

## Kant on the Systematicity and Purposiveness of Nature\*

Forthcoming in Oliver Thorndike (ed.), *Rethinking Kant*, volume 5 (Newcastle upon Tyne: Cambridge Scholars Publishing)

### I

In the Transcendental Analytic of the *Critique of Pure Reason*, Kant lays down a number of *a priori* synthetic judgments which he describes as "transcendental principles for the use of understanding" (A148/B187).<sup>1</sup> These transcendental principles specify conditions which are constitutive of nature as an object of possible experience. In particular, they dictate that nature must consist of temporally enduring substances with determinate

---

\*This paper was originally written in 1992. It was circulated and elicited some critical discussion (see in particular Philip Kitcher, "The Unity of Science and the Unity of Nature," in *Kant and Contemporary Epistemology*, edited by Paolo Parrini (Dordrecht: Kluwer, 1994, 253-272), but I refrained from trying to publish it at the time because I was not satisfied with the positive account of the principle of nature's purposiveness offered in sections IV and V. It seemed to me that the account over-emphasized the problem of what entitles us to regard empirical regularities as lawlike rather than accidental, and did not do enough justice to the more fundamental problem of how we are capable of bringing objects under empirical concepts. My subsequent work on purposiveness in the aesthetic and biological contexts has led me to a revised account which, while in many respects similar to the one presented here, sees the presupposition of nature's purposiveness as directly required for empirical conceptualization. This account, sketched in "Why Must we Presuppose the Systematicity of Nature?", in *Kant and Laws*, edited by Angela Breitenbach and Michela Massimi (Cambridge: Cambridge University Press, 2017), draws on the idea of purposiveness as a very minimal kind of normativity, an idea which I had not yet arrived at when I wrote this paper. To regard nature as purposive for our cognitive faculties, on the revised account, is to regard it as meant to be conceptualized by us in the ways we conceptualize it, or as making appropriate the conceptualizing activity we bring to bear on it; and we have to regard nature in this way in order for our activity to amount to conceptualization as opposed to mere association of representations. In spite of the revision in my view, and my original dissatisfaction with the paper, I now see two reasons why it is worth having in print. First, the critical discussion in sections II and III has some value in its own right, and helps to support the view I have arrived at more recently. Second, the positive proposal contains an idea which has continued to seem to me important and worth developing, both in its own right and as an interpretation of Kant, although I was unable to work it into the more recent paper. This is that we cannot attempt either to conceptualize nature, or, relatedly, to seek natural laws, unless we assume that the conceptualizations we in fact arrive at are, in a sense, the result of nature's teaching us how we ought to conceptualize it. To offer a very rough analogy: we have to approach nature as though it were a board game with pieces intended to be moved in accordance with fixed rules, but a game which – since it comes without instructions – has been designed in such a way that, through our interaction with the pieces, we naturally come both to move them around in ways which conform to those rules, and to come to recognize the rules and regard them as binding on us. Without supposing that nature, so to speak, has a way of teaching us how to conceptualize it, we cannot suppose, of any conceptual system or theory we arrive at, that it is any more appropriate to nature than any other, and that deprives our supposed activity of seeking concepts of its point; in fact it is not an activity of seeking at all. The proposal sketched in this paper, although far from satisfactory, at least gives some indication of why we might see such an idea at work in Kant's account of the purposiveness and systematicity of nature

<sup>1</sup>References to Kant's *Critique of Pure Reason* will cite the usual A and B pagination. References to the *Critique of Judgment* (CJ) will be located by indicating both the section number (arabic numerals preceded by "§" will refer to sections in the main text and roman numerals will refer to sections in the Introduction) and the page number according to the pagination of volume 5 of the *Akademie* edition of Kant's collected writings (Berlin: De Gruyter and predecessors, 1900-). References to the First Introduction to the *Critique of Judgment* will be abbreviated "FI" and will include the section number and the page number according to the pagination of volume 20 of the *Akademie* edition. References to all other writings by Kant will cite volume and page number of the *Akademie* edition. All translations are my own.

qualitative and quantitative features, and that these substances are in mutual and reciprocal causal interaction.

But Kant makes clear that these are not the only *a priori* principles that contribute to our empirical knowledge of nature. For in the Appendix to the Dialectic, and in the two versions of the introduction to the *Critique of Judgment*, Kant lays down further *a priori* principles which he also describes as transcendental. According to these principles, which are referred to in the Appendix as principles of reason and in the introductions to the *Critique of Judgment* as principles of reflective judgment, there is a further level of organization among natural phenomena which goes beyond that dictated by the principles of understanding. The laws governing causal interactions among substances, and the causal powers and natural kinds that correspond to these laws, are not haphazardly arranged. Rather, they are organized systematically in a hierarchical structure.

The principles of reason and reflective judgment, however, are different in status from the principles of understanding. While we know, for example, that every event has a cause, we do not know that nature is systematic. Rather, Kant suggests, the systematicity of nature is something we must presuppose, as opposed to something that we are entitled to claim as an *a priori* truth. If we do not proceed on the assumption that nature is systematic, then empirical scientific enquiry is impossible. It is from this fact that the principles of nature's systematicity derive their transcendental status.

But it is not easy to see from Kant's discussion why the presupposition of nature's systematicity is necessary for empirical enquiry. Because of this, commentators have understood Kant's views about the systematicity of nature in widely different ways. On one view, the presupposition of nature's systematicity is required to encourage the activity of empirical enquiry. Without the presupposition, such enquiry would not strictly speaking be impossible; but we would lack rational motivation for pursuing it. On a second and contrasting view, the presupposition of nature's systematicity plays a much stronger role in accounting for the possibility of empirical enquiry into nature. If nature's laws are not regarded by us as constituting an empirical system, then they do not qualify as laws at all. Thus empirical scientific enquiry is impossible because there is nothing for it to discover.

I wish to argue in this paper that neither of these accounts provides an adequate explanation of why the presupposition of nature's systematicity is necessary. As has been recognized before, the first fails because the role it ascribes to the presupposition is too weak. And as I shall try to show, the second fails because the role it ascribes to the presupposition is too strong. I shall suggest in their place a third account which avoids both kinds of criticism. This account, while it draws on insights from the views which it is meant to replace, differs in an important respect

from both. It takes as central, not the notion of systematicity *per se*, but the notion of purposiveness: specifically, the notion of nature's being organized in a way that is purposive for our cognitive faculties. It is through understanding the importance of this notion that we can arrive at the most satisfactory interpretation of Kant's claim that we must presuppose the systematicity of nature.

The remainder of the paper proceeds as follows. In section II, I provide an initial sketch of Kant's views on the systematicity of nature, and discuss the first of the two accounts mentioned above, going on in section III to discuss the second. In sections IV and V, I introduce my own account by trying to show why, on Kant's view, it is necessary for us to presuppose that nature is purposive for our cognitive faculties. I then conclude in section VI by showing how the requirement to presuppose the purposiveness of nature entails a requirement to presuppose the systematicity of nature as well.

## II

The Appendix to the Dialectic describes the employment of reason in the empirical investigation of nature, an employment which Kant describes as "hypothetical." Reason in this employment, Kant says, "concerns the systematic unity of the cognitions of understanding" (A647/B673); that is, it "seeks to achieve the *systematization* [das Systematische] of empirical cognition" (A645/B673). Kant reformulates this point by saying that reason prescribes for itself a logical principle or maxim to search for systematic unity (A648-50/B676-8). This self-imposed logical principle is initially described by Kant as requiring us to "reduce the apparent diversity" of empirical phenomena by seeking their underlying unity or homogeneity (A649/B677). But Kant goes on to expand the scope of reason's search for systematicity by taking it to include the converse aim of seeking diversity among those empirical phenomena which appear at first to be homogeneous. Thus it turns out that reason is governed, not only by the logical principle of homogeneity or genera, but also by a further logical principle of species or variety. And the combination of these two principles turns out to yield a third logical principle, that of continuity or affinity, according to which reason must not rest content with any classificatory system of nature which leaves gaps between one species and another, but must also seek intermediate species between any two apparently neighbouring ones.

In addition to these logical principles, Kant claims, reason must adopt a corresponding set of principles which, by contrast, are "transcendental". That is, reason must not merely seek a complete systematic unity of

empirical cognitions, but must also assume that such unity is there in nature to be discovered. This, he suggests, is because without transcendental principles of systematicity, the logical principles would not be applicable and would thus be empty. Kant makes this point first with respect to the principle of homogeneity:

Indeed, we cannot see how there can be a logical principle of reason's unity of rules [*der Vernunfteinheit der Regeln*] if we do not presuppose a transcendental principle through which such systematic unity is assumed *a priori* as necessarily attaching to the objects themselves. For with what authority can reason in its logical use demand that the manifoldness of powers which nature gives us to cognize be treated as a merely hidden unity...if reason is free to admit that it is equally possible that all powers are heterogeneous and that the systematic unity of their derivation is not in conformity with nature? (A651/B669)

In short,

the logical principle of general presupposes a transcendental principle if it is to be applied to nature...In accordance with this latter principle, homogeneity is necessarily presupposed in the manifold of a possible experience.(A654/B682)

A similar point is made about the logical principle of species, "which would be without sense and application if it did not rest upon a transcendental law of specification" (A656/B684) and about the logical principle of continuity.

This logical law, Kant says,

presupposes a transcendental law (*lex continui in natura*), without which the use of the understanding would only be led astray by the former principle, in that it would follow a path which is perhaps quite contrary to nature itself. (A660/B688)

At the same time, however, Kant maintains that these transcendental principles do not have the same status as the principles of understanding established in the *Transcendental Analytic*. They are regulative rather than constitutive (A664/B692ff., A680/B708), they possess merely "indeterminate" validity (A663/B691, A680/B708), and they cannot be proved by means of a transcendental deduction (A663/B691). Since they are not imposed by the understanding on nature, we do not know *a priori* that nature is systematic. Nor, as Kant makes clear, can we arrive at a grasp of these principles through experience: "we cannot say that reason...has previously read off [abgenommen] this unity...from the accidental constitution of nature" (A651/B679). The fact that reason's self-imposed aim of systematizing empirical cognition requires reason also to presuppose that nature is systematic does not allow us to conclude that nature is, as a matter of fact, systematic. It entails only that we must regard nature as systematic if we are to carry out the task of seeking systematic unity in nature.

The theme of empirical enquiry into nature is taken up again by Kant in the Introduction and First Introduction to the *Critique of Judgment*. Here, Kant's discussion differs in several ways from that in the Appendix

to the Dialectic. First, the aim of seeking systematic unity in nature is ascribed, not to reason but to reflective judgment, which is introduced as a capacity for finding universals for given particulars. This capacity is responsible for systematizing empirical cognition in so far as it discovers higher empirical laws and concepts under which lower empirical laws and concepts may be subsumed, but it is also responsible for finding empirical laws and concepts in the first place. Second, Kant does not ascribe to reflective judgment a specific set of logical principles which are then individually described as presupposing corresponding transcendental principles. Rather, Kant describes reflective judgment more generally as aiming at systematic unity in experience, and then claims that reflective judgment presupposes *a priori*, as a transcendental principle, that nature conforms to this aim. Third, the content of the principle of systematicity is apparently broader than in the Appendix to the Dialectic, including not only the idea of systematic hierarchy of empirical concepts corresponding to species or causal powers, but also the idea of a systematic hierarchy of empirical causal laws. Fourth, while the transcendental principles of homogeneity, specification and continuity are described in the Appendix as possessing a qualified kind of objectivity (as noted above, they are "indeterminate" and have a merely regulative status), the principle of systematicity is described in the *Critique of Judgment*<sup>2</sup> as subjective (FI IV, 209; CJ V, 184 and 185).

Despite these and other differences, however, a similar doctrine emerges:

It is a subjectively necessary transcendental presupposition that...nature qualifies itself through the affinity of particular laws under more general ones for experience as an empirical system....This presupposition is...the transcendental principle of judgment....judgment, which is obliged to bring particular laws under higher but still empirical laws, must lay such a principle at the basis of its procedure....Only under this assumption is it possible to order experience in a systematic fashion. (FI IV, 209-211)

In order to carry out the task of systematizing our experience of nature, we have to assume *a priori* that nature's empirical laws (and, as Kant makes clear elsewhere, empirical concepts) are systematically organized. Yet at the same time, as the term "subjective" suggests, this does not entail that nature is in fact systematic. For Kant again makes clear that the principle is neither prescribed *a priori* to nature by understanding (FI IV 210) nor derived from experience (FI IV 211).

While the predominant view expressed in both the *Critique of Pure Reason* and in the *Critique of Judgment* is that the transcendental presupposition of nature's systematicity is a condition of our being able to classify and

---

<sup>2</sup>For the sake of brevity, the term "Critique of Judgment" is used here and in similar contexts to include the First Introduction. I will refer to the First Introduction separately only in citations and where it is necessary to distinguish between Kant's views in the First Introduction and his views in the published introduction.

explain natural phenomena in a systematic way, Kant also suggests in both works that the presupposition is required more generally for the possibility of empirical concepts. This is most clearly implied in the *Critique of Judgment*, in which Kant ascribes to reflective judgment the task of finding empirical concepts for given particulars as well as that of systematizing natural phenomena, and asserts explicitly that the presupposition is required for the first as well as the second.

Judgment which, as reflective, seeks concepts for purely empirical representations, must for this purpose assume...that nature in its unlimited diversity has hit upon a division into genera and species which enables our judgment to find harmony when comparing natural forms, and to reach empirical concepts and their interconnection by ascending to more universal yet empirical concepts... (FI V 211n.)<sup>3</sup>

But it is also suggested in the *Critique of Pure Reason*. In a frequently quoted passage about the transcendental principle of homogeneity, Kant claims that, without homogeneity in the manifold

there would not be a concept of genus or indeed any other universal concept... No empirical concepts and therefore no experience would be possible. (A654/B682)

And Kant makes a related point with respect to the transcendental principle of specification:

it is only under the presupposition of differences in nature, just as it is only under the condition that nature's objects are homogeneous [Gleichartigkeit an sich haben] that we have a faculty of understanding. For it is precisely the diversity [Mannigfaltigkeit] of that which can be comprehended under a concept which constitutes the use of this concept and the business of the understanding. (A657/B685)

Kant appears to be claiming, then, that the transcendental presupposition of nature's systematicity is required both for the task of systematizing our experience of nature, and for the more basic task of bringing natural phenomena under empirical concepts. But why is the presupposition required for either of these tasks? With regard to the first, we saw that Kant claims in the Appendix that the logical principles of systematicity would be "without sense or application" were it not for their corresponding transcendental principles. In a recent article<sup>4</sup>, Paul Guyer draws on this and on related remarks to interpret Kant as arguing that the assumption of nature's systematicity is required if the pursuit of systematicity is to be rationally motivated. We need to presuppose the existence of systematicity in nature, both in order to encourage us in our search for systematicity, and in order to provide

---

<sup>3</sup>See also FI V, 213 and CJ VI, 187.

<sup>4</sup>"Reason and Reflective Judgment: Kant on the Significance of Systematicity," *Noûs* 24 (1990), 17-43. Guyer presents a similar view in "Kant's Conception of Empirical Law", *Proceedings of the Aristotelian Society*, Supplementary Volume 64 (1990), 221-241.

assurance that this search will not be frustrated by failure. Without this presupposition, it would be irrational to adopt the ideal of systematicity as our aim ("Reason," 26-27). Guyer follows Stephan Körner and J.D. McFarland in ascribing a similar view to the *Critique of Judgment*. The faculty of judgment has as its task to arrive at "empirical concepts which represent a systematization of our experience," and "it must...presuppose that what we are given is sufficiently systematizable for us to pursue such an objective rationally" ("Reason," 35).<sup>5</sup>

The idea that the presupposition provides rational motivation for the activities of reason and reflective judgment serves for Guyer to explain its being needed for empirical conceptualization also. We can hope to subsume the variety of natural phenomena under empirical concepts only on the presupposition that nature, despite its diversity, contains a manageable number of empirical uniformities, and moreover, that these uniformities are organized in such a way that discovery of one empirical concept will lead us to discover others ("Reason," 37). That is, "we must presuppose a degree of organization among the uniformities of nature in order to have a reasonable expectation of discovering them" ("Reason," 40). Guyer concedes that it does not follow strictly from this that the required organization must be hierarchical; but he suggests that Kant's argument can be extended to yield this result and so to establish the presupposition of nature's systematicity as a condition of discovering empirical concepts.

However, the "rational motivation" view is subject to serious difficulties. First, as both Guyer and McFarland have pointed out,<sup>6</sup> it is simply implausible to claim that our activities of systematizing and conceptualizing nature would be irrational without the prior assumption of their success. There seems to be no reason why we should not attempt to systematize our empirical cognition of nature while waiting to see if these attempts will yield fruit. Even if we need encouragement to persevere in these activities, there is apparently no reason why this encouragement must derive from an *a priori* belief that they will succeed, rather than from the evidence of partial success that they have so far provided. The most that Kant might be entitled to claim along these lines is that it would be irrational to seek systematicity or empirical uniformity in nature while at the same denying that such systematicity or uniformity is there to be found; but this claim is not strong enough to show that the systematicity of nature must actually be presupposed if empirical enquiry is to be possible.

---

<sup>5</sup>Stephan Körner, *Kant* (Harmondsworth: Penguin, 1955), 179-80; J.D. McFarland, *Kant's Concept of Teleology* (Edinburgh: Edinburgh University Press, 1970), 85-88. See also Guyer, *Kant and the Claims of Taste* (Cambridge, Mass.: Harvard University Press, 1979), 48-49.

<sup>6</sup>Guyer, *Kant and the Claims of Taste*, 49-50; McFarland, *Kant's Concept of Teleology*, 86-87.

Second, even if we grant that reflective judgment would lack rational motivation without an *a priori* assumption of success, it does not follow that it would be impossible. If all Kant can argue is that the assumption is needed to encourage the activities of reason or reflective judgment, he is not entitled to claim that it is a necessary presupposition of these activities. But this is a claim that he makes explicitly in the Appendix to the Dialectic as well as in both introductions to the *Critique of Judgment*. "In accordance with [the transcendental principle of genera] homogeneity is necessarily presupposed in the manifold of a possible experience" (A654/B682); "it is a subjectively necessary transcendental presupposition that... [nature]...qualifies itself to experience as an empirical system" (FI IV, 209); "the unity of experience (as a system in accordance with empirical laws)...must necessarily be presupposed and assumed" (CJ V, 183).

### III

Clearly, the rational motivation account is too weak to explain why we must assume that nature is systematic in order to engage in empirical enquiry. Is there an alternative account of Kant's view which makes this claim defensible?

We have so far considered two ways in which Kant takes the presupposition of nature's systematicity to be required by reason or reflective judgment: as a condition of systematizing our cognition of nature, and as a condition of bringing natural objects under empirical concepts. But in sections IV and V of the published introduction to the *Critique of Judgment*, Kant describes what is apparently a third reason why nature must be assumed to be systematic. This reason has to do with the status of empirical laws. In addition to being governed by the universal transcendental principles of understanding, nature is subject to particular causal laws which are cognized empirically. Because of their empirical status, we cannot know them to be necessary. Nonetheless, the fact that they involve the concept of cause entails that they "carry necessity with them" (CJ V, 183); and we must thus regard them as necessary "even though understanding does not cognize their necessity and could never have any insight into it" (CJ V, 184). This is possible, Kant suggests, only if we adopt the transcendental principle that nature's particular laws are cognizable by us, where this in turn entails the presupposition that nature is systematically organized in accordance with the principles of homogeneity and continuity.

Understanding must, in order to investigate these empirical so-called laws, lay at the



basis of all reflection on them an a priori principle, i.e. that in accordance with them a cognizable order of nature is possible. A principle of this kind is expressed in the following propositions: that nature contains a hierarchy of general and species that is comprehensible for us; that these again approximate to one another in accordance with a common principle, so that a transition from one to the others and thereby to a higher species is possible; that...[the various kinds of causality] are subordinated to a small number of principles which we have to occupy ourselves in finding, etc. (CJ V, 185)

This suggestion offers a potentially more promising route to explaining the need for the principle that nature is systematic, a route which has been taken up by Gerd Buchdahl and, more recently, by Philip Kitcher.<sup>7</sup> According to both of these commentators, the passage just quoted reflects a doctrine which is central to Kant's thinking in both the *Critique of Pure Reason* and the *Critique of Judgment*: namely, that the necessity of empirical laws is a function of their systematizability. The doctrine can be understood in light of the distinction, helpfully laid out by Kitcher, between merely accidental or contingent generalizations, and generalizations that are necessary or strictly universal. When we claim that some regularity instantiates an empirical causal laws, we are making a generalization of the second kind. We are saying, not just that every event falling under one description has so far been followed by an event falling under some other description, but that there is a necessary connection between the two types of event such that an event of the first type will always and without exception be followed by an event of the second type.<sup>8</sup> But as Kitcher points out, the only evidence we have to support an empirical generalization is inductive; and Kant holds that induction can never justify us in making a claim to strict universality.<sup>9</sup> How can we be justified, then, in claiming of any regularity that it instantiates a causal law? Now it might be thought that this is answered by the Second Analogy, which shows not only that we are entitled to employ the concept of cause in experience, but that we have to do so as a condition of having any objective experience at all. But the Second Analogy does not resolve the problem. For while it justifies in principle the validity of the concept of cause as a

---

<sup>7</sup>Gerd Buchdahl, *Metaphysics and the Philosophy of Science* (Cambridge, Mass.: MIT Press, 1969), ch. 8, esp. 484-532; "The Kantian 'Dynamic of Reason' with Special Reference to the Place of Causality in Kant's System," in *Kant Studies Today*, ed. Lewis White Beck (La Salle: Open Court, 1969), 341-374; Philip Kitcher, "Projecting the Order of Nature," in *Kant's Philosophy of Material Nature*, ed. Robert E. Butts (Boston: D. Reidel, 1986), 201-235. Guyer also suggests something like this route as a way of approaching Kant's argument in the published introduction, although he does not believe that it applies to the Appendix to the Dialectic or the First Introduction. However, Guyer's account is less fully articulated than that of Buchdahl and Kitcher, and he also seems to have a different, and weaker, conception of the kind of necessity that the principle of nature's systematicity can bestow on empirical laws. See note 11.

<sup>8</sup>Kitcher puts this point by saying that the generalization in question is counterfactual-supporting, although, as he acknowledges, this is not explicit in Kant's own account of the matter.

<sup>9</sup>See the *Critique of Pure Reason*, B3-4, and §84 of the *Jäsche Logic* (9:133).

condition of objective experience, it does not license any individual instance of its use. And even if it tells us that nature is subject to particular causal laws<sup>10</sup>, it does not justify us in claiming of any given empirical regularity that it instantiates one of these laws.

According to Buchdahl and Kitcher, it is reason and reflective judgment, operating in accordance with principles of systematicity, that provide the required justification. As Kitcher puts it:

Kant's solution to the puzzle of how we manage to recognize the necessity of laws is that, properly understood, this necessity accrues to lawlike statements in virtue of their incorporation in a system that is constructed by following certain rules [i.e. the principles of reason and reflective judgment]. Taken individually, statements that we normally count as laws can only be regarded as empirical and contingent. But, we are required to systematize the body of our beliefs, and, as a consequence of the systematization, some statements (in fact, those we count as laws) come to be credited with necessity. ("Projecting the Order of Nature," 209)<sup>11</sup>

It is rational for us to take a statement of empirical regularity to be lawlike, on Kitcher's interpretation of Kant, if it plays the right kind of role in the ideal systematization of our beliefs about nature. And the same point holds for the related difficulty of what justifies us in taking our empirical concepts to pick out natural kinds. Here again, empirical concepts are rationally regarded as picking out natural kinds if they have the right kind of place in a systematic theory of nature.<sup>12</sup>

---

<sup>10</sup>This is in fact disputed by Buchdahl, who argues that the Second Analogy shows only that all happenings in nature are causally related to one another, and not that nature is governed by particular causal laws. (See "Kantian Dynamic," especially 350-368, and *Metaphysics and the Philosophy of Science*, 648-665). Michael Friedman has argued persuasively against Buchdahl's account of the Second Analogy by pointing out that happenings which are causally related to one another are, on Kant's own definition of cause, subject to particular causal laws. See his "Causal Laws and the Foundations of Natural Science" in *The Cambridge Companion to Kant*, ed. Paul Guyer (Cambridge: Cambridge University Press, 1992), 161-199, especially at 170-171; see also his "Regulative and Constitutive," *Southern Journal of Philosophy*, Volume 30, Supplement (1991), 73-102, especially at 77. The arguments that I go on to give in this section against the Buchdahl/Kitcher reading are, I believe, complementary to Friedman's objections to Buchdahl's view. However, as indicated below (note 22), I have reservations about Friedman's positive interpretation of Kant's account of empirical causal laws.

<sup>11</sup>See also Kitcher, "Projecting the Order of Nature," 221; Buchdahl, *Metaphysics and the Philosophy of Science*, 505; and Buchdahl, "Kantian Dynamic," 342-343. Note that the necessity which systematicity allows us to ascribe to empirical laws is stronger than the conditional necessity we ascribe to a statement in virtue of its being derivable from another statement (*Metaphysics and the Philosophy of Science*, 518). Guyer sometimes writes as though it is this latter kind of necessity which systematicity confers on laws, and that this weaker necessity, although not equivalent to necessity in the stronger sense, provides an "approximation" or "semblance" of it ("Kant's Conception of Empirical Law," 238-239). But I agree with Buchdahl and Kitcher that Kant is concerned only with necessity in the stronger sense, and that the notion of conditional necessity does not enter his argument.

<sup>12</sup>The role of the principle of systematicity in connection with empirical concepts is discussed in detail by Patricia Kitcher in *Kant's Transcendental Psychology* (Oxford: Oxford University Press, 1990), 217-230 and in "Reasoning in a Subtle World," *Southern Journal of Philosophy*, Volume 30, Supplement (1991), 187-195.

Why should systematizability serve in this way as a criterion for the necessity of laws? The answer for Buchdahl and Kitcher is that the former is constitutive of the latter. It does not make sense, on their interpretation, to think of laws of nature as holding independently of the activity of systematizing. Rather, it is this activity which confers lawlikeness or necessity on empirical regularities in the first place.<sup>13</sup> There is nothing more to being a law of nature or a natural kind than figuring appropriately in the ideal systematization of natural phenomena: laws, according to Kitcher, are just "statements that play a particular role in the system that would emerge from an ideally extended enquiry" ("Projecting the Order of Nature," 215). So we need not worry that the laws of nature might "in reality" be unsystematic and thus fail to conform to the principles of reason or reflective judgment. For either the worry makes no sense, or it admits of a trivial reassurance. Nature's laws must be systematically organized, otherwise they would not be laws.<sup>14</sup> By the same token, we need not fear that reason's self-imposed injunction to seek systematicity might be leading us astray in our attempts to identify laws and kinds, or, more specifically, that in rejecting less systematic theories in favour of ones that are more systematic, we may be getting further away from the truth about nature rather than approximating to it more closely. For according to Kitcher, Kant holds that truth is "obtained in the ideal limit of inquiry," where "part of what gives sense to the notion of the 'ideal limit of inquiry' is the pursuit of certain goals -- systematic unity prominent among them" ("Projecting the Order of Nature," 214). Getting closer to the truth about nature *just is* arriving at a more systematic account of natural phenomena.

But there is a discrepancy here between the Buchdahl/Kitcher interpretation and Kant's own account of the matter. Recall that in the Appendix to the *Dialectic* Kant distinguishes between "logical" and "transcendental" principles of reason. The logical principles, he claims, enjoin us to seek systematicity in nature; but without corresponding transcendental principles they would be "without sense and application" (A656/B684). The logical principle of genera alone leaves reason free to admit that "all powers might be heterogeneous, and that [the] systematic unity [prescribed by the logical principle]...may not be in conformity with nature" (A651/B679). Without the transcendental principle, reason might "adopt an idea which completely contradicted the arrangement

---

<sup>13</sup>Buchdahl, "Kantian Dynamic," 342-4. Kitcher articulates this point in more detail than Buchdahl by arguing first that there is a necessary connection between explanation and systematization, and secondly that explanation does not consist in seeking independently existing truths. As will become clearer, I agree with Kitcher on the first point, but not on the second.

<sup>14</sup>The first of these options is indicated by Buchdahl (*Metaphysics and the Philosophy of Science*, 507) and the second by Kitcher ("Projecting the Order of Nature," 212n).

[Einrichtung] of nature" (ibid.). On a similar note, as we have seen, the logical law of continuity "presupposes a transcendental law...without which the understanding would follow a path which is perhaps quite contrary to nature itself" (A660/B688). In other words, there is a genuine worry to be raised, both that nature might fail to conform to reason's demand for systematicity, and that reason's pursuit of systematicity might lead us astray. To eliminate this worry, we need to go beyond the claim that reason seeks systematicity, and to take the additional step of presupposing that nature accords with reason's aims.

Now neither Kitcher nor Buchdahl allude to the distinction between logical and transcendental principles of reason. But their interpretation seems to be largely based on Kant's discussion of the so-called logical principles. Kitcher introduces his account of reason as conferring necessity on laws by citing Kant's remark that "the aim of reason is to bring unity into the body of our detailed knowledge, and thereby to *approximate* the rule to universality" (A647/B675, "Projecting the Order of Nature," 206). And both Kitcher and Buchdahl draw on Kant's statement in the next paragraph that the systematic unity at which reason aims is "only a *projected* unity, to be regarded not as given in itself, but as a problem only" (A647/B675). It is as a gloss on this passage that Buchdahl brings out the central theme of his interpretation:

the idea of unity...is treated as something which expresses a *decision* to seek systematic connections; reason is regarded, not as *assuming* ("dogmatically") the *existence* of a unity, but as something 'which [itself] requires us to seek for this unity'." (*Metaphysics and the Philosophy of Science*, 506)

But immediately after invoking the idea of a "projected unity", Kant warns us that "from these considerations we can see only that the systematic unity or unity of reason [Vernunftseinheit] of the manifold cognitions of understanding is a *logical* principle," where the idea of a logical principle is understood specifically in contrast with that of a transcendental one (A648/B676). And he goes on to point out that, although we must "try...to bring systematic unity into our knowledge" by seeking, for example, an absolutely fundamental causal power, "this idea of a fundamental power is not treated [bestimmt] merely as a problem." Rather,

we presuppose that such a unity is to be met with....[In all such cases] reason presupposes the systematic unity of the various [mannigfaltig] powers, on the ground that particular laws of nature fall under more general laws, and that parsimony [Ersparung] in principles is not merely an economical principle of reason, but an inner law of nature. (A650/B678)

Buchdahl's claim is true only if we take it to be confined to what Kant says about the logical principles. If we take seriously Kant's remarks about the need for transcendental principles of reason, it becomes apparent that reason does

assume the existence of order or unity, as well as prescribing it as a goal.

The discrepancy I have noted also emerges from the introductions to the *Critique of Judgment*. For here Kant repeatedly indicates that, although reflective judgment is obliged to aim at the systematicity of empirical laws and concepts<sup>15</sup>, there remains a legitimate worry about whether nature's laws and kinds are in fact systematic. And this worry can only be removed by an assumption to the effect that nature accords with the aims of reflective judgment. In a well-known passage from section IV of the first introduction, Kant claims that in spite of the fact that nature constitutes a system according to transcendental laws,

it does not follow that nature is also, in accordance with *empirical laws*, a system that is *comprehensible* [faßlich] for the human cognitive faculty, and that the thoroughgoing systematic coherence of its appearances in one experience, consequently this experience itself as a system, is possible for human beings. For the manifoldness and heterogeneity of the empirical laws could be so great that, while it would admittedly be partly possible for us to connect perceptions to form an experience in accordance with accidentally [gelegentlich] discovered laws, it would never be possible for us to bring these empirical laws themselves to unity of kinship under a common principle, if indeed, as is surely possible in itself (at least as far as the understanding can determine [ausmachen] *a priori*) the manifoldness and heterogeneity of these laws, likewise the corresponding natural forms, were infinitely large and manifested a crude chaotic aggregate without the slightest trace of a system. (FI IV, 209)

Consequently, if nature does accord with reflective judgment's need for systematicity, this accord is, at least as far as we can tell, a matter of chance:

it is contingent, as far as we can see, that the order of nature in accordance with its particular laws, with their at least possible manifoldness and heterogeneity transcending all our power of comprehension, nonetheless actually conforms to this power of comprehension. (CJ VI, 187)

Indeed, we can even accept the idea that nature may not be completely systematizable by us:

if we are told that a deeper or broader acquaintance with nature through observation must eventually come up against a manifoldness of laws which no human understanding can trace back to a single principle, we are reconciled to the thought [wir es auch zufrieden sind]. (ibid., 188)

It is thus perfectly intelligible that nature's laws and kinds might fail to be systematic.<sup>16</sup> But on the Buchdahl/Kitcher interpretation, nature's laws and kinds necessarily form a systematic unity, for if they did not, they

---

<sup>15</sup>See for example FI IV, 210; FI V, 211n.; FI V, 213, FI V, 215; CJ IV 180; CJ V 186.

<sup>16</sup>See in addition CJ §77, 406 and CJ IV, 184 and 185. Guyer draws the same moral from the *Critique of Judgment*: see "Reason and Reflective Judgment", 42.

would not be laws and kinds. As Kitcher puts it, "the fundamental causal mechanisms are necessarily few in number. For those fundamental mechanisms correspond to the most general principles of our explanatory systematization, and, because this systematization is explanatory it is, ipso fact, unified" (212n.).

The difficulty with the Buchdahl/Kitcher interpretation can be sketched more broadly as follows. According to the interpretation, reason and reflective judgment play a role with respect to empirical laws and kinds which directly parallels the role played by understanding with respect to objects. Just as the notion of an object of experience is definable only in terms of the activity of understanding in unifying the manifold of intuition, so the notion of an empirical law or kind is definable only in terms of the activity of reason or reflective judgment in unifying the manifold of empirical cognitions. Consequently, just as objects of experience are necessarily subject to the categories of understanding, so empirical laws and kinds are necessarily subject to the principles of systematicity which govern the activity of reason and reflective judgment. In Buchdahl's words, Kant holds that "'nature' (i.e. 'the order of nature') is a function of [reason's] constructive activity itself" and that "the order of nature...must be viewed as a spontaneous creation of methodological reason" (*Metaphysics and the Philosophy of Science*, 511). Reason, like understanding, is legislative for nature (albeit for nature's laws and kinds as opposed to its objects); and in support of this interpretation, both Buchdahl and Kitcher quote Kant as declaring that "reason does not here beg but command" (A653/B681, Buchdahl, *Metaphysics and the Philosophy of Science*, 511, Kitcher, "Projecting the Order of Nature," 213).

But while this account has an undeniably Kantian ring, it fails to square with Kant's depiction of nature's empirical laws and kinds as potentially at odds with the demands of reason and reflective judgment. In the *Critique of Judgment*, Kant specifically denies that reflective judgment is legislative for nature: "reflective judgment can only give such a transcendental principle as a law to itself...and cannot prescribe it to nature" (CJ IV, 180).<sup>17</sup> This is because "reflection on the laws of nature adjusts itself [sich richten] to nature, not to nature to the conditions under which we try to acquire a concept of it (a concept which is quite contingent with respect to these conditions)" (ibid.). Now this might seem to stand in a plain contradiction with Kant's earlier statement that "reason does not here beg but command." But Kant does not in fact say this. He says, rather, that "we *presuppose*...that reason does not here beg but command" (my emphasis). It is precisely because reason's self-imposed principle of systematicity does *not*

---

<sup>17</sup>See also CJ V, 186, FI V 215

dictate to nature, that the conformity of nature's laws to the demands of reason must be presupposed, rather than accepted as a matter of *a priori* truth.<sup>18</sup>

#### IV

We saw in section one that the "rational motivation" interpretation is too weak to account for Kant's view that we are obliged to presuppose the systematicity of nature. The Buchdahl/Kitcher interpretation seemed to avoid this problem by making systematicity a necessary attribute of nature's laws and kinds. But we saw that this leads to precisely the opposite problem, namely that the account yielded is too strong to capture Kant's view. For while Kant holds that the presupposition of nature's systematicity is necessary, in that we are required to adopt it as a condition of exercising reason or reflective judgment, he also holds that the content of the presupposition is contingent. It is not necessary that nature's laws and kinds be systematically organized, even though it is necessary for us to presuppose that they are: "we judge the unity of nature according to empirical laws...to be contingent" even though "such a unity must necessarily be presupposed and assumed" (CJ V, 183).

Clearly, what is required is an interpretation which steers between these two alternatives, and that is what I will offer in what follows. As a preliminary step, I wish to propose a provisional change in the terms of the discussion. So far, I have been following Guyer, Buchdahl and Kitcher in referring to the transcendental presupposition in question as a presupposition of nature's systematicity. But while this apparently accords with the account Kant gives in the Appendix to the Dialectic, it is unsuited to Kant's discussion in the introductions to the

---

<sup>18</sup>In insisting on the possibility that nature's laws might fail to conform to the demands of reason, I am denying Kitcher's claim that Kant steers a *via media* between a realist view and the sort of view associated with Mach and Duhem. In effect I am claiming that, as far as empirical laws are concerned, Kant's position must be interpreted as a realist one. Even though the concepts of causality and lawlikeness are imposed by human understanding, the question of *what* the laws of nature are is an *a posteriori* matter which (at least as far as we can tell) is not determined by the nature of our cognitive capacities. However, I am not sure that Kant's views about empirical laws are best summed up by saying that he asserts the reality of empirical laws. Rather, I think that his view may ultimately be that we have to adopt a realist standpoint on empirical laws in order to preserve the distinction between the *a posteriori* and the *a priori*. On this tentative reading, our need for a realist standpoint on empirical laws coexists with the requirement, which I go on to discuss in the next two sections, that we regard nature as cognizable by us. The question of whether these two requirements are compatible lies outside the scope of this paper.

Kant's realism about empirical laws has been emphasized (also with qualifications) by Ralph Walker, in "Kant's Conception of Empirical Law", *Proceedings of the Aristotelian Society*, Supplementary Volume 64 (1991), 242–58 (1991, 254-258) and in Gordon Brittan, "Systematicity and Objectivity in the Third Critique," *Southern Journal of Philosophy*, Volume 30, Supplement (1991), 167-186.

*Critique of Judgment*. For here what Kant claims is not that we must presuppose nature's systematicity *per se*, but that we must presuppose that nature "conforms to" or is "purposive for" our cognitive faculties, where systematicity is only an aspect of this purposiveness. Thus in section II of the First Introduction, even before mentioning the systematicity of nature, Kant declares that

if there is to be any concept or rule which originates in the power of judgment, it must be a concept of things in nature in so far as they direct themselves [sich richten nach] our power of judgment...in other words, it must be the concept of a purposiveness of nature for the sake of our faculty of cognizing it. (FI II, 202)<sup>19</sup>

It is only subsequently that he identifies this concept as "that of an experience *as a system according to empirical laws*" (ibid., 203). And he continues through both introductions to provide characterizations of the principle of reflective judgment which are couched in terms of the "technic" or "purposiveness" of nature.<sup>20</sup>

Moreover, when Kant goes on to indicate that the presupposition of nature's systematicity is required as a condition of conceptualizing and systematizing nature, he does not say that we can satisfy this condition by assuming nature's systematicity *tout court*. Rather, we must make the more specific assumption that nature is systematic in such a way as to conform to our capacities for conceptualizing and systematizing.

Judgment...must assume that nature in its unbounded manifoldness has hit upon such a division in genera and species as makes it possible for our judgment to meet with harmony in the comparison of natural forms and to arrive at empirical concepts, and coherence among them, by ascending to more general but equally empirical concepts. (FI V, 211n)

All comparison of empirical representations...presupposes that nature has observed in regard to its empirical laws a certain economy commensurate with our judgment and a similarity of forms which we can grasp.(FI V, 213)

Similarly, when Kant suggests in the published introduction that the assumption of systematicity is required as a condition of regarding empirical laws as necessary, the point is presented as subsidiary to the more central idea that we have to presuppose that nature is cognizable by us or conforms to our cognitive faculties.

Understanding must, in order to investigate these empirical so-called laws, lay at the basis of all reflection on them an *a priori* principle that in accordance with them a

---

<sup>19</sup>Note that here and at similar places in which Kant refers to our "cognitive faculties" or our "powers of cognition", he is referring specifically to our faculties for the *empirical* investigation of nature. Thus the expression "cognitive faculties" excludes, in this and related contexts, pure understanding. Since the *Critique of Pure Reason* has already shown that nature is necessarily subject to the *a priori* categories and principles of the understanding, the question of nature's "purposiveness" for pure understanding does not even arise. I shall follow Kant in this usage.

<sup>20</sup>See for example FI II, 204; FI II, 204n.; FI IV, 214; FI V, 215; CJ V, 184; CJ V, 186.



cognizable order of nature is possible....[T]his harmony of nature with our cognitive faculties is presupposed *a priori* by judgment for the sake of its reflection on nature in accordance with empirical laws. (CJ V, 185)

While Kant points out, as we have seen, that the laws of homogeneity and continuity "express" such a principle, it is clear that the principle itself is that of nature's purposiveness for our cognitive faculties, and not of its systematicity as such.<sup>21</sup>

Now the problem that I posed at the beginning of this paper was that of explaining why, on Kant's view, we have to presuppose that nature is systematically organized. But these passages from the *Critique of Judgment* suggest that the notion of nature's purposiveness for our cognitive faculties may be crucial for arriving at a satisfactory explanation of why we have to assume its systematicity. Drawing on this suggestion, I shall try in this section and the next to show why we have to assume that nature is purposive for our cognitive faculties. I shall leave for section five the task of showing how the assumption that nature is purposive for our cognitive faculties in turn entails the assumption that it is systematically organized.

Let us begin by recalling the question raised by Kitcher of what entitles us to take empirical generalizations to be necessary or lawlike. According to Kitcher, the answer is given by the notion of systematicity which, on his account, is conceptually linked to that of lawlikeness. But I argued in the last section that there is a gap between systematicity and lawlikeness. The systematic organization of nature's laws is, as far as we know, a contingent matter; and as a result, our drive towards systematicity may lead us astray. We seem forced to conclude, then, that on Kant's view neither induction nor principles of systematic organization can justify us in taking empirical regularities to be lawlike. Indeed, with both of these possibilities excluded, it seems as though nothing could provide the appropriate justification.<sup>22</sup> This is not just to make the obvious point (with which Kitcher would agree)

---

<sup>21</sup>While Buchdahl makes a point of commenting on Kant's characterization of the principle of reflective judgment as a principle of purposiveness (*Metaphysics and the Philosophy of Science* 520-523), he takes the import of this characterization to consist in the idea that nature is designed according to a deliberate intention or plan. He leaves out what I take to be the crucial point, namely that we must think of nature not just as purposive (i.e. designed according to a plan or purpose) but as purposive *for the sake of our cognitive faculties*.

<sup>22</sup>This is disputed by Friedman, who argues that the *Metaphysical Foundations of Natural Science* illustrates an *a priori* procedure for justifying the law of universal gravitation and hence for showing that the empirical regularities described by Kepler's laws are genuinely lawlike ("Causal Laws," IV). According to Friedman, this procedure can in principle be extended to provide an *a priori* justification for lower-level empirical laws such as the laws of chemistry ("Causal Laws," V). Initially, Friedman's proposal might be questioned on the grounds that the proof of the law of universal gravitation assumes the legitimacy of the empirical concept of matter, so that the law of universal gravitation is ultimately subject to the same uncertainty that affects the claim of any empirical concept to correspond to a genuine natural kind. Friedman's answer to this question is that the legitimacy of the law of universal gravitation does not

that our conclusions about nature's laws and kinds are fallible and always subject to correction. It is to make the stronger point that we have no reason at all to believe that any of our claims about laws or kinds even approximate to the truth about nature. And, as we have seen, our *a priori* knowledge that there *are* natural laws is of no help here. For we have no reason to identify any empirical regularity as corresponding to one of these laws. It could be that our putative empirical laws are all merely contingent generalizations and that the real laws and kinds have so far remained completely hidden.

Now the skeptical aspect of this possibility is admittedly not emphasized in Kant's discussion. In saying that nature's systematicity is a contingent matter, and that nature need not conform to the demands of reflective judgment, Kant's explicit concern does not seem to be that we might be deceived by considerations of systematicity into taking merely contingent regularities to be lawlike. In a characteristic passage, Kant invokes the possibility that

regardless of the harmony of natural things in accordance with the universal laws [of understanding]...the specific diversity of the empirical laws of nature, together with their effects, might be so great that it would be impossible for our understanding to discover in it a comprehensible order [and] to divide its products into genera and species. (CJ V, 185)

The primary worry here seems to be that we might find no order in nature at all, not that we might be deceived by an order that was illusory. And this worry does not in itself look like a skeptical one. Since we do in fact appear to find a partially comprehensible order in nature, the concern may seem only to be that this conformity of nature to our judgment, while actual, is contingent: that nature might have failed to be comprehensible to human beings, not that nature might (despite all appearance of comprehensibility) fail to be comprehensible even now.

However, the possibility that nature might appear to be comprehensible without actually being so is also implicit in Kant's account. For Kant does not just deny that nature's conformity to reflective judgment is known *a priori*, but also that we can know it empirically. It "cannot be ascribed to the account of experience" (FI IV, 211) and is "not learned by observation" (CJ V, 186). Thus despite the fact that we seem to find a systematic order in

---

depend on that of the concept of matter, but rather that the two are established together by the same procedure: while the proof of the law of universal gravitation does depend on the provisional adoption of the empirical concept of matter, the success of the proof yields a way of retrospectively legitimizing the concept. However, even if this answer is accepted, a further question arises as to how the procedure is to be extended to lower-level concepts and laws. The concept of matter may be argued to have a special status among empirical concepts because it is the highest genus of substance in space. But it is hard to see how one could find *a priori* principles to legitimize a further division of matter into lower kinds, and thus how one could avoid the worry that any division arrived at might yield arbitrary groupings as opposed to natural kinds. Thus while Friedman may succeed in showing that there is an *a priori* justification of a single empirical law, namely the law of universal gravitation, I do not think that he is able to show that this kind of justification could extend, even in principle, to more specific laws of nature.

nature, we do not know that nature is actually comprehensible to us. If it is possible that nature's laws and kinds are not systematic, then it is possible in addition that human beings are being temporarily presented with an apparently systematic series of uniformities and regularities which we mistakenly identify as corresponding to nature's laws and kinds. Kant hints at this possibility of deception when, as we have already seen, he alludes to the worry that reason's demand for systematicity might lead the understanding to "follow a path which is perhaps quite contrary to nature itself" (A660/B688). And there is also a flavour of skepticism in Kant's marginal note to the First Introduction, which raises the possibility of Linnaeus's

having to worry that, when he saw a stone which he called granite, this might be different as regards its inner constitution from every other stone which looked just like it. (FI V, 216)

If we can be misled in our identification of natural kinds by observed uniformities, we can equally well be misled by hierarchical structures of uniformities; and the same goes for our identification of natural laws on the basis of observed regularities.<sup>23</sup>

But even though we might be led to mistake accidental regularities and uniformities for laws and kinds, how could the genuine laws and kinds evade our enquiry? That is, if natural phenomena are governed by strictly necessary and universal laws, how can these laws fail to manifest themselves to us? There are two ways of making this possibility intelligible. First, the laws and kinds might be organized so haphazardly that, even if we grasped some of the more obvious lower-level laws, we might never be led to other, higher-level ones.

For the manifoldness and heterogeneity of the empirical laws could be so great, that while it would indeed be partially possible for us to connect perceptions into an experience through accidentally [gelegentlich: literally, "occasionally"] discovered laws, we would never be able to bring these empirical laws themselves to unity of affinity [Verwandschaft] under a common principle. (FI IV 209)

Since we would be able to recognize only a few individual laws, and could never arrive at a systematic theory on the basis of them, we would not be in a position to devise the sorts of experiments that would yield the rest of the laws

---

<sup>23</sup>I believe that this point is supported by a passage from the *Metaphysical Foundations of Natural Science* which Friedman cites as part of his argument against Buchdahl's view. In this passage, Kant claims that, despite the fact that chemistry has a systematic form, the laws of chemistry are not cognized as necessary, that is, as apodeictically certain (4:468; "Regulative and Constitutive," 91-92). Thus the possibility is left open that, for all the apparent systematicity of generalizations about chemical regularities, these regularities may fail to pick out genuinely necessary laws. While I do not want to suggest that this passage is intended to make a specifically sceptical point, I do believe that it leaves room for the sceptical possibility that I am entertaining here.

governing natural phenomena.<sup>24</sup> The laws would remain hidden simply because we would lack the methodology required for discovering them: the only methodology available to us would be that guiding our current practice of seeking to maximize systematic unity, and this methodology would be useless if the laws and kinds were not in fact systematically organized.

A second, more radical, possibility is that nature's laws and kinds might not conform to the ways in which human beings conceptualize. We initially group objects together because they strike us as similar. And subsequent attempts to refine these initial groupings and to give them a basis in science are also guided by standards of similarity operating at a higher level (for example, in interpreting the results of experiments). But as Kant's example of Linnaeus and the putative piece of granite shows, there is no reason why the groupings indicated by considerations of similarity should be the same as the groupings relative to which nature's laws are framed. Kant remarks in the published introduction that

the universal laws of nature [i.e. the transcendental principles of understanding] indeed provide coherence among things generically [ihrer Gattung nach], as things of nature in general, but not specifically, as such particular beings of nature. (CJ V, 183)

For us, things in nature are determined as being of this or that particular sort: gold, water, granite etc. But there is no reason why the laws of nature should hold of these things *qua* beings of the particular sorts into which we group them. For all we know, the laws of nature could hold of things *qua* exemplars of kinds that are quite alien to our ways of classifying: for instance, kinds expressed by concepts of a disjunctive character such as grue.<sup>25</sup> Now this possibility is not raised explicitly by Kant; and it would certainly be anachronistic to ascribe to him a concern with grue-like concepts as such. But the possibility is implicit in the idea that nature's kinds and laws might fail to conform to our power of conceptualizing, that is, to reflective judgment.

On Kant's view, then, we are not entitled to claim that any of the putative empirical laws yielded by

---

<sup>24</sup>This possibility is suggested in Guyer's view that one of the purposes of the principles of systematicity is to provide a method for generating empirical hypotheses ("Kant's Conception of Empirical Law," 237-238). (However, Guyer does not consider the supposition entertained here, i.e. that the principles might provide a "method" which is actively misleading.) It should also be noted that this possibility depends on Kant's view that correlations among natural phenomena are not immediately evident to superficial observation. This view of the world as "subtle" is discussed and ascribed to Kant by Patricia Kitcher in her "Reasoning in a Subtle World."

<sup>25</sup>The constraints imposed on nature by human forms of intuition would probably rule out grue itself as a possible natural kind concept for Kant. But there are other disjunctive concepts which are analogous to grue and which do not involve a reference to space or time.

scientific enquiry are in fact necessary. For such a claim to be justified, we would need an assurance that nature *did* accord with our powers of conceptualizing and theory-construction. And we have seen that no such assurance is forthcoming. But as we have also seen, Kant holds that we must regard these putative empirical laws as necessary, even though their necessity cannot be cognized by us. How are we supposed to do this? It is here that the need emerges for the transcendental presupposition of nature's purposiveness for our cognitive faculties. We can regard empirical regularities as necessary only if we assume that nature harmonizes with our cognitive faculties in such a way as to rule out the skeptical possibility raised above. Unless we presuppose that nature is somehow fitted to the peculiarities of human conceptualization and theorization, we cannot think of the uniformities and regularities that emerge as a result of this conceptualization and theorization as corresponding to genuine kinds and laws of nature.

It is in this way, I suggest, that we should understand Kant's linkage of the necessity of empirical laws and the cognizability of nature. The point is not, at least in the first instance, that to regard empirical laws as necessary we must regard them as forming a systematic hierarchy. Rather, Kant's point is that we must regard ourselves as standing in the kind of relation to nature that can account for our having a grasp of its necessary laws. If we are to regard the empirical regularities we observe as necessary, we cannot regard the relation between nature and our cognitive faculties as a merely contingent one, for in that case we have no reason to identify the putative empirical laws yielded by our procedures of scientific enquiry with the genuine empirical laws that govern nature itself. Instead, we have to presuppose that there is a non-accidental relation between the workings of our cognitive faculties and the constitution of nature: one that determines *a priori* that nature's laws will not be at odds with the procedures that purport to reveal them. It is this relation that Kant is aiming to capture when he says that we must regard nature as though it had been designed for the sake of our cognitive capacities (CJ IV, 180), or, in other words, that we must regard it "according to a principle of purposiveness for our cognitive faculties" (CJ V, 184).<sup>26</sup>

Now it may seem, on this interpretation, that Kant is avoiding the skeptical worry by invoking the rationalist idea of a pre-established harmony between our representations and the world. The only difference, it may appear, is that Kant refrains from asserting dogmatically that this pre-established harmony exists, and claims only that we must presuppose it. But Kant's position is more subtle than this characterization suggests. What must be presupposed, on Kant's view, is not a correspondence between ideas or representations on the one hand and features

---

<sup>26</sup>The idea that the principle of purposiveness is introduced, at least in part, to solve the problem of the necessity of empirical laws, is suggested in passing by Gordon Brittan ("Systematicity and Objectivity," 186n8).

of nature on the other. Rather, the correspondence is between nature and our *ways* of representing it: nature must be presupposed to harmonize with our cognitive powers, not with our representations as such. Accordingly, since our cognitive powers can function better or worse depending on psychological or external circumstances, the assumption of harmony does not require that we take ourselves to be infallible in picking out lawlike uniformities and rejecting accidental ones. We can certainly accept, for example, that surface similarities or even deeper uniformities in behaviour can lead us to group objects into sorts that later turn out to be heterogeneous.<sup>27</sup> All we need to do, on Kant's account, is to rule out the skeptical worry; and this is something that can be achieved without assuming either that all our empirical representations are infallible, or that a privileged group of them are. We have only to assume that the particular constitution of nature is not independent of our powers of conceptualizing and theorizing, but that it is, rather, related to them in such a way that we can trust them, properly used, to approximate ever more closely to the correct classification and systematization of natural phenomena.<sup>28</sup>

## V

In the previous section I tried to give an account of the line of argument presented in sections IV and V of the published introduction, where Kant connects the presupposition of nature's purposiveness with the necessity of empirical laws. However, it does not seem implausible that this account might be extended to explain those passages in both introductions where Kant argues that the presupposition of nature's purposiveness is a condition of the exercise of reflective judgment.<sup>29</sup> This is because the task of reflective judgment in conceptualizing and systematizing natural phenomena is inseparable from that of discovering nature's laws and kinds, and it is reasonable to suppose that the conditions for our being able to regard putative laws and kinds as necessary are related to the

---

<sup>27</sup>For a historical example of a related kind of phenomenon see J.S. Mill, *A System of Logic* (London: Longmans, Green and Co., 1930), 91. The example is cited and discussed by Kitcher in "How Kant Almost Wrote Two Dogmas Of Empiricism," *Philosophical Topics* 12 (1981), 217-249, at 227.

<sup>28</sup>Note also that on Kant's conception of the harmony, we are to regard nature as though it had been designed for the sake of our cognitive faculties, as opposed to regarding our cognitive faculties as though they had been designed in order to conform to nature. This feature of Kant's conception, which I believe is intended to safeguard the autonomy of our cognitive powers, also contributes to the contrast with the rationalist conception.

<sup>29</sup>Here I disagree with Guyer, who takes the two lines of argument to be distinct.

conditions of our being able to discover them. The role of reflective judgment, most generally characterized, is to "find the universal for the particular" (FI IV 209-210), where the term "universal" is most naturally understood as connoting the strict universality associated with necessity or lawlikeness. More specifically, reflective judgment aims "to seek...universal laws for particular experiences" (FI II, 204) and "to bring particular laws...under higher although still empirical laws" (FI V, 210), where this latter activity of systematizing clearly includes the discovery of the higher-level laws under which the lower-level laws are to be subsumed. It makes sense, then, to regard reflective judgment's activity of conceptualizing along the same lines, that is, as a search for natural necessities. When Kant describes reflective judgment as trying to "arrive through comparison of perceptions at empirical concepts of that which is common to the various forms," (213), the empirical concepts he has in mind should be understood specifically as concepts of natural kinds. And the point is confirmed when Kant goes on to say that this comparison is undertaken "in order to cognize in natural things empirical laws and the corresponding specific forms" (ibid.). The project of conceptualizing nature is of a piece with the search for its necessary -- albeit empirical -- laws.

This means that the skeptical worry raised above casts a *prima facie* doubt on whether reflective judgment is possible. How can we undertake a search for nature's laws and kinds if we are never in a position to know that we have found them? The project of looking for something does not make sense unless it is assumed that I am in principle capable of recognizing what I am looking for. If I do not believe myself to possess rules or criteria for identifying the objects of my supposed search, or if I have reason to suspect that the rules I in fact employ may be altogether unreliable, then I cannot intelligibly be thought of as looking for anything. I may engage in an apparently organized and well-regulated procedure for picking out some objects and rejecting others, but if I do not believe myself capable of telling whether or not the objects I am picking out are the ones that I want to attain, then the procedure lacks the connection to its supposed purpose that would qualify it as a search. It is merely a procedure for generating unconfirmable guesses. Thus if I am to engage in the activity of reflective judgment, I must believe that I am in a position to tell when I have arrived at nature's laws and kinds. I must believe myself to be in possession of rules or criteria for determining when my search has been successful.

Now initially it seems that I am in possession of such criteria. I take my search to be successful when I discover patterns in nature which conform to the standards of similarity implicit in the way I conceptualize, and which are, in addition, amenable to systematic organization. But the skeptical worry raised above undermines the

basis for this belief by suggesting that these supposed criteria are arbitrary with respect to nature's laws and kinds. It suggests that I have no reason to believe myself capable of telling when my search has been successful. Yet if I lack this belief, then I cannot search for laws and kinds at all. Thus if I am to be able to engage in reflective judgment, I must believe that I *am* in a position to identify nature's laws and kinds (although not necessarily that I can do so infallibly). This means not only that I have to possess rules for identifying lawlikeness, but also that I have to believe these rules to be reliable. That is, I must assume that nature conforms to the procedures of conceptualizing and systematizing in which these rules are embodied. Without this assumption, to use Kant's words, "all reflection would be carried out at random and blindly, and without legitimate expectation of its agreement with nature" (FI V, 212). Or, as Kant goes on to put it, "we could not hope to find our way in the labyrinth of nature's possible particular laws" (FI V, 213); for "we would have no guiding-thread for an experience and investigation of nature in all the manifoldness [of its empirical laws]" (CJ V, 185). If I do not assume that my procedures of scientific enquiry can be trusted to pick out the correct laws and kinds, then the rules they incorporate are useless. I cannot think of them as leading me to what I want to discover, but only as reflecting my own cognitive needs. Hence the activities which I undertake under the "guidance" of these rules do not qualify as activities of enquiry or investigation at all. They are merely a blind "groping about [herumtappen]" among the forms of nature (FI IV, 210).

It might be useful to see how this interpretation compares with the rational motivation interpretation introduced in section one. On the rational motivation view, the point of the presupposition of nature's systematicity or purposiveness is to encourage reflective judgment in its activities of systematizing and conceptualizing natural phenomena by providing advance assurance that these activities will be successful. However, on the view that I am suggesting, the point of the presupposition is not to make us believe that reflective judgment will be successful, but to make us believe that we are in a position to tell whether or not it is successful. The chief proponents of the rational motivation view assume that we can tell by experience when reflective judgment is successful. Indeed, it is precisely because of this that they criticize Kant for believing that an *a priori* presupposition is required in order to provide reflective judgment with motivation. Why can't we just wait and see if reflective judgment turns out to be successful? But on my view, success for reflective judgment is differently construed. It consists, not just in achieving a degree of systematic organization among our empirical cognitions, but, more specifically, in systematizing our cognitions in such a way as to arrive at nature's laws and kinds. And we cannot tell from experience when success, thus construed, has been achieved. It is for this reason that we need to assume that we are



capable of identifying success when we reach it, and hence that nature conforms to the rules for determining lawlikeness which are implicit in the exercise of reflective judgment itself.

We can see in the light of this contrast how the interpretation that I am suggesting avoids the central difficulty of the rational motivation view. On the rational motivation view, the presupposition of nature's purposiveness is not a condition of the possibility of reflective judgment. We can coherently engage in reflective judgment even if we do not presuppose that it will be successful: the only problem is that our activity will be unmotivated. Thus the presupposition, in spite of Kant's explicit claims to the contrary, is not necessary to the exercise of reflective judgment. But on my interpretation, the exercise of reflective judgment is impossible without the presupposition. For if we do not assume that we are in a position to tell whether or not it is successful, then the activity which we call "reflective judgment" does not qualify as an activity of searching at all. It can qualify as "reflection" in the attenuated sense in which Kant ascribes reflection to animals (FI V, 211), but not as the activity of enquiring into nature which constitutes reflective judgment in the full sense of the term.

## VI

We are now in a position to sketch an answer to the question posed at the beginning of this paper, of why Kant takes it to be necessary for us to presuppose the systematicity of nature. I have argued in the last two sections that, in order for us to engage in the empirical investigation of nature's laws and kinds, we have to presuppose that nature is purposive for the cognitive faculties that carry out that investigation. But I now want to suggest that part of what it is for nature to be purposive for our cognitive faculties, is for it to be systematic. This is because our cognitive faculties necessarily proceed in their investigation of nature by aiming to systematize it. The project of searching for nature's laws and kinds is inseparable from that of seeking a systematic account of natural phenomena.

Thus to assume that nature is purposive for our cognitive faculties is to assume that its laws and kinds can be systematized by us: for if they could not be systematized by us then they would not conform to the necessary procedures through which we attempt to discover them and to identify them as laws and kinds.

Now in drawing on the idea that it is essential to our cognitive faculties that they seek systematicity, I am adopting a different emphasis from that of the previous section. There I emphasized that reflective judgment is not to be construed as successful merely in so far as it approaches a more systematic account of the phenomena, but only

in so far as it approximates to nature's genuine laws and kinds. For, as I argued in sections two and three, we could be moving towards an increasingly systematic theory of nature without coming any closer to the constitution of nature itself. However, this does not mean that reflective judgment could simply dispense with its principle of aiming to systematize natural phenomena, and adopt some other procedure for seeking nature's laws and kinds. While systematizability is not in itself a necessary criterion of lawlikeness, it is, so to speak, built into the exercise of our cognitive faculties, and we have no choice but to use it. Thus, for human beings, the search for empirical laws and kinds will always have to consist in an attempt to maximize the systematicity and completeness of our theories of nature; and it will always remain impossible for us to recognize something as a law of nature if we do not view it as playing the right kind of role in a systematic theory.

On this point, I am in complete agreement with Kitcher. As Kitcher argues, Kant takes there to be a necessary connection between the explanation of natural phenomena and their unification. We cannot take ourselves to have grasped nature's laws unless we see them as part of a unified system. Where I disagree with Kitcher is in his inference from this point to the further claim that the laws themselves are necessarily systematic. Even though we can regard regularities as lawlike only in the context of a systematic theory, it does not follow that what *makes* a regularity lawlike is its role in a system. What makes the connection between two types of events lawlike is simply this: that there is a strictly universal and necessary connection between the two types such that the occurrence of an event of the first type will invariably be followed by the occurrence of an event of the second type. And there is nothing about the idea of systematicity *per se* which ensures that a more systematic theory will have a greater likelihood of picking out these regularities, as opposed to accidental ones which may cease to hold at some point in the future or in some distant region of space.

Thus the fact that we necessarily seek systematicity does not, contrary to the Buchdahl/Kitcher view, carry any immediate implication regarding the systematicity of nature's laws. Rather, its implications are mediated through the notion of nature's purposiveness for our cognitive faculties. The argument I have ascribed to Kant, namely that in order to investigate nature empirically we have to assume that it is purposive for our cognitive faculties, is independent of any reference to systematicity. The fact that our cognitive faculties can only proceed by pursuing systematicity is relevant to this argument only as a way of specifying its conclusion. In allowing us to capture more concretely how our cognitive faculties must operate, it allows us to be more specific about what it means for nature to conform to our cognitive faculties. But it is this prior assumption of nature's purposiveness for

our cognitive faculties which allows us to make the crucial move from the principles governing our cognitive faculties to the principles governing nature. Only on this assumption can we regard the principle of systematicity as a "transcendental" principle which may be ascribed to nature, as opposed to a merely "logical" principle governing reason and reflective judgment alone.

In alluding just now to Kant's terminology in the Appendix to the Dialectic, I am inviting an obvious objection. The interpretation I have been developing is for the most part based on Kant's discussion of reflective judgment in the *Critique of Judgment*. How is it supposed to apply to Kant's account of nature's systematicity in the *Critique of Pure Reason*, where the notion of purposiveness plays no explicit role? The reply, in short, is that it can do so only in a qualified way. It reflects the general conclusions about systematicity that Kant reaches in the Appendix, but not his line of argument there. But this, I would suggest, is because Kant's account of nature's systematicity in the *Critique of Pure Reason* is unsatisfactory. And it is unsatisfactory precisely because it fails to invoke the notion of purposiveness. It is only in the *Critique of Judgment* that Kant is able to provide an adequate grounding for his view, held throughout the critical period, that we must necessarily presuppose the systematicity of nature.

This suggestion clearly requires elaboration and defence, neither of which I can provide here. However, I shall conclude with a brief and highly speculative sketch of it. In the Appendix, Kant defends the transcendental principles of nature's systematicity by arguing that they are needed to provide a grounding for the logical principles of systematicity. These logical principles, he suggests, would be illegitimate without the transcendental presupposition of nature's systematicity; and as a result our procedures of empirical investigation might fail to accord with nature. But this strategy fails. For it simply shifts the question of legitimacy to the transcendental presupposition itself. If we are worried that the search for systematicity may proceed contrary to the constitution of nature, why should we not be worried that the presupposition of nature's systematicity runs foul of nature in just the same way? Thus Kant is left only with a weaker line of defence. The presupposition of nature's systematicity does not actually guarantee that reason's logical principles of systematicity conform to nature. But it must nonetheless be adopted by us as a necessary condition of employing these logical principles and hence as a necessary condition of the empirical investigation of nature.

However, as we have seen, this latter point is by no means obvious. And in the Appendix, Kant does not expand on it beyond offering the suggestion, remarked on by Guyer, that it encourages our activity of enquiring into

nature. Thus it remains unclear why reason's empirical investigation of nature requires the presupposition of nature's systematicity in any sense strong enough to qualify that presupposition as necessary. It is not until the *Critique of Judgment*, in which he comes to realise the importance of the notion of purposiveness, that Kant is able to see that our cognitive faculties must necessarily operate on the self-referential principle that nature is purposive for them. And this enables him to reintroduce his earlier views about systematicity, but this time with a firmer grounding. He can continue to maintain that the presupposition of nature's systematicity is a condition of empirical enquiry into nature, but he can now show this to be the result of a more general, and independently motivated, condition of empirical enquiry: namely, that we presuppose nature's conformity to the cognitive faculties through which this enquiry is carried out.