as "a new and certain path for the mind to proceed in, starting directly from the simple sensuous perception.[11] However, as experience is a "tortuous labyrinth",[12] directions for the proper study of nature must be supplied: first, the scientist must try "to educe and form axioms from experience"; second, he must "deduce and derive new experiments from axioms".[13] Thus, the authority of scientific axioms and theories ultimately depends on their reference to experiential data yielded by experiment.

Bacon strives to institute "confidence in the native and spontaneous process of the mind".[14] He extols the employment of argument

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[10] Ibid., p. xv.

[11] Bacon's The New Organon, in op. cit., p. 34 ["Preface"].

[12] Cited in Paolo Rossi, Francis Bacon (London: Routledge & Kegan Paul, 1968), p. 141. This source has been of great aid in the present analysis of Bacon's thought.

[13] Bacon's The New Organon, op. cit., p. 130 [Bk. II, aphorism #10].

[14] Ibid., p. 34 ["Preface"].

or "invention" and - in keeping with the twofold directions supplied above - determines its function as follows:

> ... all true and fruitful natural philosophy hath a double scale or ladder, ascendent and descendent, ascending from experiments to the invention of causes, and descending from causes to the invention of new experiments ...[15]

The rational component is thus ultimately dependent on experience. In order to formulate this rational component, however, we are required

> ... out of the knowledge whereof the mind is already possessed, to draw forth or call before us that which may be pertinent to the purpose which we take into our consideration.[16]

Such knowledge is 'drawn forth' in two ways, according to Bacon: by "preparation" and by "suggestion". First, "preparation", as the name suggests, demands that the material pertinent to each scientific argument or 'rhetorical invention' be "ready handled in all the variety that may be".[17] Thus, Bacon exhorts the inquirer to take stock of all that is encompassed within the parameters set by his argument, which presumably includes the experiments devised to test it, such that "he may

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[15] F. Bacon, Of the Proficience and Advancement of Learning, in Great Books of the Western World: Vol. 30 (Chicago: Encyclopaedia Britannica Inc., 1952), p. 42 [Second Book, viii, 1.].

[16] Francis Bacon, Advancement of Learning, in Great Books of the Western World (Vol. 30), (Chicago: Encyclopaedia Britannica Inc., 1952), p. 58 [Second Book, xiii, 6.].

[17] Ibid., p. 58 [Second Book, xiii, 7.].

have it [viz., the pertinent material] in effect premeditate[d] and handled in thesi".[18] Second, "suggestion" is the part of the 'invention' which will direct the scientist's inquiry. Inventions must thereby contain a question that is asked, or "points to search and revolve", and which will "assign and direct us to certain" ends.[19] Such questions or "suggestions" are indispensable guides for the inquirer, according to Bacon; "wise interrogating is half a knowledge".[20] In brief, a rhetorical invention, as here defined, is a pointed question, or a hypothesis specifying an issue of inquiry and all that pertains to its quest for knowledge. It is an essential component of scientific endeavour, as is the evidence of experience for Bacon. Although we are not concerned with describing Bacon's views on the nature of the relationship between hypotheses and the evidence of experience, it should be noted that for Bacon the former (hypotheses) are valid only if confirmed by the latter (experience). The two following passages will attest to Bacon's contention that truth about nature must be derived from sense-experience:

> There are and can only be two ways of searching into and discovering truth. The one flies from the senses and particulars to the most general axioms, and from these principles ... proceeds to judgement and to the

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[18] Ibid.

[19] Ibid., [Second Book, xiii, 9.].

[20] Ibid.

> discovery of middle axioms. And this way is now in fashion. The other derives axioms from the senses and particulars, rising by a gradual and unbroken ascent, so that it arrives at the most general axioms last of all. This is the true way, but as yet untried. [21]

Secondly:

> The conclusions of human reason as ordinarily applied in matters of nature, I call for the sake of distinction Anticipations of Nature (as a thing rash or premature). That reason which is elicited from facts by a just and methodical process I call Interpretation of Nature. [22]

Having at least briefly outlined some key elements in Bacon's contribution to natural science, we may now turn back to Kant's "Second Preface" and educe the importance of the implicit references to Bacon therein.

Kant cites several instances of the hypothetico-experimental method of arriving at empirical principles in natural science. The method followed by Galileo, Torricelli and Stahl are, for Kant, indicative of the dawning of a new era in the study of nature, where scientists became aware of the fact that "reason has insight only into that which it produces after a plan of its own". (20, B xiii) Reason must seek to establish truth by the application of its own "principles of judgement based upon fixed laws, constraining nature to give answers to questions of

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[21] Bacon's The New Organon, op. cit., p. 43 [Bk. I, aphorism #19.].

[22] Bacon's The New Organon, op. cit., p. 44 f. [Bk. I, aphorism #26.]. See also n. 10 above.

reason's own determining". (Ibid.)

We need go no further, for the time being, in order to make out the extent of the responsibility for this change which Kant attributes to Bacon. The single reference to Bacon made in the "Second Preface"[23] might suggest that Kant bestows the great distinction of a scientific 'revolutionary' on that thinker only in a very limited way:

> Natural science was very much longer [than the mathematics] in entering upon the highway of science. It is, indeed, only about a century and a half since Bacon, by his ingenious proposals, partly initiated this discovery, partly inspired fresh vigour in those who were already on the way to it. (19 f., B xii)

Yet he continues by saying:

> In this case also the discovery can be explained as being the sudden outcome of an intellectual revolution. In my present remarks I am referring to natural science only in so far as it is founded on empirical principles. (20, B xii)

The remarks that follow in Kant's discussion contain explicit references to the three exemplars of modern natural science, which we have already noted previously. They also contain Kant's analysis of their new-found approach. It is only in writing about the experiments of those scientists that Kant mentions that "a light broke upon all students of nature", (20, B xiii) which presumably marks the actual

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[23]We might add that the only other reference to Bacon in the entire Critique is in the dedication mentioned previously in this chapter.

inception of the scientific revolution, as we surmise from his use of the metaphor in connection with the revolution for the mathematics:

> A new light flashed upon the mind of the first man (be he Thales or some other) who demonstrated the properties of the isosceles triangle. (19, B xi)

Kant's introduction of the metaphor in his discussion of Galileo, Torricelli and Stahl seems to lend credence to the view that the honour of being the instrumental revolutionary figure for natural science is not bestowed on Bacon alone. Yet, not much later, Kant says that both the mathematics and the natural sciences became truly scientific "by a single and sudden revolution". (21, B xvi) Moreover, we have seen Kant refer to the revolution in natural science as being a "sudden" event when talking about Bacon. As he only "partly initiated" this discovery, Kant's limited ascription of this merit on Bacon may best be interpreted as a guarded assertion of his having instituted the hypothetico-experimental method: the method only appears as fully developed in Galileo, Torricelli and Stahl for Kant. In brief, Bacon may not rank as the Euclid of natural science for Kant, though he does suggest that he is not unlike Thales by virtue of his ground-breaking contribution.[24]

Although the extent of Bacon's allegedly indirect contribution to Kant's critical philosophy - via his contribution to natural science - cannot be fully educed until the conclusion of the present work, we

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[24]See Appendix at the end of this Chapter.

should now return to the task of examining how the study of nature came to achieve the rank of a science for Kant, and the role attributed to Bacon in this matter.

Kant maintains, as we already saw, that natural science employs the hypothetico-experimental method of arriving at fundamental principles about the behaviour of objects. In holding that the scientist is "constraining nature to give answer to questions of reason's own determining", it seems to me that Kant is referring to the two features that are essential to Bacon's thought: First, the metaphysical principle that the inquirer "must approach nature in order to be taught by it", which has to do with the ultimate ground of the knowledge acquired - namely, nature or experience. (20, B xiii) Second, the methodological principle stating that reason carry out its study ...

> ... not ... in the character of a pupil who listens to everything that the teacher [viz., experience] chooses to say, but of an appointed judge who compels the witnesses to answer questions which he has himself formulated. (Ibid.)

This methodological precept is of crucial importance in raising the study of nature to the rank of a science as only the possession of a project, of a previously thought-out plan, can "yield a necessary law, which alone reason is concerned to discover". (Ibid.) Rather than fictitiously attributing principles to the workings of nature by the virtually unaided employment of reason and then, as it were, fitting the empirical evidence to the principles, Kant - along with Bacon - felt

that "reason must seek in nature ... that which it has itself put into nature". (20, B xiv) As Ted B. Humphrey says:

> For Kant, the single most important element in the revolution of empirical science is the self-motivated, spontaneous act of hypothesis and experiment formation, not because it antedates encounter with the world, but rather, because one can control and be fully and explicitly aware of the content of propositions expressing hypotheses and experimental procedure.[25]

Kant maintains that a very important feature in the revolution for the natural sciences was that its aim and achievement consisted in the establishment of necessary laws which are determined by reason and which must universally obtain in experience. The mathematician, it will be remembered, 'revolutionized' his discipline to the rank of a science by recognizing that certain knowledge must be sought after and can only be found in a study of what is implied in the mathematical concepts he had formed a priori. Both of these veritable sciences therefore effect a methodological change resulting in the acquisition of certain knowledge about their respective objects, according to Kant. In his attempt to find the sure road of a science for metaphysics, Kant intends to imitate the procedure of these veritable sciences "so far as the analogy ... they bear to metaphysics may permit". (22, B xvi) And this, he declares, can only be done after "considering what may have

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[25] Ted B. Humphrey, "Kant's 'Copernican Revolution'", in Reflections on Kant's Philosophy, ed. by W. H. Werkmeister (Gainesville, Florida: Florida State University Press, 1975), p. 155.

been the essential features in the changed point of view by which they have so greatly benefited". (Ibid.) The attempted analogy is effected as follows: Philosophers have attempted to extend our knowledge of objects under the assumption that our knowledge must conform to the nature of objects. They have failed in their attempts to establish any a priori features about objects generally. Success may follow upon changing this basic assumption: Kant proposes that we suppose that objects must conform to the nature of knowledge. This should also be done regarding the mind's perceptual contact with objects, or intuition: Kant does not see how a priori knowledge of objects could possibly be established under the assumption that intuition must conform to the nature of objects. However, if the perceived object is regarded as conforming "to the constitution of our faculty of intuition, I have no difficulty in conceiving such a possibility". (22, B xvii) In essence, the example of the 'revolutionized' sciences serves to furnish the methodological precept "that we can know a priori of things only what we ourselves put into them". (23, B xviii) If this precept is extended to the domain of philosophy, it will lay out the following framework, from which its enquiries must be carried out: the faculties of intuition and understanding are presupposed as being constituted by forms and rules "prior to objects being given to me, and therefore as being a priori"; only under such an assumption can philosophy hope to establish necessary

laws. (23, B xvii)[26]

Two issues peripherally related to the discussion of scientific method in the "Second Preface" warrant some comment: First, the controversial issue of Kant's attempted scientific "revolution" for philosophy in analogy with Copernicus's work in astronomy. Second, Kant's employment of the term "metaphysics".

## III. The Copernican Analogy

Kant draws an analogy between a feature of Copernicus's work and his own suggested change in fundamental viewpoints regarding knowledge and perception which we have just discussed. The supposition that objects conform to the functions of the mind is expected to enable "determining something in regard to them [i. e., objects] prior to their being given". (22, B xvi) This altered conception of the role of the mind to its knowledge and to intuition proceeds, according to Kant ...

> ... precisely on the lines of Copernicus's primary hypothesis. Failing of satisfactory progress in explaining the movements of the heavenly bodies on the supposition that they all revolved round the spectator, he tried whether he might not have better success if he made the spectator to revolve and the stars to remain at rest. (22, B xvi f.)

Kant's only other reference to Copernicus is made in a footnote later on in the "Second Preface": while Copernicus first put forth his

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[26] These presuppositions are, of course, argued for in the Critique itself. See note 53 below.

fundamental assumptions as scientific hypotheses, Kant's own change in point of view must be "proved, apodeictically not hypothetically". (25, B xxii n.)

There has been a great deal of controversy about how Kant understood his own analogy with Copernicus's work. In his Text-Book to Kant, for instance, S. Alexander maintains that the analogy is altogether inappropriate:

> It is very ironical that Kant himself signalised the revolution which he believed himself to be effecting as a Copernican revolution. But there is nothing Copernican in it except that he believed it to be a revolution. If every change is Copernican which reverses the order of the terms with which it deals, which declares A to depend on B when B had before been declared to depend on A, then Kant - who believed that he had reversed the order of dependence of mind and things - was right in saying that he effected a Copernican revolution. But he was nor right in any other sense. For his revolution, so far as it was one, was accurately anti-Copernican.[27]

Harald Hoffding is uncharacteristically vague on this issue.[28] Joseph Marechal holds that just as Copernicus simplified and clarified astronomy by introducing a heliostatic system, Kant's solution for the

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[27]Cited by N. Kemp Smith, op. cit., p. 23.

[28]Hoffding offers little more than the following as his interpretation of the analogy:

> As it is due to our position on the earth that the heavenly bodies appear to move around us, so it is owing to the nature of our senses that we perceive things in space and time.

H. Hoffding, A History of Modern Philosophy (Vol. 2), trans by B. E. Meyer (Toronto: Dover Publications, 1955, p. 45 f.

problems of metaphysics involves the introduction of a new schema which, in effect, is the reverse of the previous one.[29] Norman Kemp Smith maintains that Kant is carrying out the analogy specifically in terms of "Copernicus' hypothesis of a subjective explanation of apparently objective motions"; by means of the analogy:

> Kant professes on the one hand to account for our scientific knowledge, and on the other to safeguard our legitimate metaphysical aspirations. The spectator projects his own motion into the heavens; human reason legislates for the domain of natural science. The sphere of the fixed stars is proved to be motionless; things in themselves are freed from the limitations of space and time.[30]

Paton basically concurs with Kemp Smith in this interpretation.[31] As S. Morris Engel points out, in following Ewing's interpretation,[32] Kemp Smith's is a definite improvement on previous analyses insofar as it does not emphasize "the place of the sun in Kant's analogy . . . [which gives] it a prominence which it does not possess.[33] Kant himself

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[29]See Joseph Marechal, El Punto de Partida de la Metafísica: III: La Crítica de Kant, trans. into Spanish by F. Hernanz Mínguez (Madrid: Editorial Gredos, 1958), p. 227.

[30]N. Kemp Smith, op. cit., p. 25.

[31]H. J. Paton, Kant's Metaphysic of Experience Vol. I (London: George Allan & Unwin, 1936), p. 75 f.

[32]See A. C. Ewing, A short commentary on Kant's "Critique of Pure Reason" (Chicago: Methuen & Co., 1938), p. 16.

[33]S. Morris Engel, "Kant's Copernican Analogy: A Re-Examination", in Language and Illumination: Studies in the History of Philosophy (The Hague: Martinus Nifhoff, 1969), p. 130.

refers to the static elements of Copernicus's astronomy as "heavenly bodies", viz., in the plural. (22, B xvi) Kemp Smith's citations from Copernicus's De Revolutionibus attest to the fact that he regards the "sphere" of stars as static.[34] Kemp Smith thereby succeeds in discouraging interpretations of Kant's analogy simply in terms of the shift from a geocentric to a heliocentric Weltanschanung, as do Alexander, Hoffding, Marechal and others. Nonetheless, we agree with Engel's contention that this interpretation does not represent "all that can and should be said on the question".[35] It is still focussed on Copernicus's overall achievement, rather than on the locus of affinity which Kant expresses, namely Copernicus's "primary hypothesis". (22, V xvi) A brief digression to Copernicus's astronomy is necessary if we are to come to an understanding of what hypothesis Kant has in mind and the relevance of the analogy on Kant's general programme in the Critique.

There are striking resemblances between the prefatory letter to Copernicus's De Revolutionibus and some of the material of Kant's "Second Preface" that we have already discussed. The reasons we saw Kant single out for the need to raise metaphysics to the rank of a science almost perfectly echo Copernicus's criticisms of the state of astronomical studies in his day. He maintains, first, that astronomers:

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[34]Norman Kemp Smith, op. cit., p. 24, n. 2.

[35]S. M. Engel, op. cit., p. 132.

> ... are so unsure of the movements of the Sun and Moon that they cannot even explain or observe the constant length of the seasonal year. Secondly, in determining the motions of these and the other five planets, they use neither the same principles and hypotheses nor the same demonstrations of the apparent motions and solutions. So some use only homocentric circles, while others eccentrics and epicycles ... the former have not been able fully to establish a system which agrees with the phenomena ... [while the latter have been unable] to discern or deduce the principal thing - namely the shape of the Universe and the unchangeable symmetry of its parts.[36]

Much like Kant then, Copernicus held that there were no universally accepted theories in his discipline and that it sorely lacked a common method of procedure. Thomas Kuhn attests to these claims in reporting that there were a dozen or more Ptolemaic systems in operation at that time, each with its own specified technique for computing data about planetary positions.[37]

The above quotation makes clear that Copernicus felt a need to establish an astronomical system which, in accord with the data, accounts for the Universe as symmetrical in shape. Though he recognized that some of the prevailing astronomies offered "excellently drawn" accounts of the behaviour of each celestial body, Copernicus regarded these variant systems as "monsters" because each of their

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[36]Nicolai Copernicus, De Revolutionibus Orbium Caelestium, trans. by J. F. Dobson & S. Brodetsky, cited in Thomas S. Kuhn, The Copernican Revolution (New York: Vintage Books, 1959), p. 139 f.

[37]See Ibid., p. 139 f.

parts "were not related to a single body".[38] Copernicus strived to reform the techniques for calculating planetary positions; according to Kuhn, the "De Revolutionibus was written to solve the problem of the planets, which, Copernicus felt, Ptolemy and his successors had left unsolved".[39] In his own words, Copernicus "was induced to think of a method of computing the motions of the [planetary] spheres".[40] The solution to this problem would involve producing an astronomy with planets which follow orderly movements in a single symmetrical Universe, as befits the workings of "a supremely good and orderly Creator".[41] The problem which Copernicus sought to solve may be described as follows: One of the observable features about planets is that the direction of their movements, with respect to the stars, is not constant. Planets generally appear to move eastward though they

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[38]Copernicus cited in Ibid., p. 139. An explanation of this asymmetry would lead us far astray from our topic. It will suffice to suggestively cite a passage from Norwood R. Hanson's article "Nicolas Copernicus", in The Encyclopedia of Philosophy, ed. Paul Edwards (New York: Macmillan Publ. Co. & The Free Press, 1967), Vol. 2, p. 221:

> ... the Ptolemaist, because he addressed his problems singly and without regard for the configurational complexities of taking all planets at once, never had to invoke [all of his] 83 epicycles simultaneously. The number was usually no more than 4 or 5 per individual calculation.

[39]T. Kuhn, op. cit., p. 136.

[40]Copernicus cited in Ibid., p. 138.

[41]Copernicus cited in Ibid., p. 142.

periodically reach a stationary point, move westward, reach another stationary point, and then resume their eastward motion across the firmament. "The eastward motion is known as 'direct' motion, the westward motion as 'retrograde'."[42] While the Ptolemaic astronomies resorted to very elaborate contrivances to account for retrograde motion,[43] the Copernican system could explain this motion with "relative ease".[44] The daily apparent motions of the sun, moon, stars and planets were accounted for on the ground that the earth rotates on its axis once a day.[45] Yet the planets, as we have said, are seen to move with respect to the stars, from one constellation to another; moreover, they seem to wander in retrograde arcs. The former of these apparent movements was accounted for by maintaining that all planets revolve around the sun. The problem of retrograde movement was thereby easily solved: The hypothesis that the earth also revolves around the sun, when checked against the movements of the other planets, led to the solution of the problem:

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[42] I. Bernard Cohen, The Brith of a New Physics (New York: Anchor Books, Doubleday & Co. Inc., 1960), p. 39. This analysis of the problem is culled from Chapter 3 of this work.

[43] See Ibid., pp. 40-42 for a brief explanation of the Ptolemaic treatment of retrograde motion.

[44] Ibid., p. 57.

[45] The movements of the moon, of course, were subject to more special treatment by Copernicus.

> . . . if the motions of the rest of the planets be brought into relation with the circulation of the Earth and be reckoned in proportion to the circles of each planet, not only do their phenomena presently ensue, but the orders and magnitudes of all stars and spheres, may the heavens themselves, become so bound together that nothing in any part thereof could be moved from its place without producing confusion of all the other parts and of the Universe as a whole.[46]

As the solar circumlocutions of outer ("superior") planets are slower than the revolutions of planets closer to the sun, retrograde motion was explicable simply by taking account of the relative speed of the observer and the sighted planet. The apparent retrograde motion of planets is therefore a function of the fact that the sighting lines from the observer to the observed planet are seldom parallel and sometimes intersect, when projected to the background of fixed stars.[47]

Before attempting to see what sense can be made of Kant's analogy with Copernicus's work, the following must be made clear: Kant does not draw an analogy between his declared innovation for philosophy and the Copernican Revolution per se.[48] Although repeated use is made of the notion of 'revolution' in the "Second Preface", we have seen that

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[46]Copernicus cited by T. Kuhn, op. cit., p. 142.

[47]For a simple diagram illustrating Copernicus's analysis of retrograde motion, see I. B. Cohen, op. cit., p. 50, fig. 9.

[48]See S. Morris Engel, op. cit., p. 133 f., where he shows how this misconception has been the source of much confusion to Kantian scholars.

it is always in connection with the transformation of a discipline from a state of "random groping" to the exalted rank of a science. Kant does not refer to the famed "Revolution" in astronomy that Copernicus's work eventually led to, but rather merely to the hypothesis which gave rise to the very formulation of this astronomical system. The supposition "that objects must conform to our knowledge", he maintains, allows for the possibility of having "knowledge of objects a priori". If philosophy takes on this supposition "We should then be proceeding precisely on the lines of Copernicus' primary hypothesis". (22, B xvi) This "primary hypothesis", as we have already seen, is the supposition that the earth is a planet which rotates on its axis daily and revolves around the sun annually. Moreover, Copernicus regards the stars to be static, unlike his predecessors, who held that they pertained to a mobile "outer sphere" of the Universe. It is therefore the method of procedure followed by Copernicus to which Kant explicitly refers.[49] In view of the inadequacies of Ptolemaic astronomy, Copernicus, in Kant's words, "tried whether he might not have better success" with a different set of assumptions - his hypothesis; similarly, Kant sees his own declared innovation for philosophy as prompted by the awareness that the long-standing assumption about knowledge has "ended in failure".[50]

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[49]See Ibid., p. 133.

[50]Kant's Critique, p. 22, B xvii & B xvi respectively.

Copernicus's method of solving the problem he was faced with involved rethinking the relation of the variables in astronomy with the projected intention of yielding a single, orderly system with a symmetrical shape that would both conform with the observed phenomena and enable calculating the location of any of its parts. Kant's proposed method of making metaphysics scientific is, analogously, to rethink the relation of its 'variables' - reason and its objects - in a manner that can account for the necessary features that he regards as pervading experience. Moreover, such rethinking presumably makes possible the inquiry into the justifiability of claims to knowledge which overstep the limits of experience.

Thus far, we have been in general agreement with S. Morris Engel's claim that:

> What has tended to mislead critics in their attempt to get at the point of Kant's analogy is their concentration upon Copernicus's achievement whereas what really interested Kant in Copernicus was his method.[51]

While this may well be true about Kant's analogy at the explicit level, it seems to me that such an analysis stops short of revealing the full import of the analogy. It is indeed the case that "everything in the [Second] Preface is about scientific method" as Engel maintains.[52] Nonetheless, we must not lose sight of the fact that in the passages

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[51] S. Morris Engel, op. cit., p. 133.

[52] Ibid., p. 134.

where the Copernican analogy is presented, Kant is writing for the first time about the specific way in which philosophy must proceed if it is to become scientific. Having already raised what he considers to be the essential features of scientific method in general, his statement of a resemblance between the concrete solution he presents for philosophy and Copernicus's solution for the problem in astronomy suggests that Kant feels he has a special affinity with this particular thinker that goes beyond the issue of method. This claim can be supported with a somewhat obvious example: Kant chose Copernicus because he believed him to be correct. That is to say, although Copernicus's method displayed keen critical acumen, if the system to which it gave rise had not received the assent of his fellow astronomers, Kant would have most likely likely selected some other scientific instance to use in analogy with his own philosophical innovation (provided a suitable one was available). Yet this has to do with Copernicus's achievement - his "Revolution" for astronomy - and not with his hypothesis - his method of solving the problem - which may properly be regarded as its seed. Thus, it is not inaccurate to interpret that Kant wants to instigate a 'Copernican Revolution'[53] for philosophy by the use of a hypothesis[54] which is analogous to Copernicus's.

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[53]Engel implicitly denies this in his reference to H. J. Paton at Ibid., p. 135 n. 19.

[54]Kant holds that this proposed change in philosophical view-

The most important feature which suggests itself with reference to the Kantian analogy has to do with the application of Copernicus's hypothesis. In the De Revolutionibus he declares that when ...

> ... the motions of the rest of the planets be brought into relation with the circulation of the Earth and be reckoned in proportion to the circles of each planet, not only do their phenomena presently ensue, but the orders and magnitudes of all stars and spheres, nay the heavens themselves, become so bound together that nothing in any part thereof could be moved from its place without producing confusion of all the other parts and of the Universe as a whole.[55]

Two consequences are thereby seen to follow upon the application of Copernicus's hypothesis: First, the planetary "phenomena presently ensue". Second, as he says elsewhere in a more limited way, "we find underlying ... [the planetary] ordination an admirable symmetry in the Universe, and a clear bond of harmony in the motion of the [planetary] Spheres".[56] Although these two issues are very closely related, we shall treat them separately. Kant himself comments on the

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(footnote 54 continued)...
point is "put forward in this preface as an hypothesis only, in order to draw attention to the character of these first attempts at such a change, which are always hypothetical". In the same passage he writes that in the Critique this viewpoint "will be proved, apodeictically not hypothetically, from the nature of our representations of space and time and from the elementary concepts of the understanding". (25, B xxii n). He also maintains, as we shall discuss later, that "Everything ... which bears any manner of resemblance to an hypothesis is to be treated as contraband". (11, A xv)

[55]Cited by T. Kuhn, op. cit., p. 142.

[56]Ibid., p. 180.

latter issue in the "Second Preface": Although "progress in the field of the supersensible" is shown to be an impossibility for that part of reason which has experience as its proper domain, Kant maintains that "it is still open to us to enquire" if reason in its practical employment may succeed in justifiably going "beyond the limits of all possible experience". (24 f., B xxi)[57] He urges that philosophers "are summoned to take occupation of" the domain left empty by speculative reason, "if we can, by practical data of reason". (25, B xxii) He appends a footnote to this discussion:

> Similarly, the fundamental laws of the motions of the heavenly bodies gave established certainty to what Copernicus had at first assumed only as an hypothesis, and at the same time yielded proof of the invisible force (the Newtonian attraction) which holds the universe together. The latter would have remained for ever undiscovered if Copernicus had not dared, in a manner contradictory of the senses, but yet true, to seek the observed movements, not in the heavenly bodies, but in the spectator. (25, xxii n.)

Thus, Kant sees a similarity between what he calls "the field of the supersensible" and what he regards as Copernicus's inadvertent discovery of what would later be known as "gravity". Though Copernicus had a primitive conception of the force which, as he says, 'binds the universe together',[58] it was a feature that was necessarily concomitant

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[57] A fuller discussion of Kant's division between the employment of reason in the experiential and the supersensible realms follows this analysis of the Copernican analogy.

[58] See T. Kuhn, op. cit., p. 253, where he cites: "Now it seems to me", said Copernicus, "gravity [which here means simply

with his new cosmology. Removing the earth from its central position in the universe, by regarding it merely as another planet, involved a repudiation of the traditional distinction between the terrestrial and celestial regions. This repudiation entailed, among other things, positing a 'binding force' which acts uniformly throughout the universe. Kant recognizes that a truly scientific notion of gravity only came to be formulated by Newton, though in this footnote he acknowledges that it was Copernicus who first brought this problem to bear upon modern natural science.

At first glance, this interpretation may suggest that there is a disanalogy: while Copernicus repudiates a traditional dichotomy, Kant is instituting a division between the speculative and practical employments of reason. However, we must realize that this analogy is drawn up in connection with findings which ensue from these thinkers' unique starting-points. That is to say, these findings themselves are not substantially akin; rather, what is analogous is the fact that they are inevitable consequences of the fundamental hypothesis of each thinker's system. Therefore, certain corollaries are forced upon those who adopt these novel hypotheses: Just as modern science had to contend with accounting for cohesiveness in a Copernican universe, Kant himself

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(footnote 58 continued)...
weight] is but a natural inclination, bestowed on the parts of bodies by the Creator so as to combine the parts in the form of a sphere."
[Kuhn's square brackets]

anticipates having to account for the justifiability of the supersensible employment of reason.

Kant's reference to this element of the Copernican cosmology in analogy with a feature of his own thought therefore goes a long way in helping us understand the over-all analogy. We shall now turn back to the other consequence which followed upon the application of Copernicus's hypothesis, in order to complete our interpretation of the analogy in connection with Copernicus's over-all achievement.

Copernicus discovered that the planetary "phenomena presently ensue"[59] when the hypothesized movements of the earth were checked against the apparent movements of the planets. We have already seen that this provided a relatively simple way of accounting for their retrograde motion.[60] However, Copernicus also believed that he could offer accounts of other astronomical phenomena which were preferable to the descriptions given by Ptolemaic astronomers. Notable among these accounts are: why Venus is seen only as evening star or morning star[61] and why the behaviour of Venus and Mercury differ from that of other planets.[62] Moreover, his system afforded a basis for determining

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[59] See p. 45 above.

[60] See p. 41 above.

[61] See I. B. Cohen, op. cit., p. 52 f.

[62] See Ibid.

the distances of planets both from the sun and from the earth - whereas the Ptolemaic astronomies were confined to calculations by the use of angles, which precluded the measurement of distances.[63] Copernicus's view of the Ptolemaic astronomies provides the proper relief to the way in which he regards these phenomena as following upon the heels of his applied hypothesis. Although Copernicus had great admiration for Ptolemy,[64] T. Kuhn reports that:

> ... he felt that in adding more and more circles his [Ptolemaic] predecessors had simply been patching and stretching the Ptolemaic system to force its conformity with observations; and he believed that the very necessity for such patching and stretching was clear evidence that a radically new approach was imperatively required.[65]

Copernicus may therefore be regarded as a "scientist" in Kant's technical sense of this term. Rather than continually adapting the astronomical theory to the phenomena, he effectively formulated a theory which not only accounted for the observations which puzzled him, but which also prescribed new conceptions of several other astronomical phenomena which were deemed preferable to previous conceptions.

The single, symmetrical universe with planets that follow orderly movements which was the ultimate achievement of Copernicus's

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[63] See Ibid., pp. 53 & 57.

[64] See Ibid., p. 48.

[65] T. Kuhn, op. cit., p. 76.

application of his hypothesis has its analogous counterpart in the Critical philosophy. Kant's "Copernican hypothesis", as we have already seen, states "that objects must conform to our knowledge". (22, B xvi) The task before him involves examining the extent and limitations of the scope of reason in its production of knowledge; more technically, as his title suggests, the task involves performing a critique of pure reason. Such a critique, according to Kant, necessarily leads to scientific knowledge. The critique makes it possible for metaphysics ...

> ... to come to a decision either in regard to the objects of its enquiries or in regard to the capacity or incapacity of reason to pass any judgement upon them ... (57, B 22)

Thus, the 'discovery' that claims which transcend the realm of experience are not veritable claims to knowledge is a scientific finding yielded by the critique of pure reason. For Copernicus then, a reckoning of the observer's motion will supply a scientific knowledge of the actual movements of planets in a symmetrical universe. Similarly, a critique of the applications of reason will furnish a system of scientific knowledge about the validity of its various claims. The supposition that a critique of reason will provide adequate and complete accounts about empirical experience, ethics, aesthetics and religion is as peculiar to Kant as Copernicus's hypothesis that the earth is in motion.

## IV. The Two Parts of Metaphysics

The attempt to alter the procedure of metaphysics by emulating

the method employed in the veritable sciences succeeds only with regard to the "first part" of the discipline, namely that which deals with "those concepts a priori to which the corresponding objects commensurate with them, can be given in experience". (23, B xviii) That is, theoretical knowledge will be shown to be possible only for that branch of philosophy which has to do with the employment of reason about the empirical realm. As with the natural sciences, the "first part" of metaphysics attains the rank of science in virtue of the fact that it is concerned only with "what admits of confirmation or refutation by experiment". (23, B xviii n.) Kant claims that the application of the scientific method will succeed not only in enabling an explanation of how there can be knowledge a priori, but also in furnishing "satisfactory proofs of the laws which form the a priori basis of nature, regarded as the sum of the objects of experience". (23, B xix)[66]

Although Kant regards metaphysical problems that transcend the empirical realm as comprising a "second part" of the discipline, this should not be taken to indicate his depreciation of their value. On the

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[66]The debate as to whether or not Kant regards the principles of physics as pure synthetic judgements a priori is not directly pertinent to this work. Nonetheless, we refer the reader to Konrad Cramer's article "Non-Pure Synthetic A Priori Judgements in the 'Critique of Pure Reason'" (Kant's Theory of Knowledge, ed. by Lewis White Beck, Boston: D. Reidel Publ. Co., 1974, pp. 62-70). Here he argues that the principles set down in Kant's Metaphysical Foundations of Natural Science are regarded by Kant himself, and could only be, synthetic judgements a priori that are not pure. (See esp. p. 64)

contrary, in the "Introduction" to the Critique he maintains that the "final intention" of metaphysics is to solve these problems. (46, A3=B7)[67] These problems come second only in the sense that they come after the inquiry about that which pertains to the empirical realm; the question:

> ... [to] first be considered, [is] how the understanding can arrive at all this knowledge a priori, and what extent, validity, and worth it may have. (46, A3f. =B7)

This is therefore the proper order to be followed: one which has previously been disregarded and which Kant intends to pursue. Kant contends that in the past metaphysicians had mistakenly embarked on the task of trying to resolve matters pertaining to the second part of metaphysics - having to do with matters which transcend experience, pertaining to concepts about God, freedom and immortality - without having concerned themselves with the domain of reason's knowledge a priori about experience.[68] Therefore, the first part of metaphysics is

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[67] In this same passage he goes on to write:
> ... our reason carries on ... enquiries ["in a realm beyond the world of the senses"] which owing to their importance we consider to be far more excellent, and in their purpose far more lofty, than all that the understanding can learn in the field of appearances ... These unavoidable problems set by pure reason itself are God, freedom and immortality. (46, A3=B6f.)

[68] Thus, he holds:
> It is, indeed, the common fate of human reason to complete its speculative structures as speedily as may be, and only afterwards to enquire whether the foundations are reliable. All sorts of excuses will then be appealed to, in order to reassure us of their solidity, or rather indeed to enable us to dispense altogether with so late and so dangerous an inquiry. (47, A5=B9)

regarded as "preparatory" for the second.[69]

We have digressed somewhat in order to clarify some needed insights for our study - concerning the Copernican hypothesis and Kant's use of the term 'metaphysics'. In our digression about the latter, we have learned that imitating scientific procedure in the first part of metaphysics is a precondition of proceeding with the study of its second part. Concerning the Copernican hypothesis, we learned that a reconsideration of the part played by the mind in the production of knowledge can, for Kant, solve metaphysical problems about necessary features in empirical knowledge. Thus, the first part of metaphysics - or the 'metaphysics of experience', as we shall henceforth call it - can hope to establish necessary laws only under the view that intuition and understanding are constituted by forms and rules prior to experience; under the view, that is, that the mind's activity is instrumental in the constitution of knowledge. We should now try to reconstruct a fuller understanding of this view, as well as of Kant's notion of a "critique". Both of these issues have a significant bearing on his notion of science. They will be dealt with consecutively and, as far as possible, in isolation from one another. It should be kept in mind that a study of the present size and nature cannot hope to present exhaustive and definitive accounts of these complex issues. Rather, as our aim is to analyze Kant's

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[69] See Ibid., p. 57, B23. Also p. 59, A11=B25: "propadeutic".

transcendental method of proof, our commentary on these matters must be brief and mainly concerned with guiding us towards the issue of proof procedure.

## V. Science and the 'a priori'

Kant's explanation of what he generally understands by a priori knowledge is given in the "Introduction" to the Critique. Such knowledge, which is supplied by the faculty of understanding, is the necessary and universal component in our experience. The question Kant raises is whether there is such a thing as a priori knowledge; that is, "whether there is any knowledge that is thus independent of experience and even of all impressions of the senses". (42, B2) Such knowledge is radically contrasted with a posteriori or empirical cognitions, which cannot fulfill the criteria of strict universality and logical necessity as Hume succeeded in proving according to Kant.[70]

But Kant believes it "easy to show that there actually are in human knowledge judgements which are necessary and in the strictest sense universal, and which are therefore pure a priori judgements". (44, B4) Examples exhibiting reason's non-empirical or pure employment can be found both in certain concepts and in judgements. If we divest our empirical concept of an object of all its empirical properties,

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[70] See Kant's Critique, p. 606 f. (A760=B788).

Kant holds that we are left with some non-empirical features: in the case of bodies, we are left with the space the objects previously occupied; in the case of even incorporeal objects the "concept of substance forces itself upon us" once their empirical properties have been removed. (45, B5f.) As regards pure a priori judgements, Kant cites the propositions of mathematics and the principles or rules which in his view enable the very possibility of experience and furnish its certainty. In connection with these latter judgements, he maintains that "it is possible to show that pure a priori principles are indispensable for the possibility of experience, and so to prove their existence a priori". (45, B5) Such proofs are given by Kant later on in the Critique, among which is his proof for the principle of causation, which we shall analyze in the following section. For the time being it will suffice to establish that for Kant there are pure a priori concepts and judgements yielded by reason and without which experience would not be possible.

However, Kant is not interested in all of the understanding's a priori cognitions, as some such cognitions do not extend our knowledge. These judgements he entitles "analytic", and they are distinguished from judgements which are "synthetic". In affirmative analytic judgements, the concept of the predicate is overtly or covertly contained in the concept of the subject; such judgements are therefore merely explicative, as the concept of the predicate does not go beyond what is

contained in the concept of the subject. Synthetic judgements in general, on the other hand, are ampliative, as the concept of the predicate makes an addition of a new element which was not previously thought in the concept of the subject to which it is conjoined. Kant cites "All bodies are extended" as an example of an analytic judgement, because the notion of extension is subsumed under the concept of a body: an analysis of the concept of the subject would necessarily yield the concept referred to by the predicate. "All bodies are heavy" is his example of a synthetic judgement, as the concept of the predicate is not contained in the concept of the subject - i. e. no amount of analysis of the mere concept of body could possibly yield the concept of heaviness. Thus, only by expressing judgements of this last type do we attempt to amplify our stock of knowledge; judgements of the former kind are utilized only for clarificational purposes. Once he has established this distinction in types of judgement, Kant goes on to hold that all judgements of experience, or a posteriori judgements, are synthetic, because the (sensible) connection of the concept of a predicate to the concept of a subject which does not already contain it is done only by virtue of an empirical observation, and not merely by contemplating concepts.

All analytic judgements must therefore be a priori for Kant. We also saw that all judgements about experience must be synthetic. But, as is well known to any reader of the first Critique, Kant holds that there is a third kind of judgement yielded by reason: the synthetic

judgement a priori. One such judgement that Kant cites is "Everything which happens has its cause". However, there is a problem with this judgement and with all judgements of its class. Where the synthesis of concepts in a synthetic judgement a posteriori "rests upon experience" (50, A8=B12) - i. e. is occasioned and verifiable only by taking recourse in experience - such is not the case with synthetic judgements a priori. The radical contrast Kant sees as obtaining between a priori and a posteriori judgements accounts for this. So, as synthetic a posteriori judgements are one and all contingent, and because the cited judgement is an instance of a universal and necessary synthesis of concepts, they differ radically in their natures. The above judgement therefore cannot be occasioned nor verified in the same way as an a posteriori judgement can be, viz., by experience and by taking recourse in experience, respectively. Similarly, where the synthesis of concepts in an analytic judgement is occasioned by thought about what is implied in a given concept and verifiable solely by recourse to an analysis of such concepts, this offers no aid regarding the problem of synthetic judgements a priori. An analysis of the concepts synthesized in the above judgement will shed no light on the possibility of such a synthesis, nor will it succeed in verifying or refuting it because the judgement is synthetic - because "the concept of a 'cause' lies entirely outside the other concept, and signifies something different from 'that which happens', and is not therefore in any way contained in this latter representation". (50f.,

A9=B13) In sum, the problem which exists with respect to synthetic judgements a priori is that, as they are claims to ampliative knowledge which do not arise out of experience, their occasioning ground or possibility is neither experience nor mere thought about ideas.[71]

Although Kant is interested in discovering how such propositions are possible, he holds no doubt about the fact that they are possible. All principles at the basis of the theoretical sciences are, he argues, synthetic judgements a priori.[72] Thus, mathematical propositions - such as "7 + 5 = 12" in arithmetic and "the shortest distance between two points is a straight line" in geometry - are necessary and, he argues, synthetic. So are the principles of natural science or physics - such as "that in all changes of the material world the quantity of matter remains unchanged; and that in all communication of motion, action and reaction must always be equal". (54, B17) Moreover, he claims that the propositions of metaphysics pretend to be synthetic a priori judgements. That is to say, although he regards metaphysics as hitherto

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[71]For an excellent discussion of the significance of this problem, and its equation with the general problem of metaphysics in Kant's view, I refer the reader to D. P. Dryer's "The Aim of the Critique of Pure Reason", Dialogue 2 (1963), pp. 142-154.

[72]On p. 54 (B16f.) he holds that: "Some few fundamental propositions, presupposed by the geometrician are ... analytic, and rest on the principle of contradiction. But, as identical propositions, they serve only as links in the chain of method and not as principles".

having failed in its aim, the very nature of this aim - viz., to extend our a priori knowledge - requires that it "ought to contain a priori synthetic knowledge ... Thus metaphysics consists, at least in intention, entirely of a priori synthetic propositions". (55f., B18) The proposition that the world must have a beginning does not arise by virtue of an analysis of the concept "world", nor by dint of a particular experience, or set of experiences. Therefore, its verification or refutation cannot be properly conducted by taking recourse either in an analysis of ideas or merely in the evidence of experience. For our present purpose it will suffice to conclude from the above that Kant believes there is an abundance of synthetic judgements a priori in the mentioned sciences and that he regards it as his task to inquire into their possibility, in order to determine whether or not such a possibility is also open to metaphysics.

Having looked into Kant's notion of a priori knowledge, we are now in a position to start interpreting the "new method of thought" he envisages for metaphysics, viz., "that we can know a priori of things only what we ourselves put into them". (23, B xviii) In the footnote which refers to this claim, he holds that this method of approach is "modelled on that of the student of nature". Indeed, we recall that this procedure is analogous to the method Copernicus used to solve his problem about planetary motions. This concept is also akin to Bacon's inasfar as he was in some important way instrumental in forwarding the

'revolutionary' view that "reason must seek in nature ... that which it has itself put into nature", as we saw previously. (20, B xiii f.) We have also seen that there is a similarity between the quoted methodological precept Kant intends to use in attempting to put metaphysics on the path of science, and the scientific mathematician's realization that:

> If he is to know anything with a priori certainty he must not ascribe to the [geometrical] figure anything save what necessarily follows from what he has himself set into it in accordance with his concept. (19, B xii)

Despite the obvious formal similarities between metaphysics, physics and mathematics, there are radical differences which cannot be altogether ignored if we are to avoid misinterpreting Kant's conception of "science". These differences have to do with the matter or object of these disciplines, and they have a crucial bearing upon Kant's transformation of metaphysics to the status of a science.

In the science of mathematics, the validity of judgements about geometrical concepts is determined by their conformity with the intuition of space. For the physicist, the validity of judgements about nature - i.e. the validity of his hypothesis - is contingent upon the results of the experiment, or the "response" of the object "on the witness stand". However, the claim being made with respect to the first part of metaphysics is quite different. Here, the witness is reason. Given the 'revolutionary' assumption that reason contributes necessity to experience, the synthetic a priori principles it so contributes are not said

to conform to experience. Rather, reason is said to impose "rules ... prior to objects being given [it] ... [and]to which all objects of experience necessarily conform, and with which they must agree". (25, B xvii f.) In conclusion, the following makes for a disparity between the cases of geometrical judgements and the physicist's hypotheses on the one hand, and the case of the 'revolutionary' metaphysician on the other: the former are deliberately formulated possibilities imposed upon intuited space and nature, and their validity is contingent upon the results of constructions and experiments; whereas in the latter case; the metaphysician will show that reason naturally or non-deliberately imposes a priori concepts and principles upon experience. Moreover, these a priori features are not possibilities to be "tested out" for validation in experience, but are rather what lend necessity to it and enable its possibility.

In sum, the term "a priori" is applied by Kant in a disanalogous way. There is no ambiguity in its employment insofar as it denotes concepts and judgements that are necessary and universal. There is rather a disanalogy in the fact that while the mathematician and the physicist pursue scientific knowledge by the use of a priori concepts, the philosopher pursues it by operating in the awareness that experience displays necessary (a priori) features which must be contributed by reason, which is the object of his study. It is therefore from such a transcendental viewpoint that the philosopher will perform a critique of pure

reason. This disanalogy must be borne in mind when we read the "Second Preface". As we shall see later in this paper, it plays an importnat role in distinguishing between the transcendental and the hypothetical employment of reason.

## VI. The Notion of a "Critique"

In the Preface to the first edition of the Critique Kant characterizes the critique as being a task of attaining self-knowledge, a task which assesses the validity of the mind's cognitions.[73] It is intended to supply a systematic inventory of the mind's possessions in order to answer what Kant conceives as the central question of this work, namely, "what and how much ... the understanding and reason [can] know apart from all experience".[74] That is, the critique is seen as an examination of the faculty of reason in general which aims to list off all of its a priori knowledge in order to ascertain the lawfulness of its various kinds of claims. Also in this Preface, he maintains that there should be no insurmountable difficulty in the performance of such a task in the sense that whatever "reason produces entirely out of itself cannot be concealed but is brought to light by reason itself immediately the common principle has been discovered".[75] Another way of putting this

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[73] See Critique, p. 9 (A xi).

[74] Ibid., p. 14 (A xx) and p. 12 (A xvii), respectively.

[75] Ibid., p. 14 (A xx). See also pp. 25 f. (B xiii).

would be to say that whatever reason contributes to its judgements and cognitions should not elude critical examination as it will be manifested as that which supplies them with the features of necessity and universality.

We are already familiar with Kant's contention that philosophers prior to him had been amiss for engaging in metaphysical disputes about God, freedom and immortality - which pertain to the realm that transcends experience - without first taking care of the domain which studies the employment of reason in experience. In the Preface to the second edition, Kant holds that a criticism of these "powers" of pure reason "is the necessary preparation for a thoroughly grounded metaphysics", i.e. a scientific one. (32, B xxxvi) Therefore, the determination of what a priori features reason contributes to experience, "and what extent, validity and worth" such a priori knowledge may have, is a prerequisite to any attempt to make cognitions which "leave the field of all possible experiences".[75] Such an assessment is indispensable because the latter cognitions pretent to extend the scope of reason's a priori knowledge beyond experience, where, as a consequence, "experience can yield neither guidance nor correction". (46, A3=B7) In the "Second Preface", as we have also mentioned previously, Kant anticipates that the major finding in performing such a critique is that the

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[76] Ibid., p. 46 (A3=B7) and p. 45 (A2=B6), respectively.

a priori knowledge employed by pure speculative reason "is limited to mere objects of experience" and does not extend beyond the sensuous realm".[77]

The primary issue which concerns us here, however, is not so much the final result of this critique, but rather how Kant conceives the task itself.

In our general discussion of Kant's views on a priori knowledge we saw that not all a priori judgements need to be examined in the Critique. Only a priori judgements which are synthetic require close scrutiny - to the exclusion of empirical judgements, which are also synthetic, though a posteriori. In order to show that there are synthetic judgements a priori, Kant cited several instances from mathematics and from physics. Thus, he defines the central issue for metaphysics - which entirely consists, at least in intention, of such judgements - as having to show not that synthetic judgements a priori are possible, but rather how they are possible. So:

> The possibility of analytical propositions ... [is] easily comprehended, being entirely founded on the law of Contradiction. The possibility of synthetical a posteriori judgements, of those which are gathered from experience, also requires no particular explanation; for experience is nothing but a continual synthesis of perceptions. There remain therefore only synthetical propositions a priori, of which the possibility must be sought

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[77] Ibid., p. 27 (B xvi). Emphasis removed.

> or investigated, because they must depend upon other principles than the law of contradiction.[78]

In the "Introduction" to the Critique Kant states that "the proper problem of pure reason is contained in the question: How are a priori synthetic judgements possible?" (55, B19) This question is, in effect, merely a somewhat different way of expressing the notion of a "critique", viz., of "an inquiry into pure rational [synthetic] cognition", as he says in the Prolegomena.[79] In less succinct fashion, Kant maintains that the Critique:

> ... must itself exhibit the whole stock of a priori concepts, their division according to their various sources (Sensibility, Understanding, and Reason), together with a complete table of them, the analysis of all these concepts, with all their consequences, especially by means of the deduction of these concepts, the possibility of synthetical cognition a priori, the principles of its application and finally its bounds, all in a complete system.[80]

The search for limits, as the concluding phrases of this excerpt reveal, is of crucial importance to the task of performing the critique of pure reason. Thus, while the inquiry into the possibility of synthetic judgements a priori is as concerned, for example, with judgements that the

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[78] I. Kant, Prolegomena to Any Future Metaphysics, in Philosophers Speak for Themselves: Berkeley, Hume and Kant, ed. T. V. Smith and M. Greene (Chicago: Chicago University Press, 1963), p. 279 [Section 5].

[79] Ibid., p. 280 [Section 5].

[80] Ibid., p. 359 ["Scholia: Solution of the General Question ..."]

world must have a beginning as with the principle of causation (which holds that every event presupposes a cause) the issue of the limits of the objective employment of reason sets these judgements apart. Although they are both synthetic judgements a priori, the Critique's discovery that the valid (objective) employment of synthetic judgements a priori is limited to the realm of sensibility allows the philosopher to verify, i. e. to determine the veracity or falsity, of only the latter, and not the former judgement.[81] Nonetheless, this is not to say that the critique of reason does not result in scientific knowledge about metaphysical problems. It is rather because of the alleged discovery of the limits of reason's valid employment that Kant would argue that a critique necessarily leads to scientific knowledge; as we saw in the last section, the critique makes it possible for metaphysics:

> ... to come to a decision either in regard to the objects of its enquiries or in regard to the capacity or incapacity of reason to pass any judgement upon them ...
> (57, B22)

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[81] As the former judgement is an instance of a thought without sensible content, it is "empty". (See p. 93, A51=B75) Moreover, as it is, as it were, 'unfillable', it is one of the many judgements of pure reason which "transcend the conditions of all possible experience, outside which the authentication of truth is in no wise possible"; such judgements can never be verified (or refuted) as they "make use of the laws of the understanding - laws which are adapted only for empirical employment". (p. 601, A751=B779) The principle of causation is, of course, a law applying in the realm of experience and is therefore part of the class of synthetic judgements a priori which is not subject to the above criticism.

A critical examination of pure reason will therefore determine the limits of its valid employment and thereby furnish the philosopher with a knowledge of the type of metaphysical problems about which reason must remain ignorant.[82] For instance, judgements asserting the existence of matter or denying the existence of God both make claims that transcend the field of possible experience, and are "therefore beyond the limits of human insight".[83] That such insight is precluded is therefore a scientific finding afforded by the critique of pure reason. This finding, in turn, "will effectively guard us against" making claims to knowledge beyond possible experience (436, A486=B514) - thereby enabling the first appearance of a truly scientific metaphysical system, according to Kant.

In conclusion, Kant contends that a critique of pure reason consists in the examination of the possibility of synthetic a priori judgements. This involves ascertaining how the validity of, i.e. how the truth or falsity of such judgements can be determined. Philosophy is able to arrive at certainty regarding this issue, for Kant, insofar as the critique will involve a decision with respect to reason's ability or inability to validate all judgements.

This brief discussion of Kant's notion of the nature and overall

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[82] See Critique, pp. 605-606 (A758-9=B786-7).

[83] Ibid., p. 602 (A753=B781). Re: matter, see esp. p. 359 (A392).

findings in performing the critique of pure reason enables us to grasp more fully his persistent theme of putting metaphysics on the secure path of a science. We noticed, at the beginning of this chapter, that there are two main reasons for so transforming metaphysics, in Kant's view: the absence of unanimity over even a single metaphysical contention and the absence of a plan of procedure common to all philosophers. The fact that these features hold true of all past metaphysical studies shows, for Kant, "beyond all questioning, that the procedure of metaphysics has hitherto been a merely random groping, especially when compared with the successes had in the veritable sciences". (21, B xv) With the exception of the science of logic - and this only in virtue of its "quite precisely delimited" sphere[84] - the veritable sciences have the advantage of ensuring the possibility of "progress throughout all time and in endless expansion". (19, B xi) This possibility is ensured by the fact that mathematical claims since Thales and, for instance, the scientific claims of a Copernicus or of a Galileo are, for Kant, universally regarded as authoritative. Such authority is borne out by the weight of the testimony facing the scientist: the construction in intuition and the evidence of experimentation, respectively, suffice to corroborate

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[84] Ibid., p. 18 (B ix). The narrowness of its scope, which comprises only the abstract study of the understanding and its form, fully accounts for its success as well as for the fact that it has been "a closed and completed body of doctrine" since the time of Aristotle, according to Kant.

(or to refute) the mathematician's judgements and the physicist's hypotheses. This testimony grants such claims the status of knowledge, which must be accepted by fellow scientists and which thereby enables them to expand such knowledge by being able to assume the adequacy of such claims. Therefore, as distinct from pre-Critical metaphysics, for Kant there is a unanimity about scientific claims. As for the issue of a method of procedure which is common to all mathematicians and to all physicists, we have already seen that Kant believes that such agreement does exist, at least tacitly, since the occurrence of their respective revolutions in procedure.

The revolution in metaphysical procedure proposed by Kant is, we saw, also intended to gain common assent in virtue of the fact that rethinking the relation of the variables in metaphysics a la Copernicus will furnish the true account of the origin and validity of the necessary features that he regards as pervading experience. Therefore, the reformulation of the relationship obtaining between reason and its objects which is manifested in the Critical Philosophy entails a methodological revolution for metaphysics and is Kant's intended solution for the variance in procedure hitherto besetting metaphysical inquiry.

The "overall findings", as we called them above, in performing the critique of pure reason are intended to provide the solution to the other problem that ails metaphysics, viz., the absence of unanimity regarding metaphysical contentions. Post-Kantian metaphysicians

would be scientific by abiding with the two main findings established in the Critique: first: that metaphysical knowledge, i. e. the objective employment of reason's synthetic judgements a priori, is limited to the realm of sensibility. And, secondly, this entails that synthetic judgements a priori which transcend possible experience transcend the limits of human insight and do not therefore allow of being known, but rather merely of being thought. Thus, analogous with the cases of mathematics and natural science, Kant expects to ensure the possibility of progress for metaphysics by way of the insights gathered in the Critique. The authority of its contentions, which is presumably borne out by the arguments it contains, is expected to be universally acknowledged by a new generation of scientific metaphysicians. This inevitable acknowledgement - presumably similar to that following upon the heels of Thales and, for instance, Copernicus - would thereby enable post-Kantian philosophy to devote its time to expanding the body of metaphysical knowledge and thought, rather than aimlessly groping in random fashion, as had previously been the case.

## APPENDIX

(Footnote 24)

The fact that Bacon's contribution is regarded by Kant as seminal at the very least, coupled with Kant's metaphor about revolutionary turns for science being like a "light" for reason suggests that he read Bacon's Advancement of Learning before writing his "Second Preface". Therein we read:

> ... every degree of proceeding in a science giveth a light to that which followeth; which light if we strengthen by drawing it forth into questions or places of inquiry, we do greatly advance our pursuit. (op. cit., p. 59 [Second Book xiii, 10])

Several other issues common to both the "Second Preface" and this book support this conjecture: First, two additional linguistic similarities arise: Kant devises an economic simile with respect to the corroboration of claims to knowledge which is much like, and is possibly borrowed from, a kindred simile in the Advancement of Learning. In writing about the value of the "inventions" of neo-Aristotelian natural inquiries, Bacon claims to find it ...

> ... deficient; which seemeth to me to be such a defi-cience as if, in the making of an inventory touching the state of a defunct, it should be set down that there is no ready money. For as money will fetch all other commodities, so this knowledge [viz., the purportedly ill-grounded claims to knowledge of the neo-Aristotelians] is that which should purchase all the rest. (op cit., p. 56 [Second Book, xiii, 1])

Kant uses the same simile in pointing out the importance of ascertaining in what kinds of case empirical corroboration is indispensable to the truth of the "knowledge of reason":

> ... it is bad management if we blindly pay out what comes in, and are not able, when the income falls into arrears, to distinguish which part of it can justify expenditure, and in which line we must make reductions. (18, B x)

The second point of linguistic similarity has to do with Kant's use of juridical jargon in his analysis of the new-found method in natural science: While the predominant metaphor in the "First Preface" is about sovereignty, in the "Second" it is indeed appropriate to a law-court. Though Kant was presumably aware that Bacon was Chief Justice of England, in the Advancement of Learning Bacon makes references to "the voice of nature" which consents (op. cit., p. 47 [Second Book, viii, 4]) to "a faculty of wise interrogating" (Ibid., p. 59 [Second Book, xiii, 9]).

There are two remaining issues supporting our conjecture - both of which are about material in the "Second Preface" with which we have recently discussed: the use of the term "metaphysics" and the work of Copernicus. For the time being, a paragraph will suffice on each.

Bacon devides "metaphysics", or "natural philosophy", into two branches: "physic", or the study of "material and efficient causes" is the first; the second is "metaphysic", which is about "formal and final causes". (op. cit., p. 43 [Second Book, vii, 3]) While the former "are parts of knowledge not deserted by the labour of man" (Ibid., [4]), "the latter part whereof I allow as extant, but wish it confined to its proper place". (Ibid., p. 45 f. [7]) While Kant does not explicitly effect a similar rift between the two kinds of philosophical inquiry in the "First Preface", it may fairly be said that that is the main concern of the "Second Preface", as we have just seen in Chapter 2.

Within the passages in the Advancement of Learning containing the material discussed above (op. cit., pp. 41-59 [Second Book, vi to xiii]), Bacon briefly remarks on Copernicus's work in astronomy. His comments evince the prevalent lack of concensus in Bacon's day regarding the choice of astronomical systems made available by Copernicus's work:

> ... the same phenomena in astronomy ... and the calculations are agreeable to both [the Ptolemaic and Copernican systems], so the ordinary face and view of experience is many times satisfied by several theories and philosophies; whereas to find the real truth requireth another manner of severity and attention. (op. cit., p. 48 [Second Book, viii, 5])

Bacon leaves it to future natural philosophers to determine the truth of the dispute. (See op. cit., p. 49 [Second Book, ix, 1]) Our reading of

the "Second Preface" indicates that Kant wholly agrees with Bacon. He mentions Copernicus's achievement in connection with the task he sees before himself in the Critique, which indicates that the dispute had been settled by then, viz., since the advent of 'enlightened' natural science. We suggest that Kant's use of Copernicus's success in the "Second Preface" may have been prompted by a reading of Bacon's hopeful remarks.

# CHAPTER 3

## THE TRANSCENDENTAL METHOD OF PROOF

In order to achieve our ultimate aim in this chapter - which is to analyze certain aspects of Kant's transcendental method of proof - we shall proceed as follows: First we shall briefly describe some Kantian notions which must be understood before going on to reconstruct any transcendental proof. Specifically, the term "transcendental" requires at least a brief examination, particularly as used in context with his notion of a "transcendental logic". Second, an instance of a transcendental proof will be reconstructed. For this purpose I have chosen the "Second Analogy of Experience". As this analysis of the principle of causation may well be seen as a response to Hume's views on the issue, occasional reference will be made to the Empiricist's argument. Our reconstruction of Kant's understanding of his transcendental method of proof will be drawn from passages selected from the first Critique and from the Prolegomena to any future Metaphysics.

### I. Transcendental Logic

The term "transcendental" is first defined in the Introduction to the Critique as being:

> .... all knowledge which is occupied not so much with objects [in edition A: "... as with our a priori concepts of objects in general". In edition B: ...] as with the mode of our knowledge of objects in so far as this mode of knowledge is to be possible a priori. (59, A11-12, B 25)

As the word "objects" is being used in an ordinary sense, and not in Kant's technical sense, it is almost superfluous to note that transcendental knowledge should not be confused with the issue of the possibility of transcendent knowledge, i. e. of that knowledge which pretends to soar beyond the realm of experience. The passage cited clearly shows that "transcendental" denotes a type of knowledge; moreover, that this type of knowledge is not concerned with objects of experience themselves; finally, that this type of knowledge is knowledge a priori. In sum, transcendental knowledge is knowledge a priori of objects in general. However, later on in the Critique Kant points out that:

> Not every kind of knowledge a priori should be called transcendental, but that only by which we know that - and how - certain representations (intuitions or concepts) can be employed or are possible purely a priori. The term 'transcendental', that is to say, signifies such knowledge as concerns the a priori possibility of knowledge, or its a priori employment. Neither space nor any a priori geometrical determination of it is a transcendental representation; what can alone be entitled transcendental is the knowledge that these representations are not of empirical origin, and the possibility that they can yet relate a priori to objects of experience. (96, A56=B80-81)

Although the definitions offered in Kant's "Introduction" might suggest that transcendental knowledge and knowledge a priori are one and the same, this suggestion is considerably qualified in the passage just

quoted. The term transcendental denotes a philosophical approach or standpoint. This standpoint, according to him, will yield knowledge - obviously transcendental knowledge. Furthermore, transcendental knowledge must be non-empirical or a priori. But this last quotation reveals that the term transcendental refers to a reflexive viewpoint which will enable the scrutiny of the possibility and the manner of the mind's application of a priori elements and structures in knowledge. The findings of such reflexive scrutiny must therefore be entitled transcendental knowledge. Kant contends that only the transcendental approach could yield such knowledge, and that this can only be done by the implementation of a transcendental logic:

> In the expectation ... that there may perhaps be concepts which relate a priori to objects ... solely as acts of pure thought ... we form for ourselves by anticipation the idea of a science of the knowledge which belongs to pure understanding and reason, whereby we think objects entirely a priori. Such a science, which should determine the origin, the scope, and the objective validity of such knowledge, would have to be called transcendental logic .... [This science] concerns itself with the laws of understanding and of reason solely in so far as they relate a priori to objects. (96 f., A57=B81-82)

It is in virtue of the fact that such a science is concerned with such a priori laws that it is characterized as being a type of logic. Aristotelian logic (which ranks as a science for Kant, as we saw in the previous section) and transcendental logic have a great deal in common; this is made amply evident in the first chapter of the "Analytic of Concepts": "The Clue to the Discovery of All Pure Concepts of the Understanding",

or the "Metaphysical Deduction". Nevertheless, Kant regards them as dissimilar in a very important respect.

Classical or "pure general" logic, as he calls it here, "abstracts from all content of knowledge" and considers the forms of judgement yielded by the understanding.[1] Transcendental logic, by contrast, is concerned with the content of these forms of judgement, i. e. with the material of knowledge. Thus, while classical logic merely deals with the forms of judgement, transcendental logic deals with their objective employment. However, its province is not inclusive of all such employment - viz., both pure and empirical - but rather comprises "solely the rules of the pure thought of an object". (95, A55=B80) For instance: The conclusion of the "Transcendental Aesthetic" of the Critique was that space and time are the only forms of human sensibility; that is, the mind is objectively receptive only of what can be presented to it within the spatio-temporal framework. Thus, the concept of any object, be it empirical or pure, is conditioned by - i. e. has as its condition - the fact that its matter or content is only spatio-temporally accessible to the mind. The understanding can yield judgements about objects only by means of such access or reception. While classical logic is not interested in this insight, transcendental logic, being concerned with

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[1]Kant's Critique, p. 111 (A 76=B102). See also p. 106 (A70=B95).

objective knowledge, cannot fail to take it into consideration.[2]

Therefore it is the dissimilarity of the general prupose of classical and transcendental logic which sets them apart for Kant. As the former entirely abstracts from the content of knowledge, its only task "is to give an analytical exposition of the form of knowledge as expressed in concepts, in judgements and in inferences". (177, A133=B172) Transcendental logic does not abstract from the content of knowledge and will have as its concern to ascertain the origin, scope and validity of the objective use of the forms of knowledge.

Transcendental logic is applied by Kant to two spheres: transcendental analytic, "which deals with the elements of the pure knowledge yielded by the understanding", as well as with its principles (100, A62=B87); and transcendental dialectic which will consist in "a critique of understanding and reason in respect of their hyperphysical i.e. transcendent employment". (100, A63=B88) As stated in our Introduction, we are not concerned with the latter area, but only with the former. Moreover, within the transcendental analytic we will as far as possible disregard the sub-section which is involved with the "elements" mentioned above in order to concentrate on the one concerned with the principles - and specifically with the principle of causation.

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[2]See Ibid., p. 100 (A62=B87).

## II. The Transcendental Method of Proof

### A. As exemplified in the "Second Analogy of Experience":

The main aim of this section will be to isolate and reconstruct a passage in the "Second Analogy of Experience" which contains Kant's transcendental proof of the principle of causation. However, as is not uncommon in Kantian scholarship, there is controversy about how the search for such a passage should be carried out. Adickes, Kemp Smith and Paton concur in maintaining that there are six separate proofs successively presented in the "Second Analogy".[3] Graham Bird holds that while there are variations in the arguments that Kant presents, these are merely intended to provide a variety of comment upon an initial proof".[4] After careful study the details of which are immaterial to our present concern, we have decided that Bird's view is correct.[5]

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[3]See H. J. Paton, Kant's Metaphysic of Experience (London: George Allen & Unwin, 1936), Vol. II, p. 224 f. and p. 224 n.

[4]Graham Bird, Kant's Theory of Knowledge (New York: Humanities Press, 1962), p. 153.

[5]By implication, at least regarding the "Second Analogy", we are not at loggerheads with Kant's contention "that only one proof can be found for each transcendental proposition". (624, A787=B815) In fact, he refers specifically to the proof of the principle of causation to corroborate this general observation on transcendental proofs:

> In the Transcendental Analytic, for instance, we derived the principle that everything which happens has a cause, from the condition under which alone a concept of happening in general is objectively possible - namely, by showing that the determination of an event in time, and therefore the event as belonging to experience, would be

We also concur with Bird's choice of the passages containing Kant's "initial" or essential proof. Before going about the business of reconstructing this proof however, a brief comment should first be made about Kant's general aim in the "Analogies of Experience".

The principle for which Kant argues in the Analogies as a whole is that "Experience is possible only through the representation of a necessary connection of perceptions". (208, B218) Here he equates experience with empirical knowledge, which involves "a knowledge of objects through perceptions". (209, B219) As he is conducting an inquiry into the necessary conditions for the possibility of experience, this will be an investigation of what is presupposed in empirical knowledge. Empirical knowledge, he maintains, requires the synthetic unity of the manifold of perceptions as it exists objectively in time. As time itself cannot be perceived for Kant, "the determination of the existence of objects in time can take place only through their relation in time in general". (209, B219) There are only three modes of time: duration, succession and coexistence. That is to say, time, which is the medium of all appearances, enables us to know appearances in only

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(footnote 5 continued).....

> impossible save as standing under such a dynamical rule. This is the sole possible ground of proof; for the event, in being represented, has objective validity, that is, truth, only in so far as an object is determined for the concept by means of the law of causality. (624, A788=B816)

these three ways. Kant hopes to show that there are "three rules of all relations of appearances in time, and these rules will be prior to all experience, and indeed make it possible". (209, B19) These rules are therefore concerned with the temporal modes of duration, succession and simultaneity, and they will describe how "a unity of experience may arise from perception". (211, B222)

The Analogies of Experience must be necessarily true of all experience, as is the case with the principles dealt with in the Anticipations of Perception and the Axioms of Intuition. However, there is a radical distinction drawn between the Analogies (and the Postulates of Empirical Thought), on the one hand, and the Axioms and Anticipations on the other. These last two principles are said to be constitutive; that is, their proofs attempt to justify the application of mathematics to appearances, whereby the possibility of appearances is argued as being quantitatively determinable. The Analogies, however, are said to yield regulative principles, and not constitutive ones, as their concern is with the existence of things, and not with their possibility. As "existence cannot be constructed, the principles can apply only to the relations of existence". (210, A179=B222)

The principle of causation expressed in the "Second Analogy" has to do with the knowledge of objects with respect to the successive mode of time. In the 'A' edition it reads as follows: "Everything that happens, that is, begins to be, presupposes something upon which it follows

according to a rule". (218), A232) The principle is rephrased in the 'B' edition: "All alterations take place in conformity with the law of the connection of cause and effect". (218, B232) Prior to the reconstruction of the passages we have isolated as containing the essence of the proof of this principle - from the new paragraph on 220 (A191=B236) to the end of the second paragraph on 222 (A194=B239) - several preliminary points are mentioned by Kant. We will list some of the more important of these:

1. The first paragraph in the Analogy is a reminder of the conclusions arrived at in the "First Analogy", where the close connection between both proofs was made explicit.

2. Kant argues that necessary features about experience cannot be supplied by perceptions themselves: "the objective relation of appearances that follow upon one another is not to be determined through mere perception". (219, B234)[6] The notions of 'object' and

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[6]Kant concurs with Hume on this point. In the Treatise Hume suggests that we turn our attention:

> ...on any two objects, which we call cause and effect ... in order to find that impression, which produces an idea of such prodigious consequence. At first sight I perceive, that I must not search for it in any of the particular qualities of the objects; since, whichever of these qualities I pitch on, I find some object that is not possesst of it, and yet falls under the denomination of cause or effect. And indeed there is nothing existent, either externally or internally, which is not to be consider'd either as a cause or an effect; tho' 'tis plan there is no one quality, which universally belongs to all beings, and gives them a title to that denomination.

David Hume, A Treatise of Human Nature, ed. by L. A. Selby-Bigge (Oxford: Clarendon Press, 1888), p. 75.

'necessity', and the relationship between the two; will also be dealt with below.

3. Even assuming that it is possible to recognize different states of an object at different times, the recognition of the objective time order of these states requires something more. (218 f., B233 f.)

4. (i) Appearances are always generated in the mind successively.

(ii) Appearances are not things in themselves.

(iii) As appearances "are what alone can be given to us to know", Kant has "to show what sort of connection in time belongs to the manifold in the appearances themselves". (220, A190=B235)

5. An objective time order cannot belong to things in themselves. (220, A190 f.=B235 f.)

6. A distinction must be drawn between an 'appearance' and the representations of 'apprehension', in order that 4 (iii) be understood. Although the appearance is nothing but the sum of its apprehensions, "it is viewed as their object; and my concept, which I derive from the representations of apprehension, has to agree with it". (220, A191=B236)

7. The distinction drawn immediately above will be viable only if the appearance stands under a conceptual rule which distinguishes it "from every other apprehension and necessitates some one particular mode of connection of the manifold". (220, A191=B236)

Once these points are summarily made, Kant proceeds with the

main proof of the principle of causation. This is done in terms of an analysis of the concept of an event. This procedure will presumably furnish the conditions without which it would be impossible to discriminate the experience of events from the experience of other successions of perceptions which are not events.

In order to be perceived, he maintains, every state must be preceded by another apprehension. For the moment, Kant regards as self-evident, or at least in no need of substantiation, that "an event which should follow upon an empty time, that is, a coming to be preceded by no state of things, is as little capable of being apprehended as empty time itself". (221, A192=B237) We have already seen a formulation of this notion above (item 4 (i)) and it is also treated in the argument immediately following the proof we are presently dealing with. But although this condition necessarily obtains with respect to all events, it also holds regarding cases of successive apprehensions which are not considered to be events. Kant's example of the successive apprehension of the parts of a house illustrates this point: Although the apprehension of the manifold in the appearance of a house is successive - proceeding, for example, from the roof to the window, etc. - the manifold of the house itself is not regarded as being successive. The successive apprehension is therefore not regarded as the apprehension of an objective succession, i. e. of an event.

Given that the above is a necessary, though insufficient,

condition which must be fulfilled in order that a succession of apprehensions rank as an event, Kant goes on to offer another condition: Whereas the order of the succession of apprehensions of a house is entirely arbitrary, the order of the successive apprehension of an event is governed by a conceptual rule. The example of an event which Kant offers is that of a boat sailing downstream. "The order in which the perceptions succeed one another in apprehension is in this instance determined, and to this order apprehension is bound down". (221, A192=B237) In such a case, then, there is a determinate order governing the succession of our apprehensions: the boat can only be perceived upstream at first and further downstream later. (Of course, if the boat was travelling upstream, it would be a different event and, thereby, a different rule-governed order.) The order of apprehensions of an event must, therefore, be a necessary order; the concept of an event presupposes the notion of a rule that makes the order in which the apprehensions follow upon one another a necessary order. In all events, then:

> ... we must derive the subjective succession of apprehension from the objective succession of appearances ... The objective succession ... [consists] in that order of the manifold of appearance according to which, in conformity with a rule, the apprehension of that which happens follows upon the apprehension of that which precedes. (221 f., A193=B238)

As necessary determination in the appearance is presupposed in the concept of an event, when a particular succession of apprehensions is regarded as constituting the apprehension of an event, it must ipso

facto have been regarded that the succeeding state necessarily follows upon the preceding. Thus, in that which precedes a happening there must lie "the condition of a rule according to which this event invariably and necessarily happens". (222, A193=B239)

In conclusion, we have seen that for Kant the concept of an objective event presupposes the notion of the necessary determination of the temporal order of apprehensions. The conception of an objective time order therefore requires the awareness of a necessary determination, of an irreversibility, about certain successions of apprehension. Such determination implies that in an event the preceding apprehension conditions the succeeding one, or causes it. Thus, the concept of a determinant or cause is a necessary condition for the possibility of conceiving an objective time order and therefore of experience.

Further insight into Kant's views on causation can be had by viewing his argument in comparison with Hume's treatment of the issue. For this we will need to present a brief summary of Hume's account and analyze his general approach and the conclusions to which it leads him.

B. Digression: Hume's Argument on Causality

Hume considers it fruitless, as we saw, to seek for the origin of the idea of causation at the level of perception (see footnote 6 above). It must rather "be deriv'd from some relation among objects; and that

relation we must now endeavour to discover".[7] In "Of Knowledge and Probability" (Book I, Part III of the Treatise), Hume limits his discussion on causation to the "external" or spatial realm. Once this proviso is made, he argues that the two following relations obtain of causally related objects: First, a cause and its effect must be in spatial proximity, or rather, immediacy to one another. Spatial contiguity is therefore essential to the idea of causation. Second, a cause must be temporally prior to its effect. Nevertheless, he recognizes that an "object may be contiguous and prior to another, without being consider'd as its cause"; the idea of a necessary connection between causes and effects, he stresses, "is of much greater importance, than any of the other two above-mention'd".[8] His inquiry into the origin of this idea proceeds in an indirect manner: by posing other "questions, the

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[7] David Hume, op. cit., p. 75. The following analysis of Hume's views on causation are expressed in this text. The differences between it and the arguments presented by Hume later in the Inquiry, that are relevant to our discussion will be brought up as they arise.

We are concentrating on the account given in the Treatise because of its more comprehensive and systematically organized character. Although it is believed that Kant was only familiar with the teaching contained in the Inquiry, and only with excerpts from the Treatise quoted by Beattie (in his Essay on the Nature and Immutability of Truth), there is still evidence which militates against this view. * By proceeding in the above-mentioned way we can circumvent this controversy.

(*See, for example, L. W. Beck's "A Prussian Hume and a Scottish Kant", n. 20.)

[8] Ibid., p. 77.

examination of which will perhaps afford a hint, that may serve to clear up the present difficulty".[9]

Hume's first question is basically: Why is it that 'whatever begins to exist must have a cause of existence' is regarded as necessarily true in philosophy, and as requiring no proof of its truth?[10] He holds that in so regarding this proposition, philosophers are mistaken. The argument supporting this criticism relies to a large extent on his previously formulated classification of the only seven ways in which ideas may be meaningfully connected in propositions.[11] In that analysis, he concluded that necessity or certainty is yielded by four of the seven "philosophical relations" - those which connect ideas about proportions in quantity, degrees in quality, resemblance and contrariety. In the Inquiry he entitles all necessary connections of ideas the "Relations of

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[9] Ibid., p. 78.

[10] Hume is very likely referring to John Locke in particular, who held that:

> ... "everything that has a beginning must have a cause" is a true principle of reason or a proposition certainly true; which we come to know by ... contemplating our ideas and perceiving that the idea of beginning to be is necessarily connected with the idea of some operation; and the idea of operation with the idea of something operating which we call a cause. And so the beginning to be is perceived to agree with the idea of a cause ...

J. Locke, First Letter to Bishop Stillingfleet (1697), in: Problems in Philosophical Inquiry, ed. by J. R. Weinberg and K. E. Yandell (U.S.A.: Holt, Reinhart & Winston Inc.), p. 163.

[11] See Hume's Treatise, Book I, Part III, Sec. 1 (pp. 69-73).

Ideas" proper, as the claims to knowledge furnished by such connections are verifiable by reason's contemplation of the ideas alone, quite independently of empirical considerations.[12] The three remaining kinds of propositions, where the ideas connected have to do with identity, spatio-temporal contiguity and causation, all yield merely

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[12]See Hume's An Inquiry Concerning Human Understanding, ed. by Charles W. Hendel (Indianapolis: Library of Liberal Arts, Bobbs-Merrill Co. Inc., 1955), p. 40 (Sec. IV).

In the Inquiry Hume altogether omits the exhaustive breakdown of philosophical relations into these seven types. Furthermore, in at least one instance he explicitly suggests that one of these is not a valid relation; in a footnote he says:

> ... Contrast or Contrariety is also a connection among ideas, but it may perhaps be considered as a mixture of Causation and Resemblance. Where two objects are contrary, the one destroys the other; that is, the cause of its annihilation, and the idea of the annihilation of the object, implies the idea of its former existence. (Inquiry, p. 32. Emphasis omitted.)

While he does divide Matter-of-Fact reasonings into three (see next footnote), he finds it sufficient to assert, about the Relations of Ideas, that they are contained in the mathematics and that their truth is "discoverable by the mere operation of thought". (Inquiry, p. 40)

As R. P. Wolff points out (Kant's Theory of Mental Activity, p. 26 f.), it is important to avoid equating the Treatise's doctrine of four ways in which ideas can be connected with necessity and Kant's views on analytic judgements:

> The judgement that the early compositions of Mozart sound like (resemble) those of Haydn, for example, would belong to the ... category of relations of ideas, although it would never be called analytic. Hume's criteria are psychological rather than logical, and as they are based on a now-discarded theory of conscious experience, they do not correspond to any modern system of classification. In the Inquiry, a new distinction is introduced ... which comes quite close to the Kantian division of propositions.

contingent truth value as they have to do with matters of fact.[13] If Hume appealed to this purported contingency of the connections of ideas about matters of fact, he would be seriously amiss and, indeed, would not prove that philosophers are mistaken regarding the self-evidence of the principle of causation formulated above. This is so for the simple reason that it is precisely this contingency which he is attempting to establish in the present discussion. Instead, his appeal to the classification of meaningful connections of ideas takes the following form: Hume argues that none of the four relations of ideas which yield certainty are implied in the proposition that every beginning of existence must have a cause; therefore it cannot be verified with necessity, by a mere contemplation of the ideas it contains.

Some necessary propositions may not evince certainty intuitively, according to Hume; their necessity needs to be exhibited by a demonstration, or by deduction. In order clearly to establish that the principle in question could not be shown to be necessary even in this covert way, he offers the following argument: It is easy to conceive an object

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[13]These three philosophical relations of ideas are fittingly labelled as comprising all reasonings about "Matters of Fact" in the Inquiry, as distinct from the four "Relations of Ideas". (See Inquiry, p. 40) However, in this text, these three relations are said to be "Resemblance, Contiguity in time or place and Cause or Effect". (Inquiry, p. 32) Hume uses the terms "identity" and "resemblance" interchangeably, because of their close interconnection. The criterion which can be used to distinguish the application of either of these terms to Relations of Ideas or to Matters of Fact is that only in the case of the latter will ideas about "external" or empirical objects be connected with others.

as non-existent one moment and existent the next, without thinking of the idea of a productive principle or cause. For Hume (as well as for Locke)[14] all distinct ideas are separable. Therefore, as the idea of a beginning of existence can be conceived independently from the idea of a cause without rendering an absurdity or a contradiction, the principle itself cannot be "refuted by any reasoning from mere ideas".[15] The possibility that the principle can be proven to be necessary is thus discarded. In conclusion: an explanation of philosophy's belief in the necessity of the principle of causality must take recourse beyond the ideas contained in the principle; given Hume's "fork", experience provides the only recourse.

A second and final question is posed by Hume: "Why we conclude that such particular causes must necessarily have such particular effects; and what is the nature of that inference we draw from one to the other, and of the belief we repose in it?"[16]

Hume denies the possibility that the inference from a cause to its effect (or vice-versa) is the product of "a penetration into their essences", as no object:

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[14]A "distinct idea is that wherein the mind perceives a difference from all other" ideas. (J. Locke's Essay Concerning Human Understanding, ed. by A.S. Pringle-Pattison Oxford: Clarendon Press, p. 205.)

[15]Hume's Treatise, p. 80.

[16]Ibid., p. 78.

> ... implies the existence of any other if we consider these objects in themselves, and never look beyond the ideas which we form of them. Such an inference would amount to knowledge, and would imply the absolute contradiction and impossibility of conceiving anything different. [17]

Hence, the idea of heat is evoked by the impression or idea of a flame because of "their constant conjunction in all past instances"; that is, the inference of the idea of heat "is supply'd in conformity to our past experience" and not because it is essentially contained in the impression or idea of a flame. [18] Hence, it can be "by experience only, that we can infer the existence of one object from that of another. [19]

The foregoing discussion, Hume maintains, brings to light another important feature about the issue of causation: while spatio-temporal contiguity is essential to the ascription of a causal relationship between two objects, as important is the awareness that these have been constantly conjoined in the past - that they have been "preserv'd in several instances". [20] That is, the exposure to this repetition of or constant conjunction between two particular objects in similar relations of contiguity and succession ingrains an expectation of the repetition of that pattern, such that the perception of one will induce the inference of

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[17] Ibid., p. 86 f.

[18] Ibid., p. 87.

[19] Ibid.

[20] Ibid.

the other. On the strength of this view - supplemented by some arguments we need not go into -- Hume concludes that:

> ... the supposition, that the future resembles the past, is not founded on arguments of any kind, but is deriv'd entirely from habit, by which we are determin'd to expect for the future the same train of objects, to which we have been accustom'd. [21]

Thus, it is not by means of any probable or necessary reasonings that causal inferences are made. The transition from a present impression or idea to its usual attendant must be effected by an association of the imagination: it "must be a resemblance betwixt those objects, of which we have had experience, and those which lie beyond the reach of our discovery" which is at the basis of causal inferences. [22] Therefore, ideas about experience are said to acquire a habit-formed union in the imagination due to the constant conjunction of certain events. This union is so strong, according to Hume, that the awareness of the impression or idea of an object resembling one of them will evoke the idea of the other "before we have time for reflexion" and "without a moment's delay", such that it would "scarce be possible for the mind, by its utmost efforts, to prevent that transition". [23] This experientially-induced habitual association of ideas in the imagination "alone determines the

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[21] Ibid., p. 134. Emphasis removed.

[22] Ibid., p. 92.

[23] Ibid., pp. 104, 93 and 93, respectively.

mind in all instances to suppose the future conformable to the past. However easy this step may seem, reason would never, to all eternity, be able to make it". [24]

This, however, does not help Hume resolve one of the main difficulties concerning causal inferences, viz.: why is the imagination's impulse, in the production of such inferences, to treat habit as if it were "full and perfect"? [25] After rejecting the possibility that the idea of a necessary connection between specific causally-related events is the copy of an external impression, Hume proceeds to seek for an "internal" impression, or an impression of reflection, of which the idea could be a copy. As he feels he has shown that it is the resemblance of instances which is "the first source of our idea of power or necessity", he contends that it must be "the observation of this resemblance which produces a new impression in the mind". [26] But the only effect of this resemblance, he maintains, is that "we immediately feel a determination of the mind to pass from one object to its usual attendant, and to conceive it in a stronger light upon account of that relation". [27] As this

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[24] D. Hume, "An Abstract of A Treatise of Human Nature", in An Inquiry Concerning Human Understanding (Indianapolis: Library of Liberal Arts, Bobbs-Merrill Co. Inc., 1955), p. 189.

[25] See Hume's Treatise, p. 134.

[26] Ibid., pp. 163 and 165, respectively. Emphasis removed.

[27] Ibid., p. 165.

determination is the sole internal impression relevant "to the present business", Hume concludes that it must be the essence of necessity".[28] Therefore, just as the necessity obtaining in reasonings about necessary relations of ideas "lies only in the act of the understanding" for Hume, the idea of an object having the power to produce another - or in other words, the idea that specific causes and their effects are bound with necessity - is an impression of the mind which is merely "internally felt by the soul, and not perceiv'd externally in bodies".[29] Necessity in the sphere of experience is therefore "nothing but that determination of the thought to pass from causes, according to their experienc'd union".[30]

C. Kant's 'Response' to Hume

Kant sums up Hume's analysis in the Critique as follows:

> The accepted view is that only through the perception and comparison of events repeated by following in a uniform manner upon preceding appearances are we enabled to discover a rule according to which certain events always follow upon certain appearances, and that this is the way in which we are first led to

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[28] Ibid.

[29] Ibid., p. 166.

[30] Ibid. It is important to note that Hume is not asserting an identity between the idea of necessary connection and this propensity of the mind, but rather that the latter is the internal impression from which the idea of necessity is copied.

> construct for ourselves the concept of cause. (223, A195f. =B240f. )[31]

Kant agrees with the former of these contentions though not with the latter, as L. W. Beck maintains.[32] The concept of cause for Kant must be contributed by the understanding as it is a necessary condition for the possibility of the experience of an objective time order, and thereby of experience. It is therefore not derived from "the materials afforded us by the senses and experience"[33] for Kant, but is rather a

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[31]As L. W. Beck points out (in "A Prussian Hume and a Scottish Kant", n. 43), it is strange to find Kant calling Hume's analysis: "The accepted view", as the theories which were expounded by Christian Wolff and Christian August Crusius (an anti-Wolffian) held far more sway with the philosophical community of Kant's day.

[32]See L. W. Beck, op. cit., p. 21.

[33]Hume's Inquiry, p. 27. All ideas for Hume must ultimately have such reference to the empirical realm, including that of a cause. This doctrine holds without exception in Hume's philosophy despite his mention of an instance to the contrary in the Treatise (p. 6). In this particular example, which is repeated almost verbatim in the Inquiry (p. 29), Hume argues that if a subject were presented with an incomplete spectrum of shades of a given colour, even if he had not previously had an impression of the missing shade, the agent would be able to produce it "from his own imagination". Although this seems plausible enough, Hume's theory of imagination actually does not allow for such creativity. In its capacity as creator of whimsical fantasies, the imagination is limited to altering the form and order of ideas gathered from experience. The content or substance of a distinct idea can therefore not be supplied by the imagination qua creator. Qua associator of ideas, the faculty of imagination is again unable to account for the production of the missing shade, as associations can only occur in conformity with previous experience.

In sum, given the limits of the functions Hume ascribes to the faculty of imagination, there is no exception possible to his doctrine that all ideas must ultimately have an experiential referent.

precondition of experience which must be supplied by the understanding. Nevertheless, Kant is in agreement with the first part of the above quotation - that is, with Hume's conclusions about specific causal connections:

> ... even though the understanding is itself the source of the laws of nature, and so of its formal unity ... empirical laws, as such, can never derive their origin from pure understanding. That is as little possible as to understand completely the inexhaustible multiplicity of appearances merely by reference to the pure form of sensible intuition. (148, A127)

Elsewhere, he also says:

> Pure understanding is not ... in a position, through mere categories, to prescribe to appearances any a priori laws other than those which are involved in a nature in general, that is, in the conformity to law of all appearances in space and time. Special laws, as concerning those appearances which are empirically determined, cannot in their specific character be derived from the categories, although they are one and all subject to them. (173, B165)

Kant is therefore in agreement with Hume's view that even though we assume that (the Biblical) Adam had fully developed rational faculties, the absence of a stock of previous experience would make us realize that he "could not have inferred from the fluidity and transparency of water that it would suffocate him, or from the light and warmth of fire that it would consume him".[34] Kant, of course fundamentally disagrees with Hume's very approach. He would argue that certain fundamental principles of experience - like those of substance and causation - must

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[34]Hume's Inquiry, p. 42.

already be in operation in order for Adam to be conscious of things (like water or fire). Setting this aside, however, he might modify Hume's example as follows: if Adam had suffered such mishaps, and had lived long enough to recount them, he would seek the reason for his trials in the events that transpired and would be rationally justified in supposing that something in these events can account for his pains.[35] Put differently, Kant would agree that Adam would be unable to arrive at the concept of 'drowning' or 'suffocating' from examining the concept of water; yet he would say that Adam has the rational equipment which would enable him to regard the sequence of states leading up to drowning as irreversible and hence, as being rule-governed. The recognition that this series of mental states was determined objectively would entail the realization that the drowning - the succeeding state - was necessarily related to (caused by) being submerged in water - the preceding state.[36]

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[35]Hume would argue that, as Adam hasn't acquired the habit of associating perceptions (which can be acquired only after experiencing a multiplicity of resembling instances), he would not seek to account for his pains by an examination of the impressions which are spatially contiguous and temporally prior to them. Moreover, even if he had acquired such habits, Adam could never be rationally justified in attributing a set of impressions as the cause of his pains.

[36]This simplifies matters in a way that could mislead. It should therefore be made clear that Adam could very well apply the logic properly and yet misinterpret the empirical data in the following way: after almost drowning, he may ponder the sequence of states in the event and realize that the latter states were caused by the former. However,

To conclude on Kant's views on causation, we have seen that he maintains that "Empirical laws can exist and be discovered only through experience" (237, A216=B263) though they are not derived from experience:

> Although we learn many laws through experience, they are only special determinations of still higher laws, and the highest of these, under which the others all stand, issue a priori from the understanding itself. (147f., A126)

The analysis of Kant's argument for the validity of the principle of causation offered above is open to two valid objections: First, that it does not cover the bulk of the text of the "Second Analogy". Second, that it omits Kant's account of how the law of causation issues a priori from the understanding.[37] Though these objections are, as stated, valid only from the point of view which seeks a full analysis of Kant's

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(footnote 36 continued).....
he may conclude that he ought never to wash his hair again, as that was what almost made him drown, and not the fact that he choked in the tub of water. Kant will allow for such mistakes in the quest for causal explanations of specific events; all he regards as beyond doubt is the logic of these mental operations.

[37]Such an account is essentially given by Kant in the "Transcendental Deduction", where he argues for the question of right or justification of the employment of the categories of the understanding. This 'quid juris', as he calls it, is sharply opposed to the 'quid facti', or the issue concerning the fact that these categories are employed in experience and how they are so employed. (See 120, A84=B116) While both questions require proofs - of the transcendental kind - the quid juris stands in need of a 'deduction' from a higher principle, while the quid facti must establish how they are employed by recurring to illustrations in a possible experience. (See 126f., A94=B126f.) We have just seen an exemplification of the latter kind of proof.

account of causation. That analysis, however, was not our purpose. The main purpose of the foregoing discussion was rather to present a specific transcendental proof 'in action', as it were, in order that we may abstract from it some insight about its structure.

## III. Transcendental Proofs and Possible Experience

In this section we intend to discuss some of the key elements in Kant's transcendental method of proof and draw some conclusions that will be relevant to our study. Thus, we do not aim to offer definitive views on every aspect of the proof method, but rather to concentrate on the issues which will ultimately determine Kemp Smith's assessment of the matter.

We have already seen that for Kant only judgements yield knowledge. Moreover, that there are three kinds of judgements for him: analytic (a priori), synthetic a posteriori and synthetic a priori. According to D. P. Dryer, "the problem of the Critique of Pure Reason is to discover how the truth of synthetic a priori judgements can be made out".[38] Kant is thus not particularly interested in analytic or empirical claims to knowledge; his main concern is with metaphysical judgements, which are all synthetic judgements a priori. However, Kant is interested in judgements generally; principally in terms of their verifiability.

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[38] D. P. Dryer, "The Aim of the Critique of Pure Reason", p. 309.

He holds that judgements can yield knowledge only if "there is a basis by which to make out that it is true" or false.[39] Thus, all judgements that can yield knowledge must have a ground or reason in terms of which it can be verified. This principle is analytically true for Kant: merely "by reflecting what we mean by knowledge we realize that no judgement can yield knowledge unless it is true and there is a ground whereby to make out that it is true".[40] When this principle is applied to each of the classes of judgement Kant allows for, as we saw previously, a problem arises merely in terms of one kind of judgement: the synthetic judgement a priori. The ground of all empirical judgements is the observation of experience; by recurring to experience empirical judgements can be verified. The ground of all analytic judgements is the meaning of concepts; they are verified by analyzing the concepts they contain.

The principle that every event presupposes a cause is an instance of a synthetic judgement a priori of immanent metaphysics, or the metaphysics of experience. Given the above, neither taking recourse in empirical observation nor the mere analysis of the concepts contained in the principle can serve as a means of its verification.

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[39] D. P. Dryer, Kant's Solution for Verification in Metaphysics, (Toronto: University of Toronto Press, 1966), p. 96.

[40] Ibid., p. 97. See also n. 6 therein.

Put differently, this and all other such judgements must have a ground which is different to the two mentioned above if they are to rank as genuine knowledge. The verification of metaphysical judgements must take recourse in a third ground or medium, and this third thing is possible experience.[41] Concomitant with this different medium is a different means of procedure for verification of metaphysical claims, namely, the transcendental method of proof. As this method of proof is so related to the notion of possible experience for Kant, our study should turn to an analysis of what Kant means by this term and of just how it can serve as the ground for metaphysical judgements about experience. We have chosen Kant's Prolegomena to any Future Metaphysics as the most convenient starting point in our analysis of this notion.[42]

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[41] See esp. Kant's Critique, p. 238 (A217=B264 and p. 610 (A766=B794).

[42] The manner of exposition of the philosophical issues which concern Kant is substantially different in this work from that which we find in the Critique. The Prolegomena again indicates that the principal issue for philosophy is the inquiry into the very feasibility of metaphysics. This issue resolves itself, as previously mentioned, into the general problem expressed in the question: "How are Synthetic Propositions a priori possible?" (Prolegomena, p. 280) The overall problem is therefore to establish how such judgements are yielded by reason, rather than whether or not they actually are. The "Second Preface" of the Critique, as we saw in the previous chapter, puts forth the view that such judgements are yielded by reason in the disciplines of mathematics, natural science and metaphysics; furthermore, that only the last of these stands in need of being put on the secure path of a science. To return to the matter of the exposition in the Prolegomena, here we find these three disciplines treated separately. The problem of transcendental philosophy is subdivided into three parts: "How is Pure Mathematics Possible?" (p. 284), "How

Kant defines 'nature', specifically with reference to the objects which can be concretely presented to the understanding, as "the complex of all the objects of experience".[43] As this definition excludes any "hyperphysical" entity which cannot be presented in experience, immanent philosophy is thereby concerned merely with cognitions about nature regarded as a complex of existents "the actuality of which can be confirmed by experience".[44] Now Kant maintains that we are in possession of a body of knowledge about nature which is a priori and which contains universal laws of nature. Therefore, by virtue of

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(footnote 42 continued).....
is the Science of Nature Possible?" (p. 296) and "How is Metaphysics in General Possible?" (p. 325) The first part of the problem therefore would correspond to the "Transcendental Aesthetic" of the Critique, the second to the "Transcendental Analytic" and the third to the "Transcendental Dialectic". The second subsection - i. e. concerning the possibility of a pure science of nature - deals exclusively with immanent metaphysics. One of Kant's more sustained elaborations on the motion of "possible experience" is included in this subsection. For this reason we have chosen the Prolegomena as the most convenient starting point in our analysis of this notion.

[43]Kant's Prolegomena, p. 297. See also Critique, p. 404 (A437=B465), where Kant says that "by the world of sense we must mean the sum of all possible experiences".

[44]Prolegomena, p. 298. This definition is more limited than the understanding of "nature" as "the existence of things, so far as it is determined according to universal laws" (Ibid., p. 296), in that it is formulated specifically in terms of the relationship between 'nature' and the cognitive faculties - rather than generally with respect to 'things'. This more limited definition therefore takes account of the range of concepts which can be concretely furnished by experience, to the exclusion of "hyperphysical" notions, which are not experientially supplied. Cf. Critique, p. 259 (A238=B298).

the necessity and universality of these laws, cognition about nature "is possible a priori and precedes all experience".[45] Although such cognitions are limited to confirmation by experience, the fact that they have a validity which goes beyond what experience is able to confirm raises the problem of determining how a body of cognitions about nature which has a priori validity can be at all possible. Kant decides that:

> ... it is better to arrange the problem thus: How can we cognize a priori that things as objects of experience necessarily conform to law? or thus: How is is possible to cognize a priori the necessary conformity to law of experience itself as regards all its objects generally?[46]

The reformulation affected by these two questions - which amount to a single new approach to the problem for Kant - indicates the lines along which the inquiry must be conducted: The inquiry into the possibility of cognitions about nature must "be concerned with experience only, and [with] the universal conditions of its possibility which are given a priori".[47] The inquiry will also determine "how the conditions a priori of the possibility of experience are at the same time the sources from which all the universal laws of nature must be derived".[48] Thus,

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[45] Ibid., p. 298.

[46] Kant's Prolegomena, p. 298.

[47] Ibid., p. 299.

[48] Ibid.

Kant argues that a solution to the problem presented by the a priori science of nature - or, for that matter, by any cognition about nature which has a priori validity - can only be sought by inquiring, not into experience, but into the universal conditions of the possibility of experience. That is, as experience itself can be of no aid in the solution of this problem, a solution can only be had by an examination of the processes which go to make it (experience) up. The laws which lie in experience, according to Kant, can be accounted for only by the scrutiny of that which makes experience possible in the first place.

The notion of possible experience, we should point out without ado, relates not to logical possibility but to an existential or real possibility that is concomitant with Kant's transcendental method. When Kant says that at the basis of a "transcendental philosophy is the division into the possible and the impossible",[49] he is not referring to possibility in terms of the logic that he has called "General" and which he attributes to Aristotelians. Nor is he referring to judgements that are verifiable "logically" in the conventional sense; that is, this mentioned division does not refer to the establishment of criteria delimiting the scope of analytic judgements a priori. Transcendental philosophy must effect a division between what is possible in experience and that which

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[49]Kant's Critique, p. 294 (A290=B346).

cannot be had in experience. A single example[50] will suffice to illustrate the point: There is no logical contradiction in the concept of a two-dimensional geometrical figure enclosed within two straight lines, since the concepts subsumed in it - i. e. the concepts of two straight lines and of their coming together - do not negate the concept of a figure. However, there is a real impossibility about such a concept insofar as it cannot be constructed in two-dimensional space. Transcendental philosophy thereby relegates such a concept to the realm of the experientially impossible, and this by virtue of the fact that it conflicts with "the conditions of space and of its determination". (240, A221= B268) The concept of a two-dimensional figure bounded by two straight lines cannot be included in the realm of possible figures in Euclidean geometry, and must therefore be excluded from the realm of things which can possible appear in experience.[51] The notion of possible experience therefore refers to the real possibility of objective (empirical) cognitions.[52] Although it should not be associated with logic in the

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[50]Taken from Critique, p. 240 (A220f. =B268).

[51]See, for instance, the Prolegomena, p. 294 where Kant says:
> ... all the propositions of geometry hold good of space as well as of all the objects of the senses, consequently of all possible experience ...

The problem arising from Kant's view of space as Euclidean is not germane to this discussion.

[52]Kant equates "experience" with "empirical cognition". See Critique, p. 208 (A177=B218): "Experience is an empirical knowledge, that is, a knowledge which determines an object through perceptions".

senses just described, there are two ways in which possible experience and logic are related for Kant: First, the principle of contradiction is a necessary condition of the truth of synthetic cognitions (though it is an insufficient condition for determining such truth);[53] by this, Kant means simply that all true synthetic judgements must abide by this principle. Second, as was suggested in the previous paragraph, possible experience is inextricably bound up with Kant's conception of transcendental logic. It is this relation which we must try to explicate.

There is no great difficulty in keeping apart the ground of all analytic judgements (the relation of the concepts expressed in them) from the ground of all synthetic judgements a priori (the relation of the concepts expressed in them to possible experience). However, the contrast between the ground of the latter and the ground of empirical judgements (the relation of the concepts expressed in them to experience) is a matter of greater complexity. The feature which is essential to the establishment of this contrast is Kant's contention that the ground of all synthetic judgements a priori, i.e. possible experience, has to do not with particular phenomenal objects, but rather with phenomenal objects in general.[54] Put differently, synthetic judgements

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[53] See Critique, p. 190 (A151f. =B191) and p. 240 (A220=B268).

[54] See, for example, Ibid., p. 294 (A290=B346).

a posteriori are verified by mere observation, that is, by checking their agreement with objects of experience, while synthetic judgements a priori are verified by the transcendental method, that is, by checking that the concepts of things expressed in them "agree with the formal conditions of an experience in general". (239, A220=B267) Thus:

> We cannot therefore study the nature of things a priori otherwise than by investigating the conditions of the universal (though subjective) laws, under which alone such a cognition as experience (as to mere form) is possible, and we determine accordingly the possibility of things, as objective of experience.[55]

The inquiry into the formal conditions of experience in general therefore will result in the establishment of criteria which must be fulfilled if an empirical cognition is to rank as being objective.

Kant points out in the Prolegomena that, while all judgements of experience are empirical, not all empirical judgements are judgements of experience, in the sense of being objectively valid. Only objectively valid judgements are regarded as being judgements of experience, while those which have merely subjective validity are entitled judgements of perception.[56] These last are merely subjectively valid in that they contain "no pure concept of the understanding, but only the logical connexion of perception in a thinking subject".[57] For instance,

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[55]Kant's Prolegomena, p. 299.

[56]See Prolegomena, p. 299.

[57]Ibid.

"When the sun shines on the stone, it grows warm" and "If I support a body, I feel an impression of weight" are judgements of perception because the concepts are referred to each other in virtue of the subject's association of feelings or perceptions. On the other hand, judgements like "The sun warms the stone" and "The body is heavy" are judgements of experience because a concept of the understanding has been added to the perceptions associated in the judgement. Reference to an object has thereby been made, beyond the level of mere perceptions. Such reference implies that the subject regards the judgement to be valid objectively; that is, that under the same circumstances the same perceptions will necessarily be connected by any other subject.

This analysis of an experience in general, i. e. of the form of any empirical judgement shows, for Kant, that the logical connection of perceptions must be subsumed under a pure concept of the understanding. Thus, empirical cognitions can be objectively valid only if this formal condition is fulfilled. In other words, objective judgements about the empirical realm are possible only if the concepts are connected with necessity and universality. However, this is not to say that synthetic judgements a posteriori are necessary, but rather that the manner of the connection of their concepts must be effected "according to principles of the objective determination of all representation".[58]

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[58]Further detail in this explanation of the necessary features involved in empirical cognitions for Kant would, I believe, take us too far afield from our topic and into some very complex matters worked out in the "Transcendental Deductions". In lieu of such detail I refer the reader to the passages where this discussion takes place: In the Prolegomena

(159, B142) Kant holds that all judgements "are at first merely judgements of perception; they hold good only for us (i. e. for our subject), and we do not till afterwards give them a new reference (to an object)", and this is done by subsuming the given intuition under a concept.[59] This subsumption "determines the form of judging in general relatively to the intuition, connects its empirical consciousness in consciousness generally, and thereby procures universal validity for empirical judgements".[60] Such a concept, he holds, can only be a pure concept of the understanding. Only by subsuming judgements of perception under any such concept is empirical knowledge, that is, experience, possible. This subsumption is therefore a necessary condition of the possibility of objectively valid cognitions about experience. As indicated by the previous quotation, however, the entire process which culminates in the objectively valid cognition about experience involves three stages; namely, that which has to do with intuition or perception, with the association of intuitions and with their necessary ascription to an object. Subsumption under a category therefore presupposes that an empirical manifold be immediately presented in intuition and connected by an act of synthesis of the empirical imagination. These are therefore the conditions of all possible experience. Nonetheless, Kant maintains that as

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(footnote 58 continued) . . . . .
pp. 300-306 especially. In the Critique, as stated, the Deductions generally, and paragraph 19 (158f., B 140-2) in particular.

[59] Prolegomena, p. 300.

[60] Ibid., p. 302.

ranscendental logic contains nothing but the pure fundamental concepts of all possible experience, there is "absolutely nothing" empirical about it. (205, A171=B213) Although, in contradistinction to general logic, transcendental logic is concerned with the material of objective knowledge, it will be remembered that it is concerned only with "the rules of pure thought of an object" (95, A55=B80) Thus, even though perception is an integral part of the issue of the conditions of the possibility of experience, no a posteriori features of perception are relevant to this inquiry. We have seen Kant identify the search for the conditions of the possibility of experience with the possibility (of the valid concept) of an object in general. Now, because intuitions are an intrinsic component of any empirical cognition,[61] Kant holds that intuitions in general are also a central concern in this inquiry; thus, "intuitions in general ... constitute the field, the whole object, of possible experience" (129, A95) This, in effect, is merely another way of saying that transcendental logic concerns itself with the material of knowledge.

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[61]See Kant's Critique, p. 93 (A51=B75).

# CHAPTER 4

## CONCLUSIONS: TRANSCENDENTAL PHILOSOPHY AND THE HYPOTHETICO-EXPERIMENTAL METHOD

### I. Preliminary

Norman Kemp Smith does not use the term 'hypothesis' in his Commentary in a manner that diverges with Kant's conception of the term: no indication is given that there is any difference between how he and how Kant understand the term. We must therefore assume that Kemp Smith's understanding of the notion is none other than what he takes Kant to mean by the term 'hypothesis'. Furthermore, Kemp Smith seems well aware that Kant's avowed intention is to emulate the success of the natural sciences.[1] Consequently, Kemp Smith would have it that the general identification he sees as obtaining between the hypothetical and the transcendental methods is either a deliberate or an inadvertent function of the programme Kant sets for himself. In other words, Smith must believe either that Kant deliberately intended the transcendental method to be roughly the same as the hypothetical

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[1] See esp. Smith's Commentary, p. 19, where he maintains that "the 'Copernican hypothesis', so far from destroying positive science, is, he [Kant] claims, merely a philosophical extension of the method which it has long been practicing".

method, or else that both proof methods are, in the final analysis, and contrary to Kant's intention, 'generally identical'. This is the first basic problem regarding Kemp Smith's argument that needs to be settled.

The settlement of this issue is a matter of no great difficulty. In the text of the Critique, Kant is quite unambiguous about the inadequacy of hypothetical proofs for philosophical matters. First of all, hypotheses, in his view, are unable to yield the certainty which is required in philosophy. This view is emphasized in the "Second Preface", where, as we saw, Kant first puts forth his claims about the scientific model that philosophy must emulate:

> The change in point of view, analogous to this [Copernican] hypothesis, which is expounded in the Critique, I put forward in this preface as an hypothesis only, in order to draw attention to the character of these first attempts at such a change, which are always hypothetical. But in the Critique itself it will be proved, apodeictically not hypothetically, from the nature of our representations of space and time and from the elementary concepts of the understanding. (25, B xxii n.)

In other words, even though the solution of philosophical problems that Kant proposes has the resemblance of a mere likelihood in the "Second Preface", he contends that in the body of the Critique itself it will be shown to be the absolutely certain - or distinct from a hypothetical - solution to these problems.

In the "Transcendental Doctrine of Method" further evidence is given, albeit indirectly, about Kant's view of the inadequacy of

hypothetical proofs for the realm of philosophy. In Chapter 1, section 3 of this second division of the Critique - "The Discipline of Pure Reason in Regard to Hypotheses" - Kant defines hypotheses as inventive suppositions formulated by the imagination. A supposition will have the status of a hypothesis only on the condition that it be based on:

> ... something that is completely certain, and not invented or merely a matter of opinion, namely, the possibility of the object itself. Once that is established, it is then permissible to have recourse to opinion in regard to its actuality; but this opinion, if it is not to be groundless, must be brought into connection with what is actually given and so far certain, as serving to account for what is thus given. Then, and only then, can the supposition be entitled an hypothesis. (613, A770=B798)

Hence, a hypothesis is a likelihood about things formulated by the understanding which requires as its condition that such things can be possible in the first place; only upon the establishment of such possibility can we properly begin to imagine hypotheses or likelihoods about things. As Kant says in a germane context, if his proofs were hypothetical in character, he "would appear to be taking the liberty simply of expressing an opinion, in which case the reader would be free to express a different opinion". (12, A xvii) The possibility of the pertinent object in any adequately formulated hypothesis must have been taken into consideration prior to its inception for Kant. Put very simply, the sound enunciation of any likelihood requires that it be grounded in what is possible. Transcendental philosophy cannot make use of the ground of the hypothetical method of the natural sciences, experience,

precisely because its concern is with its possibility.[2]

In sum, there are two main reasons given by Kant in support of his view that any hypothetical proof should "be treated as contraband" (11, A xv) in philosophical matters: they do not furnish the certainty which is indispensable to philosophy and they presuppose the conditions of things which transcendental philosophy seeks to establish. Therefore, we must understand these important features as qualifications of Kant's proclamation that philosophy learns from the example offered by the natural sciences. The object of study for the natural sciences is empirical, while the object for philosophy is transcendental. In this respect, their ontologies differ. Secondly, the method of the natural sciences, which is essentially hypothetical and thereby leads to contingent results, falls short of philosophy's need for a method that yields certainty. In this respect, the methodologies of natural science and philosophy must differ. We must therefore conclude that Kant does not contend that the philosophical method and that employed in the natural sciences are 'generally identical' in character. Later on in this section we shall see that Kamp Smith is aware of this, and that his view is formulated in purported accordance with Kant's modus operandi, though in opposition to his avowed intentions. We shall also assess Kemp

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2"... transcendental logic ... concerns itself with the laws of understanding and of reason solely in so far as they relate a priori to objects." (96f., A57=B81-82)

Smith's view in the light of our interpretation of what Kant is doing in the Critique. For the moment, however, it is necessary to qualify the insights gathered above by probing more deeply into Kant's conception of the example that the hypothetical method offers for philosophy.

The passages of the "Second Preface" which were reconstructed in Chapter 2 showed that the hypothetical method employed in natural science offers the philosopher an example after which he can set his discipline on the secure path of a science. However, as we just saw, it cannot be taken over wholesale by the philosopher and applied to the issues which concern him; rather, he must adapt it to the requirements of philosophy. As it is axiomatic for Kant that philosophy requires certainty, the philosopher must modify or altogether transform the hypothetical method in order that it fulfill this need.[3] Consequently, it cannot be with respect to the validity of its proofs that the method of natural science will be emulated by philosophy. The problem, then, is to identify the features in virtue of which Kant thinks that the analogy obtains. In the "Second Preface" itself Kant tells us the sense in which philosophy can emulate the method employed in natural science:

> This i. e., [the philosophical] method, modelled on that of the student of nature, consists in looking for the elements of pure reason in what admits of confirmation or refutation by experiment.[4]

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[3]Kant's views on certainty in philosophy will be discussed briefly later on in this chapter.

[4]Kant's Critique, p. 23 (B xviii) n. Emphasis removed.

Philosophy therefore follows the lead of natural science in two fundamental respects: in terms of cognitive elements and in terms of experimentation. We shall now discuss how philosophy is said to emulate natural science with respect to these two features. Due to its relative simplicity, we shall first deal with experimentation.

## II. Experimentation

In the light of the foregoing discussion about the proper ground of any proof, we may interpret the above quotation as follows: The experimental appeal is common to both the natural scientist's and the philosopher's proof method for Kant, even though the latter cannot appeal directly to experience.

Kant obviously does not maintain that all philosophers prior to his Critique had not bothered to scrutinize their own contentions by means of some test which confirms them and which could have shown them wrong. Rather, he maintains that these philosophers were amiss in seeking to confirm or refute philosophical principles by the use of means which could not adequately test them. Thus, in his view, the 'skeptics' floundered by putting metaphysical principles to the test in experience, while the 'dogmatists' unsuccessfully attempted to provide metaphysical principles "from concepts alone" and "without previous criticism of its reason's own powers".[5] Natural scientists, on the

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[5] Ibid., p. 32 (B xxxv). Emphasis removed.

other hand, seem to succeed in their aim of attaining universally-accepted knowledge about the objects of their inquiry. This, Kant suggests, is a function of the fact that they have reached a concensus about the proper means to test their hypotheses. These are soon refuted or confirmed by the proof-method of experiment in nature: by "constraining nature to give answer to questions of reason's own determining", in the manner Kant traces back to Bacon.[6] The problem for philosophy is therefore to find the proper testing-ground for metaphysical assertions; that is, a testing-ground that will be able to determine the truth or falsity of its assertions. This problem is purportedly solved by Kant's discovery of the "third medium" - possible experience - the ground where the propositions of metaphysics may be properly confirmed or refuted. Thus, we interpret Kant's emphasis on the notion of experiment to resolve itself mainly as an expression of philosophy's need to have a means of testing its claims successfully, just as science has its successful means in natural experimentation. In other words, the realm of possible experience is, for Kant, the proper ground wherein the philosopher must conduct the tests that will validate philosophical principles and is analogous to the field of observeable experience, which has served as the ground for the validation of the theories of post-Baconian natural scientists. As in the natural sciences, so in

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[6] Ibid., p. 20 (B xiii). The emphasis is mine.

transcendental philosophy such experiments may yield positive or negative results, that is, confirmation of principles or their refutation. A case in point for each is presented in the "Second Analogy". The passage of the Critique reconstructed in the last chapter, which we regard as the essential proof of the principle of causation offered by Kant, can be taken as a paradigm case of the confirmation of a principle by way of experimentation in possible experience. Immediately following that argument in the text of the Critique,[7] Kant presents a brief refutation of a principle that runs contrary to the principle of causation. He argues that no objective time-relations could be determined if the principle that an event can occur which follows an empty state according to a rule were true. Therefore, this principle must be false. Appeal has again been made to possible experience as an experiment to test the validity of this supposition. The experiment fails when so tested, yielding an instance of a transcendental disproof, or refutation, of a philosophical principle.

## III. The Cognitive Elements: Hypotheses and Reason

### A. Reason as Object

Having interpreted Kant's understanding of the analogy to be made between the scientific and the philosophical method regarding the

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[7]See two paragraphs, beginning at "Let us suppose ...", Critique, p. 222 (A194=B239).

notion of experiment, we may now turn to the comparatively more difficult matter of interpreting the analogy with respect to the features which undergo said experimentation. In the natural sciences such 'features' are, of course, the hypotheses we have been discussing; in philosophy, these are loosely labelled by Kant as "the elements of pure reason". (23, B xviii n.) As the concern of this study is with the critique of the immanent employment of reason, we may regard these elements as ultimately consisting in the categories and the pure forms of sensibility. The problem is therefore to interpret the sense in which Kant sees an analogy obtaining between scientific hypotheses and the pure concepts of the understanding and the pure forms of sensibility in philosophy.

The theoretical formulations of any natural scientist are regarded by Kant as in some sense analogous with the mentioned a priori elements of reason. However, as T. B. Humphrey points out,[8] there is also a marked disanalogy between the two. The rational functions studied by the philosopher differ from the natural scientist's (and the mathematician's) hypotheses in that the knower stands in a passive relationship with respect to the former, though in an active relationship regarding the latter. Thus, the philosophical inquirer seeks out and, if successful, is presented with the mentioned elements of pure reason -

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[8]T. B. Humphrey, "Kant's 'Copernican Revolution' and the certainty of geometrical knowledge", op. cit.

the categories and space and time - and the principles which ensue from them. That is, aside from the issue of justification, the philosopher's task for Kant is ultimately to tabulate systematically the elements of pure reason with which he is confronted in conducting his inquiry. Not so for the natural scientist: Kant's own understanding of the task of this inquirer precludes him from being passively presented with theories and tabulating them according to a system. The reverse is actually the case. The natural scientist, Kant says with obvious Baconian simile, approaches nature in the character "of an appointed judge who compels the witnesses to answer questions which he has himself formulated". (20, B xiii) This is also the case with respect to the mathematician:

> In mathematical and scientific thought the knower qua thinker is self-motivating in relation to the a priori element ... he actually gives the content to the concept he wants to construct or to the hypothesis he wants to confirm.[9]

In sum, there is an important difference between the thinker's relationship to philosophical concepts and to scientific hypotheses in virtue of their origin: The concepts which pertain to immanent philosophy depend on the conditions of cognition, which Kant agnostically attributes to "a blind but indispensable function of the soul". (112, A78=B103) Hypotheses formulated by natural scientists originate in what T. B. Humphrey

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[9] Ibid., p. 158 f.

calls the scientist's "self-motivating" thinking activity. Therefore, the Kantian analogy is not carried out on this plane.

There is another very important respect in which the mathematics and natural sciences differ from philosophy.[10] This concerns the intention of those disciplines. The mathematician's and the natural scientist's hypotheses are formulated and experimented upon in order to establish if they conform with what is the case in nature. The transcendental philosopher, on the other hand, tests the concepts he believes to be transcendental conditions of cognition or of perception in order to determine if they actually are such conditions. That is, in a manner which is the converse of the aim of the natural scientist and the mathematician, if the philosopher's experiment is successful it will prove that experience must conform with his concept. Hence, the Kantian analogy cannot refer to this aspect of the disciplines in question.

A reference to the characteristic in virtue of which the cognitive elements of philosophy and the natural sciences are analogous is contained in the indented quotation from Humphrey's article above. Both disciplines are akin insofar as the former's "elements of reason" and the latter's hypotheses are both a priori. In Chapter 2 we saw that the student of nature is said to have revolutionized his discipline by realizing:

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[10]This point is also discussed by Humphrey. See Ibid., p. 158.

> ... that reason has insight into that which it produces after a plan of its own ... viz., by showing the way with principles of judgement based upon fixed laws, constraining nature to give answer to questions of reason's own determining. (20, B xiii)

Thus, the natural scientist comes to his object equipped with his hypothesis, which Kant regards as a sine qua non of science. This spontaneously-formulated cognitive element serves as the guide in the inquirer's approach to nature. Hence, the cognitive element, the hypothesis, must be prior to the experimental inquiry itself. Philosophy emulates this model, as we saw, in realizing that the order and regularity of experience are originally imposed by functions of the mind, rather than by being abstracted from the nature of the objects presented to the mind. Hence, Kant regards the proper model of thought about the act of knowing as being "that we can know a priori of things only what we ourselves put into them". (23, B xviii) Just as the natural scientist confronts nature with a preconceived cognitive element, his hypothesis, reason must come to experience with a priori predispositions. The first inkling that this must be the case is presumably a function of the philosopher's awareness that there are synthetic judgements which are a priori in our stock of knowledge - judgements which are about the mathematics and about experience.

B. Reason as Subject

Aside from all the previously mentioned qualifications on this

interpretation of Kant's analogy, there is a problem in accepting it as it stands. So stated, the analogy is carried out strictly in terms of the object of the philosopher's inquiry, namely reason and its role in the complex of experience. That is to say, under this interpretation the analogy is limited to being the formulation of a new understanding of the inquirer's object, reason; so far, then, the manner in which the inquirer approaches his object is in no way altered. This is a problem for the following reason: Assuming that we were correct in isolating a particular change in the inquirer's approach as the essential revolutionizing feature which gave the mathematics and natural studies the rank of sciences, a like change in the inquirer's approach must exist in terms of the philosophical inquirer. As no such change is apparent in the above interpretation of the analogy, we must conclude either that our interpretation is inadequate or that the analogy itself is radically flawed. The Kantian analogy is not flawed, in my estimation, if we interpret it as operating on a level which is additional to the one which we have already constructed. To wit:

The indented quotation above taught us that Kant regards the natural scientist as contributing an a priori element in virtue of his coming to nature already equipped with a spontaneously-formulated cognitive element, his hypothesis. This formulation both serves as the inquirer's general guide in the approach to nature and poses the problem to be resolved by means of experimentation. In the "Introduction"

to the Critique Kant lays out the general problem for philosophy in a strikingly parallel way, which we believe obviates the problem of regarding the above interpretation of the analogy as complete. As he has raised complaints about previous ways of philosophizing, very generally stated his case and defined certain important terms, it is only in the "Introduction" that Kant sets about the task of specifically defining "The General Problem of Pure Reason".[11] Posterity, he maintains, will be better able to judge the success of the task he has set out to accomplish if it is accurately defined, "under the formula of a single problem" ...

> ... the proper problem of pure reason is contained in the question: How are a priori synthetic judgements possible? (55, B19)

The success or failure of metaphysics depends either on finding an answer to this question "or upon a sufficient proof that the possibility which it desires to have explained does in fact not exist at all". (55, B19) Unlike the passages referred to in the "Second Preface", this talk about "pure reason" is unmistakeably about the reflexive or philosophical reason which performs the critique of its object - i. e. of reason and its role in the complex of experience. It is these comments, then,

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[11]This is the title of Section VI of the "Introduction". (55-58, B19-24) This and the preceeding section - on the presence of synthetic judgements a priori as principles in all sciences - are additions to the first edition of the Critique, as was the "Second Preface", where the analogy at issue is first made.

which have to do with the inquirer's approach to his object, and not to the object itself. The defined "general problem of pure reason" is therefore the 'preconceived equipment' - the a priori cognitive element - which is analogous to the natural scientist's hypothesis. The outcome of the study is dependent on the test his object will undergo. That is, it will be determined by the "transcendental critique"[12] to which reason will be subjected in the light of philosophy's central concern - the formulated question. As in natural science, the formulated question will be either furnished with an account or shown to be invalid. Moreover, the above "formula" both poses the specific problem which stands in need of resolution and provides a guide for the inquiry, determining what pertains to it and what falls outside of its sphere.[13]

In sum, we interpret the Kantian analogy between the method of the natural sciences and that of philosophy with respect to their cognitive features, as taking place at two levels. First, in terms of the

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[12]See first quotation in the following note.

[13]This last is carried out in the following section of the "Introduction". For instance, analytic judgements are said to not be pertinent, so: "We have to carry the analysis so far only as is indispensably necessary in order to comprehend, in their whole extent, the principles of a priori synthesis, with which alone we are called upon to deal. It is upon this enquiry, which should be called not a doctrine, but only a transcendental critique, that we are now engaged." (59, A12=B25f.)

Also: "The critique of pure reason therefore will contain all that is essential in transcendental philosophy. While it is the complete idea of transcendental philosophy, it is not equivalent to that latter science; for it carries the analysis only so far as is requisite for the complete examination of knowledge which is a priori and synthetic." (61, A14=B28)

philosopher's object, where the new conception of reason is an extension or extrapolation of the natural scientist's approach to nature with a previously formulated cognitive element. Second, the analogy is carried out in terms of the philosopher as scientific inquirer, who has an affinity with the natural scientist's approach insofar as both are equipped with a specifically formulated project previous to the inquiry itself.

We are now in a position to complete our account of Kant's Copernican analogy. This will also serve to further illustrate the relationship between the two 'levels' on which we argue the analogy with science is being conducted in terms of cognitive features.

The Copernican Weltanschauung broke new ground by proposing that the earth revolves around the sun - thus opposing the geometric cosmological systems prevalent in Copernicus's day. As S. Morris Engel contends, even though this new cosmology "simplified some problems (e. g. the rising and setting of the stars could now be ascribed to the daily rotation of the earth) it gave rise to others".[14] Prominent among these was to find a way to distinguish the notions attributed to planets on the assumption of the earth's immobility from the motions that planets actually make; i. e. with respect to a cosmology which repudiates this assumption and has the viewer himself in motion. As we saw previously, his hypothesized cosmology was confirmed by formulating and testing the

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[14] S. Morris Engel, op. cit., p. 35.

so-called "primary hypothesis". Copernicus realized that in order to find what motions the planets actually make, account would have to be taken of the earth's supposed motion. Thus, he subtracted this motion (viz., the earth's rotatory motion, upon its own axis, and its revolutionary motion, around the sun) from the available stock of data about planetary positions. The results of that test led him to declare:

> ... I have at last discovered that ... not only do their [viz., the planetary] phenomena ensue, but the orders and magnitudes of all stars and spheres, nay the heavens themselves, become so bound together that nothing in any part thereof could be moved from its place without producing confusion of all the other parts of the Universe as a whole ... [15]

Thus, not only was the primary hypothesis proven to be true; it also served to corroborate the larger cosmological hypothesis concerning the Universe as a whole, which has come to be known as the "Copernican Revolution".[16] Kant, for his part, is concerned with establishing how the truth of synthetic judgements a priori can be made out. This is the overall project he sets out for himself in the first Critique. It

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[15] N. Copernicus's De Revolutionibus: "Prefatory Letter", cited in T. Kuhn, op. cit., p. 142.

[16] Hence, if we are to make any sense of the Copernican analogy drawn out by Kant, it is of the utmost importance to realize that he never writes about the "Copernican Revolution" itself, but only about "Copernicus' primary hypothesis". (22, B xvi) This point is made by S. Morris Engel in his previously cited paper (p. 134, n. 19) against a veritable tradition of critics who have misrepresented Kant in this respect.

may be considered as akin to the Copernican Weltanschauung insofar as both represent what their authors proposed as their ultimate aim. Secondly, Kant's view that objects must conform to our intuition and knowledge or, otherwise stated; that the mind contributes elements which are essential to its knowledge, is analogous to Copernicus's primary hypothesis, as its proof would serve to corroborate the overall project.

We may now briefly recapitulate our interpretation of Kant's views regarding philosophy's need "to imitate" the natural scientist's and the mathematician's scientific "procedure, so far as the analogy which, as species of rational knowledge, they bear to metaphysics may permit". (22, B xvi) The scientific method is essentially a hypothetico-experimental method for Kant. The scientist therefore comes to his experimental 'field' equipped with a hypothesis about his object - the mathematician's 'field' being pure intuition, and the natural scientist's, experience. Regarding the experimental feature, Kant maintains that the philosopher must experiment in a medium peculiar to his discipline, namely experience in general, or possible experience. A two-fold analogy is carried out with respect to the scientist's hypothesis, which is to say, regarding the cognitive element which is contributed a priori by the scientist: in terms of the philosopher's object and in terms of the transcendental or reflexive approach of the philosopher qua inquirer. The analogy concerning the latter is quite straightforward, though only implicit in the text of the Critique: in their capacity as scientific inquirers,

mathematicians, natural scientists and philosophers alike must be equipped with a cognitive element which is formulated antecedently to the validation procedure, that is, to the actual experimental investigation. In the case of philosophy, this "question of reason's own determining" is: "How are a priori synthetic judgements possible?"[17] The analogy concerning the philosopher's object is less self-explanatory: The analogy consists in extrapolating the active role of the scientist, who is characterized by his a priori contribution, to Kant's conception of reason. Reason (at least within the confines of the "Second Preface") is 'hypothesized' as playing an active role regarding its knowledge insofar as it is said to contribute a priori elements to all its cognitions.

## IV. Kemp Smith's Case

Having now completed our interpretation of Kant's analogy with science, we are in a position to assess Smith's contentions about the affinities between the transcendental and the hypothetical methods of proof.

In his Commentary, Kemp Smith claims that there is an affinity between the two proof-methods. The foregoing study has shown that this is the case. Kemp Smith's view is confirmed both by the preliminary remarks contained in the Prefaces and "Introduction" and by the

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[17] Critique, p. 20 (B xiii) and p. 55 (B19) respectively.

manner of proof we saw carried out with respect to the principle of causation. Therefore, Kemp Smith's overall claim about an affinity between the two proof methods is correct. However, the foregoing study has also shown that, while there is no problem in accepting this general claim, difficulties do arise when we look more closely at the specifics Kemp Smith appeals to in the statement of his case. Let us briefly recapitulate the three statements that go to make up Kemp Smith's case and deal with each as it arises.

1. Kemp Smith makes two very general claims that are closely linked together: First, that "the transcendental method, rightly understood, does not differ in essential nature from the hypothetical method of the natural sciences" (p. 239); also, the transcendental method "is really identical in general character with the hypothetical method". (p. xxxviii) The further claim is made that "all proof conforms in general type to the hypothetical method of the natural sciences". (p. 36)

Although it is true that an affinity exists between the transcendental and the hypothetical methods of proof - indeed, between all proof methods - our study has shown that this is the case only in a very general sense. Special attention should be paid to the way Kant qualifies the analogy he is drawing up in the "Second Preface"; he suggests considering ...

> ... what may have been the essential features in the changed point of view by which they [i. e., the sciences] have so greatly benefitted. Their success should

> incline us, at least by way of experiment, to imitate their procedure, so far as the analogy which, as species of rational knowledge, they bear to metaphysics may permit. (22, B xvi, my emphasis)

Thus, the analogy involves abstracting the features which are essential to every scientific 'revolution' and adapting them to philosophy. Adaptation is required in virtue of certain fundamental differences between the inquiry into rational knowledge per se and the inquiry into particular species of knowledge which are scientific. We have already shown what some of these important differences are; we will now merely restate the affinities and differences between the proof-methods in order to adjudicate Kemp Smith's case.

The two features that we have come to see Kant regarding as essential to the scientific method are the use of hypotheses and the onus on experimentation. In both of these respects philosophy may be seen as emulating science. Regarding both of these essentials then, the proof-methods in each discipline may be said to be fundamentally akin. Now, insofar as analytic judgements are arrived at in accordance with a general plan - to amplify the meaning of certain concepts -- they may also be regarded as having an affinity with the scientific method. Nevertheless, what sense would it make to say that the proof-method of analytic judgement - the analysis of the concepts they contain - is, like the scientific proof-method, experimental? Such a claim would indeed stretch the meaning of the notion of experiment beyond recognition.

Thus, considering the difference in method of proof that is required by analytic judgements, we may conclude it incorrect to say that all proof conforms in general type to the hypothetico-experimental method. This claim may be salvaged, however, if reconstructed in a more limited way. A necessary condition for both experimentation and conceptual analysis of the kind under discussion is that there be a ground for carrying out the proof procedure. That is to say, all proof procedure requires a ground or basis wherein claims to knowledge can be established: the ground of analytic judgements a priori being the meaning of concepts; the ground of synthetic judgements a posteriori, experimentation in experience; and the ground of synthetic judgements a priori, experimentation in possible experience. Therefore, the only way that all proof methods may be regarded as conforming in general type to the hypothetical method of the natural sciences is if we regard the essential features of natural sciences as being (a) the hypothesis, and (b) the possession of a ground wherein proofs may be conducted. This, of course, limits Kant's general intention in drawing up the analogy in the "Second Preface", where he explicitly extols the merits of seeking "confirmation or refutation by experiment". (23, B xviii n.)

The transcendental method of proof is not "identical in general character with the hypothetical method of the natural sciences", as Kemp Smith claims (p. xxxviii), in two important respects we have brought up at the beginning of this chapter: First, transcendental proofs must yield

certain results, and not the contingent results that the hypothetical method of the natural sciences can only yield. Although we are unable in this study to look into the possibility that Kant is incorrect in claiming that transcendental proofs can yield necessity, it is clear that this claim is central to the Kantian enterprise, particularly when seen as an attempt to improve on Hume, whose radical skepticism was ultimately a function of the contingency he found pervading experience. Secondly, transcendental proofs are far from being "identical in general character" with hypothetical proofs insofar as they are exclusively concerned (within the realm of reason's employment in immanent metaphysics) with the transcendental conditions for the possibility of experience. Hypothetical proofs, on the other hand, have as their exhaustive field of inquiry experience itself. Thus, the natural scientist formulates his hypothesis at a cognitive level that presupposes or at least leaves aside a multitude of more fundamental issues which pertain to the domain of the philosopher. Transcendental proofs, on the other hand, are not formulated in the presence of a set of issues that are open to inquiry, at least according to Kant. Thus, even though appeals must occasionally be made to "indispensable functions of the soul", these are regarded as being altogether beyond the ken of inquiry. Consequently, while natural scientists seek to formulate and prove what are ultimately nothing but sophisticated opinions, the philosopher is concerned with the ultimate justifications of any opinion.

Evidence which casts further doubt on the adequacy of Kemp Smith's claim about the essential similarity between the proof-methods of natural science and philosophy will arise in the discussion of the two remaining statements we must now analyze.

2. Kemp Smith makes some assertions in the "Introduction" to his Commentary which are intended to defend the general equation we have seen him present. The pertinent paragraph needs to be quoted in full, as much of its substance seems to be contained 'between the lines':

> Though the method employed in the Critique is entitled by Kant the "transcendental method", it is really identical in general character with the hypothetical method of the natural sciences. It proceeds by enquiring what conditions must be postulated in order that the admittedly given may be explained and accounted for. Starting from the given, it submits its conclusions to confirmation by the given. Considered as a method, there is nothing metaphysical or high-flying about it save the name. None the less, Kant is in some degree justified in adopting the special title. In view of the unique character of the problem to be dealt with, the method calls for very careful statement, and has to be defended against the charge of inapplicability in the philosophical field. (pp. xxxvii f.)

It would be merely tedious at this point in our study to restate the features that set the transcendental and the hypothetical methods apart; suffice it to repeat that they vary with respect to their ground and to the truth value of their results. Secondly, we must point out that in virtue of the variance in concern between these proof methods, we are justified in regarding the transcendental method as being "high-flying" in some sense of that disparaging term. As the transcendental method is

concerned with seeking out the conditions for the possibility of knowledge in general (and not with the knowledge that is furnished by disciplines which rely upon and take for granted such conditions), there is every reason to regard it as operating on a "higher", or at the very least, on a more fundamental plane. As its aim is to furnish the formal underpinnings of any possible cognition and to account for the presence of synthetic judgements a priori, there is nothing inappropriate in viewing this method as being "metaphysical" in the immanent sense of that term which is defined in the "Second Preface". Thirdly, a word on the overall thrust of this paragraph: Kemp Smith's suggestion, it seems to me, is that Kant is engaging in a sham by trying to make the commonly known hypothetical method pass for the esoteric transcendental method: The name is supposed to lend the mystique. The "special title" is merely intended to conceal the fact that it is "really identical" to a less exhalted method. Using the different term is merely "in some degree justified", in Kemp Smith's estimation, due to the peculiarity of the problem at hand. He implies that this uniqueness is responsible for nothing more than a "very careful statement" of the method to be employed. In sum, one gets the distinct feeling that Kemp Smith does not think that the transcendental method is a genuine transformation of the hypothetical method other than in a nominal sense. This feeling is somewhat mitigated by his identification not of the proof methods, but rather of their "general character" - a reference which is not explicated

in the passage at hand and which we shall deal with later. Despite these considerations, there is an argument of some substance contained in this passage which we should now try to evaluate.

The second and third sentences in the quoted paragraph are related to Kemp Smith's view that Kant maintains there to be a reciprocal relationship of validation between principles and facts. This passage, as was pointed out in our first chapter, belongs within the context of Kemp Smith's larger argument about the role of the Coherence theory of truth in Kant's philosophy. However, as we are not directly concerned with that argument, we shall consider this passage merely as a purported corroboration of Kemp Smith's equation between the philosophical and the hypothetical methods. We alluded above to the fact that this text contains no explication of differences between the methods of proof. Rather, Kemp Smith merely presents features in virtue of which the transcendental and the hypothetical methods of proof should be seen as "identical in general character". To paraphrase, the methods are akin in that they seek to account for the given by enquiring into the conditions which must be postulated as underlying it. Moreover, their starting-point is this "given", and their conclusions are confirmed by it. The obvious question which arises is: does this analysis apply to both methodologies?

Kemp Smith's formulations of this argument elsewhere[18] induce

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[18]See Kemp Smith's Commentary, p. xxxvii f., p. 36, p. 238 f.

us to believe that he understands this "given" to be the empirical, as opposed to the rational, element in cognitions. In the case of the natural sciences this would refer to experience, while in the case of philosophy it refers to that which is conditioned or synthesized by the forms of the understanding. Thus, in the latter case Kemp Smith's "given" may be equated with Kant's technical term "given" (which is the source of great controversy for Kant scholars). As the mind has access only to the conditioned or synthesized "given", viz., to experience, we may surmise that this is what Kemp Smith regards as the "starting-point" for philosophy, as well as for science. In sum, if our interpretation of Kemp Smith's meaning is correct, we understand his claim as follows: the methods of philosophy and of natural science are identical as they attempt to account for experience by stating its conditions; starting from experience, their conclusions are confirmable by reference back to experience. If this understanding of Kemp Smith's meaning is correct, it is again liable to the second criticism we levelled at item (1) above. That criticism essentially points out that the ground of transcendental proofs is possible experience, whereas the ground of hypothetical proofs is experience itself. Thus, while the latter are concerned with confirming or refuting hypotheses by reference to experience, the latter require validation in possible experience. Moreover, while experience may be viewed as the "given" to which Kemp Smith refers, possible experience is in no way a "given", as it is a logical construct

or a philosophical device posited by the philosopher who employs the transcendental method. We thus rule out the possibility that by the "given" - with reference to the transcendental method - Kemp Smith means "possible experience".

So much for the identification Kemp Smith posits between the methods of proof in terms of their validation. His claim that a like identification between them obtains with reference to their starting-points nonetheless stands. In the light of our discussion in the preceding paragraph, we are left to interpret Kemp Smith's claim that both proof-methods start from the given to mean that the originating point in these methods is somehow a function of or a derivation from the given, i. e. from experience. This appears to me to be inaccurate in its entirety with respect to the transcendental method and not entirely true regarding Kant's understanding of the hypothetical method of the natural sciences. We have already shown (in Chapter 2) how Kant maintains that hypotheses are not solely formulated on the basis of induction from experience. The method employed by natural scientists does not entirely start from experience as deductions of hypotheses from the basic axioms of a science are possible. Concerning the claim that the transcendental method starts from the given we need only refer to the fact that the postulates to be proved by transcendental means are all ultimately derived not from experience, nor from possible experience but from the categories of the understanding. These categories, in turn, are pure concepts which Kant maintains to have derived from

the science of logic[19] and not, again from experience.

3. Kemp Smith maintains that the second edition "Transcendental Deduction of the Pure Concepts of the Understanding" has a relation of dependency to and is inadequate without the first edition "Deduction". The latter is the proper foundation of the former, according to Kemp Smith, because of the psychological element it contains and which is suppressed in the objective "Deduction". In the context of that argument he maintains:

> His [Kant's] a priori cannot establish itself save in virtue of hypothetical reasoning. His transcendental method, rightly understood, does not differ in essential nature from the hypothetical method of the natural sciences; it does so only in the nature of its starting point, and in the character of the analyses which that starting point prescribes. (p. 238 f.)

As we are not concerned with the argument about the indispensability of the first edition Deduction, we shall limit our comments to the meaning of his term "hypothetical reasoning". It seems to me that while we may grant that some form of "hypothetical reasoning" is involved in Kant's postulation of the a priori, this does not commit us to any conclusion about his proof method. Thus, it may well be the case that empirical apperception, for instance, is said to be grounded in a hypothetically-postulated faculty of transcendental apperception; moreover, that the latter would not be posited in the absence of the former. This does not

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[19] See Kant's Prolegomena (L. W. Beck edition), p. 71 323-324.

entail that there is a similarity between the proof methods of philosophy and natural science as Kant's postulation of that transcendental faculty is not equivalent to its proof. The indispensability of the a priori is proved not by reference to empirical facts - to experience - but rather by showing that experience itself would not be possible without the operation of a priori functions of the mind.

Contrary to Kemp Smith's contention in item (2) above, here he says that the proof methods differ with respect to their starting-points. Moreover, here he contends that the character of the analyses prescribed by these different starting points will also be different, whereas he previously held that "all proof conforms in general type to the hypothetical method of the natural sciences". (p. 36) Although in this paper we have been concerned mainly with confronting Kemp Smith's argument with the letter of Kant's text, such contradictions make it difficult for us to see the precise nature of his argument. This difficulty is made well-nigh insurmountable when we realize that his vague statement of the "general" equation he posits between the proof methods is never qualified with clarity.

# CHAPTER 5

# AFTERWORD

Although in the last chapter Norman Kemp Smith's case was divided into three main sections, this was done merely in order to assess it most expediently. They are actually parts of one argument, which itself falls into the overall thesis of the Commentary, namely, Kemp Smith's attack on the Rationalist elements in Kant and his attempt to 'salvage' the Critique by highlighting its Empiricist leanings. This endeavour to 'rescue' the Critique, we have seen, entails a considerable disfiguration of Kant's approach to the problems of philosophy. Aside from the charges that Kemp Smith's case is too vague and sometimes self-contradictory, that has been one of the main conclusions of this Thesis. Nonetheless, such a conclusion does not imply that the problems which prompted Kemp Smith to so recast the Critique are not genuine. In this chapter I should like to raise a few of these problematic issues in order to qualify my rather sympathetic treatment of Kant and to pinpoint areas for study which go beyond the limits of the foregoing work.

There are several distinctions at the foundation of Kant's Critique which have been the source of considerable controversy for

philosophy. Among these we might mention the distinction between analytic and synthetic judgements, between judgements a posteriori and a priori and between the form and content of thoughts. The last two are of particular interest to those who wish to properly assess Kant's transcendental method. Indeed, as Kemp Smith says, these distinctions are 'rather difficult' to accept - and, if they are unacceptable, can the transcendental method be salvaged without them?

Kant's 'Rationalistic' bent, according to Kemp Smith, accounts for his repeated stress on the need for certainty in philosophy. Such certainty, as we saw, can only be had if philosophy is made to emulate science. But what kind of truth-value is concomitant with the veritable sciences? We have noticed that, unlike Descartes, Kant opts for philosophy's emulation primarily of the natural sciences, and not of the mathematics. If so, what kind of certainty does Kant believe possible for philosophy? Does he believe that, even if the hypotheses of natural science are mere opinions, their confirmation yields certain knowledge?

The supposition "that objects must conform to our knowledge", analogous to Copernicus's application of his primary hypothesis, is a notion which is especially problematic in connection with natural sciences. Are the laws of nature, as Kant suggests, ultimately derived from what is somehow "supplied" by reason?

Lastly, we might mention an overall problem facing the

transcendental method itself: are the concepts Kant uses in his critique of reason the same concepts he justifies in the Deduction? If so, is he not engaging in an inescapeable circularity? If not, how are these concepts justifiable? Moreover, what concepts could be employed for such a justification?

The above are but some of the problems which need to be resolved if we are to come to a more thorough understanding of the nature of transcendental proofs in Kant's Critique of Pure Reason. This study can be regarded as a preparation which lays the foundations for such a task.

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