

Kant's Transcendental Philosophy of Nature

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To outline, even in a provisional and general way, Kant's philosophy of nature would be an immense task, requiring a full survey of his work from his initial inquiry into living forces up to the concluding *Opus Postumum*. That this is so indicates immediately that the provision of a philosophy of nature was not one task amongst others for Kant but rather the supreme task of his work. Recognition of this is not however as widespread amongst commentators on Kant as it should be. The main reason why this is so is due to the fact that concentration on Kant's Critical works has largely severed them from the works that preceded them and, in particular, has led to a narrow focus on the supposedly purely epistemological inquiries of the *Critique of Pure Reason*.¹ Whilst the basis of the narrow focus of work on Kant was partly inspired by decisions Kant himself made concerning the posthumous reception of his writings, more important than this has been the understanding of transcendental philosophy as primarily concerned with conditions understood as largely indeterminate in relation to nature. A basis for this is clearly found in the "Preface" to the *Metaphysics of Natural Science* where Kant describes "the transcendental part of the metaphysics of nature" as concerned to treat "the laws which make possible the concept of a nature in general even without reference to any determinate object of experience" (Ak.4: 469-70).

Despite this claim that the "transcendental part of the metaphysics of nature" should not require reference to "any determinate object of experience" it is my aim here to indicate that Kant's specifically transcendental philosophy of nature, as laid out in any case in the Critical period, is nonetheless engaged in a considerable way with empirical cognition. In order to demonstrate this I will be mainly content to simply lay out the different levels of transcendental principles that are connected to a sense of nature.

Transcendental Dynamics

The first and most obvious place to look for Kant's account of "nature" in the *Critique of Pure Reason* is in his description of dynamical principles. The dynamical principles, in contradistinction from the mathematical ones, are declared by Kant to be concerned with "nature" and this is taken to refer to "the unity in the *existence* of appearances" where the condition of what happens is supplied by causality (A419/B447). These dynamical principles are those of the Analogies of Experience and the Postulates of Empirical Thought. When concluding the discussion of the Analogies Kant describes nature in the following way:

By nature, in the empirical sense, we understand the connection of appearances as regards their existence according to necessary rules, that is, according to laws. There are certain laws which first make a nature possible, and these laws are *a priori*. Empirical laws can exist and be discovered only through experience, and indeed in consequence of those original laws through which experience itself first becomes possible. (A216/B263)

Here the general description of nature as a connection of existences according to necessary rules conforms to the generic sense elsewhere given by Kant to "experience".ⁱⁱ What it is that we experience, when we have experience, is "nature". However, if "nature" is a connection of existences according to necessary rules then it is so due to certain laws that make it possible at all whilst other things that we empirically refer to us as "laws" appear not to meet this condition of being described as "laws". So there are two kinds of law in experience but there is also here indicated to be a connection between them as the "original laws" which make experience possible are also ones that enable the other, less law-like "laws", to be discovered. The first question that seems to emerge from this concerns how it is that the "original laws" carry out this enabling role with regard to what Kant has here termed "empirical laws" and this question has particularly exercised commentators with regard to the status of the Second Analogy in regard to empirical laws.ⁱⁱⁱ An important text in regard to this dispute occurs towards the close of the discussion of the Second Analogy to what Kant terms "the law of the continuity of all alteration" (A209/B254), a law that tells us that all alteration is only possible "through a

continuous action of the causality” (A208/B254). Since this law suggests that the understanding of the *continuity* of causal action is central to it then it would appear to lead to viewing the principle of the Second Analogy as one that concerns not merely causal laws as connections between events where each was singularly related to a specific condition but also to bring in discussion of *types* of event that govern the condition of appearance of the *kind* of event in question.^{iv}

The other question however concerns whether there is some kind of understanding of the empirical laws that are distinct from those “original” ones that are the apparent concern of the transcendental analysis that identifies these empirical laws as being closer than might initially appear plausible to the “original” ones from which they are in some sense derived. Michael Friedman gives some rationale for this suggestion when he argues that there are two kinds of necessary law in Kant’s account. As Friedman puts it:

The transcendental principles of the understanding are absolutely necessary and *a priori*: they are established entirely independent of all perception and experience. Empirical laws that somehow fall under these transcendental principles are then necessary and *a priori* in a derivative sense. They, unlike the transcendental principles themselves, indeed depend partially on inductively obtained regularities (and thus on perception), yet they are also in some sense grounded in or determined by the transcendental principles and thereby acquire a necessary and more than merely inductive status.^v

Laws of Nature and Empirical Laws

Kant’s specific discussions of empirical laws are double-edged and lead to a second level of analysis. If the first level pointed to the view of “nature” as governed by necessary laws that related to a dynamical causal connection between the existences of appearances, the second level suggests that “nature” initially at least appears to have laws that are only improperly named such. If the dynamical conception of “nature” related to the full-fledged conception of “experience” that the *Critique* apparently justifies this more contingent conception of “nature” relates by contrast to a more classical empiricist view of “experience” as is made clear in the “Introduction” to the *Critique* when Kant mentions that:

Experience never confers on its judgments true or strict, but only assumed and comparative *universality*, through induction. We can properly only say, therefore, that, so far as we have hitherto observed, there is no exception to this or that rule...Empirical universality is only an arbitrary extension of a validity holding in most cases to one which holds in all, for instance, in the proposition, ‘all bodies are heavy’.” (B3-4.)^{vi}

Again, despite making this claim of the only comparative universality involved in empirical laws, Kant is far from denying the status of “law” to what is apparently only a product of induction. This is made clear precisely at the point at which Kant introduces the conception that there are principles of pure understanding, principles that make the cognition of “nature” as a law-governed whole possible. Here Kant remarks that: “Even natural laws, viewed as principles of the empirical employment of understanding, carry with them an expression of necessity, and so contain at least the suggestion of a determination from grounds which are valid *a priori* and antecedently to all experience” (A159/B198).^{vii} Nor should this claim that there is some form of necessity even in the element of “nature” that is expressed in empirical natural laws be entirely surprising. There are two things that should have prepared us for it.

Firstly, in the argument of the B-Deduction, Kant effectively corrects the account of the “Introduction” to the *Critique*. Whereas in the “Introduction” Kant suggests that it is only synthetic *a priori* judgments that pose a special philosophical problem with none attaching to analytic *a priori* judgments or synthetic *a posteriori* ones, in the B-Deduction, he corrects this. Here, for example, Kant states of even contingent judgments that there is built in a reference to necessary unity. Referring again to the same example of bodies being heavy Kant now states that in this judgment there is a necessary unity as the judgment has to be related to the transcendental unity of apperception, a point that leads him to correct the earlier assertion from B3-4 writing now:

To say that ‘The body is heavy’ is not merely to state that the two representations have always been conjoined in my perception, however often that perception be repeated; what we are asserting is that they are combined *in the object*, no matter what the state of the subject may be. (B142)^{viii}

In this statement from the B-Deduction Kant effectively argues that even an empirical judgment expresses necessity inasmuch as it partakes of the quality of *being a judgment that concerns the object* opposed to being merely a set of associations of mine. This argument concerns the understanding effectively of how it can be that such empirical judgments are capable of being given in a form that reaches beyond impressions and states something about an object. If even empirical judgments however require to be understood as having such a form it follows surely from this that empirical laws will also “carry with them an expression of necessity” as is suggested in the introductory remarks of the *Analytic of Principles*.

In support of this conception of the B-Deduction’s relationship to the view of empirical law is a contrast that is often set against this discussion, the contrast made in the *Prolegomena* between judgments of perception and judgments of experience. When Kant first introduces this contrast he writes that it is only with the judgment of experience that we require categories and not judgments of perception that merely involve logical connections with regard to a perception. With regard to judgments of perception Kant states that these are the first form our judgments take and that they merely involve connections of perceptions to a given subjective state. They include comparison and we noted that at B3-4 Kant speaks of a comparative universality. However since these judgments are expressions concerning subjective states they are not intrinsically intended to speak of objects. An example that Kant subsequently gives concerns the sun’s shining on a stone. With a judgment of perception we associate the sun’s shining on the stone with the stone growing warm but this is contrasted with a judgment of experience that would speak not of the stone merely growing warm, a growing that can be understood through the reference of the stone merely to my perceptions, but we add the point that it is *the sun* that does *warm* the stone. As Kant puts this:

Such a proposition would be that the sun is by its light the cause of heat. The empirical rule is now considered as a law, and as valid not merely of appearances but valid of them for the purposes of a possible experience which requires universal and therefore necessarily valid rules. (Ak. 4: 312.)^{ix}

Here, as in the passage from the B-Deduction, we see that the understanding of the empirical rule as a law involves surpassing

the comparative universality involved in induction and understanding connections in perceptions as based on those between objects themselves. However, this view of what is involved in empirical laws, a view that brings them substantially closer to the “original” transcendental laws that belong to nature in general than seems likely from Kant’s remarks in the introduction to the *Metaphysical Foundations*, has, for that reason, been specifically opposed by Gerd Buchdahl and his opposition is certainly grounded on some further features of the transcendental philosophy of nature, features I intend now to take account of. Buchdahl’s position is stated in the following way:

Within the Kantian system, the phrase ‘nature is subject to law’ has...two quite different senses: once, as a reference to the fact that transcendental necessity is built into the concept of possible experience in general (or objectivity or thinghood); a second time, that reason or judgment *ascribes* to nature an order which is the source of empirical lawlikeness.^x

This suggestion of a “double role” for the expression “nature is subject to law” is not one that is connected to the two levels I have thus far distinguished or, rather, it is not connected to them in the *way* in which I have distinguished them. I have suggested that whilst the conception of nature in general is a picture of a dynamical whole governed by causal relations between existences that specific empirical laws are in some sense derived from the laws of nature in general. Even Kant’s initial characterisation of inductive judgments in the “Introduction” to the *Critique* is subsequently revised giving a picture of “empirical laws” that harmonizes with Michael Friedman’s view that they need to be understood as having a “mixed” or “hybrid” status, containing in some sense an element of the necessity that is described in the laws of “nature in general”. By contrast, Buchdahl’s argument is that what appears as lawful in empirical laws is not something that can be based on the dynamical conception of nature given in Kant’s *Transcendental Analytic* but is rather grounded on the regulative understanding of reason and the procedures of reflective judgment. Even though this picture contrasts with the one I have supplied thus far it does undoubtedly draw on further aspects of Kant’s transcendental philosophy of nature so I now intend to turn to these in order to

fill out how they relate to the two levels I have thus far identified.

Reason and the System of Nature

In the “Appendix” to the Transcendental Dialectic Kant turns to assessing what positive role there is for the transcendental ideas after having disputed the role to which they have been put in the special metaphysics of early modern philosophy. The basic answer he gives to this is formulated immediately when Kant states that they have “an excellent, and indeed indispensably necessary, regulative employment, namely, that of directing the understanding towards a certain goal upon which the routes marked out by all its rules converge, as upon their point of intersection” (A644/B672). It is this aiming of the rules of the understanding towards this goal that is the basic source of illusion since it suggests that there is “a real object lying outside the field of empirically possible knowledge” (A644/B672). In one sense however this illusion is a fortunate one since it is due to it that we direct our understanding beyond any and all particulars given to us in search of universals of which they are instances, a search that enables the “greatest possible extension” of our understanding. This search is guided by the distinctive attitude of reason of searching for systematisation or formulation of the conception that there is a means of bringing the whole of knowledge together.

In relation to the investigation of nature the view that there is a unity that we can aim towards in our comprehension of instances is one that enables a distinctive interpretation of nature, an interpretation that is distinct from the reference either to the nature in general that is based on the concepts of the understanding or the generation of the conception of distinctive empirical laws such as I was previously referring to. The distinctive interpretation of nature that emerges from reason concerns firstly a purity of conception such as is given when we speak in terms of such apparent “objects” as “*pure earth, pure water, pure air*”, concepts that, in their purity, emerge from reason itself and enable it to describe operations in a certain way. Kant gives an example of how this operates:

Thus in order to explain the chemical interactions of bodies in accordance with the idea of a mechanism, every kind of matter is reduced to earths (*qua* mere weight), to salts and inflammable substances (*qua* force), and to water and air as

vehicles (machines, as it were, by which the first two produce their effects). (A646/B674)

Having begun by referring to the interpretation of nature through concepts such as pure water and pure air Kant here demonstrates how these concepts are arranged together in the idea of an approach to nature, an approach such as mechanism. The idea of mechanism proposes, as it were, a kind of plan by which reduction of phenomena to certain discreet operations is rendered possible. On this basis we do not formulate particular empirical laws directly but provide the means by which such laws can be given a framework within which they have sense. The postulation of matter in terms of weight is then adopted as a general idealisation by means of which its operation can be summarized and allocated a specific role in the comprehension of “nature” undertaken. On this ground “nature” is not the “nature in general” of the pure transcendental sort apparently explicated in the dynamical principles. The means of connection between the specific empirical laws in a general whole *and* the way in which specific laws combine together in a given object: these are both the work of the systematizing activity of reason.

Kant describes the means by which this procedure works as the “hypothetical employment of reason” and he articulates it as follows:

“Several particular instances, which are one and all certain, are scrutinised in view of the rule, to see whether they follow from it. If it then appears that all particular instances which can be cited follow the rule, we argue to its universality, and from this again to all particular instances, even to those which are not themselves given.” (A646-7/B674-5)

Here the rule is first provided and then the instances are checked in relation to it and the rule, in its turn, checked in relation to the instances. This is a kind of double-reflection and by means of it the rule and the instances confirm each other. This relationship to a hypothesis does not enable universality to be established in a strict sense, for, as Kant puts it, “how are we to know all the possible consequences which, as actually following from the adopted principle, *prove* its universality?” (A647/B675). The principle is one of constant approximation to universality without this universality being however finally attainable.

That this postulation of unity concerns the manner in which specific powers in a given object come together is illustrated by

Kant's example of the way in which substances are to be understood. In the first instance it appears that the various appearances of any given substance have such a diversity that there could be as many different powers within it as there different effects unless "we presuppose a transcendental principle whereby such a systematic unity is *a priori* assumed to be necessarily inherent in the objects" (A650-1/B678-9).^{xi} This transcendental principle is specific to reason and without it, states Kant, "we should have no reason at all" (A651/B679) since we would have no means of coherently employing the understanding. Rather than contenting himself with this general claim for a transcendental principle by means of which the unity of the apparently distinct powers in the specific objects is postulated Kant subsequently goes on to describe more specifically the three-fold function of reason with regard to the investigation and interpretation of nature.

In approaching nature we need a sense that there are genera but this sense cannot be simply based on a logical reference to it for systems to be ordered but has to be grounded on a transcendental principle by means of which "homogeneity is necessarily presupposed in the manifold of possible experience" (A654/B682). Homogeneity is effectively suggested in fact to be the ground on which not empirical laws but empirical *concepts* are first rendered possible.^{xii} If this principle is the ground on which generic distinction can find a place in nature however it is balanced by a search for diversity in terms of *species* so that there is a normative rule "of seeking under every discoverable species for subspecies, and under every difference for yet smaller differences" (A656/B684). This again is a transcendental principle of specification that extends beyond any sensory given. Kant subsequently formulates the sense in which these principles come together and relate to a third, terming this the means by which reason "prepares the field for the understanding":

"(1) through a principle of the *homogeneity* of the manifold under higher genera; (2) through a principle of the *variety* of the homogeneous under lower species; and (3) in order to complete the systematic unity, a further law, that of the *affinity* of all concepts—a law which prescribes that we proceed from each species to every other by gradual increase of the diversity. These we may entitle the principles of *homogeneity*, *specification*, and *continuity* of forms." (A657-8/B679-80)

The combination of homogeneity and diversity in affinity ensures that the phenomena related to are consistently unified with it following that there is thus “no void in the whole sphere of possible concepts” (A659/B687). Whilst the rules are stated to have “objective but indeterminate validity” they are such as to organize not merely the unification within any given phenomena of the powers it possesses under a common conception but also such, as with the mechanical picture already referred to, as to enable a system to emerge within which all such phenomena is organized. The conception of the affinity of the manifold specifically concerns the way in which this organization is conceivable by means of the powers in the manifold:

“Thus, for instance, if at first our imperfect experience leads us to regard the orbits of the planets as circular, and if we subsequently detect deviations therefrom, we trace the deviations to that which can change the circle, in accordance with a fixed law, through all the infinite intermediate degrees, into one of these divergent orbits. That is to say, we assume that the movements of the planets which are not circular will more or less approximate to the properties of a circle; and thus we come upon the idea of an ellipse. Since the comets do not, so far as observation reaches, return in any such courses, their paths exhibit still greater deviations. What we then do is to suppose that they proceed in a parabolic course, which is akin to the ellipse, and which in all our observations is indistinguishable from an ellipse that has its major axis indefinitely extended. Then, under the guidance of these principles, we discover a unity in the generic forms of the orbits, and thereby a unity in the cause of all the laws of planetary motion, namely, gravitation. And we then extend our conquests still further, endeavouring to explain by the same principle all variations and seeming departures from these rules; finally, we go on to make additions such as experience can never confirm, namely, to conceive, in accordance with the rules of affinity, hyperbolic paths of comets, in the course of which these bodies entirely leave our solar system, and passing from sun to sun, unite the most distant parts of the universe—a universe which, though for us unlimited, is throughout held together by one and the same moving force.” (A662-3/B690-1)

In this inspiring picture of the formation of the conception of the universe as a whole in which the single moving force of gravity operates to unite the most disparate and divergent phenomena under a continuity of operation it would appear that the conception of the unified system of the world is a generic product of reason. However whilst Kant speaks here of the concept of affinity as a transcendental idea that unites the principles of homogeneity and diversity in the possible form of a system it remains the case, as noted earlier, that reference to it is also built into the discussion of the Second Analogy where Kant spoke of the “continuous action of the causality” of the cause (A208/B254). This continuous action is further referred to in the Postulates of Empirical Thought where Kant describes the “principle of continuity” as a rule of understanding which forbids any leap in the series of appearances according to which “nothing which proves a vacuum” can enter into experience (A229/B281). There are therefore two types of reference to continuity in Kant’s transcendental philosophy of nature. The continuity that is a rule of understanding is one that describes the continuity of causes such that there could be no failure of connection between them whilst the continuity of reason prevents there being concepts that could have no place in a system.^{xiii} The empirical laws in their inter-relation and their systematisation operate in accord with the transcendental principles that emerge from reason whilst the form of law that they express must still emerge from the model of the laws of nature in general set out by the transcendental use of understanding. Hence the discussion of regulative principles in the *Critique of Pure Reason* does not upset the pattern set out thus far but can rather be incorporated into it. What remains to be considered is the relationship of the transcendental principle of reflective judgment to the elements of the transcendental philosophy of nature we have now had described.

Reflective Judgment and the Purposiveness of Empirical Laws

Gerd Buchdahl is particularly insistent that it is with the understanding of reflective judgment that we meet an account of empirical laws that requires us to view them as quite divergent from the transcendental laws of nature in general. My reading of the discussion of reflective judgment is quite at variance with this but my account here is only preliminary since I will just be discussing some central passages

of the two introductions Kant wrote to this work, beginning with the first, unpublished one and then moving on to some of the key motifs of the second which Kant published.

In the “First Introduction” Kant early on describes the procedure of what he views as a “technic” of judgment, a procedure whereby we judge objects of nature “*as if* they were made possible by art”, a procedure which is here elevated to that of judging nature itself “by analogy with an art” (Ak. 20: 200-1). After indicating this point Kant later speaks about judgment itself by contrast to reason and understanding, denying to judgment the capacity to produce concepts as understanding does or ideas as reason does. Judgment is just the means by which concepts, which are taken from elsewhere, are found means of organization. This leads to Kant’s general statement that the principle or rule that arises from judgment would be a concept of things of nature “*insofar as nature conforms to our power of judgment*” (Ak. 20: 203) which he further describes as “a purposiveness of nature for the sake of our ability to cognize” it (Ak. 20:203). So the principle of judgment that is specific concerns the means by which it is possible for us to cognize nature. Since this might seem to be precisely what was provided by the view of nature in general as specified in the dynamical principles I began by laying out it is unsurprising that Kant moves immediately to distinguish these from the view of nature that he is now concerned with. Kant points out that empirical laws might be infinitely diverse so that the way in which the forms of law provided by the understanding’s principles relate to the system of empirical laws may not guarantee the systematic coherence of these empirical laws.

Unless a system of the empirical laws is possible there can ensue no “empirical unity” that matches the unity of laws given to the transcendental principles of nature in general. The relationship between the types of unity that can emerge from one in contrast to the other is also laid out in a footnote where we find the following contrast:

“What the category is with respect to every particular experience, that is what the purposiveness or fitness of nature is to our power of judgment (even with regard to its particular laws), and that is why nature is represented as not merely mechanical, but also as technical, a concept that certainly does not determine synthetic unity objectively, but still subjectively furnishes principles which serve to guide our inquiries into nature”. (Ak. 20: 203n)

This comparison between the role of the category and the purposiveness of nature marks a form of analogy and one that it is necessary to be careful with. The category is generally understood to be that which makes each particular experience fit into a pattern of experience in general by means of universal and necessary characteristics. What the purposiveness of nature does with regard to our power of judgment is surely fit the particular laws of nature together into the system that enables them to be seen as a unified whole so that the result that emerges is purposive in its relation to our cognition. If, however, what emerges from the latter system of judgment is a means of representing nature technically then this would be a general representation of nature *as if* it were art given our earlier description of “technics”. Such a representation would differ from the mechanical system that emerges from the systematizing power of reason as laid out in regulative principles of a transcendental kind. The general comparison between purposiveness and the category is that purposiveness must surely mediate between the activity of the table of judgments and the particularity of experience in the way that the category does.

The reason for seeing the relationship between purposiveness and the category in this way emerges from the manner in which Kant moves from a generic to a specific understanding of the principle of reflective judgment. The generic sense is given in the possibility of systematization described, a systematization distinct from that of reason as it is described in exclusively purposive terms.^{xiv} For it to be possible for us to so cognize empirical laws there is required what Kant now refers to as a “transcendental *presupposition*” to the effect that “nature is fitted for experience as an empirical system through the affinity of particular laws under more general ones” (Ak. 20: 210). This principle of affinity is said to concern the “whole manifold of possible empirical laws” by means of which particular laws are brought under higher but still empirical principles. For this to happen we need to adopt the transcendental presupposition and this presupposition is claimed to be the transcendental principle of the power of judgment. So empirical laws, not merely transcendental ones, can be organized into a system and this principle is also explicated as a statement that “empirically determinate *concepts* can indeed be found for all things in nature” (Ak. 20: 211).

In making the principle concerning systemization of empirical laws equivalent to a principle concerning the possibility of conceptual empirical determination for all things in nature Kant moves from discussing a generic procedure and point of reflective judgment to stating its role with regard to particulars and in so doing makes clear the point of the analogy between purposiveness and the category. To compare empirical representations in such a way that it is possible to classify them and generate the sense that there are specific forms involves a presupposition that “nature has observed in its empirical laws a certain economy, fitted for our power of judgment, and a similarity amongst its forms which we can comprehend” (Ak. 20: 213). This presupposition of the economy within nature is the presupposition that guides investigation and classification of particulars since to set them out in terms of species and genera requires that nature itself be seen through the guises of the logical form of a system. This gives us finally the “First Introduction”’s most complete description of the special principle of reflective judgment: “*nature specifies its universal laws as empirical ones, in accordance with the form of a logical system, on behalf of the power of judgment*” (Ak. 20: 216).^{xv}

The revised second “Introduction” to the *Critique of Judgment* similarly describes the problem of reflective judgment as one of finding the principle of the unity of the manifold of empirical laws with this unity again understood as that of “a system of experience according to particular natural laws” (Ak. 5: 180). As in the “First Introduction” so in the second the understanding of this principle is that of the purposiveness of nature, a purposiveness that guides the multiplicity of laws into a whole. Kant gives now an example of the reason for the need for this principle when he mentions the relationship between the causal principle of the Second Analogy and its connection to the causal operation of objects of empirical cognition. Whilst the formal law of the Second Analogy is a necessary one of objects of possible experience the objects of empirical cognition could be causes “in an infinite variety of ways” (Ak. 5: 183). So the manner of operation of the causal principle with regard to the objects of empirical cognition requires further determination and limitation such that the objects of empirical cognition can become related to as elements of a purposive whole. The whole is, again, understood as purposive in relation to our possibility of cognising empirical objects as subject to a rule of unification so that “a certain order of nature in its particular rules” (Ak. 5: 184) is produced.

Noticeably it is the *order* of the particular rules and their inter-relation that is subject to the principle of reflective judgment not the articulation of empirical laws as such. Kant indeed explicitly makes this distinction when he states that the principle of articulation of such an order according to logical genera is prescribed not directly to nature but by judgment to itself in order to guide reflection *upon* nature. Kant articulates this point most clearly when he writes:

To find out this order is an undertaking on the part of our understanding, which pursues it with a regard to a necessary end of its own, that, namely, of introducing into nature unity of principle. This end, must, then, be attributed to nature by judgment, since no law can be here prescribed to it by understanding. (Ak. 5: 187)

It is surely clear that what Kant means here is that the *order*, that is, the systematization of principles of empirical laws is the product of the unity of principle of reflective judgment not a reference to the cognizability of specific empirical laws.^{xvi} The principle of reflective judgment is the means by which the empirical laws are brought together into a system that attaches them to our means of cognizing them. It is not a basis for viewing the necessary character of such laws as grounded on a principle other than that which relates these laws to the transcendental laws of nature in general.

Conclusion

What I have argued thus is that there are four distinct elements to the transcendental philosophy of nature as expounded in Kant's Critical period. These are: firstly and most obviously, the principles laid out in the Transcendental Analytic as those of a nature in general, most specifically the dynamical principles which relate existences together in a causal manner. Secondly, principles of empirical objects that indicate reasons for viewing the cognition of the possibility of empirical laws on derivation from the transcendental laws of nature in general in addition to inductive empirical processes, the former giving them characteristics of universal and necessary kind. Thirdly, the regulative principles of reason that enable the formation of systematic investigation of nature both in terms of pure concepts that are specifically related to nature and in terms of the notion of systematic

organization within which the specific empirical laws can be ordered, re-ordered and generically presented by means of further transcendental principles. Fourthly, the specific principle that enables empirical laws to be related to each other and bound together in a system that is distinct from that of regulative principles as it is intrinsically ordered by relation to our possibility of cognition, this principle being a purposive harmony of the laws as applicable to the order of nature. This last principle is what enables the diversity of empirical laws to be connected to the unification of a generic manifold that would be that of the whole of nature albeit a whole that is not here conceived of as mechanistic. The specifically transcendental philosophy of nature thus supplies us with the material for comprehension of dynamical order as the basis of natural laws, the means of understanding how empirical rules can be represented as empirical laws, the comprehension of the possibility of scientific cognition as systematic investigation and the relation of the understanding of empirical laws together to our capacity to cognize them. The rest is left to a more general metaphysics of nature but that would be another story.

ⁱ In saying that concentration on the *Critique* has “largely” severed it from its connection to earlier and later works I naturally wish to make room for recognition of notable exceptions. In recent work Eric Watkins (2005) *Kant and the Metaphysics of Causality* (Cambridge University Press: Cambridge and New York) and Jeffrey Edwards (2000) *Substance, Force, and the Possibility of Knowledge: On Kant’s Philosophy of Material Nature* (University of California Press: Berkeley and London) are clear exceptions. For other works that include decisive connections between the Critical works and a broader inquiry than suggested above see also Michael Friedman (1992) *Kant and the Exact Sciences* (Harvard University Press: Cambridge, Mass.) and Paul Guyer (2005) *Kant’s System of Nature and Freedom: Selected Essays* (Clarendon Press: Oxford). A work that does emphasize this broader context but still contains it in an epistemological model is Gerd Buchdahl (1969) *Metaphysics and the Philosophy of Science: The Classical Origins Descartes to Kant* (Basil Blackwell: Oxford).

ⁱⁱ At B1 Kant outlines two conceptions of “experience” between which he moves, namely the sense of it as “raw material of the sensible impressions” and that of “knowledge of objects”. The former has been termed “Lockean-experience”, the latter “Kantian-experience” by Lewis White Beck in Beck (1972) “Did the Sage of Königsberg Have No Dreams?” in L.W. Beck (1978) *Essays on Kant and Hume* (Yale University Press: New Haven and London), pp. 40-1. Note how accepting this claim as definitive of “Kantian-experience” requires a partial revision of what we would have expected given the claim in the *Metaphysics of Natural Science* cited above. Whilst the “transcendental part of the metaphysics of nature” may not be concerned with “any determinate object of experience” it is clearly in some sense concerned

with “knowledge of objects” as it is precisely such knowledge that is “experience” in Kant’s fullest sense.

ⁱⁱⁱ There is a serious dispute concerning this question between Michael Friedman (1992b) “Causal laws and the foundations of natural science” in Paul Guyer (ed.) (1992) *The Cambridge Companion to Kant* (Cambridge University Press: Cambridge and New York) and Henry E. Allison (1994) “Causality and Causal Law in Kant: A Critique of Michael Friedman” in H.E. Allison (1996) *Idealism and Freedom: Essays on Kant’s Theoretical and Practical Philosophy* (Cambridge University Press: Cambridge and New York). The ultimate argument, as Allison makes quite clear in his piece, is really between Friedman’s view of the Kantian philosophy of nature and that of Buchdahl. In a sense this paper will present a view that, whilst broadly in line with much of Friedman’s analysis will nonetheless grant a certain validity to the view of Buchdahl.

^{iv} Allison states that “the fact that a causal law affirms a connection between event-types” is something that he takes to be uncontroversial but, since he thinks that a type could cover an instantaneous law, that had only one instance, it has been made uncontroversial *by definition* in his account (Allison, 1994, p. 86). Allison does not refer to the question of continuity. Watkins (2005) disputes the view that reference to events is involved at all in the Second Analogy though this is due to identifying the notion of an “event” with certain Humean conceptions that need not be built into the conception of an “event” as such.

^v Friedman (1992b) p. 174. Friedman adds however: “The unfortunate fact is that Kant does very little to explain – or even to illustrate – this crucially important relationship between transcendental principles and empirical laws of nature in either the first *Critique* or the *Prolegomena*”. (Friedman (1992b) p. 175). Due to this he moves to the *Metaphysical Foundations of Natural Science* for an account of the relationship between Newton’s laws and Kepler’s, an account that is certainly very important in its own terms but not obviously helpful with describing the specifically *transcendental* philosophy of nature, with which Friedman shows no real concern.

^{vi} The reference to “experience” here is of evidently a different order to that in “Kantian-experience” and fits Beck’s conception of “Lockean-experience”.

^{vii} Notably this citation does not strictly correct the first from the “Introduction” as the earlier claim concerned the type of “universality” involved in empirical laws whilst this concerns the provision in them of some sort of “necessity”.

^{viii} Note here, as in the second definition of “experience” given above, the reference to the “object”, a reference not mentioned in the earlier treatment of the judgment concerning bodies. And cf. Buchdahl’s remark: “at a general level, *both* those contingent propositions that are synthetic *a posteriori* and those which are normally regarded as synthetic *a priori*, are treated by Kant on similar lines, as raising the problem of the nature, ‘existence’ of status of the link that unites their terms.” (Buchdahl, 1969, p. 571).

^{ix} For an argument that the judgments of perception are incompatible with the discussion in the *Critique* see Henry E. Allison (1983) *Kant’s Transcendental Idealism: an Interpretation and Defense* (Yale University Press: New Haven and London) pp. 149-52.

^x Gerd Buchdahl (1974) “The Conception of Lawlikeness in Kant’s Philosophy of Science” in L.W. Beck (ed.) (1974) *Kant’s Theory of Knowledge: Selected Papers from the Third International Kant Congress* (D. Reidel Publishing Company: Dordrecht and Boston), p. 137.

^{xi} On my view this transcendental principle is a response to Locke’s problem concerning how the real essence of natural powers can enable these powers to be united.

^{xii} So the order of dependence is something like this: to form an empirical *concept* of something we need the postulation of homogeneity but for the concept to move from being a *rule* to a *law* we need further the provision of the transcendental concepts of “nature in general”.

^{xiii} Kant’s lectures on metaphysics include numerous discussions of the principle of continuity. In the *Metaphysik Mrongovius* he speaks of the principle as a mathematical one concerning relations between quantities: Ak. 29:862-4 and Ak. 29: 921-2 where it is also used against the Leibnizian monadology. It is related to principles of space and time in *Metaphysik L₂* at Ak. 28: 561-2 and in the *Metaphysik Dohna* Ak. 28: 662-4 a dynamic law of continuous motion is distinguished from a logical law of continuity whilst the physical law of continuity is presented in accord with the understanding of affinity in the “Appendix” to the Transcendental Dialectic. In the *Critique* itself it is clear that there is a mathematical law of the continuity of matter that specifically has the consequence of ruling out empty space (hence anticipating the point about vacuums in the Dialectic) (A176/B218) and this is clearly related to the point about the causality of a cause in the Second Analogy as what makes this causality continuous is its relationship to the space and time in which it operates (A209/B254). Continuity of quantity is also explicitly referred to in the solution of the Second Antinomy (A527/B555). It would be the work of another piece to bring together all these senses of the principle of continuity in Kant’s work.

^{xiv} In the *Critique of Pure Reason* however Kant does speak of purposive unity as a regulative principle of reason (A687/B715-A689/B717) and in doing so precisely refers to the need to adopt the principle that no part of nature is without a purpose (B425). However the systematization by means of regulative principles that he is most interested in the “Appendix” to the Dialectic is, as indicated above, in terms of mechanism. In a sense, in determining the principle of reflective judgment exclusively in terms of purposiveness, Kant has left it possible to retrospectively view the unification of system brought about by reason as just concerned with mechanism as fits with the predominant account in the earlier *Critique*.

^{xv} I will prescind here from the specifics of this procedure both with regard to the general question of understanding organisms and the possibility of aesthetic reflection since it is the question of whether there is a generic procedure that affects the possibility of empirical laws as such which is my concern here.

^{xvi} Buchdahl presents this passage however as a justification of his view that here there is a sense of the order of nature that shows that empirical lawlikeness is dependent on reflective judgment (Buchdahl, 1974, p. 137). If the expression “lawlikeness” if intended to indicate propensity to be inserted into a *system* of laws then Buchdahl is correct though this does not entail that the specific empirical laws are hence grounded on reflective judgment or that “the necessity of particular causal laws is entirely a function of their place in

a systematic structure of such laws” as Henry Allison puts it (Allison, 1994, p. 90).