11 The Role of Experience in Kant's *Prize Essay*

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1 Introduction

Kant wrote an *Inquiry Concerning the Distinctness of the Principles of Natural Theology and Morality* in response to the 1763 competition proposed by the Berlin Royal Academy. In this treatise, Kant claims to show, with all requisite certainty, "the true degree of certainty to which it [i.e. metaphysics] may aspire as well as the path by which certainty may be attained."[1] This *Prize Essay* (as it is commonly known) deserves our attention because it contains Kant's first published attempt to establish a proper method for metaphysics, and it is relevant to the theme of the present volume because a significant component of that method consists in an appeal to experience. Indeed, in the very first paragraph of the *Prize Essay*, Kant makes a most remarkable, but hitherto largely underappreciated claim, namely, that he intends to establish his new method upon "nothing but propositions of experience that are secure, and the inferences that are drawn immediately from them" (Inq, 2:275). His reason for taking experience as his basis, he proceeds to explain, is that:

> If what is presented in this treatise is itself metaphysics, then the judgment of the treatise will be no more certain than has been that science which hopes to benefit from our inquiry […] and then all our efforts will have been in vain. (Inq, 2:275)

In other words, Kant appeals to experience as a basis for *determining with certainty* the method of metaphysics itself, something which he believes metaphysics is unable to accomplish on its own.

Although Kant was awarded a close second in the prize competition, the Wolffians in the Academy must have read such bravado with disapproval, if not bewilderment, while the ever-present Newtonians—Euler, as president of the Academy, being first among them—must have been delighted to see such words written by an ambitious young German academic. The parties on both sides were only too keenly aware that Wolff, following in the spirit of Descartes and Leibniz, claimed for metaphysics the role of supreme and sole guarantor of certainty in scientific knowledge.

However, Kant and a few of his contemporaries ultimately held that Wolff had failed to recognize that experience makes a material contribution to knowledge, i.e., a contribution that cannot be derived from the single principle of non-contradiction. Lacking material principles, Wolff's attempt to build a philosophy that could sufficiently explain what is given in experience was doomed to failure. On their view, Wolff really just ended up espousing the account of innate ideas put forward by Leibniz in the *New Essays*, according to which experience is indeed the beginning and necessary condition of all knowledge, whereas the universality and strict necessity of such knowledge, and hence its certainty, is a product of reason alone.[2] Moreover, they took Wolff to claim that the certainty of our experience is grounded on principles proven in metaphysics, and ultimately on the principle of contradiction, which Wolff unequivocally held to be both a necessary and sufficient source of all certainty in human knowledge.[3]

The Newtonians in the Academy must have been even more pleased to see Kant claim later in the essay that "the true method of metaphysics is basically the same as the one introduced by *Newton* into the natural sciences" (Inq, 2:286). With this statement, Kant announces clearly and forcefully which side he intends to take in the longstanding debate between the Newtonians and the Wolffians in the Academy. By doing so, he also implicitly rejects what was supposed to be a signal achievement of the Wolffian philosophy, namely its ability to establish metaphysics as a true science.

But does Kant truly succeed in articulating a method that is distinct from the one proposed by Wolff? Despite Kant's stated intentions in the *Prize Essay,* modern interpreters have struggled to answer this question in the affirmative. Anderson even claims that the method of the *Prize Essay* "does not yet underwrite any criticism" of Leibnizian and Wolffian metaphysics.[4] Indeed, most commentators have concluded that Kant in this treatise ultimately fails to free himself from a rationalist framework, even if he succeeds in placing renewed emphasis on the importance of experience within that framework.

Two main reasons have been provided in support of this view. The first was voiced by Herman de Vleeschauwer, who otherwise places the greatest emphasis on Kant's so-called Newtonian empiricism during this period. However, he believes this empiricism to be spoiled by a single "embarrassing remark" in the *Prize Essay*, namely, Kant's suggestion that metaphysics may one day proceed synthetically.[5] De Vleeschauwer sees this as a profound violation of the brand of empiricism found in Newton's writings. As he puts it,

> despite the empiricism which is evident in Kant at this moment, the ideal of an *a priori* construction of universal science retains for him all its attraction and force. In spite of everything, the ideal of

> Descartes and of Hegel remains the Kantian ideal. And this dream [...] removes Kant from the Newtonian and positivist orbit. [...] Kant is not an empiricist.[6]

Thus, on De Vleeschauwer's view, since genuine empiricism is impossible without a total rejection of the synthetic method, Kant remains a rationalist in spirit.

Michael Friedman provides a different reason for seeing the *Prize Essay* as covertly rationalist. According to Friedman, the *Prize Essay* is deeply Newtonian in the sense that it gives priority to the analytic method and, most of all, recommends the incorporation of mathematical propositions into metaphysical analysis, but not because of its apparent appeal to experience. As he explains, "there is no suggestion at all that what will later be called *sensibility* plays any essential role in the 'secure inner experience' that furnishes Kant's data." As for analysis, Friedman claims that "all Kant's examples are *a priori* judgments of conceptual connection."[7] In support of this view, Friedman does not point to any explicit remarks in the essay but, instead, to a couple of examples in which the use of mathematics is particularly apparent.[8]

My aim in this chapter is to challenge such views by analyzing the essential features of Kant's method in the *Prize Essay*. I will argue that, even if Kant fails to present a perfectly clear and defensible account of a method for metaphysics, the manner in which he describes this method and the kind of transformation of metaphysical inquiry that he hopes it will accomplish do not testify to a broadly rationalist approach but, in fact, embody the anti-rationalist spirit of Bacon and Newton. While Kant does indeed believe that metaphysics will one day be able to readopt the synthetic method, I argue that this is perfectly consistent with the views of Bacon and Newton as he understood them. In contrast with Friedman's claim, I will also show that experience does play a role in Kant's conception of data and that this is particularly clear if we take into account other texts of the same period. Before turning to the role of experience in Kant's *Prize Essay*, however, I think it is imperative to clarify the way Kant and his contemporaries understood the empiricism associated with Bacon and Newton.

2 The 'Empiricism' of Bacon and Newton in Perspective

The term 'empiricism' in its modern sense is a coinage of Kant's critical philosophy, and many of the current connotations of that term are not found in his writings. Also, the sharp distinction between impressions and concepts, which is now used to formulate the empiricism-rationalism divide, is notably absent from the works of Wolff and the young Kant.[9] To clarify this matter, I propose to carefully examine the writings Kant himself would have studied in the 1760s and to reconstruct, on this

basis, a more accurate picture of the choice facing the young Kant. To aid in this reconstruction, I will also draw upon the few synoptic accounts of the British philosophy that we know him to have read, namely those found in Brucker's monumental *Historia critica philosophiae* (1742–1744) and Formey's *Abrégé de l'histoire de la philosophie* (1760).

Let us begin by considering Bacon. In *De augmentis scientiarum*, Bacon claims that philosophy is still defective and in need of a complete renovation. Such a renovation, he suggests, must begin with the creation of a single "universal science, [that is] to be the mother of the rest." This science would therefore be opposed to no other science, "treating only of the highest stages of things," and would be "a receptacle for all such axioms as are not peculiar to any particular of the sciences, but belong to several of them in common" (AS 337). Since this science is to provide the basis for all other branches of philosophy, Bacon gives it the title of *Philosophia prima* and further explains that its "true office" is "displaying the unity of nature" by investigating and collecting those axioms which show "plainly the same footsteps of nature treading or printing upon different subject matters" (AS 339).

Bacon believes that this universal science must follow a method unlike any previously applied to such matters in the past. Instead of consulting logic and linguistic usage (as Aristotle had done), philosophers should consult nature itself through study and experiment even in order to discover the most basic and universal of all principles. More specifically, he notes that we must search out what is universal and first in this science insofar as it can be abstracted from the specific contents of the individual sciences themselves. To illustrate what he has in mind here, Bacon mentions such axioms as "if equals be added to equals the wholes will be equal," which applies as much in mathematics as in distributive justice, and "[t]he Quantum of nature is neither diminished nor increased," which applies as much in physics as in natural theology (AS 338). Similarly, he asserts that the concepts of similitude and diversity require us to "assign a reason […] why betwixt different species there almost always lie certain individuals which partake of the nature of both" (AS 340). In other words, the true meaning of such terms must be sought in the universal "laws of nature and not of language," laws which are discovered in and corroborated by the empirical sciences (AS 340).

Subordinate to this *Philosophia prima* are the three main branches of science—natural theology, natural philosophy, and civil philosophy—which are distinguished by their subject matters, namely God, nature, and man. Natural philosophy branches further into a speculative part, or "Inquisition of Causes," and an operative part, or "Production of Effects." These parts "must in a certain way be united and conjoined" since "all true and fruitful Natural Philosophy has a double scale or ladder, ascendant and descendent, ascending from experiments to axioms [i.e., analytically], and descending from axioms to the invention of new

experiments [i.e., synthetically]" (AS 343). Speculative natural philosophy in particular can treat either what is "inherent in matter and therefore transitory," , i.e., "the Material and Efficient Causes" in nature, in which case it is called physics, or instead what is "more abstracted and fixed," i.e., "the Formal and Final" causes, in which case it is called metaphysics (AS 346). The metaphysics of formal causes, Bacon further explains, is

> the most excellent [...] because it is the duty of all knowledge to abridge the circuits and long ways of experience (as much as truth will permit). [...] And this is best performed by collecting and uniting the axioms of the sciences into more general ones, and such as may comprehend all individual cases. (AS 361)

These passages make it clear that Bacon, like all so-called rationalists, is fully committed to the ideal of a first philosophy concerned with universal concepts and axioms, to the view that the more general truths provide the real underlying reasons for individual cases, and to the necessity of using both analysis and synthesis.

Bacon's originality lies, therefore, not in the overthrow of these traditional doctrines but in the assertion that they must be understood within the context of an entirely new method in the sciences, one in which "the order of demonstration also is completely reversed."[10] As the *Novum organum* makes evident, Bacon indeed relocates the positive task of philosophy, and in particular that of metaphysics, from a search for rational insight into first principles to an inductive analysis of the results already established in the empirical sciences.[11] The latter investigate the particulars presented by the senses, but then ascend, through carefully conducted experiments, to increasingly higher and more abstract principles, until they finally reach general axioms and the knowledge of forms. Only after this analytic process is accomplished can philosophers proceed to an analysis and comparison of the axioms thus established, which allows them to ascend to a knowledge of the most universal axioms and concepts and, thus, to first philosophy. Contrary to the one embraced by 'rationalist' philosophy, the order of demonstration Bacon defends goes from experience to science, from science to metaphysics, and from metaphysics to first philosophy.

From this brief sketch we can see that there is actually very little Kant could have read in Bacon's account of the *arbor scientiarum* (or Brucker's summary of it) that one would expect to find in a narrowly 'empiricist' account of knowledge. Two points should be emphasized in this regard. First, although Bacon clearly approves of the use of both the analytic and the synthetic methods in philosophy, he believes that the cognitive predicament of human beings requires that they start from inductive analysis and that measures be taken to counter their innate

tendency to 'leap' from analysis to a synthesis based upon spurious first principles and the belief in the possibility of purely rational insight into their truth. Consequently, despite its great importance and utility, first philosophy must be regarded as the most distant goal of our efforts.

Second, Bacon can allow the axioms and concepts that used to be treated in first philosophy, and likewise the complete definitions and logical demonstrations based upon them, to be among the very last achievements of science *only because* they play no role in lending it a scientific character. Unlike Descartes and Wolff, Bacon locates the only certain basis for demonstration in propositions and concepts derived from a carefully regimented analysis of particulars by means of the rigorous study of human nature and supplemented with the probative use of intermediate syntheses. Accordingly, he holds that the empirical sciences themselves provide both the material and the evidential basis for the principles arrived at by analysis in metaphysics.

Turning now to Newton, there can be no doubt that Kant knew Newton's writings in the originals and was familiar with the accounts of it in historical compendia and the lectures of Knutzen. He also owned, studied, and sometimes referred to the works of Willem Jacob 's Gravesande, which contain a thorough discussion of the unique features of the Newtonian method and were instrumental in giving shape to the discussion of it on the continent.

Two of Newton's own texts deserve our attention here, namely Query 31 of the *Optics* and the *Philosophiae naturalis principia mathematica*. The former not only most clearly attests to Newton's Baconian heritage but also contains the *locus classicus* for his views on the analytic and synthetic methods. I have inserted roman numerals and italics in the following passage in order to facilitate its finer anatomization:

> As in mathematics, so in natural philosophy, the investigation of difficult things by [i] *the method of analysis ought ever to precede the method of composition*. This analysis consists in making experiments and observations, and in [ii] *drawing general conclusions from them by induction*, and [iii] *admitting of no objections against the conclusions but such as are taken from experiment*, or other certain truths. For hypotheses are not to be regarded in experimental philosophy. And although the [iv] *arguing from experiments and observations be no demonstration of general conclusions, yet it is the best way of arguing which the nature of things admits of, and may be looked upon as so much stronger by how much the induction is more general*. And if no exception occur from phenomena, the conclusion may be pronounced generally. But if at any time afterward any exception shall occur from experiments, it may then begin to be pronounced with such exceptions as occur. [v] *By this way of analysis we may proceed from compounds to ingredients*

> *and from effects to their causes and from particular cases to more general ones, till the argument end in the most general.* This is the method of analysis; and the synthesis consists in assuming the causes discovered and established as principles, and by them explaining the phenomena proceeding from them and proving the explanations.[12]

As Newton goes on to explain, the first books of the *Optics* consist mainly in this kind of analysis, but the results "may be assumed in the method of composition [i.e. of synthesis] for the explaining of the phenomena arising from them, an instance of which method I gave in the end of the First Book."[13]

At first blush, the methodology described in this passage appears to be perfectly compatible with the views of Wolff, and perhaps even those of Leibniz, particularly in respect to points [i] and [v]. Both would agree with Newton that analysis must always precede synthesis (since the latter should begin from simples), that it must begin from experience (but as the occasion, not the source of concepts), and that its goal is to proceed from complex, particular experiences to their simple and general "ingredients" or "causes." The other three marked passages, however, show why this agreement is merely superficial, and why Newton is rightfully to be considered a follower of Bacon. In [ii], Newton asserts that the analysis in question is always inductive, and so never results in knowledge that is absolutely certain, as Leibniz and Wolff believed it could. In [iv], he concludes from this that our inferences of principles and causes from experience will always be less certain than the experiences from which they are derived. This in turn implies—again contrary to Leibniz and Wolff—that employing such principles in order to synthetically demonstrate the *necessity* of what happens in experience is entirely misguided. Newton employs synthesis, to be sure, but only for the sake of 'illustrating' that certain phenomena really do follow from the principles that have been inferred. All of this amounts to an acceptance of Bacon's reversal of the order of demonstration.

A similar but more nuanced picture can be gathered from the layout of the *Principia*, which appeared many years prior to the *Optics*. In the Preface, Newton states that "the basic problem of philosophy seems to be to discover the forces of nature from the phenomena of motions and then to demonstrate the other phenomena from these forces" (PM 382). In other words, philosophy is to first employ analysis and then synthesis. The *Principia* follows this path by beginning with a list of fundamental definitions accompanied by the three famous Newtonian laws of motion. Although these definitions provide the axiomatic basis of the work, they are accepted not because they are self-evident or simple but because they have been established beyond any reasonable doubt based on the analysis of experiments. Books 1 and 2 then develop the mathematical tools for using these axioms to demonstrate the specific motions that

would be observed in various constellations of objects if the latter were acted on by hypothetical forces. For example, Book I, Proposition 4, Corollary 6 states that "If the periodic times are as the 3/2 powers of the radii, and therefore the velocities are inversely as the square roots of the radii, the centripetal forces will be inversely as the square of the radii, and conversely" (PM 451). Since such propositions do not "discover the forces of nature from the phenomena of motions" (PM 382) but merely express the relationships between certain possible motions and the forces one would have to assume in order to explain them, they are not philosophical but merely mathematical in character.

Book 3 contains what is certainly one of the most famous and discussed parts of all Newton's writings, namely the 'Rules for the Study of Natural Philosophy.' These rules provide the methodological foundation for the transition from a purely mathematical investigation to natural philosophy proper and are thus intended to serve the same role as Leibniz and Wolff attributed to the principle of sufficient reason. The correct scientific method, as Newton explains it, is based upon four essential rules. The first two are rules of economy that provide the basis for induction by analogy: "No more causes of natural things should be admitted than are both true and sufficient to explain their phenomena," and "the causes assigned to natural effects of the same kind must be, so far as possible, the same" (PM 795). The third rule states that qualities "that cannot be intended or remitted and belong to all bodies on which experiments can be made should be taken as qualities of all bodies universally" (PM 795). This rule is required to generalize the properties and laws belonging intrinsically to particular natural kinds. Finally, the fourth rule codifies Newton's reasons for excluding hypotheses. It reads: "In experimental philosophy, propositions gathered from phenomena by induction should be considered either exactly or very nearly true notwithstanding any contrary hypotheses, until yet other phenomena make such propositions either more exact or liable to exceptions" (PM 796). Rather than providing a deductive foundation for demonstrating or refuting particular doctrines, which is their function in Leibniz and Wolff, Newton sees such rules as serving at most as heuristic guidelines for collecting, comparing, and inductively inferring laws from the phenomena.

These four rules of method are followed by two further chapters. The first of them describes six different celestial "phenomena," while the second applies the four methodological rules to these phenomena in order to infer a number of propositions, including the central claims that "[g]ravity exists in all bodies universally and is proportional to the quantity of matter in each" and that the strength of this force varies with the inverse of the square of the distance between bodies (PM 810). Newton finally proceeds from analysis to synthesis by assuming universal gravitation in order to mathematically demonstrate the reasons for various other phenomena found in nature.

From this brief outline we can abstract the basic pattern of the reasoning found in the *Principia*. The work commences with a preparatory study that is purely mathematical. This is followed by a phenomenological description of certain basic experiences. This description is then inductively analyzed with the help of mathematics and guided by the four rules of method. All of this makes up the analytical stage of his investigation. After this, a synthetic explanation of further phenomena, which is based upon the principles inferred by the previous analysis, is finally used to corroborate and illustrate said analysis. With this pattern of argumentation, Newton adheres essentially to the spirit of Bacon's attempt "to abridge the circuits and long ways of experience." However, he extends it, first, by including a mathematical foundation for his inductive analysis and, second, by explicitly recognizing not only a practical but also a corroborative role for synthesis.

The various textbooks always list the four basic rules of induction mentioned in the *Principia*, or some variation thereof, under the title of the 'Newtonian analytical method.' Hence it is most likely that they would be foremost on Kant's mind when he speaks of the Newtonian method in the *Prize Essay*.

3 The Method of the *Prize Essay*

The first part of the *Prize Essay* takes the form of a comparison between the method of mathematics and the one which Kant believes is proper to philosophy. He bases his comparison on "propositions [treated] only as conclusions derived from our experiences" (Inq, 2:278), that is, from observations regarding the practice and success of the two sciences. In § 1, he asserts that the philosophical method must proceed analytically instead of synthetically, and thus in the opposite direction of mathematics and the 'rationalist' philosophy modeled after it. Kant writes:

> If this procedure [i.e., the analytic method he proposes for metaphysics] is compared with the procedure […] which is currently in vogue in all the schools of philosophy, one will be struck by how mistaken the practice of philosophers is. With them, the most abstracted concepts, at which the understanding naturally arrives last of all, constitute their starting point, and the reason is that the [synthetic] method of the mathematicians, which they wish to imitate throughout, is firmly fixed in their minds. (Inq, 2:289)

Kant says something similar in the announcement for his lectures for the winter semester of 1765–1766:

> Its [i.e., metaphysics's] method is not *synthetic*, as is that of mathematics, but *analytic*. As a result, what is simple and most universal

> in mathematics is also what is easiest, whereas in the queen of the sciences it is what is most difficult. In mathematics, what is simple and universal must in the nature of things come first, while in metaphysics it must come at the end. In mathematics one begins the doctrine with the definitions; in metaphysics one ends the doctrine with them; and so on in other respects.[14]

It is difficult to believe that in writing such passages Kant did not intend to echo Bacon's proposal of a new method in which "the order of demonstration […] is completely reversed,"[15] thereby rejecting the probative role given to synthesis by rationalists. And yet De Vleeschauwer's claim that Kant's comment about synthesis in the *Inquiry* places him in the rationalist camp, which was quoted in the introduction to this chapter, would require us to think otherwise; for Kant truly belongs in the rationalist camp only if he also believes that the synthetic method can provide demonstrations. Bacon's reversal, we should recall, consists in shifting the burden of demonstration from synthesis to analysis, not in the rejection of synthesis itself.

As the *Prize Essay* further explains, mathematics creates or defines its more complex concepts by relying upon simpler concepts already accepted "as *given* in accordance with his [i.e., the mathematician's] clear and ordinary representation" (Inq, 2:278). By contrast, the task of philosophy is to make such given concepts fully *distinct* and, if possible, to discover their definitions or complete general concepts. In other words, although both mathematics and philosophy begin from given clear concepts, the primary business of mathematics is to synthesize new complex concepts out of them, while that of philosophy is rather to infer their underlying simple and universal concepts by means of analysis. As Kant explains:

> In philosophy, the concept of a thing is always given, albeit confusedly or in an insufficiently determinate fashion. The concept has to be analyzed; the characteristic marks which have been separated out and the concept which has been given have to be compared with each other in all kinds of contexts; and this abstract thought must be rendered complete and determinate. (Inq, 2:276, cf. 283–84)

To illustrate what he means by analysis here, Kant gives the example of time, of which he says that "everyone has a concept":

> The idea of time has to be examined in all kinds of relations if its characteristic marks are to be discovered by means of analysis; different characteristic marks which have been abstracted have to be combined together to see whether they yield an adequate concept;

> they have to be collated with each other to see whether one characteristic mark does not partly include another. (Inq, 2:277)

The basic idea in these passages appears straightforward, but many key details are left in the dark. First, although Kant indicates that the concepts in question are given clearly but not yet distinctly, he does not further specify precisely *how* they are given. The phrase "inner experience," which occurs in another key passage (Inq, 2:286), suggests that these concepts are given through sense, since experience is generally defined by Kant's contemporaries (and by Kant too in later works) as whatever originates in sense rather than the intellect.[16] Second, Kant states here that given concepts must be analyzed by being "compared with each other in all kinds of contexts." But what kind of comparison does he have in mind? Third, in the passages quoted above, Kant does not indicate the source of the certainty of philosophical analysis. Does it stem from the intellect and from the self-evidence of the principles it discovers, as a rationalist would maintain, or rather from the clarity and reliability of the originally given representation and the care taken in its analysis, as an empiricist would? The nature of the *Prize Essay* thus depends upon the specific answers Kant would give to these three questions regarding the givenness of the data for analysis, the exact nature of the analysis itself, and, finally, the source of the certainty of the fundamental principles reached in such analysis. I will therefore turn to an examination of these three questions.

The Question of Givenness. Kant's emphasis in the *Prize Essay* on the essential givenness of metaphysical concepts reflects a deep and persistent feature of all his writings in the 1760s. This emphasis is marked by Kant's frequent use of the Latin term 'datum' to indicate the proper starting point of all fruitful philosophical analysis. According to the method proposed by Wolff, metaphysics must begin with proper definitions. Moreover, proper definitions require the philosopher to both enumerate the essentials or *possibilia* of a certain concept and to guarantee the possibility—or objective reality—of the concept itself by proving that it does not contain a contradiction. But Wolff and Baumgarten went even further by asserting that the possibility of a concept consists in nothing but its being non-contradictory. For this reason, the ideal for the metaphysician would be to prove the possibility of concepts entirely through a priori conceptual analysis. However, since such an analysis is not always feasible, they argued that it sometimes suffices to locate an object answering to the concept among the objects that actually exist or to explain the manner in which it could be made actual; for if the object exists or could exist, then surely its concept must be possible and hence non-contradictory.

Kant's consistent use of the term 'datum' in the 1760s is based upon his rejection of the idea that possibility consists in being non-contradictory alone. As he writes in the *Only Possible Argument*, which was published just prior to the *Prize Essay*:

> It is clear from what has now been adduced that possibility disappears not only when an internal contradiction, as the logical element of impossibility, is present, but also when there exists no material element, no *datum*, to be thought. (OPA, 2:78)

For Kant, the real possibility of a concept, unlike its logical possibility, is "given in something actual, either as a determination existing within it or as a consequence arising from it" (OPA, 2:79). For this reason, philosophical analysis *must always* begin from something actual, and hence from something empirically given. According to Kant, it was the failure to do just this that made it possible for Leibniz to mistakenly believe that he had provided a real definition of a spiritual monad when in fact he had only invented it (Inq, 2:277).

Just how profoundly this should affect philosophical analysis is clear from a passage from *The Only Possible Argument* in which Kant challenges an imaginary interlocutor to prove that the concept of a fiery body is indeed a concept of something that is possible without appealing to an existence of some kind. Kant admits, of course, that the existence of neither a fire nor even a body is required as 'data' in order for such a being to be possible. He also admits that there is no logical contradiction to be found between the concepts of fiery and body. But he then presses the inquiry further concerning just one of the relevant component concepts, asking: "is then a body itself possible in itself?" To establish the possibility of a fiery body, we must surely first establish the very possibility of a body. In answer to this demand, Kant's imaginary interlocutor is permitted to further "enumerate the data of its [i.e. body's] possibility, namely, extension, impenetrability, force, and I know not what else" and to assume that still no contradiction is to be found.

But Kant is still not satisfied, explaining:

> You must, however, give me an account of what entitles you so readily to accept the concept of extension as a datum. […] Suppose that you can no longer break up the concept of extension into simpler data in order to show that there is nothing self-contradictory in it—and you must eventually arrive at something whose possibility cannot be analysed—then the question will be whether space and extension are empty words, or whether they signify something. The lack of contradiction does not decide the present issue; an empty word never signifies anything contradictory. If space did not exist, or if space was not at least given as a consequence through something existent, then the word 'space' would signify nothing at all. (OPA, 2:81)

Believing he has hereby demonstrated the futility of trying to establish the possibility of a simple material concept by appeal to pure thought alone, which for him constitutes a hallmark of the Wolffian methodology, Kant concludes that "in the end, when you consider how this [i.e., space] is then given to you, the only thing to which you can appeal is an existence" (OPA, 2:81). Now, since the existence of no being aside from God can be demonstrated except through experience, to say that a thing exists is to say that its representation "is an empirical concept; in other words, it is the representation of an existent thing" (OPA, 2:72). It follows immediately from this that all the particular data of possibility can only be given in experience and that the proper analysis of a complex metaphysical concept must trace the concepts of all its component representations back to the original experiences in which the data of their possibility were first encountered.

The negative consequence of Kant's thesis here is easy to grasp: if no relevant datum is extant, or perhaps even possible, then in principle no amount of logical analysis could ever show the concept to possess real content. Hence, whereas Wolff has recourse to experience only when purely conceptual analysis would be too demanding, Kant believes that the metaphysical method must always and essentially begin from something given in experience. Yet the positive application of the thesis requires further elaboration. Where are we to locate and how are we to recognize the right kinds of experiences and concepts? Surely not just any commonly received information can serve as data to guide the metaphysician.

Again, the *Prize Essay* is not particularly helpful when read on its own. In a couple of instances, Kant refers to such data as concerning what "the understanding initially and immediately perceives in the object" (Inq, 2:281), a claim that, beyond being unhelpful, obscures the fact that he clearly does not have in mind purely rational or a priori concepts. However, in elucidating this very claim, Kant refers to a number of items that resist a rationalist reading. Among these items are the manifoldness of physical space, the insubstantiality of its parts, and its three-dimensionality, all of which he remarks are "cognized intuitively; but […] can never be proved." Kant further adduces the fact that "every appetite presupposed the representation of the object of the appetite; that this representation was an anticipation of what was to come in the future; that the feeling of pleasure was connected with it," all of which "everyone is constantly aware of […] in the immediate consciousness of appetite" (Inq, 2:284). Similarly, as part of a later analysis of the Newtonian concept of action at a distance, Kant notes:

> First of all, bodies are *at a distance* from each other if they *are not touching* each other. That is the exact meaning of the expression. Now, suppose I ask what I mean by 'touching.' Without trouble about the definition, I realize that whenever I judge that I am touching a

> body I do so by reference to the resistance which the impenetrability of that body offers. For I find that this concept originates ultimately from the sense of touch. (Inq, 2:288)

Contrary to the claim made by Friedman, discussed in our introduction, the data Kant has in mind are neither a priori conceptual connections nor raw empirical data, but instead seem to include just about any long-received and publicly verifiable knowledge, regardless of whether it is drawn from mathematics, physics, common physical experience, or even simple introspection. Therefore, to "initially and immediately perceive" something with one's understanding does not involve some kind of purely intellectual examination, such as is required for Cartesian or Leibnizian conceptual analysis, but rather only the plain and apparent consciousness of such things as the resistance felt by the hand, the physical feeling of pleasure, or other facts established in the mathematical and empirical sciences. Indeed, even when Kant cites mathematical or physical propositions as data, he seems to put stock in them not because they are considered self-evident or rationally demonstrated from first principles but because they have proven useful and well-tested by a community of scholars. From the full range of examples Kant gives in the *Prize Essay*, it seems clear that the immediacy he has in mind is characteristic of what is given directly to the senses rather than of an intellectual vision. This strongly suggests that Kant's idea is simply that metaphysics should borrow its data from sciences based upon experience that we know are more reliable than it.

The best evidence to confirm this interpretation is found in another essay altogether, namely *Negative Magnitudes*, which was composed just after the *Prize Essay*. In my view, this essay should be read as Kant's most complete attempt to apply the method of the *Prize Essay* to the analysis of a single metaphysical concept. *Negative Magnitudes* begins with an outline of two ways in which philosophy can make use of mathematics. The first consists in copying its method, which Kant says has manifestly failed. The second consists in borrowing the doctrines established in mathematics as data for further metaphysical analysis. Here he cites the radically anti-Wolffian view of Leonhard Euler, who had argued that the principles of mechanics are so well-established that not only should any metaphysics contradicting them be rejected, but also that "the principal ideas of metaphysics will be necessarily regulated and determined" by the conclusions of mechanics.[17] In Kant's terms, this would just mean taking the empirically verified principles of mechanics as the 'data' for metaphysical analysis.

Now, in *Negative Magnitudes*, Kant claims that mathematics could have proven useful to metaphysics in a similar way, if only the practitioners of the latter had not set themselves against the results of mathematics, so that rather than gaining "secure foundations on which to base

its reflections, it is seen to be trying to turn mathematical concepts into subtle fictions" (NM, 2:168; translation emended). Metaphysics, Kant explains,

> seeks to discover the nature of space and establish the ultimate principles, in terms of which its possibility can be understood. Now, nothing could be of more use in such an undertaking than the capacity to acquire reliably established data from some source or other, with a view to using them as the foundation of one's reflections. Geometry furnishes a number of such data relating to the most universal properties of space, for example, that space does not consist of simple parts. (NM, 2:168)

In agreement with my earlier interpretation of the *Prize Essay*, Kant here cites accepted mathematical results as possible data for metaphysical analysis.[18] As we saw above, mathematics itself rests on given, clear concepts, which are subsequently subjected to synthesis. Interestingly, Kant implies in the first part of the passage that such data will not simply be accepted and combined by the metaphysician into a definition of space (this, after all, is what mathematics does) but will instead be taken as the starting point of an analytical procedure that aims to infer something about the concept of space that grounds and unifies the various data associated with it. This is perfectly in line with Euler's suggestion that metaphysics use the results of another science to "regulate and determine" its ideas.

With these comments, Kant sets the stage for the real task of the *Negative Magnitudes*, which is to analyze the mathematical concept of a negative magnitude in order to gain an understanding of a potential metaphysical version of the same concept. In the first part, Kant "elucidates" the general mathematical concept of a negative magnitude simply by recounting the main ways in which mathematicians commonly employ the sign for negation (as opposed to mere subtraction) and calculate with negative integers. He then proceeds to "extract what is philosophically significant from this concept," and is therefore not restricted to considerations of quantity, by introducing the concepts of grounds and of the real opposition of grounds, which must be assumed in order for the mathematical concept to be applicable to actual objects (NM, 2:175). In bringing together these two sets of ideas, Kant dismisses certain misunderstandings, while analytically inferring two fundamental and hence more general "laws" governing the interaction of grounds that stand in real opposition (NM, 2:177).

Yet the first mathematical section of Kant's essay is merely preparatory and serves to formulate a more distinct understanding of the general concept of negative magnitudes such as it is found and used in mathematical practice and, hence, in common experience. The second

section then searches for a more universal concept of negative magnitudes by showing its real application in philosophical disciplines such as the metaphysics of corporeal nature, psychology, moral philosophy, and natural science. These fields of 'data' show for the first time that the laws adduced in the first section, once assumed to be universal, explain similar or analogical calculations made throughout all areas of philosophy.

Whether Kant intended this portion of the essay to exactly parallel Newton's chapter on celestial phenomena in the *Principia* is impossible to determine with certainty, but I take this to be strongly suggested by the overall structure of the essay, the kinds of examples this section contains, and by Kant's explicit reference to several of his examples as "phenomena" of negative magnitudes (e.g., NM, 2:187). In any case, the overall procedure in the first two parts of *Negative Magnitudes*, as well as the kinds of data Kant adduces, prove that the analysis referred to in the *Prize Essay* has very little in common with the so-called rationalist model of analysis. Instead, what we find is a complex procedure closely reflecting Newtonian induction by analogy. Moreover, also like Newton, Kant clearly regards the various data as already sufficiently established through their long and successful use in their respective philosophical disciplines. These provide the best evidence for general principles, not the other way around, just as Euler had recommended.

Thus, if read in the context of his stated opposition to the Wolffian method and the many examples he provides in contemporaneous texts, it seems reasonably clear that Kant in the *Prize Essay* thinks that metaphysics ought to begin from data that are given to the intellect not by the intellect itself but rather by sense in the course of ordinary experience. Nevertheless, it must be admitted that Kant does not seem comfortable fully and explicitly stating the matter in such univocal terms until the middle of the 1760s. Thus, only in *Dreams of a Spirit-Seer* are we informed frankly that a chief goal of metaphysics lies in knowing whether the task of answering a given question "has been determined by reference to what one can know, and in knowing the relation the question has to empirical concepts, upon which all our judgments must at all times be based" (*Dreams*, 2:367).

The Questions of Analysis and Certainty. The strongest and most well-known statement of Kant's allegiance to the methodological tradition of Bacon and Newton is found in the second part of the *Prize Essay*. "The true method of metaphysics," Kant here writes,

> is basically identical (*im Grunde einerlei*) to that introduced by Newton into natural science and which has been of such benefit to it. Newton's method maintains that one ought, on the basis of certain experience and, if need be, with the help of geometry, to seek out the rules in accordance with which certain phenomena of

> nature occur. Even if one does not discover the fundamental principle of these occurrences in the bodies themselves, it is nonetheless certain that they operate in accordance with this law. [...] Likewise in metaphysics: by means of certain inner experience, that is to say, by means of an immediate and self-evident inner consciousness, seek out those characteristic marks which are certainly to be found in the concept of any given property. And even if you are not acquainted with the complete essence of the thing, you can still safely employ those characteristic marks to infer a great deal from them about the thing in question. (Inq, 2:286; translation emended)

The comparison in this passage contains a number of notable points. First, in partial confirmation of the results of our last section, Kant's claim that we must proceed by means of "certain inner experience" is clearly intended to provide a direct parallel to Newton's "certain experience." If we are to take Kant's claim seriously, then such "certain inner experience" must not be equated with self-evident conceptual connections as understood by so-called rationalists, for these connections are always the *terminus* of rationalist analysis. For Kant, by contrast, certain inner experiences—following the Newtonian idea—provide the *starting point* for metaphysical analysis.

Second, the passage is clearly intended to assert that the method employed by Newton and the one Kant wishes to be adopted by metaphysics are "basically identical." As we saw in our previous section, the kind of analysis that is part of the Newtonian method is fundamentally distinct from the one found in the writings of Descartes, Leibniz, and Wolff: whereas the former is inductive and draws its support from experience, the latter, though it may begin from experience, is not inductive and draws all of its strength from rational insight. Thus, if we combine Kant's assertion of an identity between Newtonian and metaphysical method with his repeated claims that the method employed in metaphysics is essentially that of *analysis*, there should be little doubt that the analysis he has in mind here is the one described by Newton and not that of Wolff. Indeed, it seems reasonable to assume that Kant intended his parallel to signal to his readers in the Academy, who were no doubt aware of the details of Newton's discussion of analysis, that the type of analysis metaphysics should employ was precisely that outlined in the famous passage from the *Optics* and in the four rules of inductive method found in the *Principia*.

Returning to the passage quoted above, the third notable feature is the clear parallel implied between its third and its last lines:

> Even if one does not discover the fundamental principle of these occurrences in the bodies themselves, it is nonetheless certain that they operate in accordance with this law.

> And even if you are not acquainted with the complete essence of the thing, you can still safely employ those characteristic marks to infer a great deal from them about the thing in question.

The first of these two lines refers to Newton's view that certainty has its source entirely in experience and carefully conducted inductive analysis and does not require a more fundamental principle of explanation. Only the laws that we inductively infer immediately from our experiences are as certain as the latter. In the second of these two lines, Kant bids us to adopt exactly the same method in metaphysics. In other words, he bids us to place the greatest certainty only in what is directly given to us and can be inferred immediately from such data through analysis. And just as in the first line, the implication in the third is clearly that the certainty of metaphysical truths does not require, and would not be served by, the discovery of even more fundamental principles.

Having examined this passage in detail, let us now ask whether our interpretation of it agrees with what Kant says more generally about the process of analysis in writings of this period. As we have seen, Kant states that in analyzing a concept "the characteristic marks which have been separated out and the concept which has been given have to be compared with each other in all kinds of contexts; and this abstract thought rendered complete and determinate" (Inq, 2:276). Elsewhere, he writes that "many operations have to be performed in unfolding obscure ideas, in comparing these with each other, in subordinating them to each other and in limiting them by each other" (Inq, 2:284).

As in other cases we have examined, it is not immediately clear what Kant means by such operations. In the first section of the *Prize Essay*, however, he states that in metaphysics we "arrive at a general concept […] by *abstracting* from that cognition which has been rendered distinct by means of analysis" (Inq, 2:248). Similarly, in the third part of *Negative Magnitudes* he explains that he plans on "*advancing to general principles from the examples* which have been introduced and are easy enough to understand" (NM, 2:289; my emphasis). As the sequel shows, this advance is from propositions secured in particular philosophical sciences to genuinely metaphysical, and therefore fully universal, principles. With such generalizations, Kant proceeds seemingly in full confidence of being able to sufficiently establish original metaphysical principles—which are supposed to be intrinsic to the meaning of concepts such as *reality*, *negation*, *cancellation*, and *something*—through a process of collecting analogies *à la* Newton that can be called nothing if not inductive in character.

If this interpretation is correct, then the young Kant believed that a general concept, and eventually perhaps also a definition, can be reached by abstraction from the initial data, once these data have been rendered

distinct by analysis. The overall process here would be distinctly inductive, moving from particular data to general concepts based upon widespread analogies. This process would be distinct from Wolffian analysis, which also involves abstraction and comparison, in that it does not attempt to provide a metaphysical guarantee for this process by assuming that the general is already contained and perceived in the particular. Likewise, as for Newton, for Kant the move from data to general principles is a move away from the source of certainty and does not hold the promise of any future rational insight into necessary truths.

The above interpretation is consistent with Kant's frequent talk in texts from this period of performing experiments (*Versuche*) on concepts. For example, in *Negative Magnitudes* Kant states that his analysis rests on "incomplete experiments, presented in the form of abstract cognition in a problematic fashion," which he believes "can contribute a great deal to the growth of higher philosophy" (NM, 2:197).

In *Dreams*, Kant explains his procedure as follows:

> I shall compare my ill-understood concept with all its different applications. By noticing with which cases my concept is compatible and with which it is inconsistent, I hope to unfold the concealed sense of the concept. (Inq, 2:320)

Nothing here or in similar instances reminds us of either a Cartesian or Leibnizian form of analysis, which consists in the separation of what is already given in our purely intellectual consciousness of a concept. Instead, Kant proposes that in metaphysics, much as in chemical analysis of the kind described by Newton in the queries to the *Optics*, we search out, compare, and abstract from all the particular positive and negative instances in which we encounter the concept in question.

This interpretation also agrees with what Kant says about the investigation of principles or indemonstrable fundamental truths, which he claims is "the most important business of philosophy." About these truths he states that:

> No matter what the object may be, those characteristic marks, which the understanding initially and immediately perceives (*unmittelbar wahrnimmt*) in the object, constitute the data for exactly the same number of indemonstrable propositions, which then form the foundation on the basis of which definitions can be drawn up. (Inq, 2:281)

Notice that Kant does *not* say that the data are these propositions. Rather, he says the data are the characteristic marks "immediately perceived" as connected in a given object. It is these data that must be

analyzed in order to arrive at indemonstrable propositions. And only once a sufficiently large number of such propositions are known can one hazard a tentative definition. The definition is still more general, since it goes beyond the particular data and relies upon an inference from the latter to a single underlying concept, which will then provide a unifying ground and explanation of the data. This procedure parallels the one described by Newton, according to whom we can draw on immediate propositions regarding the motions of particular terrestrial and celestial bodies to infer the concept of universal gravitation which explains them. In traditional rationalist methodology, the next step would be to use the resulting concept in order to prove and certify the propositions from which one began. Yet Kant again sides with the Newtonians: although we can come to know these propositions immediately or intuitively, "they can never be proved," for, he asks, "on what basis could such a proof be constructed, granted that these propositions constitute the first and simplest thoughts I can have of my object, when I first call it to mind?" (Inq, 2:281).

We can now see that by answering the two previous questions we have already generated an answer to the final one, namely that, for Kant, the certainty of metaphysical knowledge can rest on nothing more than the immediate evidence of the data, the care taken in their analysis, and the restraint exercised in limiting our claims to what is sanctioned by the same. The intellect alone is not a source of knowledge or certainty. This is the empiricist standpoint of Bacon and Newton.

4 Conclusion

Nearly all previous commentators have recognized, and some have even emphasized, the empiricism apparent in Kant's *Prize Essay*. In fact, the present chapter has benefited greatly from these earlier studies and should be understood as an attempt to build upon them. Nevertheless, in sharp contrast to my core thesis, all previous interpretations, including Friedman's, have concluded that the *Prize Essay* ultimately falls back on a broadly Cartesian or rationalist model of metaphysics. The central reasons provided in support of this claim are, however, quite unconvincing, and really amount to a misunderstanding of the brand of empiricism to which Kant subscribes. Kant never seems to have been anything like a Lockean empiricist, but instead followed the method espoused by Bacon, Newton, and Euler, among others. This brand of empiricism gives experience priority because it is thought to be the only way in which we make immediate contact with reality. Kant's empiricism in metaphysics builds on such an approach by following Euler's idea—which can already be found in Bacon—that metaphysics should borrow its data from the empirical sciences. Kant not only follows and generalizes this

method but also provides a metaphysical basis for the necessity of it through his conception of real as opposed to logical possibility. Moreover, Kant's reversal of the Wolffian method does not commit him—any more than it would Bacon, Newton, or Euler—to an outright rejection of the synthetic method. Instead, it commits him only to denying that the synthetic method can be used to provide metaphysical propositions with more certainty than is contained in the original data from which they are drawn.

Notes

1 Kant, Inq, 2:275.
2 See, e.g., Leibniz (1996: 49, 80).
3 See Wolff, PPO § 55; cf. GM § 391. Christian August Crusius, following Adolph Friedrich Hoffmann, criticized Wolff both for failing to give experience a sufficiently robust role in the production of knowledge and for not recognizing the necessity of material principles (see *Weg* §§ 259–60).
4 Anderson (2015: 156).
5 De Vleeschauwer (1962: 35); see Kant, UD, 2:290.
6 De Vleeschauwer (1962: 36); cf. Clewis (2014).
7 Friedman (1992: 24, n.39).
8 However, as we will see below, Kant provides far more examples of data that consist in nothing more than propositions drawn from various empirical sciences. Moreover, even when he speaks of mathematical propositions as 'data' he seems to refer to propositions applied to empirically given space rather than truths available to us in a purely internal or intellectual way.
9 On this basis, it would perhaps be better to avoid the terms 'empiricism' and 'rationalism' altogether in discussing Kant's *Prize Essay*. Unfortunately, however, this is the framework within which the scholarly debate has evolved, and so such terms cannot be avoided. One goal of this section is to redraw the distinction more accurately by reference to the writings of the two figures at the heart of the brand of 'empiricism' to which Kant ascribes in the *Prize Essay*. It should be noted that in the following, I use the term 'empiricism' as it has been used by commentators when discussing the *Prize Essay*, i.e. in reference to the British experimental tradition of Bacon and Newton rather than to Locke and those influenced by him.
10 Bacon (2000: 16).
11 Of course, the negative work of philosophy still concerns the examination of the deceptions of both sense and intellect.
12 Newton (1953: 178–79).
13 Newton (1953: 179). Brucker too notes that Newton makes use of a "double method," combining both analysis and synthesis, just as Bacon had done (1742–1744: vol. 4.2, 641).
14 Kant, *Announcement*, 2:308.
15 Bacon (2000: 16).
16 See Knutzen (1747: § 287); cf. also Wolff, GL, ch. 5, § 1 and Crusius, *Weg* § 461.
17 Euler (1967: 117).
18 Of course, Kant is also just echoing Leonhard Euler, whom he explicitly mentions in this context (NM, 2:168). See Euler (1967: 1–4).

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