Rethinking Kant 5

Edited by

Pablo Muchnik and Oliver Thorndike

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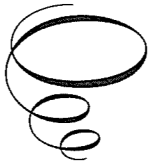

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EPIGENESIS OF PURE REASON AND THE SOURCE OF PURE COGNITIONS: HOW KANT IS NO NATIVIST ABOUT LOGICAL COGNITION

HUAPING LU-ADLER

1. Introduction

Kant describes logic as "the science that exhaustively presents and strictly proves nothing but the formal rules of all thinking" (Bviii-ix). But what is the source of our cognition of such rules ("logical cognition" for short)? He makes no concerted effort to address this question. It will nonetheless become clear that the question is a philosophically significant one for him, to which he can see three possible answers: those representations are innate, derived from experience, or originally acquired *a priori*. Although he gives no explicit argument for the third answer, he seems committed to it – especially given his views on the source of pure concepts of the understanding and on the nature of logic.

It takes careful preparatory work to gather all the essential materials for motivating and reconstructing Kant's "original acquisition" account of logical cognition. I shall proceed in two sections.

In section 1, I analyze Kant's argument that pure concepts of the understanding (or intellectual concepts) – as one kind of pure cognition – must be acquired originally and *a priori*. My analysis partly concerns his varied attitudes toward Crusius's and Leibniz's versions of the nativist account of such concepts. I give special attention to how Kant characterizes the nativist account and his own "original acquisition" account in terms of "preformation" and "epigenesis." My goal is, firstly, to tease out the sense in which Kant grants that there must be an innate ground (or preformation) for the derivation of pure concepts and, secondly, to introduce – and pave the way for answering – the question about the source of logical cognition.

In section 2, in light of Kant's reference to Locke and Leibniz as the greatest reformers of philosophy (including logic) in their times (Log, AA 9: 32), I examine the Lockean and Leibnizian approaches to logic, respectively. Both approaches are "physiological" by Kant's standard and are directly opposed to his own strictly critical method. I explain how this methodological move shapes Kant's view that representations of logical rules must be originally acquired *a priori*. This acquisition involves a kind of radical epigenesis of pure reason: unlike the acquisition of pure concepts, it presupposes no further innate ground (or preformation). This view will have important consequences for issues such as the ground of the normativity of logical rules and the boundaries of their rightful use.

2. Epigenesis, preformation, and the source of pure concepts

2.1. In his Inaugural Dissertation ("On the Form and Principles of the Sensible and the Intelligible World," 1770), Kant inquires about the source of "the concepts met with in metaphysics," including "possibility, existence, necessity, substance, cause etc." He states: such concepts "are not to be sought in the senses but in the very nature of the pure understanding" and "not as *innate* concepts but as … *acquired* concepts" (MSI, AA 2: 395). He thereby points to a basic distinction among three accounts of intellectual concepts as regards their source, which he will revisit numerous times: these concepts are innate, derived from experience, or acquired *a priori*. In general, he connects the first with preformation, the second with physical influx, and the third with epigenesis. He attributes these accounts to different philosophers, claiming the last as his own.

> Crusius explains the real principle of reason [i.e., the principle of contradiction or identity] on the basis of the *systemate praeformationis* (from subjective *principiis*); *Locke*, on the basis of *influxu physico* like *Aristotele*; *Plato* and *Malebranche*, from *intuitu intellectuali*; we, on the basis of *epigenesis* from the use of the natural laws of reason. (Refl 4275, AA 17: 492; see Refl 4859, AA 18: 12; Refl 4893, AA 18: 21; Refl 4894, AA 18: 21-2)

In Refl 4446, making a similar distinction, Kant inserts why Crusius's theory of preformation – rooted in a "method of pre-established cognition" – must be rejected: "because we do not know what God has given us" (AA 17: 554). Although Kant is evidently aware that there are different versions of the nativist account, he seems to think that they fail for

fundamentally the same reason, namely their inability to explain the objective validity of pure concepts of the understanding. He makes this point in his famous 1772 letter to Herz.

> Plato assumed a previous intuition of divinity as the primary source of the pure concepts of the understanding and of first principles. Mallebranche [*sic*] believed in a still-continuing perennial intuition of this primary being. … Crusius believed in certain implanted rules for the purpose of forming judgments and ready-made concepts that God implanted in the human soul just as they had to be in order to harmonize with things. … However, the *deus ex machina* is the greatest absurdity one could hit upon in the determination of the origin and validity of our cognitions. … it encourages all sorts of wild notions and every pious and speculative brainstorm. (Br, AA 10: 131)

On Kant's reading, the *deus ex machina* in the nativist theories is intended but ultimately fails to answer the following question: on what grounds can pure concepts of the understanding be said to *represent* their purported objects or, which amounts to the same, to be objectively valid? (Br, AA 10: 130-31).

Kant brings up a similar question when he compares three accounts of categories in §27 of the second-edition Transcendental Deduction: what explains the *necessary* agreement between those concepts and experience? He first rejects the empiricist account, by comparing it to the biological theory of *generatio aequivoca*: just as an organic being cannot be generated mechanically from mere matter, so is it impossible for *a priori* concepts to come from experience.[1] Next, he submits his own account, on which categories arise through "as it were a system of the *epigenesis* of pure reason": they are "*self-thought a priori* first principles of our cognition," as what "contain the grounds of the possibility of all experience in general from the side of the understanding" Finally, he repudiates the nativist alternative, which amounts to "a kind of *preformation-system* of pure reason" and reduces categories to "subjective predispositions for thinking, implanted in us along with our existence by our author" The "decisive" reason against this account is that "in such a case the categories would lack the *necessity* that is essential to their concept" (B167-68).[2] Kant

[1] Kant characterizes *generatio aequivoca* elsewhere as the view that an organic being can be generated "through the mechanism of crude, unorganized matter" (KU, AA 5: 419 note).

[2] Many commentators have noted, and contributed to a rich conversation over the implications of, Kant's analogy between the biological theories of origin and the philosophical accounts of the source of pure cognitions. To name a few: Wubnig

attributes this account to "Crusius alone" and repeats his old objection: "with the lack of sure criteria for distinguishing an authentic origin from a spurious one, … one can never know for sure what the spirit of truth or the father of lies may have put into us" (Prol, AA 4: 319 note; see V-Met/Schön, AA 28: 467-68).

This reaction to the nativist account of pure concepts has two features that will lead to some interesting questions. First, during the 1780's, especially in *Metaphysik Mrongovius* (1782-83) besides both editions of the *Critique*, Kant often presented Leibniz and Locke as the philosophers who somewhat replayed the Plato-Aristotle controversy over the source of intellectual concepts, i.e., over whether they are innate or acquired from experience (A854/B882; V-Met/Mron, AA 29: 760-64). Why should Kant pick out Crusius, not Leibniz, as the representative of the nativist account at B167-68? The reason might be that Leibniz's version of nativism is so complex and contains so many valuable insights that it could hardly be rejected *tout court*. What would be those insights, though, so that Kant might not see them as sharply opposed to his own account of pure concepts?

Second, at B167-68 as well as in his earlier writings surveyed so far, Kant characterizes the nativist account and his own account of pure concepts in the biological terms of preformation and epigenesis, respectively, and rejects preformation in favor of epigenesis. However, he also makes the following statement in both editions of the *Critique*.

> [In the analytic of concepts we will] pursue the pure concepts into their first germs [*Keime*] and predispositions [*Anlagen*] in the human understanding, where they lie ready [*vorbereitet liegen*], until with the opportunity of experience they are finally developed and exhibited in their clarity by the very same understanding[.] (A66/B91)

The language of germs and predispositions is that of preformation. As Kant uses these notions to talk about organic life, "germs" are the "grounds of a determinate unfolding which are lying in the nature of an organic body … if this unfolding concerns particular parts," and the same grounds are called "natural predispositions" if the unfolding "concerns only the size or the relation of the parts to one another" (VvRM, AA 2: 434). These germs and predispositions, he argues, must be posited as the *preformed* grounds that antecedently determine the specific development of an organic being in certain environments (VvRM, AA 2: 435-36; BM

1969; Genova 1974; Zöller 1988; Ingensiep 1994; Sloan 2002; Zammito 2003; Mensch 2013.

AA 8: 96-9, 101-3). *Mutatis mutandis*, Kant's claim at A66/B91 seems to be that certain germs and predispositions in the human understanding must be assumed as the preformed grounds that determine the specific development and manifestation of pure concepts. Is this claim consistent with Kant's rejection of preformation at B167-68? If the answer is positive, how shall we formulate Kant's epigenetic account of pure concepts so as not to exclude preformation in every sense of the term?

We shall see that these questions about Kant's attitude toward Leibniz's nativism, on the one hand, and about the relation between A66/B91 and B167-68, on the other, are deeply connected. Sorting out the connection will give us a particularly helpful angle to appreciate the key points – together with a crucial methodological turn – that eventually set Kant's account of the source of pure concepts apart from all the nativist accounts attempted before him.

2.2. According to John Callanan, it was after having read Leibniz's *New Essays on Human Understanding* that Kant showed – first in the Inaugural Dissertation – "a concern with the formation and acquisition of concepts" that was less pronounced in his previous writings. (Callanan 2013: 12). The *New Essays*, as Ernst Cassirer puts it, opened up "an entire [*sic.*] new source" in Kant's inquiry about pure concepts, the new source being the mind, from which they could be drawn independently of experience. (Cassirer 1981: 98).[3] If the *New Essays* was indeed a crucial source of inspiration in Kant's thinking about pure concepts, we have yet to clarify the exact nature and extent of this influence.

Kant discusses Leibniz's account of the origin of pure concepts in different contexts. To appreciate the important ways in which Kant sees his own position on the said topic as both continuous with and different from Leibniz's, it will be particularly instructive to consider two sources. One source comprises some of Kant's lectures on metaphysics. The other is "On a Discovery Whereby Any New Critique of Pure Reason Is to Be Made Superfluous by an Older One" (1790), where Kant responds to Johann August Eberhard's claim that whatever is of value in the *Critique* is already contained in the Leibnizian philosophy.

In "On a Discovery," Kant clarifies his position on nativism while responding to Eberhard's remarks about his account of space and time as pure intuitions. According to Eberhard, Kant's account is either absurd or

[3] Kant probably did not read the *New Essays* until Louis Dutens's edition of Leibniz's *Opera omnia* appeared in 1768. For a further discussion of the likely impact of the direct access to Leibniz's *New Essays* on the development of Kant's theory of cognition, see Tonelli 1974.

unoriginal – that is, he either treats space and time "as *themselves original*, not *implanted in their grounds*," in which case he "conceives a *qualitas occulta*," or accepts that they are somehow implanted, which view is "wholly or partially contained in the Leibnizian theory" (ÜE, AA 8: 221). In reply, Kant presents an "original acquisition" account of those pure intuitions, an account that can be extended to pure cognitions in general.[4]

> The *Critique* admits absolutely no implanted or inborn *representations*. One and all, whether they belong to intuition or to concepts of the understanding, it considers them as *acquired*. But there is also an original acquisition … and thus of that which previously did not yet exist at all, and so did not belong to anything prior to this act. … our cognitive faculty … brings them [i.e. pure cognitions] about, *a priori*, out of itself. There must indeed be a ground for it in the subject, however, which makes it possible that these representations can arise in this and no other manner, and be related to objects which are not yet given, and this ground at least is *innate*. (ÜE, AA 8: 221-22)

The basic point of this passage is straightforward: a pure cognition, *qua* representation, must be acquired, even though the ground of its acquisition is innate.

This claim seems to raise more questions than it answers, though. What does it mean to say that the ground for acquiring pure cognitions must be innate? Why should Kant think that this innate ground "must" be posted in the subject? Moreover, with this admission of innate ground, how is Kant's account of the source of pure cognitions any different from Leibniz's nativist account? After all, Kant appreciates some features of Leibniz's nativism that supposedly make it superior to Plato's and Crusius's. If Plato posited innate *ideas*, Leibniz only "supposed certain innate predispositions of reason as existing in us." If Crusius thought "the criterion of truth [i.e. the agreement of our ideas with objects] is to be sought for only in the ideas which the creator has placed in us, just because he could not trust it to our reason that it would find these ideas itself," Leibniz left it to us – by exercising our innate rational *capacities* on occasion of experience – to find the ideas and discover their agreement with the objects. (V-Met/Vigil, AA 29: 959; see V-Met/Dohna, AA 28: 665). On Kant's reading, then, the Leibnizian nativism is committed only to innate *predispositions* and *capacities*. Now recall his remark at

[4] Unless otherwise noted, I use 'cognition' as Kant defines it in the famous *Stufenleiter* passage, where intuition and concept are presented as two kinds of cognition, which is a species of representation (A320/B376-77).

A66/B91 that pure concepts must be traced to their "first germs and predispositions in the human understanding." These germs and predispositions may very well be the innate ground he thinks must be presupposed for the development of pure concepts on occasion of experience. Thus, the admission of innate ground seems to make Kant a follower of the Leibnizian nativism after all. Does it really?

Answering these questions is pivotal to a precise understanding of Kant's position. For that purpose, it will be helpful to begin with a quick look at how Leibniz presents his nativism in the *New Essays*. In a way, Leibniz is seeking a model of human mind that can explain why we can comprehend specific ideas or truths. By his analysis, such comprehension would be unintelligible on the Lockean model. To use the analogy of marble and its relation to a statue carved from it, "if the soul were like such a blank tablet [à la Locke] then truths would be in us as the shape of Hercules is in a piece of marble when the marble is entirely neutral as to whether it assumes this shape or some other" Instead, Leibniz argues, our mind must be like a naturally *veined* marble:

> if there were veins in the block which marked out the shape of Hercules rather than other shapes, then that block would be more determined to that shape and Hercules would be innate in it, in a way, even though labor would be required to expose the veins and to polish them into clarity, … This is how ideas and truths are innate in us – as inclinations, dispositions, tendencies, or natural potentialities, and not as actualities[.] (NE, Preface, 52)[5]

These remarks capture the essential difference between Leibniz's and Locke's conceptions of human mind. If the latter conception allows that our mind has native capacities for acquiring ideas and truths,[6] these capacities can only be "inactive faculties" or "pure powers," which Leibniz contends are "mere fictions, unknown to nature and obtainable only by abstraction" (NE, II.i.2, 110). The Leibnizian mind, by contrast, is "not a bare faculty, consisting in a mere possibility of understanding"

[5] Also: NE, I.i.11, 80; I.iii.20, 106; II.i.2, 110. References to Leibniz's *New Essays* (NE) are to book, chapter, section, and pagination in Leibniz 1996.

[6] Locke grants that the human mind – though originally a *tabula rasa* "devoid of all characters, without any *Ideas*" (EHU, II.i.2, 104) – is endowed with the natural capacity to attain knowledge: "[God] hath furnished man with those faculties, which will serve for the sufficient discovery of all things requisite to the end of such a being" (EHU, I.iv.12, 91). References to Locke's *An Essay Concerning Human Understanding* (EHU) are to book, chapter, section, and pagination in Locke 1975.

certain ideas or truths, but "a disposition, an aptitude, a preformation, which determines our soul and brings it about that they are derivable from it" (NE, I.i.11, 80).

This notion of human mind regarding its ability to derive ideas or truths from within itself reminds us of Kant's claim at A66/B91 that pure concepts "lie ready" in the human understanding – in the form of germs and predispositions, from which they can be "developed" into clear representations. Leibniz and Kant seem to share the view that, if concepts *qua* representations are not innate, the relevant predispositions – as the grounds of their derivation – must nevertheless be innate. Hence, Kant suggests that Leibniz's position in the *New Essays*, if properly interpreted, agrees with that of the *Critique* – so much so that the *Critique* "might well be the true apology for Leibniz, even against those of his disciples who heap praises upon him that do him no honor" (ÜE, AA 8: 250). A non-literal parsing of Leibniz's words, Kant proposes, is "more suited to his purpose; for otherwise his system will be inconsistent" In particular, Leibniz's claim about the "innateness of certain concepts" should be read as "an expression for a *fundamental faculty* with respect to *a priori* principles of our cognition, which he uses merely against Locke, who recognizes only an empirical origin" (ÜE, AA 8: 248-49).

These remarks, turning Eberhard's originality objection on its head, may have "rhetorical flourish" to them. (Kant 2002: 21). Nonetheless, they also truthfully reflect how Kant positions himself in the Locke-Leibniz controversy over the origin of intellectual concepts. In this regard, as Cassirer puts it, how Leibniz's philosophy influenced Kant is "not a matter of what Leibniz was, but of how Kant understood and saw him" (Cassirer 1981: 99). Kant's understanding of Leibniz's view is largely shaped by his attention to the polemic context in which it is presented. If "[i]n the quarrel between Leibniz and Locke, Kant had come down on the side of the former, and apparently without hesitation" (Cassirer 1981: 101), it is likely because he spotted valuable insights in Leibniz's account that dealt a decisive blow to Locke's empiricist account.

There are at least two such insights. The first is that no necessary cognition can be derived from sensory experience. (I shall flesh out this point in 3.2, in connection with logical cognition.) The second is that an adequate account of the origin of pure concepts must posit certain *active powers* in the human mind.[7] Kant's distinction between innate representations

[7] In one of his earlier essays, "Attempt to Introduce the Concept of Negative Magnitudes into Philosophy" (1763), Kant already recognizes "something imposing and … profoundly true" in Leibniz's thought that "the soul embraces the whole universe with its faculty of representation," the profound truth being that all concepts must be grounded in "the inner activity [*Thätigkeit*] of our minds" That is, an adequate explanation of the origin of all concepts must posit certain *active* powers in the human mind, for no concept can be produced through purely mechanical interactions with external objects. So Kant continues: "External things may well contain the condition under which concepts present themselves in one way or another; but external things do not have the power actually to produce those concepts. The power of thought possessed by the soul must contain the real grounds of all concepts, in so far as they are supposed to arise in a natural fashion within the soul" (NG, AA 2: 199).

and innate capacities can be seen as a way to disambiguate, so to speak, the notion of innate concept and thereby clarify this second insight. In the Inaugural Dissertation he points out that, if some concepts are to be sought from within the mind, they are not in the mind as innate concepts *qua* representations, but are somehow "abstracted" from it "by attending to its actions on the occasion of an experience" (MSI, AA 2: 395). In *Metaphysik Mrongovius*, he suggests that in a sense intellectual concepts can be equated with certain mental activities: "The concepts of the understanding are nothing other than actions of reflection" (V-Met/Mron, AA 29: 762). In *Metaphysik* L_1 (Pölitz), he conveys a similar point through the following remark about the "formative power" of our cognition.

> If this formative power is in the abstract (*in abstracto*), then it is the understanding. The conditions and actions of the formative power, taken in the abstract (*in abstracto*), are pure concepts of the understanding[.] (V-Met-L_1/Pölitz, AA 28: 239)

Likewise, a couple of times in the *Critique*, Kant describes pure concepts of the understanding "merely as actions [*Handlungen*] of pure thinking" (A57/B81; see B105; also see Refl 4276, AA 17: 492; MAN, AA 4: 475). If pure concepts can therefore be seen as certain actions or active powers of the human mind, and if these active powers can be reasonably deemed innate, then Kant has enough conceptual room for a non-literal rendering of Leibniz's nativism: in treating certain concepts as innate, Leibniz really meant that they must exist in the mind as active powers.

Still, Kant can only go so far in agreeing with Leibniz. In some places, we can see him shifting the gear and criticizing the philosophical method shared by Leibniz and Locke alike. A key notion in this criticism is "physiology."

In the *Critique*, Kant uses the phrase "physiological derivation" to capture the Lockean attempt to draw pure concepts from experience. He contrasts such a derivation with a true "deduction" and rejects the former

as "idle".

> [A] *deduction* of the pure *a priori* concepts … does not lie down this [empiricist] path at all, for in regard to their future use, which should be entirely independent of experience, an entirely different birth certificate than that of an ancestry from experiences must be produced. I will therefore call this attempted physiological derivation, which cannot properly be called a deduction at all because it concerns a *quaestio facti*, the explanation of the *possession* of a pure cognition. (A86-7/B119)

Although Kant mostly gives Locke the title "physiologist of reason" (Refl 4866, AA 18: 14; see V-Met/Vigil, AA 29: 958) or "physiologist of the understanding" (Refl 4893, AA 18: 21; see Aix; V-Lo/Hechsel, Pinder 1998: 301), we shall see that he has a broad enough notion of "physiology" to apply the same labels to Leibniz.

In *Metaphysik Mrongovius*, Kant distinguishes two questions about pure concepts. The first is a "question of fact (*quaestio facti*)": how have we come to possess those concepts? The second is a "question of right (*quaestio iuris*)": by what right can we avail ourselves of them? These questions correspond to two kinds of philosophical investigation, namely physiology – which is "really a part of psychology" – and critique of pure reason. Kant places Leibniz's as well as Locke's account of the origin of intellectual concepts in the former category.

> The former question has been the business of two philosophers, of Locke and Leibniz, the former wrote a book on human understanding <*de intellectu humano*> and the latter published a book with this title in French. Locke adheres to Aristotle and maintains that concepts arose from experience through acts of reflection. Leibniz adheres to Plato, but not to his mysticism, and says that the concepts of the understanding are prior to acquaintance with any sensible objects. (V-Met/Mron, AA 29: 764)

> [Examining reason physiologically] was actually an explanation and investigation of the origin of concepts. Locke and Leibniz had not thought of a critique of concepts of reason; they investigated merely how we arrive at the concepts. … Leibniz did not ask how reason comes to a concept independently of all experience – upon what is the faculty grounded for cognizing something *a priori* at all? How far does it reach? … An investigation of practices (*facti*), how we arrive at cognition, whether from experience or through pure reason. (V-Met/Mron, AA 29: 781-82)

These comments suggest that Kant has mixed opinions about the Locke-Leibniz controversy. In one sense, Locke is in a worse place than Leibniz is when it comes to explaining the origin of pure concepts: Locke, by

insisting that all concepts must be derived from experience, has an *inconsistent* position about pure concepts,[8] whereas Leibniz at least recognizes that some concepts must have a purely intellectual origin. In another sense, however, Leibniz's theory fares no better than Locke's: both have failed to explain "how it comes about that concepts of the understanding, which we have without the senses, have validity with respect to the objects of the senses" (V-Met/Mron, AA 29: 763). It is in connection to this issue of objective validity that Kant insists "critique," his own method, be "distinguished sharply from physiology" (V-Met/Mron, AA 29: 764).[9]

Here we see, from Kant's perspective, the real divide between his quest for the source of pure concepts – via a critique of pure reason – and Leibniz's. By thus separating his own critical approach from Leibniz's physiological one, Kant has in effect answered yet another originality objection by Eberhard, namely that "the Leibnizian philosophy contains just as much of a critique of reason as the Kantian" For, if the Leibnizian philosophy (*à la* Eberhard) "grounds its dogmatism [i.e., its apodictic demonstrations of metaphysics] on a precise analysis of the cognitive faculties," such analysis is not a critique of pure reason in Kant's strict sense. (ÜE, AA 8: 226).[10] It is not that Leibniz's analysis of cognitive faculties has no value. It is just that, because it focuses on the *de facto* make-up of our mind and is in that sense a mere physiology of human intellect, it cannot answer the question of right or objective validity concerning pure concepts.

With Kant thus distancing himself from Leibniz's philosophical method, one cannot help but wonder again about the nature of his aforementioned attempt to uncover the true insights of Leibniz's nativist account of pure concepts. To what extent, if any, does Kant's "original acquisition" account of such concepts really agree with the perceived Leibnizian insights? In particular, as I queried earlier, does his admission that an *innate ground* – in the form of *germs* and *predispositions* – must be

[8] For this charge of inconsistency, see A95/B 127; A854-55/B882-83; V-Met/Mron, AA 29: 761; V-Met/Vigil, AA 29: 958-59.

[9] For a directly relevant discussion of Kant's complex relations with physiology, see Mensch 2013: 122-24.

[10] In Refl 4851, Kant makes the following distinction between physiology and critique: "The study … of the subject is either physiological or critical. Critique separates 1. the pure from the empirical faculty of cognition, 2. sensibility from the understanding." He then criticizes Leibniz for taking all *a priori* cognition to be intellectual and thereby failing to recognize the sensible in space and time. This criticism amounts to denying Leibniz of a true critique (AA 18: 8-9).

assumed for such acquisition really pull him into the camp of Leibnizian nativism (even on the non-literal reading sketched above)?

2.3. Before answering these questions, it will be worthwhile to consider Kant's attitudes toward "preformation" and "epigenesis" as biological theories and to spell out some of the commitments that underlie those attitudes.

The obvious place to start is §81 of the *Critique of the Power of Judgment*. There, having argued that to comprehend the possibility of organic beings we must assume a teleological principle of their generation, Kant discusses various accounts of the causal ground of their "internally purposive form". He starts by distinguishing "occasionalism" and "prestabilism," only to dismiss the former as unphilosophical, according to which "the supreme world-cause, in accordance with its idea, would immediately provide the organic formation to the matter commingling in every impregnation" (KU, AA 5: 422). He then separates two kinds of prestabilism. One is the theory of "evolution" or "individual preformation," which "excepts every individual from the formative power of nature in order to allow it to come immediately from the hand of the creator" Kant rejects this theory for essentially the same reason as he has used against occasionalism: it is ultimately committed to "hyperphysics," even though unlike occasionalism it "would at least have left something to nature in order not to fall into a complete hyperphysics, which could dispense with all natural explanation" (KU, AA 5: 423). Thus, to borrow Zammito's words, the theory of individual preformation and occasionalism alike signify "avoidance of science, a stipulative denial of the very possibility of a *life* science" (Zammito 2007: 53).

Kant settles on the second kind of prestablism, namely the theory of "involution" or epigenesis. He makes two notable remarks about epigenesis. First,

> [epigenesis] can also be called the system of *generic preformation*, since the productive capacity [*Vermögen*] of the progenitor is still preformed in accordance with the internally purposive predispositions that were imparted to its stock, and thus the specific form was preformed *virtualiter*. (KU, AA 5: 423)

Second, regardless of whether there are enough "experiential grounds" to prove the epigenetic explanation of the possibility of organic beings,

> reason would still already be favorably disposed to this explanation because it … with the least possible appeal to the supernatural, leaves everything that follows from the first beginning to nature (without, however, determining anything about this first beginning, on which physics always founders, no matter what chain of causes it tries). (KU, AA 5: 424)

In other words, unlike the other theories, epigenesis "leaves natural mechanism an indeterminable but at the same time also unmistakable role under this inscrutable *principle* of an original *organization*" (KU, AA 5: 424).

These remarks about epigenesis partly echo what Kant wrote about the generation of organic beings five years before, in his "Review of J.G. Herder's *Ideas for the philosophy of the history of humanity*" (1785). In the review, Kant comments on Herder's theory that a "genetic force" explains the climatic differences of human beings. He agrees with Herder that one must reject both "the system of evolution and … the mere mechanical influences of external causes as providing unworkable grounds of elucidation" and that one must instead assume as the cause "a principle of life, which appropriately modifies *itself* internally in accordance with differences of the external circumstances" (RezHerder, AA 8: 62). Then he adds an important "reservation" about the assumed causal principle:

> if the cause organizing itself *from within* were limited by its nature …, then one could call this natural vocation [*Naturbestimmung*] of the forming nature also "germs" or "original predispositions," without thereby regarding the former as primordially implanted machines and buds that unfold themselves only when occasioned (as in the system of evolution), but merely as limitations, not further explicable, of a self-forming faculty [*weiter nicht erklärliche Einschränkungen eines sich selbst bildenden Vermögens*], which latter we can just as little explain or make comprehensible. (RezHerder, AA 8: 62-3)

According to Zammito, these comments – in conjunction with Kant's afore-cited claims about preformation and epigenesis in the third *Critique* – signal two steps that Kant had to take in adapting Herder's notion of epigenesis to his own methodological and philosophical commitments.

> First, Kant had to insist that even epigenesis implied preformation: at the origin there had to be some 'inscrutable' (transcendent) endowment, and with it, in his view, some determinate restriction in species variation. Thereafter, the organized principles within the natural world would proceed on adaptive (mechanical) lines. … Even so, this seemed to postulate the objective *actuality* of these forces for natural science. That violated Kant's 'Newtonianism'. Hence Kant faced the ultimate need for a second step: to transpose the whole matter from the constitutive to the regulative order. (Zammito 2007: 59-60)

The second step, as Zammito portrays it, is characteristically Kantian: the postulation of an original endowment in an organic being – in the form of "germs" and "predispositions" – is not a scientific or metaphysical speculation about what are actually there at the beginning. Rather, the postulation is at bottom a regulative principle that reason needs in order to comprehend the possibility of the specific developments of organic beings in accordance with natural laws and in response to various external circumstances.

In 2.4, we shall be able trace out a similar two-step move in how Kant goes from recognizing the insights of Leibniz's nativism to rejecting its methodology. In the process, we can also appreciate what is distinctively Kantian about Kant's view that there must be some innate ground – in the form of germs and predispositions – for the original acquisition of pure concepts.

2.4. Kant's search for an adequate account of the source of pure concepts is a principled one, as it more or less follows the thread of two constraints. The first is a methodological constraint: the sought account must be truly explanatory and philosophical – i.e., firmly based on a rational inquiry that, as Kant put it in the letter to Herz, admits no "wild notions" or "pious and speculative brainstorm" (Br, AA 10: 131). The second constraint concerns the nature of pure concepts: the account must retain the strict necessity of pure concepts, suffice to establish their objective validity, and thereby determine the precise boundaries of their rightful use. In terms of these constraints, we can recast Kant's views about the alternative accounts of pure concepts and get a clearer sense of how his "original acquisition" account departs from all of them, especially from Leibniz's.

To begin, tracing the source of pure concepts to implanted representations violates the first constraint. The hypothesis of implanted representations would be "very unphilosophical," reducing the quest for the source of pure concepts to a matter of divine "revelation," as opposed to genuine "investigation" (V-Met-L_1/Pölitz, AA 28, AA 233; see V-Met/Mron, AA 29: 760-63; V-Met/Vigil, AA 29: 949-52). On the other hand, the empiricist account does qualify as a philosophical attempt at addressing the problem of such concepts – insofar as it seeks to explain their origin in terms of natural causation (viz., physical influx). Still, it fails to satisfy the second constraint: no strict necessity can be established through empirical derivation (more on this point in 3.2).

Nor, it is important to add, would Kant find it enough to supplement the empiricist account with a hypothesis that the human mind has a sheer capacity – naturally endowed but completely indeterminate – to obtain pure concepts on occasion of experience. He would regard such a hypothesis in the same fashion as he treats the notion of *vis plastica* that was sometimes invoked to explain the formation and propagation of organic beings. In the latter case, the purported explanation is tautological or "explanation *idem per idem*," telling us nothing as to why organic beings propagate in specific ways (V-Lo/Blomberg, AA 24: 81-2; see Kant 1997: 558-59*n.*19). If one is to explain the possibility of specific developments of an organic being by positing a naturally endowed formative power, the hypothesis has explanatory value only if it also says something about the antecedent conditions that determine the function of that power. As Kant puts it in the third *Critique*,

> [for every organized being, I must] think in its form and in its construction a necessity for being formed in a certain way, namely in accordance with a concept that precedes the formative causes of this organ, without which the possibility of this product of nature is not comprehensible for me in accordance with any mechanical natural law[.] (KU, AA 5: 240)

Hence, if an organic being must have a "self-propagating formative power" (KU, AA 5: 374), this power will be more like a "formative drive" (*Bildungstrieb*) that operates, "as it were, under the guidance and direction" of the "inscrutable *principle* of original organization" (KU, AA 5: 424). Analogously, the mere hypothesis that the human mind has the natural capacity to acquire pure concepts does not yet explain how we can acquire a specific set of such concepts – e.g., cause, substance, unity, etc. For the requisite explanation, one would have to say more about the antecedent conditions that determine the capacity. Leibniz said it: if we have the mental capacity to acquire intellectual concepts, there must be a certain predisposition that "determines the soul" so that a specific intellectual concept can be derived from it – just as the veins of a piece of marble determine it to one form of statue rather than another (NE, I.i.11, 80).

This claim by Leibniz can serve as a starting point for Kant, from which he needs to take two steps – in view of the afore-mentioned two constraints on a satisfactory account of the source of pure concepts – to arrive at the "original acquisition" account. The first step is manifested in how, as we saw in 2.2, Kant would extract true insights from Leibniz's nativist account. One perceived insight was that pure concepts must be traced to an active mental faculty with inherent predispositions, which are

the basis for their derivation from the mind. If Leibniz would therefore view pure concepts as innate, Kant cautioned against a literal reading of the view, according to which these concepts are in us as implanted representations. For Leibniz's account would then become "a philosophy of the lazy," violating the condition of a genuine inquiry about the source of pure concepts (MSI, AA 2: 406). Instead, the essence of Leibniz's view is that certain active *powers* or *capacities* must be posited in the mind as the innate ground from which specific concepts can be developed.

This non-literal rendering of Leibniz's view can be seen as a step that brings Kant to his claim at A66/B91 that pure concepts must be traced to their "first germs and predispositions in the human understanding," which are not representations, but certain active powers to be developed into specific representations on occasion of experience.[11] Here, Kant would add the same kind of caveat as he did while commenting on Herder's notion of genetic force. In the latter case, if the *Naturbestimmung* of the self-forming capacity of an organic being can be called "germs" and "predispositions," these should not be seen as primordially implanted buds or machines. Likewise, if the *Naturbestimmung* that determines the derivation of pure concepts can be considered in terms of germs and predispositions, these should not be treated as implanted mental representations – for otherwise there would be no genuine acquisition of the concepts.[12]

[11] For Kant, *every* concept is "made" with respect to its *form* as a "universal representation, or a representation of what is common to several objects" (Log, AA 9: 91, 93; see V-Lo/Pölitz, AA 24: 567-8; V-Lo/Wiener, AA 24: 904, 908; V-Lo/Bauch, Pinder 1998: 151-52). More specifically, through certain "logical *actus* of the understanding," representations that are "given to it from elsewhere" may be "transform[ed] … into concepts" (A76/B102; see V-Lo/Pölitz, AA 24: 566; V-Lo/Wiener, AA 24: 907). Such acts, including reflection and abstraction among others, constitute "the essential and universal conditions for generation of every concept whatsoever" (Log, AA 9: 94; see V-Lo/Hechsel, Pinder 1998: 393-95; V-Lo/Warschauer, Pinder 1998: 609-10). Pure concepts, however, arise from the understanding not merely as to form, but "even as to content" (Log, AA 9: 92). It is presumably the need to account for their specific content that Kant finds it necessary to trace them to their first *germs* and *predispositions*.

[12] In parts of the *New Essays*, though, Leibniz seems to suggest the "implanted buds (representations)" view. For instance, while clarifying that certain ideas and truths are innate in us as predispositions, Leibniz says: the claim of innate *truths* does not entail that there are innate *thoughts* – for "thoughts are actions, whereas items of knowledge (or truths), insofar as they are within us even when we do not think of them, are tendencies or dispositions" (NE, I.i.24, 86). The wording suggests that the Leibnizian mind comes equipped with some determinate representations ("items of knowledge" or "truths"). These representations are dispositional only because we stand in such an epistemic relation to them that we are not actively *thinking* of them: "we know many things which we scarcely think about" (NE, I.i.24, 86; see I.i.5, 77). On how Leibnizian innate dispositions are reducible to inborn representations, see Jolley 1988: 85-7.

The distinction between what is "implanted" (*anerschaffen*) and what is "innate" (*angeborn*, *connatus*) is a substantive one for Kant. If one way to be innate is to be implanted, what is innate need not be implanted. These notions carry significantly different implications: the use of "implanted," but not "innate," presupposes a prior proof of God's existence (ÜE, AA 8: 222). In these terms, can Kant find a way to show that the original germs and predispositions assumed as the ground for the derivation of pure concepts are innate but not implanted, and hence presuppose no divine involvement?

The gravity of this question has to do with Kant's second constraint on a satisfactory account of the source of pure concepts: it must establish the objective validity of those concepts. Granting that the ground for the original acquisition of pure concepts is innate, Kant sometimes takes this innate ground to consist in "the laws inherent in the mind" from which the concepts may be derived (MSI, AA 2: 395). If these laws must in turn depend on the divine existence, however, the said constraint would not be satisfied. For, along the same line as Kant's earlier objection to Crusius's view, the agreement of these concepts with their objects would then be contingent on the *de facto* constitution of our mind, about which we would never be apodictically certain (insofar as it relies on a creator whose actions we cannot know). This concern about the objective validity of pure concepts might be what underlies Kant's complaint that Leibniz "did not ask how reason comes to a concept independently of all experience – upon what is the faculty grounded for cognizing something *a priori* at all?" (V-Met/Mron, AA 29: 781). More precisely, if Leibniz did examine the ground on which to obtain cognitions *a priori*, the purported ground could only be the metaphysical constitution of our mind, which would be contingent on God and so would not be a genuine ground by Kant's standard.

Therefore, Kant must take a further step away from Leibniz's account, namely from a *physiological* to a *transcendental* derivation of pure concepts. He indicated this step while criticizing Leibniz's as well as Locke's physiological method. As I explained in 2.2, by Kant's analysis Leibniz and Locke asked only a *quaestio facti* about pure concepts, namely how they actually come into our mind. Accordingly, in their quest for the origin of those concepts, they both turned to the natural constitution

of the human mind (as God's creation). Kant, by contrast, focuses on the *quaestio juris* in his quest. The result is a transcendental derivation of pure concepts – through, as it were, the epigenesis of pure reason, whereby they are acquired originally and *a priori* as what constitute the intellectual ground of the possibility of experience in general. Only this act of original acquisition can supposedly secure the objective validity of those concepts.[13]

This transcendental derivation might be what Kant meant by the claim at A66/B91 that pure concepts are "pursue[d] … into their first germs and predispositions in the human understanding" These germs and predispositions are, presumably, the "universal logical functions of thinking" (B159) specified in the Table of Judgments at A70/B95. If these "logical functions" comprise the innate ground that must be assumed for the original acquisition of pure concepts, Kant would add that this notion of innate ground is not a metaphysical speculation about the actual constitution of the human mind. Hence, instead of referring to what is literally inherent *in the mind* (as he occasionally did in the 1770's, e.g., in the Inaugural Dissertation), he now talks about the transcendental conditions that determine the function or action *of the understanding*, namely thinking.

This last point will prove vital to our understanding of Kantian logic, through which the "universal logical functions of thinking" are to be cognized. Jennifer Mensch, after explaining how 'Kant could understand the epigenesis of concepts from the use of the natural laws of reason,' wonders about the status of these laws: 'Were they in fact as preformed as the *supernaturally* preformed germs generically maintaining the species lines?' (Mensch 2013: 10). If this is a question about the origin of the laws of reason, it might make sense to pose it to the Kant of 1770's, when he was indeed concerned about issues of origin. However, having turned from physiology to critique, the Kant of 1780's would deem it irrelevant to ask whether the laws that somehow ground pure concepts – if those laws can indeed be called "innate" – have a supernatural origin. Nor would it be appropriate to call them "natural laws," if by this expression is meant the laws that govern the actual operations of the human mind, which would not have the right kind of necessity to serve as the ground of pure concepts. The grounding laws of these concepts, then, can only be innate in a very limited sense: it is not that they are constitutive of the mind as a contingently existent metaphysical entity, but that they are essential to the

[13] For a further discussion of the connection between original acquisition and the objective validity of pure concepts, see Callanan 2013 (especially pp.16-7).

human understanding *qua* faculty of thinking. Because these grounding laws are not assumed as supernaturally sourced preformation, here pure reason would not stop at any inscrutable first principle (as it would have in the case of life science). It must know exactly what those laws are before deriving specific pure concepts from them. The question is how it will obtain such knowledge.

3. Radical epigenesis and the cognition of logical rules *a priori*

3.1. Based on 2.1-2.4, we can gather three basic claims in a Kantian account of the source of pure cognitions in general. First, they cannot be derived from experience. Second, they should not be treated as representations originally imprinted on the human mind. Third, the human understanding or reason – as the only possible source of these cognitions – must be regarded as an active faculty, namely a faculty of *spontaneity* or "the faculty for bringing forth representations itself" (A51/B75). This spontaneity is key to the possibility of original acquisition: reason can bring forth new representations out of itself entirely *a priori*. Though this capacity must be awakened by experience, the cognitions emerging through it are not therefore drawn from experience (V-Met-L_1/Pölitz, AA 28: 233; V-Met/Mron, AA 29: 761; V-Met/Vigil, AA 29: 951). In the case of pure concepts, as I pointed out in 2.4, such claims were intended to meet two conditions of an adequate account of their source, i.e., to satisfy the methodological constraint of a genuine inquiry and to account for the objective validity of those concepts.

To the extent that Kant treats the cognition of logical rules as a kind of pure cognition, we can expect him to make similar claims about the source of logical cognition in light of similar constraints. In this case, the first constraint has to do with Kant's notion of logic as a proper "science" The second constraint concerns the characteristics of logical rules as the formal rules of all thinking: they are strictly necessary, universal, and normative.

More specifically, Kant presents logic in general as "the science of the rules of understanding in general" (A52/B76). The essential function or action of the understanding is thinking, which is necessarily governed by rules. Thinking may be treated in different ways, either *in abstracto* or *in concreto* – that is, either independently of or with reference to the empirical subjective conditions under which it actually takes place. Accordingly, there are two sorts of rules for thinking: necessary rules, which concern the essence of thinking and represent the conditions for the possibility of thinking as regards its mere form, without regard to any

empirical considerations, and contingent rules, which describe how the faculties of thinking tend to be used under certain empirical-psychological conditions of the subject (V-Lo/Wiener, AA 24: 790-92; V-Lo/Dohna, AA 24: 693; Log, AA 9: 12-3; Refl 1603, AA 16: 33; Refl 1620, AA 16: 40; Refl 1628, AA 16: 44). In reference to this distinction, Kant divides general logic into two parts, namely pure and applied logics. Pure logic is "the part that is to constitute the pure doctrine of reason," which "has no empirical principles" and thus "draws nothing from psychology," whereas applied logic is "directed to the rules of the use of the understanding under the subjective empirical conditions that psychology teaches us" (A53-4/B77-8).

In Kant's view, only pure logic is "properly science": it is "a proven doctrine, and everything in it must be completely *a priori*" (A54/B78). It follows that only pure logic is truly logic, which, insofar as it is a science, "rests on principles *a priori,* from which all its rules can be derived and proved" In other words, a strict logic must be "a *doctrine* or a *demonstrated theory*" – namely "a dogmatic instruction from principles *a priori,* in which one has insight into everything through the understanding without instruction from other quarters attained from experience" (Log, AA 9: 14-5; see V-Lo/Wiener, AA 24: 793; V-Lo/Blomberg, AA 24: 13, 25; V-Lo/Dohna, AA 24: 694; V-Lo/Pölitz, AA 24: 505-6).[14]

Parallel to the distinction between pure and applied logics is one between *logica artificialis* and *logica naturalis*. Again, Kant argues that only artificial logic can be scientific and hence be properly called "logic" His argument hinges on the systematic character of science: a science "requires a systematic cognition, hence one composed in accordance with rules on which we have reflected" (Log, AA 9: 139). More specifically,

> [by] *science* [*Wissenschaft*] … is to be understood the complex of a cognition as a *system.* It is opposed to *common* cognition, i.e., to the complex of a cognition as *mere aggregate.* A system rests on an idea of the whole, which precedes the parts, while with common cognition on the other hand, or a mere aggregate of cognitions, the parts precede the whole. (Log, AA 9: 72; see V-Lo/Hechsel, AA 24: 114; V-Lo/Dohna, AA 24: 697-98, 704, 717; V-Lo/Wiener, AA 24: 891)

[14] The term 'dogmatic' has a special sense in this context. "Dogmatic cognition," as cognition of reason from concepts *a priori*, differs both from "historical" cognition, which is *a posteriori* and lacks apodictic certainty, and from "mathematical" cognition, which is cognition of reason from construction of concepts. (V-Lo/Blomberg, AA 24: 99; V-Lo/Dohna, AA 24: 697, 724; V-Lo/Wiener, AA 24: 797-98, 830-31; Log, AA 9: 22, 71; Bxxxv). Thus, saying "science must always be dogmatic" is the same as saying "it must prove its conclusions strictly *a priori* from secure principles [*Principien*]" (Bxxxv).

Thus, to have a scientific cognition of x, one must not only be conscious of x but also have reflected on the ground from which it can be demonstrated. To that extent, "all science is artificial" (V-Lo/Dohna, AA 24: 694). If logic is to be a truly scientific cognition of the rules of thinking, then, it can only be *logica artificialis*, not *logica naturalis*.

> Every man observes the rules before he can reduce them to formulas. … The complex of all these rules is called *logica naturalis*. The science that expounds these rules systematically [is called *logica*] *artificialis.* … This division [of natural and artificial logics] is bad because logic is held to be the complex of rules of the understanding that we employ without being conscious. Since we do not know these rules, however, there cannot be a science. Consequently this is a contradiction. … For us, then, only *logica artificialis* is ever called logic. (V-Lo/Wiener, AA 24: 791; see Refl 1579, AA 16: 18)

To say that "[o]nly artificial or scientific logic deserves this name ['science']" is to say that the rules of thinking included therein "can and must be cognized *a priori*, independently of the natural use of the understanding and of reason *in concreto*" (Log, AA 9: 17). Such rules concern how we *ought to* think, not how we do think (Log, AA 9: 14; Refl 1579, AA 16: 18, AA 20-1; Refl 1599, AA 16: 30; Refl 3939, AA 17: 356; V-Lo/Pölitz, AA 24: 502; V-Lo/Dohna, AA 24: 694). They are necessary in the absolute sense, constituting "the sole [formal] condition of our thought" (V-Lo/Wiener, AA 24: 791) – so that without them "no use of the understanding [which consists in thinking] would be possible at all" (Log, AA 9: 12; see V-Lo/Dohna, AA 24: 694; V-Lo/Wiener, AA 24: 790; V-Lo/Hechsel, Pinder 1998: 273). It follows that the rules are also strictly universal, applying to all possible thoughts – and for that reason must be cognized *a priori*.[15]

The question is: how can we cognize certain rules as the necessary rules of thinking in general, if not by drawing them from experience? This question, to borrow Jäsche's terms, amounts to asking "how … pure logic is possible as a science," in much the same way as asking how pure mathematics is possible as a science (Log, AA 9: 8). It ultimately concerns the ground for representing logical rules as what ought to be followed in

[15] A rule with "true or strict" universality is one to which there can be no exception. Thus, it cannot be derived from experience through induction but must be proven "valid absolutely *a priori*," i.e., derived from *a priori* principles (B3-4).

all possible use of the understanding and of reason – a representation that must be accompanied by a clear consciousness of those rules and, even more, by a consciousness of their necessity. (We shall appreciate the significance of these qualifications when we compare Kant's view with Leibniz's.)

3.2. If the controversy between Locke and Leibniz over the source of pure concepts came down to different views of the human mind apropos its original state, the same difference underlies their disagreement with respect to logical rules or principles. Spelling out the basics of this disagreement will give us an opportunity to see both the continuity and the originality of Kant's account of the source of logical cognition in relation to Locke's and Leibniz's accounts, respectively.

On Locke's account, to explain how we can attain knowledge and make correct inferences, both of which consist in perceptions of the agreement or disagreement among our ideas, there is no need to posit innate logical principles. Rather, God has endowed us with appropriate "natural abilities" for achieving those cognitive ends (EHU, I.iv.12, 91). In particular, if common people can make cogent inferences without ever being taught formal inference rules such as syllogisms, it is because God has given all humans a mind with "a native faculty to perceive the coherence or incoherence of its ideas, and can range them right" without relying on any innate knowledge of those rules (EHU, IV.xvii.4, 671).

Leibniz counters that in a way everyone does know logical rules, such as the principles of contradiction and identity – just that "we use these maxims without having them explicitly in mind," i.e. without *thinking* of them (NE, I.i.4; 76).

> For general principles enter into our thoughts, serving as their inner core and as their mortar. Even if we give no thought to them, they are necessary for thought, as muscles and tendons are for walking. The mind relies on these principles constantly; but it does not find it so easy to sort them out and to command a distinct view of each of them separately, ... And it is in that way that many things are possessed without the possessor's knowing it. (NE, I.i.20; 84)

The necessity of the principles in question is central to Leibniz's argument: the fountain of necessary principles can only be the mind as opposed to the senses. For "the senses are inadequate to show their necessity": "however often one experienced instances of a universal truth, one could never know inductively that it would always hold unless one knew through reason that it was necessary". Therefore, the mind alone is

the "source" of such truths, including logical principles, with "a disposition ... to draw them from its own depth" To think otherwise is to fail to "think through the implications of the distinction between necessary or eternal truths and truths of experience" (NE, I.i.5, 80; see NE, Preface, 49-51).

Kant would certainly agree with Leibniz that no necessary principles could be derived from sensory experience. Nonetheless, he might find Leibniz's account of the source of our knowledge of logical principles inadequate for two reasons.

First, Leibniz's account is far from meeting the criterion of a true science of logic. Recall Kant's distinction between *logica naturalis* and *logica artificialis*. For Leibniz, if logical rules are constitutive of the inherent structure of the human mind and determine all possible use of the human intellect, they are the kind of rules that we often employ naturally, without being conscious of them.

> There are principles of knowledge which enter into our reasonings as constantly as practical ones enter into our volitions; for instance, everyone makes use of the rules of inference through a *natural logic*, without being aware of them. (NE, I.ii.3, 91)

Leibniz sometimes contrasts natural logic with "logic as an art". This contrast captures the difference between "the common run of men," who can reason well in ordinary circumstances without consciously thinking of the formal rules on which the cogency of their reasoning depends, and those who are "practised" in logic and can therefore *prove* their reasonings as correct (NE, IV.xvii.4, 482). The rules of reasoning involved are the same, however, no matter whether one uses them naturally or as an art.[16]

> [The laws of logic] are nothing but the laws of good sense, set into order in writing, ... The only difference is that their being put in writing and made easier to take in all at once enables one to see them more clearly with a view to developing and applying them. For when natural good sense undertakes to analyse a piece of reasoning without help from the art [of logic], it will sometimes be in a little difficulty about the validity of the inferences[.] (NE, IV.xvii.4, 480-81; see Leibniz 1956: 759, 764-5)

Articulating logical rules then amounts to uncovering the natural and constant laws of the human mind and representing them distinctly, by

[16] See NE, xlviii for the translators' note on the term 'art': when Leibniz distinguishes the use of logic as an art and its natural use, he is referring to a contrast "between what is technical and [consciously] rule-governed on the one hand and what is natural or intuitive or unschooled on the other."

reducing them "to the bare bones of 'logical form'" (NE, IV.xvii.4, 480). Thus, even what is an artful logic on Leibniz's account would not qualify as a strictly scientific logic in Kant's sense. For its grounding principles are not *a priori*.[17]

The second reason why Kant might find Leibniz's account inadequate concerns the normativity of logical rules, as rules that determine how we *ought to* use our understanding.[18] If such rules are supposed to be absolutely binding, to the extent that no thinking would be possible without them, what justifies this claim of bindingness? It would not do to say that our mind is just so constituted that it, when functioning properly, operates exactly in accordance with those rules (no matter whether we are aware of them). In this respect, Leibniz would fair no better than Locke. In Kant's terms, Locke approaches logic through an empirical-psychological analysis of the human understanding, which can teach us only how it operates under the contingent conditions of the empirically situated thinking subject.[19] Any rule of thinking derived on that basis at best has what Kant calls "assumed and comparative universality," which is not enough to make it a norm for all possible use of the understanding. For experience shows only that "something is constituted thus and so, but not that it could not be otherwise," or that there has been no exception to this or that rule, but not that "no exception at all is allowed to be possible" (B3-4).

Leibniz, on the other hand, saves logic from empirical-psychological contingencies only to make it contingent on what Remnant and Bennett call a "divine psychology" (NE, xviii). In Leibniz's own words, the "ultimate foundation" of all eternal truths, including all putative logical principles, must be "that Supreme and Universal Mind who cannot fail to exist and whose understanding is indeed the domain of eternal truths" Insofar as the said truths "contain the determining reason and regulating principle of existent things – the laws of the universe" and must be "prior to the existence of contingent beings," including our minds, they must originally reside with God, the only necessary existence. Logical rules are

[17] This feature is even more pronounced in Wolff's treatment of artificial logic. The content of this logic, Wolff argues, must be demonstrated from principles that only ontology and (empirical) psychology can supply. See Wolff, Preliminary Discourse, ##89-90, 117, 135, 139, 144, 154, 156; Empirical Psychology, Prolegomena, #9; Latin Logic, Prolegomena, §2.

[18] The normative reading of Kant's theory of logic has come under attack in Tolley 2006. I answer Tolley's challenges in Lu-Adler (forthcoming).

[19] For discussions of Locke's facultative logic and its impact, see Buickerood 1985; Winkler 2003.

the laws of the universe that regulate the operations of human intellect. As such, they must exist prototypically in the divine intelligence, as the "pattern" after which they are "engraved in our souls" – albeit "not in the form of propositions, but rather as sources which, by being employed in particular circumstances, will give rise to actual assertions" (NE, IV.xi.14, 447). Whether Leibniz intends these remarks to be taken literally or non-literally, it is clear that on his account God is the ultimate source of the purported normative force of logical rules. God, to borrow an expression from Descartes, is the "supreme legislator" of these rules (Descartes 1985: 294) – with the caveat that for Leibniz they depend on God's intellect, not on His will. To that extent, if logical rules are necessary for all possible uses of the human intellect, even their necessity is contingent.[20]

As for how Kant would account for the source of logical rules in a way that would establish their absolute necessity and authority, the key again lies in a methodological move from physiology to true critique. This time, though, he seems to use Locke as a starting point.

Kant remarks that Locke's *Essay*, or "book *de intellectu humano*," has treated "the ground of all true *logica*" (V-Lo/Blomberg, AA 24: 37). Notably, this remark occurs in the context where Kant compares dogmatic and critical methods of philosophizing and singles out Locke as the representative of the latter method. Here, critical method is taken in a broad sense, which "consists in investigating the procedure of reason itself, in analyzing the whole human faculty of cognition" (Log, AA 9: 32). In these terms, Locke's perceived insight is that logic must be grounded in an analysis of the human understanding or reason. However, Kant rejects Locke's physiological version of the critical method, which centers on the *de facto* workings of the human understanding under empirical conditions. In its place, Kant proposes a true critique of the human understanding as a pure faculty of thinking, in abstraction from all empirical conditions under which it may take place (Refl 4851, AA 18: 8-9; Refl 4866, AA 16: 14; Refl 4893, AA 18: 21).[21]

[20] Wolff holds the same view: natural logic, on which artificial logic depends for legitimacy, comprises none other than the "rules prescribed by God to the understanding, and the natural aptitude to act accordingly" (German Logic, XVI.iii).

[21] In Refl 4851, Kant begins with the broad notion of critical method, which concerns "either how we attain principles and concepts, or: what they contain and how they are possible" The clause "physiology: Locke" is added later, which corresponds to the first kind of "critical" method. (AA 18: 9; see V-Lo/Philippi, AA 24: 338).

In the end, by the strict Kantian standard of critical method, Locke's approach is only a dogmatic one. Kant says:

> [Locke] sought to analyze the human understanding and to show which powers of the soul and which of its operations belonged to this or that cognition. But he did not complete the work of his investigation, and also his procedure is very dogmatic, although we did gain from him, in that we began to study the nature of the soul better and more thoroughly. (Log, AA 9: 32)

The dogmatic aspect of Locke's approach shows itself in his insistence on basing all cognitions on experience, which ties him to an empirical-psychological or physiological investigation of the soul. If Kant finds this Lockean investigation incomplete and intends to continue its practice of founding any purported science or system of cognition on an analysis of the human understanding, he will be steering it in a different direction. While other philosophers may have followed Locke and "begun to study the human soul" (V-Lo/Wiener, AA 24: 804),[22] Kant will focus not so much on the human soul as on the faculty of human understanding considered *in abstracto* – especially if he is to pinpoint the source of logical cognition.

For Kant, then, tracing out the source in question is not a matter of figuring out the actual constitution of the human soul, a constitution that would – as it did in both Locke's and Leibniz's philosophy – finally depend on God. It rather comes down to a *transcendental* derivation of logical rules as the *a priori* conditions for the possibility of all thinking – similar to the derivation of pure concepts as the *a priori* intellectual conditions for all possible experience.[23]

As for how the transcendental derivation of logical rules would proceed, we may gather some hints from Kant's logic corpus – mainly

[22] For a relevant discussion, see Fischer 1975.

[23] Kant uses 'transcendental' to modify a whole range of things. Besides familiar notions such "transcendental deduction" and "transcendental idealism," he also talks about transcendental cognition (A11-12), transcendental use of the pure concepts (A246/B303), transcendental object (A288-89/B344-45), transcendental philosophy (A13-14/B27-8, A477-78/B505-6), transcendental constitution of the cognitive subject (A97-8), transcendental proofs (A782-94/B810-22), and so on and so forth. It is beyond the scope of this paper to determine whether these uses can be traced to a single meaning of 'transcendental', which may then be adapted for my purpose. If anything, of all the claims Kant makes about the transcendental, what is most relevant to my interpretation is his contrast of transcendental and empirical deductions at A85/B117.

from his remarks about the nature of logic and logical rules.

To begin, recall that Kant views logical rules as universal (they are rules of thinking in general), necessary (all possible thinking must accord with them), and *a priori* (they must be cognized independently of experience). These features are closely related: "if logic is to be a science of the universal laws of the understanding, then these must be necessary rules"; and "necessary rules must be derived *a priori*," as no amount of experience can prove the necessity of any rule (V-Lo/Wiener, AA 24: 792-3). Now, the apriority of logic in turn suggests that it "will thus have no other grounds or sources than the nature of human understanding" (V-Lo/Blomberg, AA 24: 25). In short, the strict universality of a rule "points to a special source of cognition for it, namely a faculty of *a priori* cognition" (B4).

The faculty for cognizing logical rules *a priori* is the pure understanding or reason. On Kant's account, logic is a rational science both because it "has reason as its object" and because it "is drawn from reason" alone (V-Lo/Wiener, AA 24: 792; see V-Lo/Dohna, AA 24: 697; V-Lo/Blomberg, AA 24: 24-5). In other words, it is "a self-cognition of the understanding and of reason" (Log, AA 9: 14). What is "the nature of human understanding" that must be the sole source of this self-cognition? How are specific logical rules supposed to be derived *a priori* from it?

To outline an answer to these questions, we may take our first cue from Kant's remark that logic "does not precede use," which "contains the first acts [*Handlungen*] of the understanding," although its rules are still *a priori* in that "they contain the ground of all judgments, namely, their form" (Refl 1602, AA 16: 31-2). To derive logical rules, then, we begin with an analysis of the nature of the understanding as regards its essential function or action *in abstracto*, namely thinking or judging, which is the act of relating a multitude of given representations in one (Log, AA 9: 101; V-Lo/Pölitz, AA 24: 577; V-Lo/Wiener, AA 24: 928; A69/B94). Such an act necessarily accords with some rules.

> Everything in nature ... takes place *according to rules*, ... The exercise of our powers [*Kräfte*] also takes place according to certain rules.... Like all our powers, *the understanding* in particular is bound in its actions [*Handlungen*] to rules, which we can investigate. (Log 9: 11; see Refl 1579, AA 16: 18; V-Lo/Blomberg, AA 24: 20; V-Lo/Philippi, AA 24: 311; V-Lo/Pölitz, AA 24: 502; V-Lo/Busolt, AA 24: 608; V-Lo/Dohna, AA 24: 693; V-Lo/Wiener, AA 24: 790; V-Lo/Bauch, Pinder 1998: 3-6; V-Lo/Hechsel, Pinder 1998: 271-72; V-Lo/Warschauer, Pinder 1998: 505)

Then, assuming that the basic units of representation treated in logic are concepts, Kant would at least include the rules pertaining to three kinds of representation: concepts, in respect of their capacity to stand in certain formal relations with one another (e.g., logical subordination); judgments, which represent those relations; inferences, which connect multiple judgments.[24] This classification correlates with the tripartite composition of Part I ("Universal doctrine of elements") of the *Logik*. (1) "Of concepts," which analyzes the "form" of a concept in terms of its capacity to represent many things (Log, §5) and specifies a few rules in that connection, such as the "universal rules in respect of the subordination of concepts" (Log, §14). (2) "Of judgments," which explicates the logical forms of judgments as to quantity, quality, relation and modality, forms that serve as rules for relating concepts in simple judgments and the latter in composite ones (Log, §§20-30). (3) "Of inferences," which identifies all the basic patterns of inference – e.g. the four figures of categorical syllogisms (Log, §§67-74). Insofar as every possible thought must exhibit some form determined by these rules, they constitute (at least part of) the necessary conditions of thinking in general.[25]

Representations of these rules, as the formal conditions of all possible thought, are thus originally acquired *a priori* in much the same way as pure concepts are acquired. In the latter case, reason – once awakened by experience – reflects on the ground of the possibility of all experience and thereby brings forth representations of pure concepts, for the first time, as what constitute that ground from the side of the understanding. Similarly, on occasion of the use of the understanding (in thinking), reason reflects on the ground of the possibility of all thinking as regards its form and thereby deduces a system of logical rules as what make up the ground in

[24] In Kant's logic lectures, concepts are always treated before judgments and inferences. The reason may be that the latter cognitions are ultimately composed of concepts and, accordingly, one must sort out the relevant formal features of concept before explicating the forms of judgment and inference. See V-Lo/Dohna, AA 24: 764; V-Lo/Blomberg, AA 24: 274; V-Lo/Busolt, AA 24: 664; V-Lo/Wiener, AA 24: 928; A130-31/B169.

[25] On Kant's account, the law of contradiction is to be considered only after we have deduced some of the rules listed here. He understands this law in terms of a relation between concepts, roughly as follows: no two contradictory concepts can be said of the same thing (A151/B190-91; V-Met-L_2/Pölitz, AA 28: 544; V-Met/Mron, AA 29: 789). As such, it determines not the form of cognition, but the logical possibility for a compound of several concepts to *represent something* (V-Met/Mron, AA 29: 811-12; V-Met-L_2/Pölitz, AA 28: 543; V-Met/Vigil, AA 29: 960-61; A291-92/B348) and for a judgment to be *true* (A75-6/B100-1; Log, AA 9: 51-3; V-Lo/Dohna, AA 24: 719, 921).

question. In both cases, the acquired representations can be seen as self-generated on the part of reason, which draws them out of itself *a priori*, by inquiring about the rules in accordance with which experience or thinking *ought to* take place, i.e., rules that (partly) determine the very possibility of experience or thinking.

On this account, the cognition of logical rules boils down to an act of self-legislation by reason with respect to the necessary laws of thinking: "[that] reason explicates, according to its own laws, the laws according to which it ought to think, means that reason provides the rules that it will discover first of all" (Refl 3939, AA 17: 356; translated in Kant 2013: 43). These words echo Kant's announcement in the *Critique* of "the altered method of our way of thinking, namely that we can cognize of things *a priori* only what we ourselves have put into them" (Bxviii). As regards the cognition of logical rules *a priori*, the alteration of method took place when Kant moved from what would be a physiological derivation of these rules to a transcendental one. This transcendental turn has profound consequences, as we shall see next.

3.3. We can detect a radical epigenesis of pure reason in Kant's account of how logical rules can be cognized originally and *a priori*. With pure concepts, the epigenesis of pure reason still presupposes some kind of preformation, in that they must be traced to their first germs and predispositions, i.e., derived from the inherent laws of human understanding. If these laws include the logical rules mentioned in 3.2, however, they cannot be traced to yet another set of germs or predispositions. If their representations emerge through a kind of epigenesis of pure reason, this epigenesis presupposes no preformation. Pure reason is completely spontaneous in this case, as it brings forth those representations by nothing other than an *a priori* analysis of the essential function of human understanding, namely thinking. This process has manifested, to borrow Zammito's terminology again, "the radicality of emergence" (Zammito 2007: 54).

This involvement of a radical epigenesis of pure reason in the original cognition of logical rules has at least two significant implications, which concern the ground of the normativity of logical rules and the boundaries of their rightful use, respectively. Both implications will remind us of Kant's emphasis on how his critical method, which focuses on the *quaestio juris* about pure cognitions, fundamentally differs from the physiological method attributed to Locke and Leibniz, which revolved around the *quaestio facti* about such cognitions.

First, Kant's transcendental derivation of logical rules supposedly grounds their normative force – or their entitlement as strictly necessary laws for thinking in general – in a way that Leibniz's account was unable to. To appreciate this point, note that Kant connects original acquisition with "natural right" (ÜE, AA 8: 221; V-Met/Vigil, AA 29: 952).[26] He distinguishes what one *originally acquires* from what one *originally possesses*, in that the act of original acquisition alone can establish an unconditional right to what is acquired.

> I acquire something when I bring it about (*efficio*) that it becomes *mine*. Something external is originally mine which is mine without any act that establishes a right to it. But that *acquisition* is original which is not derived from what is another's. (MS, 6: 258)

This contrast between what is given to me from the outside and what I have originally acquired helps to illuminate a crucial difference between the Leibnizian and Kantian views regarding the source of logical rules (insofar as they are represented as the necessary rules of all thinking). On Leibniz's account, as we saw in 3.2, if certain rules are deemed necessary for all possible use of the human intellect, the primary source of their purported authority is the divine intellect. To that extent, the validity of logical rules is contingent on something external to us, namely God. For Kant, by contrast, the original acquisition of the representations of logical rules is also a self-legislative act on the part of pure reason, by which act alone can their unconditional authority be secured over all possible use of the human understanding and reason. In this way, just as the theory of original acquisition established pure concepts of the understanding as valid for all possible experience, so has the same theory established logical rules as valid for all possible thinking.

By focusing on the question of right, Kant's account of the source of logical cognition also serves to separate the science of logic sharply from all other sciences, especially metaphysics, and thereby delineate strict boundaries for the rightful use of its rules. In particular, this account clarifies that "in logic … the understanding has to do with nothing further than itself and its own form" (Bix) and that, as a result, logic cannot be used as a tool or organon for the discovery of material truths – although it contains the criteria for assessing the formal correctness of any given cognition (A60-2/B84-6; see Log, AA 9: 15; V-Lo/Dohna, AA 24: 694-96). In this respect, Kant could stress another substantial difference between his account of logical cognition and Leibniz's, a difference that is again rooted in a methodological divide.

[26] In *The Metaphysics of Morals*, Kant characterizes "natural right" as the right that "rests only on a priori principles," in contrast with "*positive* (statutory) right, which proceeds from the will of a legislator" (MS, AA 6: 237).

Kant attributes to Leibniz the unmatched "extensive skill for philosophizing dogmatically," and warns that this way of philosophizing is "dangerous because there is much that is false in our dogmatic propositions on account of the illusion of experience" (V-Lo/Wiener, AA 24: 804). This warning, together with a pledge for the critical method of philosophizing, is reiterated in the *Logik*.

> As for what concerns the special dogmatic method of philosophizing peculiar to *Leibniz* and *Wolff*, it was quite mistaken. Also, there is so much in it that is deceptive that it is in fact necessary to suspend the whole procedure and instead to set in motion another, the *method of critical philosophizing*, which consists in investigating the procedure of reason itself, in analyzing the whole human faculty of cognition and examining how far its *limits* may go. (Log, AA 9: 32; see V-Lo/Hechsel, Pinder 1998: 301)

As for what kind of deception might be induced by a dogmatic approach to logic, Kant offers some hints in the *Critique*.

> General logic analyzes the entire formal business of the understanding and reason into its elements, and presents these as principles of all logical assessment of our cognition. … nobody can dare to judge of objects and to assert anything about them merely with logic without having drawn on antecedently well-founded information about them from outside of logic, … Nevertheless, there is something so seductive in the possession of an apparent art [*scheinbaren Kunst*] for giving all of our cognitions the form of understanding, even though with regard to their content one may yet be very empty and poor, that this logic … has been used as if it were an *organon* for the actual production of at least the semblance of objective assertions, and thus in fact it has hereby been misused. (A60-1/B84-5)

In brief, the danger of dogmatism in the case of logic is that reason might be tempted to misuse it as a tool for acquiring material cognitions. Such misuse would resemble the surreptitious move that Kant thinks is involved in the illicit use of conceptual analysis to make material or synthetic claims. In the latter case,

> [the analysis of given concepts] affords us a multitude of cognitions that … are, at least as far as their form is concerned, treasured as if they were new insights, though they do not extend the concepts that we have in either matter or content but only set them apart from each other. Now since this

> procedure does yield a real *a priori* cognition, which makes secure and useful progress, reason, without itself noticing it, under these pretenses surreptitiously makes [*erschleicht*] assertions of quite another sort, in which it adds something entirely alien to given concepts and indeed does so *a priori*, without one knowing how it was able to do this and without such a question even being allowed to come to mind. (A5-6/B9-10)

Note that in this case reason makes the surreptitious move "without itself noticing it" Likewise, reason "can deceive itself unintentionally when it oversteps the laws of logic" (V-Lo/Dohna, AA 24: 695).

Unsurprisingly, then, Kant gives a similar diagnosis of the root of reason's failing and prescribes the same kind of solution in both cases. To forestall the misuse of conceptual analysis for expanding material cognitions, one must begin by examining the nature and possibility of synthetic versus analytic cognitions. (A6/B10). In the same vein, to prevent any unwitting misuse of logic as an organon for the discovery of material truths, reason must reflect on its nature and possibility as a science, and thereby to clarify the boundaries for the rightful use of its rules. In particular, with the notion of logic as cognition of the merely formal rules of thinking, one will realize that it is only a "propaedeutic … to the sciences" and that "when it comes to information [*Kenntnissen*], … its acquisition must be sought in the sciences properly and objectively so called" (Bix). This reflective awareness of the limits of logic is Kant's remedy for the illusion that it might serve as an organon for expanding material cognitions: the illusion disappears once those limits have been clearly understood.

Ultimately, as far as Kant is concerned, this clear understanding of the limits on the rightful use of logical rules can be accomplished only through the move from a metaphysical speculation about their origin to the transcendental inquiry about the possibility of cognizing them *a priori*. This inquiry involves a (self-) critique of pure reason, whereby those rules are to be derived as the necessary conditions of all possible thinking as regards its mere form. By contrast, to approach logic dogmatically is to present its rules without a prior investigation of the ground on which human reason is able to represent certain rules as essential to all its possible use. If Leibniz's metaphysics, which claims God as the sole necessary substance and the supreme legislator, allowed him to ground the said ability in the divine conception of the universe, by the Kantian standard such grounding would be no better than a convenient inquiry stopper.

4. Conclusion

I have developed an "original acquisition" account of logical cognition on Kant's behalf. My main strategy is to see how far some of his methodological and philosophical commitments may take him when it comes to the question about the source or possibility of the pure cognition of logical rules. My analysis revolves around three propositions to which Kant seems committed. First, if pure concepts of the understanding arise through the epigenesis of pure reason, this epigenesis presupposes some kind of preformation: they must be traced to their first germs and predispositions in the human intellect – that is, derived from certain inherent rules that govern the primary function or action of the human understanding and reason, namely thinking. Second, logic is a strictly scientific cognition – hence cognition from a completely *a priori* ground – of the necessary rules of thinking as regards its form. Third, the absolute necessity or validity of pure concepts or logical rules can be established only through a true critique of pure reason, which must be sharply distinguished from the physiological analysis of the human intellect shared by Locke and Leibniz. I have used these propositions to motivate the inquiry about the source of logical cognition, frame the success conditions of the inquiry, and reveal the originality of the resulting Kantian account particularly in terms of the radical epigenesis of pure reason involved in the self-legislation of logical rules.

In a way, my presentation of Kant's non-nativist account of logical cognition is programmatic. I have left many points to flesh out. For instance, I briefly explained how on Kant's account specific logical rules might be derived, completely *a priori*, from the nature of human understanding as its sole source. It will take a separate article to fill in the details and show exactly how the derivation goes. It may even prove very difficult to obtain a fully satisfactory construction of such a derivation, considering that Kant makes no effort to provide an explicit one and that we can only figure it out by piecing together scattered fragments from his logic corpus.[27] In view of this challenge, Kant's explanation of why he left out the definitions of categories in the *Critique* may be modified to express my intention.

> In a system of pure reason one could rightly demand [a precise derivation of logical rules] of me; but here [it] would only distract us from the chief point of the investigation by arousing doubts and objections that can well

[27] I start doing so in Lu-Adler 2015, where I also discuss the exegetical challenges posed by the various texts that comprise Kant's logic corpus.

be referred to another occasion without detracting from our essential aim. (A83/B109)

Part of my aim in introducing Kant's non-nativist account of logical cognition may be conveyed in the words Jäsche used in his editorial introduction to the *Logik* to characterize Kant's position in the history of logic – not as a logician, but as a transcendental philosopher who reflected on the foundation of logic. By motivating and outlining Kant's account against the backdrop of the Lockean and Leibnizian alternatives, I aimed to underscore his status as "the great reformer of philosophy and … of this part of theoretical philosophy in particular [i.e. logic]" (Log, AA 9: 5). Moreover, by tapping into the historical connections as well as exploring the connection between Kant's reflections on the source of pure cognitions and on the formation of organic beings, I meant to suggest that it might take far more than reading Kant's logic corpus to grasp the depth and significance of his philosophical reflections on logic.[28]

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