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ARTICLE

KANT ON ANALOGY

John J. Callanan

1. INTRODUCTION

The role of analogy in Kant's critical thought is often thought to be unclear. This is in no small part due to Kant's own ambiguous statements on the matter. On the one hand, Kant thought it appropriate to refer to the principle of causation, a core principle in the project of the *Critique of Pure Reason*, as an analogy. Here Kant offers the following definition:

> An analogy of experience will therefore be only a rule in accordance with which unity of experience is to arise from perceptions (not as a perception itself, as empirical intuition in general).[1]

On the other hand, in Kant's lectures on logic, analogy is frequently paired with induction as examples of inferior forms of reasoning and Kant warns that they are to be used only with 'caution and care'. In the *Prolegomena*, Kant offers this further definition of analogy:

> This type of cognition is cognition according to analogy, which surely does not signify, as the word is usually taken, an imperfect similarity between two things, but rather a perfect similarity between two relations in wholly dissimilar things.[2]

It is perhaps here in the *Prolegomena* that the hostility that Kant displays concerning the notion of analogy is most evident. In one notable reference, Kant suggests that '[o]nly in empirical natural science can conjectures (by means of induction and analogy) be tolerated'.[3] Kant appears vehement in his theoretical opposition to 'the plaything of probability and conjecture, which suits metaphysics just as poorly as it does geometry'.[4]

[1]A180/B223. All references to the *Critique of Pure Reason*, unless otherwise indicated, will be to the Guyer and Wood translation.
[2]*Prolegomena to any Future Metaphysics* (translated by Gary Hatfield) 146–7 in Kant, 2002.
[3]Ibid., 157.
[4]Ibid., 123.

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Nevertheless, despite his own restriction on such practices, Kant freely uses the notion of analogy in the *Critique of Pure Reason* in order to explicate key metaphysical themes. The interpretative task then is to discern Kant's reasoning for applying what appears to be such a disparaging label to synthetic a-priori principles.[5] The purpose of this paper is to determine the meaning of analogy for Kant and to illuminate the role that it was intended to play in the Transcendental Analytic.[6]

Fortunately, Kant does frequently make explicit attempts to explain his use of this terminology. Unfortunately, there is a variety of competing sources available, many of which are found outside the first *Critique* and which offer seemingly contradictory accounts of the matter. I shall argue, however, that a coherent and somewhat unified notion of analogy arises that is employed in the first *Critique*. Briefly, an analogy is a principle that warrants the combination of appearances in a specific manner that distinguishes it from other principles of the understanding. For Kant, analogical inference is a means of expressing how, given an abstract transcendental principle, that principle can then be appropriately applied to a realm of particular, empirically conditioned appearances. Empirically conditioned appearances are combined *analogously* to the manner in which appearances *per se* are necessarily combined when considered abstractly. The form of the combination is one that parallels the use of analogy Kant recognized in logical and mathematical contexts, and this was the primary reason for his choice of terminology.

In the second section of this paper, an analysis is made of Kant's discussion of the meaning of analogy beyond the confines of the first *Critique* itself, primarily in regard to the role of analogy as a part of logic. There can be identified here key features which Kant retained in his

[5]Bennett suggests that, in regard to the justification of terminology, 'Kant's defence of 'Analogies' is absurd', and concludes that as far as the Principles of the Understanding are concerned, 'these daunting labels are best regarded as arbitrary, undescriptive, proper names' (Bennett, 1966: 165).

[6]Analogy plays an important role in many other areas of Kant's critical philosophy, e.g. in the Transcendental Dialectic of the first *Critique* as well as the *Critique of the Power of Judgment*. However, it is my contention that the issue that motivated the inclusion of analogy in Kant's critical project concerns the role of transcendental principles in the Analytic. Paul Guyer provides one of the few extended discussions of the different influences governing Kant's usage of the term 'analogy' (Guyer, 1998). Guyer examines the *Duisburg Nachlass* and suggests three different sources of influence for Kant's choice of terminology (67–70). The first source concerns Kant's notion that the objects experienced must follow the same rules that govern the cognitive functions of the self (67–8) and so the former are 'analogies' of the latter (or sometimes, as Guyer points out, vice versa). The second source suggested concerns the 'restricted' nature of the application of analogies in that, for the Kant of this period, the 'rules must be conditional rather than absolute' (69). The third source suggested is that the analogies are so titled because they function as '*analoga* of axioms', in that they fail to furnish the same 'determinate rules for the construction of objects' that the Axioms and Anticipations provide (69). As we shall see, while these influences must have had some role in Kant's choice (the last of these especially), there are other stronger contenders which must also be taken into account in order to elucidate the specific function that the analogies were intended to provide in the first *Critique*.

employment of analogy in his critical philosophy. In the third sections I examine several different concepts that Kant employed in order to elucidate and complement the notion of analogy. I argue that none of these concepts is intended as offering definitions of the role of analogy and in fact are misleading if interpreted too literally. In the fourth section, I outline the specific definition Kant intended for his notion of analogy and examine the motivation for Kant's distinction between 'mathematical' and 'philosophical' analogies. Finally, I propose a case study of Kant's employment of this form of analogy, taking the account of causation offered in the Second Analogy as my example. It is claimed that the notion of analogy outlined in the previous sections can offer a profitable means of interpreting Kant's intentions in this section, specifically in relation to the problem of the so-called 'weak reading' of Kant's account of causation.

2. THE LOGIC OF ANALOGY

In retaining a place within his philosophical system for the employment of analogy, Kant is merely following a tradition that viewed analogy as a valid (though limited) means of inquiry and discovery. Induction and analogy had been traditionally paired within Aristotelian logic and Bacon is the first to recover the notion within the 'new' science.[7] In Book II of the *Novum Organum* he states:

> Substitution by analogy is certainly useful but less sure, and therefore must be used with some discretion. It occurs when a non-sensible thing is brought before the senses, not by sensible activity on the part of the insensible substance itself, but by observation of a related sensible body.[8]

The idea of the improvement of knowledge through this kind of consideration of the relation between observed items is found again in Newton's *Principia*, where, in the 'Rules of Reasoning in Philosophy', we find Rule III, which states that

> The qualities of bodies, which admit neither intension nor remission of degrees, and which are found to belong to all bodies within the reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever.[9]

[7]For an analysis of the Greek account of analogy, see Lloyd, 1966 (esp. 403–20). For reasons of space, I will not attempt to discuss the relation between the ancient Greek conception of analogy and that conception which is employed in the early modern period. Vuillemin seems to suggest that Kant was aware of a notion of analogy through the work of Bacon and Newton, though he does not explore this topic further (Vuillemin, 1989: 241).
[8]Bacon, 2000: 180.
[9]Newton, 1999: 795.

In Locke's *Essay* too (Book 4, Ch. 16, §12), we find the same expression:

> Concerning the manner of operation in most parts of the works of nature, wherein, though we see the sensible effects, yet their causes are unknown, and we perceive not the ways and manner how they are produced. *Analogy* in these matters is the only help we have, and it is from that alone that we draw all our grounds of probability.[10]

The role of analogy conceived of here, roughly, is to provide a means of developing a relation to 'missing' sensible items from a consideration of the relations between given sensible items.

It is well known that much of Kant's logic was inherited from the Aristotelian corpus without modification, and so it is unsurprising therefore that Kant includes an account of the logical role of analogy in his lectures on logic.[11] Here Kant presents analogy alongside induction as two similar forms of reasoning '*from the particular to the universal*'.[12] Since analogy, like induction, proceeds from the particular items of information received in experience, it cannot aspire to infer a-priori judgements, though its judgements are nevertheless general:

> The power of judgment, by proceeding from the particular to the universal in order to draw from experience (empirically) universal – hence not *a priori* – judgments, infers *either* from *many* to *all* things of a kind, *or* from *many* determinations and properties, in which things of one kind agree, *to the remaining ones, insofar as they belong to the same principle*. The former mode of inference is called inference *through induction*, the other inference *according to analogy*.[13]

Both induction and analogy are forms of what Kant calls 'reflective' (rather than 'determinative') judgement. Reflective judgement is all judgement that proceeds from the particular to the general, and Kant warns that we can only draw by it a judgement that has '*subjective* validity, for the universal to which it proceeds from the particular is *empirical* universality only'.[14] Although this negative characterization seems clear enough, Kant's positive characterization offered above seems obscure. Kant gives an extended note in an attempt to clarify these characterizations:

> Induction infers, then, from the particular to the universal (a particulari ad universale) according to the principle of universalization: What belongs to many things of a genus belongs to the remaining ones too. Analogy infers from

[10]Locke, 1976: 412–13.
[11]All references regarding Kant's logic lectures will be to the Cambridge Edition of the *Lectures on Logic* (translated and edited by J. Michael Young).
[12]*Lectures on Logic*, 625.
[13]Ibid., 626.
[14]Ibid., 625. Kant warns that judgements may be universal in form, yet lack 'strict' universality, i.e. those judgements need not be accompanied by a-priori necessity (e.g. B3–4).

> particular to total similarity of two things, according to the principle of specification: Things of one genus, which we know to agree in much, also agree in what remains, with which we are familiar in some things of this genus but which we do not perceive in others. Induction extends the empirically given from the particular to the universal in regard to many objects, while analogy extends the given properties of one thing to several [other properties] of the very same thing[.] – One in many, hence in all: Induction; many in one (which are also in others), hence also what remains in the same thing: Analogy.[15]

Both induction and analogy, then, are forms of reflective judgement that allow us to draw only general and thus fallible judgements. In an inductive judgement the inference is drawn to apply to all objects of a certain type based on experience of a limited number of objects of that type – thus, from the judgement that the swans so far perceived have been white, one may conclude by induction that all swans are white. In an analogical judgement the inference is drawn to apply to all properties of a particular object based on experience of a limited number of the properties of that object – thus, from the judgement that the properties of the moon that have so far been perceived are the same as properties of the earth, one may conclude by analogy that all the properties of the moon are the same as those of the earth.

Kant insists that the role of such means of drawing general judgements from experience is that they 'are useful and indispensable for the sake of the extending of our cognition by experience'; that is, they allow us to form pragmatically useful generalizations about empirical nature that allow us to increase our knowledge of the empirical world without any loss of methodological unity. Nevertheless, since these forms of conclusion are subject to errors such as the ones offered above, Kant insists that 'we must make use of them with caution and care'.[16]

Reference to analogy can also be found in Kant's lectures on metaphysics. The reference is made in regard to Kant's discussion of the immortality of the soul and dates from the mid-1770s. Kant has offered already three 'proofs' of the soul's immortality before turning to the next form of proof:

> The fourth proof is empirical-psychological, but from cosmological grounds, and this is the analogical proof. Here the immortality of the soul is inferred from analogy with the entirety of nature. – Analogy is a proportion of concepts, where from the relation between two members that I know I bring out the relation of a third member, that I know, to a fourth member that I do *not* know.[17]

[15]Ibid., 626–7, n1.
[16]Ibid., 627, n3.
[17]*Lectures on Metaphysics* (translated and edited by K. Ameriks and S. Naragon) 99.

Here we find conclusions drawn by analogy presented with a different slant. For Kant, analogy is now 'a proportion of concepts'.[18] It is crucial to see how these two characterizations of analogy, that is, as a form of reflective inference and as a 'proportion of concepts', are related. The first characterization describes analogy as a means of drawing conclusions regarding properties of an object we do not know from the basis of the properties of that object that we do know. For example, we make inferences regarding the unknown properties of the moon based on the properties of the moon that were known, e.g. from the basis that we know that the moon is a planet, spheroid, in orbit of the sun, and has noticeable geographic features, just as the earth does, we conclude by analogy that it shares other properties of the earth, such as valleys, mountains and rivers, rational inhabitants, etc.[19]

This second characterization does not contradict the first characterization but rather expands upon it. The important point that is introduced in the second characterization is that the holding of properties by an object is a relation. Similarly, the properties that the object holds that we do not know (as of yet) also takes the form of a relation. The second characterization suggests that to infer by analogy is to infer the parity of these relations. For example, we know that, just as the earth is a spheroid planet, so too is the moon a spheroid planet. To infer by analogy is to infer that on the basis of the balance of 'proportion' of the earth and the moon sharing these known properties, other unknown properties that the earth holds can be attributed to the moon in the interests of the 'proportion of concepts' (e.g. just as the earth has rational inhabitants, so too has the moon rational inhabitants).

This second characterization of analogy can also help us to understand an aspect of the first not already mentioned. Kant states that in regard to 'the inference according to analogy, however, *identity of the ground* (*par ratio*) is not required'.[20] The identity of the ground referred to is the identity of the

[18]Analogy considered as proportionality is a traditional Greek characterization (see Lloyd, 1966: 175), and Kant's knowledge of Aristotle, or indeed of many medieval philosophers (especially, perhaps, Aquinas), may well have made him familiar with this interpretation. In fact, as we shall see, Kant's own ultimate characterisation of analogy will bear a striking resemblance to the ancient Greek account. However, it is noticeable that the account of analogy as proportionality does not appear in any of the *Lectures on Logic*, where one might expect it. I will argue that Kant had rather different reasons for reviving this notion of proportionality in his account of analogy.

[19]Kant himself uses this example, according to the *Blomberg* Logic, in a section where he articulates the importance of the sufficiency of the ground in rational inference, saying that

> an insufficient ground is one where only something can be cognized [rather than understood]. E.g. when we say that the moon has inhabitants because mountains and valleys are present on it, this is an insufficient ground. From this one sees only that it is possible and probable that there are inhabitants of the moon.
>
> (*Lectures on Logic*, 29–30)

[20]*Lectures on Logic*, 627.

type of objects under consideration. Thus Kant's claim is that in analogy, the requirement is only that the relation that we are attributing to the object with unknown elements must be the *same* relation that holds of the object that we do know (e.g. the relation holding between the moon and the property of having rational inhabitants can only be attributed if there is such a relation holding with the known object).

It can be seen, then, that this notion of analogy as a 'proportion of concepts' is broadly in keeping with the first characterization of analogy – the inference of unknown properties is made by extending a relation between an object and its known properties to another object and its unknown properties. In so far as this latter relation mimics the former relation, analogy involves the claim that it is 'proportional' to the first relation. A further important point to note is that, in so far as analogy concerns the comparison of the relations between two sets of relation, there are then four items that are involved in the process of drawing analogies. As we shall see, this aspect of analogy figures importantly in Kant's employment of it. The appeal of this peculiar means of articulating the nature of analogy can be understood better in relation to the employment of the notion of analogy that is found in Kant's 'critical' period, and can be particularly seen in regard to the attention it receives in the *Prolegomena* as well as the first *Critique*.

It can be seen, then, that Kant's inclusion of analogy in some form is therefore hardly out of keeping with the early modern tradition. However, Kant's account does differ in two significant ways: first, Kant's 'proportionality' interpretation differs from those preceding accounts found in Bacon and Locke; second, Kant differentiates *two* different forms of analogy, which he entitles 'mathematical' and 'philosophical' analogies. Furthermore, it will become clear that Kant understands this distinction as being related to a string of paired concepts, including the distinctions between *intuitive* and *discursive* certainty, the *composition* and *combination* of appearances, *quantitative* and *qualitative* relations and *constitutive* and *regulative* principles of understanding. First, however, understanding the manner in which the notion of analogy is intended to work for Kant concerns his distinction between *mathematical* and *dynamical* principles, which in turn elucidates the notion of the 'proportion of concepts'.[21] In examining just what purpose this and the other distinctions Kant introduces are intended to serve, it can be seen that they are directed towards explicating the *mode of application* of two types of synthetic a-priori principle.

[21]Many commentators neglect the mathematical/dynamical distinction. I am only aware of a handful that proposes explicitly to examine the meanings of the terms: these are French (1969), Dister (1972), Friedman (1994b), and Adkins (1999).

3. MATHEMATICAL AND DYNAMICAL PRINCIPLES

In his presentation of the Table of Categories, Kant accompanied the list with some remarks regarding the distinction of the Categories of Quantity and Quality on the one hand and those of Relation and Modality on the other:

> **The first is** that the table, which contains four classes of concepts of the understanding, can be first split into two divisions, the first of which is concerned with objects of intuition (pure as well as empirical), the second of which, however, is directed at the existence of these objects (either in relation to each other or to the understanding). I will call the first class the **mathematical** categories, the second, the **dynamical** ones.[22]

This distinction is not immediately helpful. It is unclear as to how we are supposed to understand the difference between a relation concerning 'objects of intuition' and a relation concerning 'the existence of these objects'. It might be thought that, considered as Categories, they *both* concern 'objects of intuition'. Similarly, as Categories, one might have thought that they must also both concern how these objects relate to the understanding.

When these classes are considered with regard to their time-schemata, and thus as principles of the understanding, the dichotomy of the Table of Categories still holds. The schemata of the classes of categories of Quantity and Quality, the Axioms of Intuition and the Anticipations of Perception, are characterized by their 'intuitive certainty'.[23] The second group, which contains the schemata of the classes of category of Relation and Modality, the Analogies of Experience and the Postulates of Empirical Thought in General, respectively, are distinguished from the first group in that they 'are capable only of a discursive certainty'.[24]

In 'The Discipline of Pure Reason', Kant offers some explication of the distinction between intuitive and discursive certainty. Intuitive certainty is the type of certainty that is supposed to accompany mathematical axioms (hence, presumably the title of Axioms of Intuition for one of the classes of mathematical relation). Since it involves analysis of the concepts involved alone, Kant says that intuitive certainty is 'immediate'. With synthetic a-priori propositions in philosophy, on the other hand, these principles cannot be immediately inferred

> because I must always look for some third thing, namely the condition of time-determination in an experience, and could never directly cognize such a

[22]B110.
[23]A162/B201.
[24]A162/B201.

> principle immediately from concepts alone. Discursive principles are therefore something entirely different from intuitive ones, i.e. axioms.[25]

In so far as all the principles of the understanding are synthetic a-priori principles, there is a clear sense in which the labels 'mathematical' and 'axiom', do *not* apply – these principles, as philosophical principles, should only be capable of *discursive* certainty. Kant justifies his use of the term axiom since the Axioms of Intuition 'served to provide the principle of the possibility of axioms in general' despite itself not being an axiom.[26] Presumably, the descriptions offered here are more intended merely to illuminate certain features of the principles of the understanding and therefore cannot be read too strictly. Nevertheless, it is still the case that Kant's description of the Axioms and Anticipations as being characterized by their 'intuitive certainty' is, strictly speaking, inaccurate.[27]

For Kant, the distinction between intuitive and discursive certainty is mirrored by the division of the principles into mathematical and dynamical principles respectively:

> In the application of the pure concepts of understanding to possible experience the use of their synthesis is either *mathematical* or *dynamical*: for it pertains partly merely to the *intuition*, partly to the *existence* of an appearance in general.[28]

This distinction seems to follow the division of the Categories into mathematical and dynamical types, the former being concerned with 'objects' (intuitions), the latter being concerned with the 'existence' of those objects.

It is not immediately clear what Kant means by *this* distinction either. Some help is offered, however, in an accompanying note which begins by stating that '[a]ll *combination* (*conjunctio*) is either *composition* (*compositio*)

[25]A733/B76. Adkins (1999) rightly notes the importance of this distinction for the accompanying distinction between mathematical and dynamical principles.

[26]A733/B761. Since discursive certainty is defined negatively, Kant appears here merely to draw attention to the *mediated* sense of certainty that attaches to philosophical proofs (as opposed to mathematical proofs) and synthetic a-priori propositions generally.

[27]This distinction does not concern the issue of each principle's a-priori certainty – Kant is clear that both types of principle are certain (A162/B201). Similarly, Kant also distinguishes between mathematical/intuitive and philosophical/discursive principles by saying that only the latter require a deduction, the former being evident (A733–4/B761–2). However, this too is inaccurate, since all the principles of the understanding, considered as synthetic a-priori principles, require a deduction. As we shall see, Kant's discussion here in the Transcendental Analytic employs several other distinctions, none of which are exactly appropriate for the general distinction Kant is attempting to draw between mathematical and philosophical analogies.

[28]A160/B199.

or *connection* (*nexus*)'.[29] All principles of the understanding, as schemata of categories, are rules for the synthetic combination of the manifold of appearances. What Kant claims here is that whereas all the principles of the understanding can be understood as principles of 'combination', this process of combination can come about in two different ways, either by 'composition' or 'connection'.

For Kant, the mathematical principles are concerned with composition, whereas the dynamical principles are concerned with connection. Mathematical principles operate through the 'synthesis of a manifold of what does not necessarily belong *to each other*', Kant claims, and offers by way of an example, 'two triangles into which a square is divided by its diagonal'. This statement is obviously in need of some clarification, as it is a little obscure to see at once what Kant means when he says that the two triangles 'do not necessarily belong to each other'. Kant might be understood, however, as saying that the given idea of a single triangle in space does not necessarily bring to the mind the idea of *another* identical triangle (at least, not in the same way that Kant feels the given idea of 'effect' is supposed necessarily to bring to the mind the idea of 'cause'). The idea here, presumably, appears to be that a 'triangle' would have to be placed in some kind of particular *constructed* relation, such as that of making up two halves of a square bisected by a diagonal line, in order for there to be some kind of necessary relation of combination with another triangle. A concept such as 'effect', on the other hand, can bring to mind the idea of 'cause' without being put in such a constructed case. The essential characteristic of this former mode of synthesis is that the constituents share some identical feature (such as being triangular), and so Kant states that 'the synthesis of the *homogeneous* is everything which can be *mathematically* treated'.[30] To summarize, mathematical principles of understanding are therefore characterized by their intuitive form of certainty which presumably (for Kant has not outlined yet why this should be so) arises from the manner in which the principles combine appearances in synthesis, a synthesis that concerns appearances in so far as they are homogeneous.

The character of dynamical principles, on the other hand, is the opposite:

> The second combination (*nexus*) is the synthesis of that manifold which is manifold insofar as they *necessarily* belong *to one another*, as, e.g., an accident belongs to some substance, or the effect to the cause – this also as represented as *unhomogeneous* but yet as combined *a priori*, which combination, since it is not arbitrary, I call *dynamical*, since it concerns the combination of the *existence* of the manifold.[31]

[29]A162/B201–2.
[30]A162/B201–footnote *a*.
[31]A162/B201–footnote *a*.

It would seem from this note that the distinction between the two types of principle is that, while they both concern rules for the combination of appearances, mathematical principles supply their mode of synthesis by combining representations in so far as they are homogeneous (as with, for example, the axiom of intuition, which states that all appearances are represented as extensive magnitudes), whereas dynamical principles supply their mode of synthetic unity by combining representations of intuitions that are 'unhomogeneous' (as with, for example, the analogy of experience, which states that all succession occurs in conformity with the law of cause and effect). In the former rule of combination, the constituent members (i.e. appearances) are considered in so far as they share some identical feature (such as 'having an extensive magnitude'); in the latter rule, they are combined in regard to some differing feature each might take (e.g. one appearance being considered in so far as it can be represented as the 'cause' while another being considered the 'effect' – the relation is not based on the parity of some identical feature).[32] It is in this sense that Kant could maintain the certainly odd-sounding claim that all constituents of the manifold that are homogeneous do *not* belong to each other, whereas some constituents that are heterogeneous *do* belong to each other.

It might be thought that the mathematical and dynamical principles each hold characteristics that the other lacks. With a mathematical principle, one can demand that, for any given appearance with some fundamental feature (e.g. that it takes up some quantifiable amount of space), it can be determined a priori, not that another appearance must exist, but that for any other appearance given, it will share that fundamental feature. With a dynamical principle no such feature can be determined a priori. What can be determined a priori, however, is that, for any given appearance, some other appearance related to it must necessarily exist. The function of these principles is similar in that, when we are confronted with appearances given in experience, we may employ them in order to licence certain demands of non-given phenomenal reality, i.e. they warrant a different type of inference regarding how experience of reality must necessarily be constituted.

Following his exposition of the Axioms of Intuition and Anticipations of Perception, Kant returns to the mathematical/dynamical distinction in the

[32]A clear worry can be raised here; namely, that if synthetic a-priori principles elucidate the necessary conditions of the representation of objects, it is unclear how Kant can maintain a distinction within the group of such principles between those that concern appearances that 'necessarily belong to each other' and those that do not. Kant surely faces a dilemma here: he cannot claim that such appearances maintain necessary relations to each other *prior* to their synthetic combination in consciousness; neither, however, can he coherently claim that, *subsequent* to such an a-priori synthesis, appearances then *lack* such a necessary connection. I would suggest that such inconsistency further confirms the role of such comments as being heuristic rather than definitive. Mathematical principles concern those appearances that, subsequent to their synthesis under rules of the understanding, can be understood to have been combined by virtue of their homogeneity; dynamical principles are those that can be understood to have combined appearances by virtue of their heterogeneous features.

section introducing the Analogies of Experience. Here, Kant introduces a distinction between constitutive and regulative principles that is intended to divide up the principles of the understanding along the same lines as the previous distinctions. In fact, in elaborating the distinction, Kant appeals to exactly the same criteria as he has used in distinguishing mathematical and dynamical principles. The Analogies, Kant repeats, as dynamical principles, 'do not concern the appearances and the synthesis of their empirical intuition, but merely their *existence* and their *relation* to one another with regard to this existence'.[33] Kant distinguishes these dynamical principles by contrasting their character with the character of mathematical principles:

> The preceding two principles, which I named the mathematical ones in consideration of the fact that they justified applying mathematics to appearances, pertained to appearances with regard to their mere possibility, and taught how both their intuition and the real in their perception could be generated in accordance with rules of a mathematical synthesis, hence how in both cases numerical magnitudes and, with them, the determination of the appearances as magnitude, could be used... Thus we can call the former principles constitutive.
>
> (A 178–9/B 221)

Constitutive principles of the understanding are therefore those rules of combination of the manifold by composition (*compositio*), in that they are based on the basic uniformity and homogeneity of all appearances in their characteristics (of extensive and intensive magnitude). One reason why they can be called 'constitutive' is that, as will be seen, they are the fundamental rules of the *construction* of the possibility of appearances; that is, when appearances are considered at their most basic level of uniformity.

As before, dynamical principles provide an entirely different function, in that these principles 'bring the existence of appearances under rules a priori; for, since this existence cannot be constructed, these principles can concern only the relation [*Verhältnis*] of existence, and can yield nothing but merely *regulative* principles'.[34] The crucial aspect of the distinction, then, concerns

[33]A178/B220.

[34]A 179/B 221–2. Kant employs the constitutive/regulative distinction at two levels. In the Transcendental Analytic, he uses the distinction to match the mathematical/dynamical distinction. However, he reuses the phrase in a broader sense in regard to the division between the principles of the understanding and reason respectively (A664/B692). Thus, the dynamical principles of the understanding are to be considered as regulative in comparison to the mathematical principles; however, all principles of the understanding are to be considered as constitutive in comparison with the principles of reason, which are regulative. For reasons of space, I shall not pursue the significance of this dual usage of the distinction here. However, given the apparent redundancy of Kant's introduction of a further distinction at this point in the discussion, and given the distinction's later repetition in the broader sense, one may surmise that one motivation was surely that Kant intended to use it to indicate a relation of one set of principles being in some sense *more fundamental than* another set. This would account for the

the notions of *existence* and *construction*. Both constitutive and regulative principles are concerned with the relations between appearances; however, constitutive principles are concerned with relations that allow us to construct appearances, while regulative principles warrant inferences regarding the 'relation of existence'. This seems a somewhat subtle distinction and is in need of some clarification. A clue is offered with the following comment:

> [I]f a perception is given to us in a temporal relation to others (even though indeterminate), it cannot be said a priori *which* and *how great* the other perception is, but only how it is necessarily combined with the first, as regards its existence, in this *modus* of time.
>
> (A 179/B 222)

Regulative principles, unlike constitutive principles, do not warrant an inference regarding particular features of an appearance (which would allow us to individuate and characterize them, at least in regard to their spatial magnitude, a homogeneous feature of appearances). Regulative principles warrant an inference regarding the fact of the existence of an appearance in regard to other appearances, even if this appearance is indeterminate, i.e. even if we lack any specific individuation and characterization of it.

The discussion Kant gives here in this section of the Analytic is designed towards explicating the meaning of the mode of application of two broadly different types of principle of the understanding. To this end, he attempts to distinguish one set in terms of a string of labels, namely intuitive/mathematical/constitutive and the other set by another string, discursive/dynamical/regulative. However, Kant's employment of these terms is certainly loose and perhaps even contradictory if taken as definitive in purpose.

4. MATHEMATICAL AND PHILOSOPHICAL ANALOGIES

Kant attempts to develop further the difference between the two modes of application of the principles of the understanding with a comparison between *mathematical* and *philosophical* analogies. Again, Kant's terminology is unhelpful here to the point of being misleading – not only does he use the terms 'mathematical' and 'philosophical' to distinguish two types of principle of the understanding (which are ultimately philosophical principles), but, as shall be seen, Kant further compounds the confusion

application of the distinction in different contexts. The exact nature of this relation of constitutive principles being more fundamental than regulative principles is left obscure by Kant (possibly deliberately, if it was his intention for the distinction to be context-relative). For analysis of the double use of this distinction, see Buchdahl (1969) and Friedman (1994b).

by describing the same distinction in terms of two *mathematical* relations. As I have suggested, however, these comments are intended by Kant to be merely illustrative of the differences between the two types of principle. By virtue of the context in which they are made, Kant's comments on the difference between mathematical and philosophical analogies should certainly be understood as corresponding to the previous distinctions between intuitive and discursive certainty and between combination by composition and combination by connection.

Kant's account of the difference between these two types of analogy concerns differentiating two types of relation, each of which offers different ways of relating 'given' items to other 'missing' items. In this sense, both types of analogy described here maintain similarity with the logical account of analogy traditionally given. Mathematical analogies are 'formulas that assert the identity of two relations of magnitude, and are always *constitutive*, so that if two members of the proportion are given the third is also thereby given, i.e. can be constructed'.[35] If one is given the quantities of two thirds of an equation, the final third may be constructed a priori. One way to formulate the relation given by mathematical analogies is by the ratio $a : b :: b : x$, where a and b are given and x is the missing item that can be constructed a priori.[36]

Kant continues by saying that philosophical analogies are of a different type of relation:

> In philosophy, however, analogy is not the identity of two *quantitative* relations but of two *qualitative* relations, where from three given members I can cognize and give a priori only the *relation* to a fourth member but not *this* fourth *member* itself, although I have rule for seeking it in experience and a mark for discovering it there.[37]

This is an important passage, and it is essential to extract just what form the equality of two qualitative relations might take. It would seem that Kant is suggesting that if we are first given knowledge of one qualitative relation ($a : b$), and second we are given a third term (c), which is of the same type as the two that are involved in the first relation, we can justifiably construct, *by analogy* with the first relation, a second relation of the same form, although now between (c) and some fourth unknown (x). The determinate character of the fourth term cannot be constructed (beyond what we know to be true

[35]A179/B222. In his translation of the first *Critique*, Kemp Smith follows Mellin in changing 'two' (*zwei*) to 'three' (*drei*) and 'third' (*dritte*) to 'fourth' (*vierte*) in the section quoted above. It is possible that Mellin's change was made to keep the first example in line with the second, which does have four distinct terms. Guyer and Wood, however, return to the original translation. What follows should lend support for the correctness of this latter approach.

[36]Of course, although this formulation does in fact involve four places, it employs only three terms and so is in keeping still with Kant's original use of *zwei* and *dritte*, respectively.

[37]A179–180/B222.

of a and b); that is, we cannot characterize and thereby individuate the term a priori (we cannot say *which* or *how great* it is). Therefore, merely on the basis of the given validity of the relation $a : b$ and given something of the same type c, we can legitimately assert the *existence* of some unknown thing x and also assert its determinate relation to c. Therefore, the proper form of a philosophical analogy is $a : b :: c : x$.[38]

There is some evidence that Kant thought that all analogy could be rendered in this way. In the *Prolegomena*, Kant clearly refers to analogy as taking just this form:

> By means of such an analogy I can therefore provide a concept of a relation to things that are absolutely unknown to me. E.g., the promotion of the happiness of the children $= a$ is to the love of parents $= b$ as the welfare of humankind $= c$ is to the unknown in God $= x$, which we call love: not as if that unknown had the least similarity with any human inclination, but because we can posit the relation between God's love, and the world to be similar to that which things in the world have to one another. But here the concept of the relation is a mere category, namely the concept of cause, which has nothing to do with sensibility.[39]

[38]Despite the similarity already mentioned (fn18), to the best of my knowledge no commentator in the Anglophone tradition has acknowledged the similarity of Kant's account of analogy to the ancient Greek account. It is my opinion that, although Kant was probably aware of this notion of analogy as proportionality, there is no evidence to suggest that this interpretation influenced the account that appears in the first *Critique*. The first Anglophone commentator to discuss explicitly this form of analogy was C. D. Broad, who elaborated the formula is regard to the mathematical/dynamical distinction (Broad, 1978: 156). Dister also discusses analogy as taking this form, though his remarks are confined to the *Prolegomena* (see Dister, 1972). Cassirer mentions in passing that 'Kant is following the way of speaking of the mathematics of his time, in which the term "analogy" was used as the universal expression for any kind of proportion' (Cassirer, 1981: 182). There is far more to the story than this, however, as has been discussed in Shabel's excellent study (Shabel 1998). Shabel offers a penetrating examination of the influence of Wolff's account of the application of algebra in a 'symbolic construction'. She argues that on the Wolffian account, a proof is incomplete when rendered solely as the proportional ratios – what is required is a *construction* of the solution and these 'constructions are effected in the Cartesian tradition by virtue of geometric interpretations of arithmetic operations' (Shabel, 1998: 611). This seems to me to be persuasive as the lead candidate for the source of Kant's employment of ratios here. As we have seen (fn 6), Paul Guyer examines different sources of the meaning of analogy for Kant. In fact, the explanation that Guyer finds least convincing is the one actually given in the first *Critique*. Guyer follows Mellin's change in rendering the terms of both mathematical and philosophical analogies as being concerned with four members. As such, he finds little to suggest a strong distinction between them, since this now only concerns the difference between constructing a fourth member *itself* and constructing the *relation to* a fourth member (Guyer, 1998: 69–70). Although I have suggested that following this rendering of the text is mistaken, we shall see that Guyer is nonetheless correct to point out the shortcomings of Kant's mode of explicating analogy by means of this mathematical model.

[39]*Prolegomena*, 147, note.

These comments support the formulation of analogy presented above, whereby the relation of c : x is itself based on the identity of the relation of a : b. It can be seen that the formulae suggested above correspond to the distinction already discussed, namely, that mathematical principles are concerned with the combination of the homogeneous while dynamical principles concern the combination of the heterogeneous. In the formula a : b :: b : x , the formula concerns its elements in so far as they are quantities, and as such are homogeneous. Thus, Kant describes this as a 'quantitative relation', whereby the third value can be 'constructed'. The formula $a : b :: c : x$ Kant calls a 'qualitative relation', whereby presumably by focusing on the *relation* between the members one may be able to construct a similar relation to a missing member, even though one cannot 'construct' the characteristic features of that member (as in quantitative relations).[40]

[40]The distinction is surely confused, however: in quantitative relations the possibility of constructing the third member is surely derived just by considering the *relations between* the first two members and thus the distinction between quantitative and qualitative relations (and thereby mathematical and philosophical analogies) is undermined. Similarly, it is unclear how philosophical analogies fail to characterize the missing item to at least some degree on this model. It would seem that the distinction is employed to draw our attention to different aspects of such analogies: with the former kind, it is the ability to deduce specific values for the missing item that is to be focused upon; in the latter, it is the fact of the identity of the relations employed that is highlighted. As such, one might claim that, even if the Mellin change is not followed, the distinction that Kant is attempting to draw by reference to these two mathematical ratios is insufficient for his purposes, and thereby Guyer is correct in downplaying this connotation of analogy. Shabel notes the two different interpretations, although she does not express a preference for either, since both are 'plausible' as accounts of the possible construction of missing members (Shabel, 1998: 611, n37). My contention, on the contrary, is that the Mellin change should not be followed since it was Kant's intention to draw some kind of distinction regarding the type of operation performed by these two types of relation. The fact that there is not a genuine significant difference between them was, I would argue, immaterial for his explanatory aims, since, as we have seen, none of the distinctions drawn are intended literally.

It is unclear when Kant began to link the more traditional logical notion of analogy with the notion of a ratio. Shabel points out that Kant was certainly influenced by Wolff's discussion of algebraic construction. Given Shabel's interpretation of the relation between Kant's principles and the algebraic method, the question arises as to which were the operative influences in Kant's adoption of the term 'analogy' for that specific subset of the principles of the understanding. It would seem to me that there is no very strong case to be made in favour of any one of the possible sources of influence as being the predominant one. The sources are (a) the three sources outlined by Guyer which imply that Kant was concerned with how these principles could be construed as analogous with principles of thought on the one hand, or as inferior analogies with the Axioms and Anticipations; (b) the role of the logical function of analogy which appears continually in Kant's lectures on logic and which gain further application within the project of transcendental philosophy from the publication of the first *Critique* onwards; (c) the algebraic construal of *Verhältnisse*, which can be rendered as 'relation', 'ratio', or 'analogy' (in a mathematical context – see Shabel, 1998: 611). To the best of my knowledge Kant nowhere in his lectures on logic makes this explicit connection between analogy and mathematical ratios. Neither have I found any reference to such a connection in Kant's comments on Meier's *Vernunftlehre* gathered in Vol. XVI of the *Gesammelte Shriften*. The reference to a 'proportion of concepts' can be found in Kant's lectures on metaphysics dating to the mid-1770s.

For Kant, a philosophical analogy, while it does not construct the character of appearances (which would be for it to serve a *constitutive* role in our experience), nonetheless unifies the manifold in terms of a synthesizing rule in accordance with which the character of appearances must be investigated:

> An analogy of experience will therefore be only a rule in accordance with which unity of experience is to arise from perceptions (not as a perception itself, as empirical intuition in general), and as a principle it will not be valid of the objects (of the appearances) *constitutively* but merely *regulatively*.[41]

The difference between the two types of principle depends not on whether they combine appearances or not, but rather on *how* they combine appearances. This difference is determined by the rule of their application and by the subsequent 'manner of their evidence'.[42]

This difference corresponds to the distinction between intuitive (mathematical) and discursive (dynamical) certainty. It seems that with mathematical/constitutive principles we can establish a-priori facts about the character of appearances not given to sensibility, such as that they must have some extensive magnitude. A limitation of this relation is that it makes no demand that there *actually be* any other appearances with extensive magnitude other than the ones currently given – the relation demands only the conditional that if we interrogate nature further and discover other existing empirical objects appearances, then we have the right to demand that those objects must also hold this feature of appearances in general.

Nevertheless, it is surely significant that it was this connotation that Kant chose to employ in elaborating the function of the Analogies in the *Critique* itself.

A tentative hypothesis might be that Kant, having employed analogy in the lectures of logic for some decades, while also employing the term for a variety of disparate reasons and purposes during the 'silent decade' of 1770–80 preceding the publication of the first edition of the *Critique*, came to form a connection between the logical and mathematical meanings of *Verhältnisse* sometime during that time, as a result of his study of the mathematical texts of Wolff, and that this accounts for the added significance that Kant saw in the term when preparing the arguments of the Transcendental Analytic.

[41]A180/B222.

[42]A180/B223. A further point in favour of this reading is that, if the distinction between the two forms of mathematical proportion is granted, they might then be thought to correspond to the distinction between intuitive and discursive certainty more accurately, in that they capture the different types of inference warranted by the Axioms and Anticipations, i.e. simply through the consideration of given appearances, inferences may be made regarding substantive features (e.g. extensive magnitude) of non-given appearances. This ability to characterize appearances may reflect the 'immediate' type of inference Kant describes as characteristic of principles known with 'intuitive certainty', whereas no such construction of characteristic features is warranted by the Analogies. As such, it could be claimed that the ratio $a : b :: b : x$ is intended to illuminate the function of the mathematical principles of the understanding as much as $a : b :: c : x$ is intended to illuminate the function of the dynamical principles.

However, it offers us no warrant to infer that, given the existence of one object with an extensive magnitude, investigation must reveal other existing objects with extensive magnitudes.

The character of the dynamical/regulative principles, again, is the opposite – it cannot tell us anything about the character of the missing items. What it can tell us however is that, since one of the given items can be understood as an 'effect', we can demand of nature that some preceding cause *must exist*, even though we cannot say anything of its features other than that it exists. This is the sense in which philosophical analogies are concerned with appearances' 'existence and their relation to one another with regard to their existence'.[43] In order to discover anything further about the missing item, we must interrogate nature herself – what the relation grants us then is the right to interrogate nature with the demand that the missing item is indeed capable of being discovered, since the fact of its existence has been secured.

5. THE SECOND ANALOGY

For Kant, then, an analogy is a principle which functions to combine appearances in a specific manner, relating non-given appearances to given ones, and warranting an inference regarding the existence, if not the characteristic features, of that former non-given appearance. The motivation for describing such a principle as an analogy is that the form of a mathematical analogy, as a 'proportion of concepts' reflects the manner in which such principles are applied to experience and warrants a particular type of inference being made. This inference concerns the qualitative nature of philosophical analogies, in that they identify a known relation (in this case a transcendental principle) and allow us to mirror that relation when making that inference.

Kant's technical account of analogy can shed light on the interpretation of the Kant's intentions in the Second Analogy.[44] In particular, I would claim that the preceding analysis lends support to the so-called 'weak reading' of the causal principle defended there, which holds that no a-priori principle guaranteeing that similar kinds of effect have similar kinds of cause is substantiated, but instead a merely general causal principle is affirmed. In the Second Analogy, Kant puts forward a proof of the thesis that '[a]ll alterations occur in accordance with the law of connection of cause and

[43]A178/B220–1.

[44]I would argue that Kant's model of analogy is equally applicable to any of the Analogies, although for reasons of space, I shall confine my discussion to the Second Analogy as a case study, since this is the area that has surely received the most critical attention. Indeed, the volume of literature on this area is enormous and any account must be selective. Some of the more notable contributors to the debate are Allison (1983), Beck (1978), Friedman (1997), Guyer (1998), Lovejoy (1967), and Strawson (1995).

effect'.[45] His objective is to identify an a-priori principle of causation whose authority might supersede that of the Humean explanation of the habitual connection of empirically observed uniformities. Kant's transcendental argument is that, while there is in experience a perception of a mere succession of appearances, the very possibility of representing that succession to oneself as a synthetic unity, within which we can distinguish between a subjective and objective succession of appearances, itself presupposes the pure a-priori concept of cause. Through the synthetic unity of appearances, the pure concept of the understanding which contributes the very form of the experience of causation can be seen:

> Therefore it is only because we subject the sequence of the appearances and thus all alteration to the law of causality that experience itself, i.e., empirical cognition of them, is possible; consequently they themselves, as objects of experience, are possible only in with accordance with this law.[46]

Again, it is essentially by the merit of his Copernican standpoint that Kant can respond to Hume's sceptical challenge. In consideration of the fact that the understanding itself contributes the *form* of experience and that it is only through the understanding that experience is possible, it becomes obvious that Kant is in a sense arguing a different case than Hume. If the human mind *constructs* the laws of nature, as Kant holds,[47] then the subjective origin of the laws of experience which supported the scepticism of Hume, instead serves to support Kant's arguments when considered in terms of the concept of an object's 'transcendental significance'.[48] For Kant, it is the case that objects, 'as mere representations, however, they stand under no law of connection at all except that which the connecting faculty prescribes'.[49] Although the perceptions are still subjective as they were for Hume, Kant

[45]B232.
[46]B234.
[47]For example, see A127–8. It is unclear as to how strongly or literally we are supposed to interpret passages such as these. See n49 below.
[48]A191/B236.
[49]B164. For the purposes of this analysis, I do not propose any special reading of what constitutes 'transcendental idealism' here; nor do I suggest an account of the related issue of the nature of dependency of Kant's arguments upon that idealism. I take it that the analysis of analogy here has relevance to an analysis of the Second Analogy, whether it involve a deflationary or metaphysical reading of the transcendental idealism that forms the background of Kant's analysis. Nevertheless, it is this aspect of Kant's argument that allows Allison to accuse Lovejoy and Strawson of a 'complete neglect of the transcendentally idealistic thrust of Kant's argument' (Allison, 1983: 233). Strawson (1995) (separately but identically to Lovejoy) concluded that the necessary connection of events in perception did not necessarily imply the necessary connection of events in reality, therefore, that the Second Analogy contained 'a *non sequiter* of numbing grossness' (137–8). Since it is Kant's argument that it is the human understanding itself that contributes the form of all possible experiences, Strawson's comments here do appear seriously off-mark. However, readings such as Beck's, especially 'A Prussian Hume and a Scottish Kant' in Beck (1978) argue that Kant's arguments here contain neither a

now argues that the 'law of connection' which makes these perceptions possible is itself a priori and objective.

Hume's sceptical position suggested that when something is perceived as having happened, there is no way to ascertain that a preceding event was the determining cause of that event. Kant's transcendental argument, on the other hand, attempts to show that, even to frame the question of the existence of a 'necessary connexion', one has first to acknowledge initially that some event has in fact occurred. Furthermore, Kant claims that a necessary condition of our understanding what it means to say that some event has occurred is the transcendental rule that all events that occur have some preceding determining cause. The transcendental rule must obey the clearly defined form of the rule of cause and effect:

> Hence, since there is still something that follows, I must necessarily relate it to something else in general that precedes, and on which it follows in accordance with a rule, i.e., necessarily, so that the occurrence, as the conditioned, yields a secure indication of some condition, and this condition, but it is the latter that determines the occurrence.[50]

The objectivity of the judgement, therefore, is guaranteed by the necessity of the transcendental rule for the possibility of coherent experience. One well-known problem, however, with this response to Hume concerns the suggestion that, just as the law of causality is understood as universally valid, in that it constitutes a rule of the understanding, that very universality prevents the law of causation from specifically determining empirically that to which it is applied. Kant states that the role of the understanding is not 'to make the representation of the objects distinct, but rather to make the representation of an object possible at all'.[51] Kant has been taken as providing a response to Hume in the Second Analogy, in showing that it may be asserted objectively that every event has a preceding cause that determines it. However, the references in the Second Analogy are to 'an occurrence'[52] or to 'something that follows'[53] or to 'something [which] precedes'.[54] There is no explicit statement asserting that it has been proved that particular *kinds* of event are necessarily connected with specific *kinds* of cause.

If this has not been proven, then it could be argued that Hume has not in fact been refuted, in that no objective rule has been provided that

non-sequiter nor an implicit appeal to transcendental idealism. I am grateful to an anonymous referee for bringing these points to my attention.

[50]A194/B239

[51]A199/B 244–5.

[52]A192/B237.

[53]A194/B239.

[54]A199/B243.

corresponds to say, the specific claim that the heat of the sun causes stones to warm. The Second Analogy has proven that every event must have *some* preceding cause, but there is no transcendental rule that states that when confronted with an event such as 'the stone warming', I can immediately deduce that it had the *particular* cause of 'the sun shining'. As Friedman puts it, in having provided a deduction of the transcendental grounding of a general causal principle, Kant has apparently failed sufficiently to prove the necessary connection between the general transcendental and the particular empirical realms.[55]

This is the so-called 'weak' interpretation of the argument of the Second Analogy.[56] According to this reading, we can make judgements regarding the workings of nature in general; however, this very generality restricts us from determining a priori specific causal laws that exist between particular empirical kinds. Friedman suggests that Kant was well aware of this shortcoming of the constitutive aspect of experience, since

> as Kant himself repeatedly emphasizes, the categories and principles of the understanding do not themselves make it evident how the transcendental concept of nature is to be determinately applied to the specific, empirically given nature with which we are in fact confronted.[57]

Kant does in fact make explicit reference to this apparent shortcoming, although he believes that he has nonetheless supplied the necessary refutation of Hume:

> In the Transcendental Logic, on the contrary, we have seen that although of course we can never *immediately* go beyond the content of the concept which is given to us, nevertheless we can still cognize the law of the connection with other things completely a priori, although in relation to a third thing, namely, *possible* experience, but still a priori. Thus if wax that was previously firm melts, I can cognize a priori that something must have preceded (e.g. the warmth of the sun) on which this has followed in accordance with a constant law, though without experience, to be sure, I could *determinately* cognize neither the cause from the effect nor the effect from the cause a priori and without instruction from experience. [Hume] therefore falsely inferred from the contingency of our determination *in accordance with the law* the contingency of *the law* itself, and he confused going beyond the concept of a thing to possible experience (which takes place a priori and constitutes the objective reality of the concept) with the synthesis of the objects of actual experience, which is of course always empirical.[58]

[55]See Friedman 1997, 174–5. Friedman does not agree with this suggestion.
[56]For an endorsement of this view, see Beck (1978) and Allison (1983) 228–34.
[57]Friedman, 1994a: 263.
[58]A766/B794.

A passage such as that quoted above would seem to support the 'weak' reading of the Second Analogy in saying that while we can know that every event must have a cause, we cannot know a priori what kinds of cause precede certain kinds of event. Kant argues that the 'contingency of our determinations' in accordance with a law does not affect the determinacy of the law itself. All pure concepts of the understanding (such as that of 'cause') are determinate of experience. However, the understanding cannot give any particular complete empirical determination of objects. Quite clearly, Kant *is* saying this in the preceding quote, yet he obviously does not believe that this amounts to a problem. It would seem that Kant has either simply failed to realize the limitations of his argument or he believes that there is an aspect of it which nevertheless is sufficient to refute Hume's sceptical challenge.[59]

As we have seen, a philosophical analogy, such as the principle of causation, is characterized by the determinate nature of the relations between appearances that it supplies. In other words, it cannot determine the appearances themselves (i.e. it cannot construct features of the appearances). However, it can specifically determine the relations of existence between appearances. The character of philosophical analogies is that they are concerned with the combination of heterogeneous appearances. For the satisfaction of a philosophical analogy (considered as a dynamical/regulative principle and characterized by the formula $a : b :: c : x$), there is required a known relation between two items, and a third given item considered qua appearances *and also some unknown item which must be sought out in experience*. In other words, the dynamical/regulative principles demand the existence of that missing item, and in so doing, simultaneously demand and legitimate the interrogation of nature for the discovery of that item.

This might be illustrated with an example: when I am representing to myself any given empirical event (say, wax melting) I relate it to several determinate rules of the understanding. One of these rules is the dynamical/regulative principle of causality, which I am suggesting takes the form $a : b :: c : x$. In this case the relation $a : b$ stands for the transcendental principle of causality; that is, the known determinate relation that must hold between any two given events ('given the event a, I can know a priori that there must be some event b which precedes it and is the determining cause of a').[60] Now

[59]This latter interpretation suggests that other aspects of Kant's transcendental idealist system are involved with the formulation of such empirical laws, thereby making the Second Analogy 'strong' enough to counteract Hume's scepticism, e.g. O'Shea (1997). I do not suggest that the account of analogy suggested here can definitively adjudicate in favour of any of these interpretations of the scope of Kant's treatment of causality. Rather, I will claim only that this account supports the interpretation that the Second Analogy, considered by itself, was intended to furnish only a general causal principle and a warrant to investigate nature for empirical law-like generalizations.

[60]As we have seen in the previous two sections, Kant's account of analogy differs from early modern accounts in that it is concerned not with analogy based on the known status of the first

I have before me a particular event *c* (the wax melting) and so *by analogy* I can know that there must be some event which precedes it which is the determining cause of *c*. In order for the event *c* to be given and so considered qua appearances, it must be simultaneously given in relation to the sensible manifold.

Therefore, when initially given an empirically conditioned event, it is considered abstractly (i.e. qua appearances) in order for it to be understood in relation to the dynamical/regulative rule of the understanding. However, having been related to the dynamical/regulative rule, it prescribes that a *further* term must be sought in order to relate it to the given term *c*. Since the fourth term (*x*) is not given and since the third term *c* was given *in* experience, it follows that, given a sensible occurrence *c* and by the determination of the dynamical/regulative rule $a : b :: c : x$, one is warranted in seeking out the fourth unknown term *x in experience*. Since one is compelled to seek out this fourth term in experience, it may be determined by analogy that the missing appearance must take the form of an empirically conditioned event. It is in this sense that a philosophical analogy provides us with a 'rule for seeking [an appearance] in experience and a mark for discovering it there'.[61] However, the 'mark' that we are warranted to seek is only that the appearance will be an empirically conditioned event.[62]

two items but rather, on the known status of the relation between any two items in general, i.e. any given appearances considered qua appearances.

[61]A179–80/B222. This interpretation, if correct, goes some way to explaining the distinction between mathematical and dynamical principles made at A160–1/B199–200:

> Hence the principles of the mathematical use will be unconditionally necessary, i.e., apodictic, while the principles of the dynamical use, to be sure, also carry with them the character of an a priori necessity, but only under the condition of empirical thinking in an experience, thus only mediately and indirectly; consequently these do not contain the immediate evidence that is characteristic of the former (though their universal certainty in relation to experience is not thereby injured).

Examined in the context of the Second Analogy, Kant's statements regarding both the strength and limitation of philosophical analogies appear to support the interpretation presented here.

[62]Kant's comment regarding the provision of a 'mark' does not entail that a *particular* kind of empirically conditioned event may be regularly found. A further fault that Guyer finds with the mathematical account of analogy is that 'this account obscures the account of the analogy that Kant is talking about; for, as originally put, Kant's claim does *not* mean that there is any use of analogy *in* the process of finding the *particular* causal explanation of some state of affairs – that causal connections can be discovered only when three things are already known, just as the missing numerator of a fraction can be discovered only when we are given its denominator and another fraction with which to compare it' (Guyer, 1998: 70). Since Guyer argues that Kant is not arguing for anything like the ability to determine particular empirical causes to particular empirical events, he argues that the description of the distinction between mathematical and philosophical analogies is mistaken. However, there are two points that Guyer's analysis neglects. First, As Shabel has argued, the formulation that Kant employs derives from his study of the employment of algebraic equations which require a geometrical expression for their completion (Shabel, 1998). Such an operation has much stronger resonance with Kant's requirement of transcendental rules being applied to spatially conditioned appearances than does the account which renders the example as being concerned with merely the relation of

From this analysis it can be seen that for Kant the form of a philosophical analogy not only licences an inference regarding the existence of a non-given appearance, but also demands that experience be examined in order for that non-given appearance to be discovered and characterized in terms of a particular empirically conditioned event. For Kant, only by doing so can one satisfy the transcendental rule as determined by the understanding. It is the analogical form of the principle of the understanding that gives the suggested connection between the constitutively determined laws of experience and the contingently determined objects that seemed to be required by the implication of the 'weak' interpretation of the Second Analogy.[63] Mistakes in the attribution of particular causes to particular effects are still possible, since Kant would concede that such a task is still made by inductive means.[64] However, the challenge was not to determine the means by which we can infallibly connect particular types of cause with particular types of event; the challenge was whether the causal law itself was justified and, if so, whether there was a means by which we could connect that transcendental law to particular empirical objects. Kant's use of analogy is part of his attempt to demonstrate that in order for the transcendental formulation of the principle of causation to be valid, it must be related to some empirically conditioned objects. On this account, then, there is provided an explanation as to why Kant believed that the formulation of the transcendental rule elaborated on his model of analogy might provide sufficient grounds to refute Hume's sceptical challenge in regard to causation.[65]

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fractions. Second, as argued above, if one does not follow the Mellin change, then there arises a (somewhat) clear meaning of the distinction that Kant intended to convey, one which in fact supports the weak reading of the scope of the Second Analogy.

[63]In this interpretation I broadly follow O'Shea (1997).

[64]Kant's strategy in the Second Analogy, then, does appear to be focused exclusively on Hume's causal antirealism rather than his inductive scepticism.

[65]There are other uses of analogy that Kant employs in the first Critique, e.g. where he talks of reason's employment of an 'analogue of a schema of sensibility' (A665/B693). Although I cannot address all the pertinent issues in this paper, I would argue that the conception of analogy is just that one elaborated here. I shall pursue this theme elsewhere. I have greatly benefitted from discussions with Jim O'Shea concerning many of the topics dealt with in this paper. I am also grateful for the helpful comments of an anonymous referee. Research for this paper was conducted with the support of an Irish Research Council for the Humanities and Social Sciences Fellowship.

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