

Andrew Cooper
Kant on Observation

1 Introduction

In Query 31 of *Opticks*, Newton (1721, 380) presents the method of natural philosophy as follows:

As in Mathematicks, so in Natural Philosophy, the Investigation of difficult Things ... consists in making Experiments and Observations, and in drawing general Conclusions from them by Induction.

Newton's methodological comments in Query 31 left an interpretive challenge for Kant's generation of natural philosophers. While they granted a fundamental role to observation and experiment in the acquisition of scientific knowledge, they left the connection between experience and reason unestablished. On what grounds does the natural philosopher infer from experiments and observations to a general conclusion?

Studies have noted that one of the achievements of Kant's transcendental deduction is to place the experimental procedure on a secure foundation, for it entitles the natural philosopher on appearance of an effect to assume the operation of a particular cause (Butts 1961; Vanzo 2012). That Kant had a theory of observation, however, has scarcely gained a mention in the literature. Commentators generally maintain a strict separation between Kant's notion of experience and the regulative use of reason, whereby the understanding comprehends the manifold of perception in a unified cognition and reason requires that the understanding's cognitions are located in a system of empirical knowledge. In the mid-1780s, however, Kant began to mention a particular kind of experience unaided by the understanding in which judgment reflects on effects in nature as consequents of a rule. Kant termed this mode of experience "observation" (*Beobachtung*), which he describes as "*methodologically* conducted experience" (ÜGTP, AA 8:161).¹ Observation forms a fundamental part of experimental inquiry, for it searches for a hypothetical rule to explain observed effects, such that the natural philosopher can test whether the consequents follow from the rule.

In this paper I suggest that Kant's account of observation can shed light on the sudden and unannounced shift in the Introductions to the third *Critique*, in

¹ Translations of Kant's work are from the Cambridge editions.

which systematicity, formerly a function of reason's regulative use, is granted to judgment's power of reflection. I argue that in contrast to reason's regulative use, which requires that the understanding's cognitions are located in a logical system, observation is a form of reflection on objects considered as products of a mechanical system. I begin with the Transcendental Dialectic, where Kant argues that the understanding's requirement to unify appearances is governed by reason's regulative use. Turning to his writings on natural history in the mid 1780s, I suggest that in response to his critics Kant began to consider judgment as a faculty that mediates between experience and reason. I conclude with the implications of this shift for Kant's account of reflecting judgment in the third *Critique*. The principle of reflecting judgment guides observation in empirical research, I argue, enabling the natural philosopher to investigate "the generation of material things" (KU, AA 5:387).

2 Experience and reason

The picture of scientific knowledge in the Transcendental Dialectic is that the understanding's requirement to unify appearances is driven by reason's logic of explanation to higher and higher principles from which more specific principles and cognitions can be derived. In contrast to the rules of the understanding, which are "objective" and "descriptive", reason does not prescribe its law to objects but to the understanding, meaning that it is merely "subjective" and "prescriptive" (KrV, A 306/B 362). Kant presents the subjective law as reason's "logical maxim":

LM: the proper principle [*Grundsatz*] of reason in general (in its logical use) is to find the unconditioned for conditioned cognitions of the understanding, with which its unity will be completed. (KrV, A 307/B 364)

LM is subjective in the sense that it expresses a conceptual requirement that governs the use of the cognitive faculties. While the understanding determines that to be an empirical object is to have a condition, it does not determine the real condition of a particular conditioned any more than it tells us that the conditioned stands within a series of real conditions. LM requires that the cognitions of the understanding are united in a series of rational inferences in which they can be classified under general concepts, such that every cognition follows necessarily from its premises, and ultimately from the highest premises (the "unconditioned").

While Kant is clear that LM is merely subjectively valid, he immediately claims that we cannot help but take it to possess objective validity. This claim has baffled commentators, for it seems to endorse the transcendental illusion that Kant goes to such lengths to expose.² Kant's point seems to be that we must assume that natural objects *are* arranged according to real connections if we are to “seek such disclosures and to keep on assuming them even when they do not immediately reveal themselves to the senses” (KrV, A 657/B 685). That is, for the understanding to act on reason's demand, we must transpose the subjective law into a “synthetic principle” that unites the *thing* that appeared to us to the unconditioned. Kant describes this as reason's “real” use, for it is not directed at the understanding but at reality, at the causes and first principles of things. The real use of reason follows what Kant terms the “supreme principle of pure reason”:

SP: when the conditioned is given, then so is the whole series of conditions subordinated one to the other, which is itself unconditioned, also given (i. e., contained in the object and its connection). (KrV, A 308/B 364)

SP is synthetic, Kant explains, for it relates the conditioned object of experience, which is analytically related to a condition, to the unconditioned. By “given” I take Kant to refer to the way that objects are “given” by intuition: intuition allows us to represent and think about real or existent objects (KrV, A 19/B 33).³ SP thus carries serious ontological implications, for it requires that if the conditioned *exists*, then the unconditioned also *exists*. In contrast to reason's logical use, which requires that we seek for the highest principles of cognition, reason's real use requires that we seek for the first principles of *things*, the causes or properties from which they follow.

Recent commentators have argued that SP need not lead to a transcendental illusion, provided that it is used regulatively (Willaschek 2018, 111). A transcendental principle can be used regulatively if it is assumed as a hypothesis, and used to derive further hypotheses. On this interpretation, SP can achieve a kind of objective validity to the extent that it does not present an object beyond possible experience but rather enables the construction of hypotheses that *can* be validated in experience. By guiding the search for the principles of things, SP implies that there are nonlogical constraints on possibility. Real possibility, which is determined by the understanding, entails that to be a material object

² Kemp-Smith (1962, 547) speaks for many readers of the Dialectic when he concludes that the “teaching of this section is extremely self-contradictory.”

³ For a helpful discussion of Kant's meaning of “given” in this context, see Stang (2016, 290).

is to have a determining cause. The history of *things* up to this moment, however, determines a much more restricted field of empirical possibility that we can only discover in experience. We find an example of this procedure in Kant's remark about seeking the determining marks of pure water:

One makes use of certain marks only as long as they are sufficient for making distinctions; *new observations* [neue Bemerkungen], however, *take some away and add some*, and therefore the concept never remains within secure boundaries. And in any case what would be the point of defining such a concept? – since when, e. g., water and its properties are under discussion, one will not stop at what is intended by the word “water” but rather advance to experiments, and the word, with the few marks that are attached to it, is to constitute only a designation and not a concept of the thing; thus the putative definition is nothing other than the determination of the word. (KrV, A 728/B 756)

While Kant does not use *Beobachtung* in this context, *Bemerkung* clearly denotes an experimental procedure whereby the answer to an empirical question cannot be extended through the explication of concepts, for the knowledge of real grounds such as causes are determined existentially. Empirical knowledge is extended through observing the objects to which empirical concepts refer. Observation, which shifts from the designation of a word to the search for real properties, thus presupposes that the *content* of experience grounds the properties of objects. While the form of experience is determined by the *a priori* grounds of possible objects, the content is *a priori* in another sense, one that is not determined by a discursive cognition like ours.

3 Kant's dispute with Herder and Forster

During the mid-1780s, Herder and Forster interpreted Kant's account of empirical knowledge as a full-blown theory of nature's self-production. Herder approved it. Forster rebuked it. Recognizing that his argument in the *Critique* had been misunderstood, Kant responded with a two-part review of Herder's *Ideas for a Philosophy of Human History* (January and November 1785) and an essay “On the Use of Teleological Principles in Philosophy” (1788). In this section I suggest that to quelling their misunderstanding, Kant was forced to clarify the transcendental status of systematicity.

The primary goal of Herder's *Ideas* is to extend analogical reasoning to its limit by unifying the manifold of living nature under a single principle, just as his predecessors had done in the limited domain of cosmology. Building on the fundamental principle of Newtonian physics – “*where effect is, there must be a force*” – Herder (1966, 51) proposes a “natural analogy” – “*where new life*

is, a principle of new life must exist.” The natural analogy identifies a law for the organic level of nature, such that the representation of an object as living carries with it, by power of the natural analogy, a transcendental principle of lawfulness. There is no need to assume the existence of preformed germs, for the natural analogy enables the naturalist to assume an organic force capable of giving form to unformed matter (Herder 1966, 51).

Scholars tend to interpret Kant’s reviews as an attack on Herder’s speculative method, based on his charge that the unifying force “lies wholly outside the field of the observational doctrine of nature [*der beobachtenden Naturlehre*] and belongs merely to speculative philosophy” (RezHerder, AA 8:54) (Zammito 1992, 185; Sloan 2002, 249). Yet here I agree with Zuckert (2014, 70), who argues that this critique places the debate in the wrong epistemic key. Kant clearly recognized that Herder’s account of the part-whole relation of living beings makes some headway in grounding classification on a physiological basis, and he praised Herder’s hypothetical starting point (RezHerder, AA 8:54). His issue is rather with the parity Herder grants to the principle of physics and its natural analogy, for this move departs from the “observational doctrine of nature.” This doctrine is the legitimate field in which the naturalist can search for and propose hypothetical forces that account for effects given in experience. Because the idea of a consequent differing in kind from its ground (e. g., an original organization arising from unformed matter) transgresses the sphere of possible observation, any such connection in a system of natural history is merely speculative. What we can observe are alterations by which members of a kind adapt to changes in environmental conditions. Observing this kind of connection requires that the natural historian presupposes a genetic force that “appropriately modifies *itself* internally in accordance with differences of the external circumstances” (RezHerder, AA 8:62). This is not an active power but a mechanical force that responds to changes in environmental conditions, thereby altering an organism’s form according to a rule.

In 1786, Forster published an essay entitled *Something More About the Human Races* in which he rejects Kant’s insistence that a rational principle is required for observation. In contrast, he defends a Linnaean conception of variation, claiming that Kant’s account of classification requires the natural historian to project onto nature structural features that are far more arbitrary than the physiological categories established by Linnaeus. Forster’s primary issue with Kant is that he provides subjective grounds for what ought to be grounded in experience. He attacks Kant’s principle of observation, which states that one “finds in experience what one needs only if one knows in advance what to look for” (Forster 2013, 153; c.f. BBM, AA 8:91). The regulative use of reason’s ideas, Forster claims, directs the natural historian to search for marks determined in advance,

which led Kant to postulate an original ancestor no one has ever encountered. Kant's principle is thus guilty of "the most common of all illusions, namely, that we, in the appointed search for that which we need, often also believe that we have found it there, where it does not really exist" (Forster 2013, 148). In contrast to Kant's projection of a genetic force from which the current varieties derive, Forster (2013, 159) proposes that we can only differentiate a variety from a species "simply through the inconstancy of its characteristic features."

Kant responds by claiming that Forster's objections "derive only from the misunderstanding of the principle from which I start" (ÜGTP, AA 8:161). Forster's belief that we can differentiate between constant and inconstant features without any prior assumptions is futile, for "nothing purposive could ever be found through mere empirical groping without a guiding principle of what to search for" (ÜGTP, AA 8:161). Rejecting Forster's empiricism, Kant claims that "only *methodologically* conducted experience can be called *observing* [*beobachten*]." Here Kant accepts that the logical use of reason cannot yield a theory of invariable inheritance, for there is no *a priori* reason why we should attribute an inner principle to living beings. Forster is right that mere experience does not reveal the boundaries of species, for without assuming that variations result from a purposive causality they are utterly contingent. Kant's response is that *experience* summons the naturalist to adopt a principle, such that she observes the form of organized beings as the product of a self-organizing force. Once the naturalist has supposed such a force, "the greatest degree of manifoldness in the generation can be united by reason with the greatest unity of descent" (ÜGTP, AA 8:200). Whether there really is such an affinity in a genus cannot be decided *a priori*. Rather, it "must be decided through the observations that make known the unity of the ancestral stem." To open such an experimental procedure,

one must be guided by a determinate principle merely in order to *observe*, i.e., to indicate the ancestral stem, not just the resemblance of characters, since in that case we are dealing with a problem of natural history, not the description of nature and of mere methodological nomenclature. (ÜGTP, AA 8:200)

To classify the diversity of forms in nature as the product of a causal sequence, the naturalist must search for physical concepts within a natural history of the genus. The problem with Forster's view is that it assumes that we can derive invariable characteristics from mere experience. Kant insists that "nothing of a purposive nature could ever be found through mere empirical groping without a guiding principle of what to search for." The naturalist must undertake methodologically conducted experience to decide on the existence of an ancestral stem.

4 Observation and reflecting judgment

In this final section I suggest that Kant's account of observation anticipates the reflecting operation of judgment presented in the Introductions to the third *Critique*. The task Kant undertakes in the Introductions is to show how a certain problem that arises in experience requires judgment to operate free of the understanding, such that it searches for, finds and then applies a principle to itself for reflection on experience. The problem is that while the understanding prescribes the rules that require that material objects can be described in terms of laws and classified under concepts, it does not require that those laws might apply to other material objects, or that there are certain kinds of material objects that can be grouped under general concepts. Judgment requires an independent presupposition about the lawfulness of empirical nature if the understanding is to successfully classify empirical objects under concepts. Kant terms this presupposition the "*law of the specification of nature*", which is

a subjectively necessary transcendental *presupposition* that such a disturbingly unbounded diversity of empirical laws and heterogeneity of natural forms does not pertain to nature, rather that nature itself, through the affinity of particular laws under more general ones, qualifies for an experience, as an empirical system. (EEKU, AA 20:209)

The law of specification evokes Kant's presentation of LM in the Transcendental Dialectic, which prescribes that we should seek to specify cognitions under concepts. That this law is *transcendental*, however, evokes his presentation of SP, which relates the conditioned object of experience to an unconditioned condition. In the third *Critique*, the ideal of systematicity is not projected by reason in advance but is discovered by the faculty of judgment in response to the underdetermination of objects, enabling the understanding to subsume them under concepts in an inferential system. The problem of underdetermination shows that even if reason presents the ideal of systematicity, it would remain the role of judgment to discover and display it. The law of specification is the presupposition that empirical laws can be discovered and applied; it enables "an experience" of nature as "an empirical system."

Kant's notion of experience in the Introductions is much broader than that presented in the Transcendental Analytic. While judgment's principle is not descriptive in the form of the understanding's categories, it enables reflection on the manifold *as if* it were produced by a non-discursive intellect, that is, as if it exhibits the order for which our intellect seeks. Judgment's principle can thus be defined as the principle of "the purposiveness of nature for our faculty of cognition" (KU, AA 5:184), where to be purposive is to be "the object of a con-

cept, insofar as the concept is seen as the cause of the object” (KU, AA 5:222). We can judge an object as the product of a concept in two ways. We judge natural forms as “indeterminately purposive” if we consider them as products of “the mechanism of nature.” Alternatively, we judge natural forms as “objectively purposive” if we consider them as products of the mechanism of nature *and* as products of themselves (EEKU, AA 20:221). The first way of judging an object as purposive allows us to search for “physical grounds of explanation” (EEKU, AA 20:235). The second way allows us to reflect on its form as the product of a purpose in nature, or a natural purpose (*Naturzweck*). Such objects are marked by a combination of efficient causes that “we must ground in the concept of a purpose, even if we wish to employ only experience, i. e., observation in accordance with a principle suitable to their inner possibility” (EEKU, AA 20:235).

In Part II of the third *Critique*, Kant investigates the principle that enables us to judge objects as purposive. The principle, he explains, can be derived from “experience of the kind that is methodically undertaken and is called observation” (KU, AA 5:376). It is discovered in experience and yet is *a priori*, for it is not derived from an object but from the “idea of one who judges” as they attempt to make sense of an object. The subjective basis of the principle places a limit on the use of teleology in natural science. Teleological judgment is “rightly drawn into our research into nature [*Naturforschung*]”, Kant explains, “only in order to bring it under principles of *observation and research* [Beobachtung und Nachforschung] in analogy with causality according to ends, without presuming to *explain* [erklären] it” (KU, AA 5:360). Explanation for Kant is an act of judgment that subsumes an object under a concept. Observation, in contrast, is an act of judgment that reflects on the form of an object *as if* it were the product of a concept. This means that teleology should not *itself* constitute a part of natural science, but serves rather as a ‘propaedeutic or transition’ (KU, AA 5:383). This separation must be made

in order to keep the study of the mechanism of nature restricted to what we can subject to our observation or experiments, so that we could produce it ourselves, like nature, at least as far as the similarity of [its] laws is concerned; for we understand completely only that which we ourselves can make and bring about in accordance with concepts. (KU, AA 5:383–384)

The mechanism of nature, as a concept of reflecting judgment, is not an object of knowledge but rather a guide for our observation and experience. It does not enable us to produce complete understanding, which would consist of a system of interlaced syllogisms in which every conclusion follows necessarily from its premises, but rather to reflect on objects as if they were products of such a system. It is only then that we can search for, test and discover laws that *do* explain

their generation. Observation, then, does not determine a conclusion under a premise but allows us to look at objects as conclusions in a deductive system, and to seek the connections that are as yet unknown to us. If we had not presupposed that nature is the product of a concept we would never “conduct research among its organized products by means of continued observation” (KU, AA 5:398).

5 Conclusion

In this paper I have argued that in response to Herder and Forster, Kant clarified his account of empirical knowledge by identifying a methodological kind of experience in which judgment applies a transcendental law of specification to itself for reflection on objects as parts of an interconnected system. In the Transcendental Dialectic, the regulative principles that guide our reflection on nature as a system are available in advance and are “admitted as problematic only” (KrV, A 646/B 674). Observation, in contrast, is a form of judgment that enables “the use of our reason in experience” (KU, AA 5:398). Purposiveness is not simply an idea of reason that guides our systematization of natural facts, but also a principle of judgment that arises from and within the investigation of nature. The shift of purposiveness from reason’s regulative use to reflecting judgment indicates that experiment and observation – and the broader question of an experimental Newtonian method – are more fundamental to Kant’s critical philosophy than is often recognized.

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