CON-TEXTOS KANTIANOS.
International Journal of Philosophy
N.º 1, Junio 2015, pp. 195-214
ISSN: 2386-7655

Bringing Biology Back In: The Unresolved Issue of "Epigenesis" in Kant[1]

Recuperar la biología: la "epigénesis" como cuestión por resolver en Kant

JOHN H. ZAMMITO

Rice Unversity, USA

Abstract

Epigenesis has become a far more exciting issue in Kant studies recently, especially with the publication of Jennifer Mensch's *Kant' Organicism.* In my commentary, I propose to clarify my own position on epigenesis relative to that of Mensch by once again considering the discourse of epigenesis in the wider eighteenth century. In order to situate more precisely what Kant made of it in his own thought, I distinguish the metaphysical use Kant made of epigenesis from his rejection of its aptness as a theory for life science. In that light, I raise questions about the scope and authority of philosophy *vis à vis* natural science.

Keywords

Jennifer Mensch; Immanuel Kant; Epigenesis; Preformation; Origins of Pure Reason

Resumen

La epigénesis se ha convertido en unas de las cuestiones más interesantes del estudio reciente de Kant, especialmente a raíz de la publicación del libro de Jennifer Mensch *Kant's Organicism*. Con

1. This essay is based on a larger composition, entitled "Epigenesis in Kant: Recent Reconsiderations," which is to appear in a special issue of *Studies in History and Philosophy of Science.*

[Recibido:19 de febrero de 2015/ Aceptado: 14 de abril de 2015]

mi comentario, me propongo esclarecer mi propia posición acerca de la epigénesis frente a la de Mensch, considerando de nuevo el discurso de la epigénesis en el espectro amplio del siglo XVIII. Para situar con mayor precisión el uso que Kant hizo de este concepto en su propio pensamiento, distingo el uso metafísico que realizó de la epigénesis de su rechazo con respecto a su idoneidad teórica para las ciencias de la vida. Desde esa perspectiva, planteo preguntas acerca del alcance y autoridad de la filosofía frente a la ciencia natural.

Palabras clave

Jennifer Mensch; Immanuel Kant; epigénesis; preformación; orígenes de la razón pura

> There are only two ways in which we can account for a *necessary* agreement of experience with the concepts of its objects: either experience makes these concepts possible or these concepts make experience possible. The former supposition does not hold ... There remains, therefore, only the second supposition – a system, as it were, of the *epigenesis* of pure reason – namely, that the categories contain, on the side of the understanding, the grounds of the possibility of all experience in general. (Kant, 1787)

I am thrilled to see a number of scholars now trying to bring biology back in to Kant studies. Many decades ago, Phillip Sloan and Timothy Lenoir made pioneering efforts.[2] Now a new generation has added enormous brio to this endeavor. They are represented in an important anthology, *Understanding Purpose: Kant and the Philosophy of Biology*, edited by my young French colleague, Philippe Huneman, published notably under the auspices of the North American Kant Society.[3] His own monograph, *Métaphysique et biologie*, is a major contribution.[4] And still more recently, Jennifer Mensch has added a provocative new study, *Kant's Organicism*.[5] In the wake of this new

2. Phillip Sloan, "Buffon, German Biology and the Historical Interpretation of Biological Species," *British Journal for the History of Science* 12 (1979), pp. 109-153; Timothy Lenoir, "Kant, Blumenbach, and Vital Materialism in German Biology," *Isis* 71 (1980), 77-108, *The Strategy of Life: Teleology and Mechanism in Nineteenth-Century Biology.* (1982; 2nd ed, Chicago/London: University of Chicago Press, 1989).

3. Philippe Huneman, ed., *Understanding Purpose: Collected Essays on Kant and Philosophy of Biology.* (University of Rochester Press/North American Kant Society Studies in Philosophy, 2007).

4. Huneman, *Métaphysique et biologie: Kant et la construction du concept d'organisme* (Paris: Kimé, 2008).

5. Jennifer Mensch, *Kant's Organicism: Epigenesis and the Development of the Critical Philosophy* (Chicago/London: University of Chicago Press, 2013). All further references to this work will be parenthetical.

body of work, it is impossible to leave the life sciences out of an account of the development of Kant's thought.

The problem is how to incorporate them without stumbling upon serious incongruities. Kant thought a lot about the life sciences, but that was not always salutary – for the coherence of his own system or for the constitution of those sciences themselves. It has been no easy matter to establish what the proper relations between natural science and philosophy should be in the modern intellectual world. We face a central question about the warrant and scope of philosophy of science. Is its task to *prescribe* or to *elucidate* scientific practice? Locke, famously but perhaps somewhat disingenuously, claimed that philosophy should serve strictly as "underlabourer" to the natural sciences.[6] Kant, I believe, intended philosophy to be *law-giver* for them, and that tradition has carried forward through Neo-Kantianism to Carnap, Hempel and Popper in more recent times, to come even more recently to be challenged flamboyantly by Kuhn and Feyerabend, and more subtly by Quine and Sellars. The core of contemporary philosophical naturalism lies, in my view, in deflating the claims of philosophy to epistemic sovereignty over natural science.[7]

Today, in response to Jennifer Mensch's new intervention, I would like to explore some issues for the philosophy of science that arise out of Kant's vexed relation with the life sciences of his time, drawing on the in-itself quite vexed notion of *epigenesis* in the eighteenth century. Before turning explicitly to the notion of epigenesis, let me elaborate on Kant in terms of three entanglements in the web between philosophy and science. First, Kant was of course a philosopher, and one of the most important founders of philosophy of science in the technical sense. But, second, Kant took himself as well to be a *scientist*. To be sure, the very term "scientist" had not yet been invented, but the German term

6. Locke, "Epistle to the Reader," *Essay Concerning Human Understanding* (1689; Indianapolis: Hackett, 1996), 3.

7. This one-sentence gesture should be taken as a place-holder for more careful discussions both of Kant's philosophy of science and of the developments in philosophy of science in more recent times in my other works, especially re: Kant, "'This inscrutable *principle* of an original *organization*': Epigenesis and 'Looseness of Fit' in Kant's Philosophy of Science," *Studies in History and Philosophy of Science* 34, (2003), 73-109; "Teleology Then and Now: The Question of Kant's Relevance for Contemporary Controversies over Function in Biology," *Studies in History and Philosophy of Biological and Biomedical Sciences* 37 (2006), 748-770; and, re: recent philosophy of science, *A Nice Derangement of Epistemes: Post-Positivism in the Study of Science from Quine to Latour* (Chicago & London: University of Chicago Press, 2004).

Naturforscher was in common use and carried most of the relevant features, and Kant was thoroughly engaged in that pursuit, as Erich Adickes long ago established.[8] I take it that what a *Naturforscher* of the eighteenth century proposed to offer to the research community for appraisal were concrete, empirical knowledge-claims about the natural world. Historically *and* philosophically, I suggest, we must distinguish the self-constitution of such a research community and its operating principles from any meta-level consideration of the ultimate warrant or definitiveness of its claims. In this sense, Kant took himself to be not only a philosopher of science, concerned with the latter questions, but also an actual participant scientist, someone who offered concrete empirical hypotheses about the natural world, and more specifically, about the life world.

Thanks to the work especially of Jennifer Mensch, we need to add a third, rather remarkable thread to this skein of relations between natural science and philosophy in Kant, namely his appropriation of concepts from empirical science for use in the construction of the system of his critical philosophy. The preeminent instance of this is at B167 of the *Critique of Pure Reason* which evokes an "epigenesis of pure reason."[9] Epigenesis is the crucial concept for Mensch, and it will be central in what follows. But equally salient, as Mensch uses to considerable effect, is the sustained analogy Kant offered, in the closing sections of the Transcendental Dialectic of the first *Critique,* between the systematicity of reason and the organicity of life forms.[10] Epigenesis and organicism are somewhat distinct, conceptually, but they proved equally central to the emergent life sciences of the eighteenth century and, as Mensch now alerts us, to Kant's metaphysical adventures with pure reason.

In *Kant's Organicism*, Mensch argues that Kant was attracted by the crucial importance of *self-formation* in embryology, yet "the epigenesis of reason ... was far more radical than the one Kant was willing to accord natural organisms." (15) Indeed, while

8. Many years ago, the great Kant scholar Erich Adickes brought together years of his own research in a two-volume study entitled *Kant als Naturforscher* (Berlin: Walter de Gruyter, 1924). Most Kant scholars have heard of this work. Some may indeed have read it. Few, in any, take it to be of any interpretive salience for us. By contrast, I think his work is crucial for not only historical but contemporary questions concerning the proper role of philosophy of science.

9. Kant, *Critique of Pure Reason*, B167.

10. Ibid, "Architectonic of Pure Reason," A832-36/B860-64.

Kant *never* believed that epigenesis could succeed as empirical life science, paradoxically it *could* be used to explain the self-constitution of reason and the warrant for knowledge. That is the essential argument of Mensch's work: "Kant embraced epigenesis as the model for understanding the *metaphysical* generation of reason and the categories alike." (fn 283, p. 214) "The very basis of Kant's long-standing attraction to epigenesis was its ability to position the mind's independence from both sense and God as suppliers of mental form." (fn 283, pp. 214-15) That is, Mensch is arguing, in contrast to other interpreters, that *more* than a metaphor was involved in Kant's use of epigenesis, yet as an explanatory principle it had traction *not* in empirical science but in *metaphysics*, specifically as an account of the *autonomy* of reason, its independence from the physical order.

I will return to these points about Kant's transcendental – indeed, metaphysical – thinking shortly. But, first, what about the life sciences themselves? Mensch writes: "Kant was consistent ... in rejecting positive discussions of epigenesis as a phenomenon of nature." That is, "while Kant seems to have thought it was reasonable to choose from organic models of generation when describing the epigenesis of reason, he would never have suggested that such a model was definitively at work in the actual generation of natural organisms." He "did not believe we could make anything like an identical claim regarding the laws by which an actual organic being might work." (141) Kant took that to be an impossible endeavor. "He was pessimistic regarding any possibility of progress in generation theory ... [E]mbryogenesis ... simply exceeded the limits of our claims to knowledge of such things." (53) That is, "the operating principles of the organism would simply never be revealed in an empirical investigation." (144)

In my terms, what Mensch demonstrates is that Kant arrogated a biological theory from its own precinct as empirical science, where he pronounced it theoretically unjustified, for a *metaphysical* theory of pure reason, where he took it to be not only justified but indispensable. Indeed, he came to allege that the very biological formulation he annexed had all along been parasitic on reason's own self conception, thus working by illicit analogy, or, in his terms, "subreption." As Mensch puts it, "when reason saw organic activity in nature, according to Kant, what it was really looking at was itself." (144) This is subreption, all right, but, I suggest, it obviates in principle the very project of life science. Thus, I part company sharply with Mensch about the fruitfulness of Kant's

approach for the life sciences, and I will return to that in my concluding remarks. Here, I wish to suggest that redescribing this "analogical" inference from organic life to mind (as in the *Transcendental Dialectic*) into an inference about organisms from human purposiveness (as in Kant's third Critique) looks rather like a bald misrepresentation, on Kant's part, of the historical development of his own thinking. Let us reconsider the notion of epigenesis in the scientific world of the eighteenth century from which Mensch and I concur that Kant annexed it.

1. Epigenesis in the Eighteenth Century.

There is remarkably little consensus about exactly what *epigenesis* signified in 18th-century discourse generally. Modern usage set out from William Harvey's 1651 text, *On Generation*, in which he characterized as epigenesis the characteristic of an organism that "all its parts are not fashioned simultaneously, but emerge in their due succession and order... For the formative faculty ... acquires and prepares its own material for itself."[11] First, Harvey's concept stressed *sequential emergence*, and second, it stressed *self-organization*. Spontaneity and systematicity were thus central features. What is ambiguous in this formulation is the nature of the "formative faculty." Is it a causal force, a supervening soul, or a teleological heuristic? What ontological status does it have? How does it emerge? What preconditions in the material environment are sufficient or necessary? Can such an approach be assimilated to materialist and to mechanist models of science or is it irreducibly vitalist, indeed animist? Crucially, Harvey's mid-18th-century successors, Maupertuis and Buffon, believed that epigenesis could be assimilated to a materialist approach to science and that it *utilized* mechanisms, even if it could not be *reduced* to mechanism. What they certainly upheld was that epigenesis arose *out of matter*, that it was a *materialism*, however "vital."[12] That ontological ground will be important when we come to Kant's maneuvers with the concept and to Mensch's reconstruction of these as conjuring an autochthony of reason.

11. William Harvey, *On generation.* (1651; Reprint: Ann Arbor: Edwards, 1943), 366.

12. For this sophisticated, "vital" materialism, see Peter Hanns Reill, *Vitalizing Nature in the Enlightenment* (Berkeley/LA: University of California Press, 2005).

Mensch establishes the prominence of Buffon in Kant's study of embryology. There is considerable controversy over whether Buffon should even be considered an epigenesist, for many interpreters find not a little "preformation" in his theory. Nonetheless I think there are grounds for taking him for an epigenesist. Certainly in his time he was lambasted as a materialist, an "Epicurean," for locating the whole process of embryogenesis *within* the natural order.[13] We need to consider that epigenesis and preformation were not merely embryological theories but connected as well with larger ontological and physico-theological considerations in that age. In particular, I want to stress the materialism and naturalism in the strand of epigenesis in the tradition of Buffon as something that Kant could never affirm.

Buffon's *moule intérieure* was a hypothetical reformulation of Harvey's formative faculty, theorizing a principle of design that set in motion determinate mechanisms of organic development. Buffon invoked an analogy between his "microforce" and Newton's gravity, as an empirically demonstrable *effect*, even without a full explanation of its *instantiating causal force*.[14] That became a consistent practice among all subsequent theorists of epigenesis in the 18th century. Ironically enough, Albrecht von Haller's pathbreaking work on irritability and sensibility (1751) offered a paradigmatic elaboration of this very methodology, even though he found it unacceptable when called upon in support of epigenesis.[15] Caspar Friedrich Wolff, in the most important reformulation of epigenesis in the mid-18th century, elaborated on all these elements. He conceived *vis essentialis* as a Newtonian force which induced, through certain chemical processes, the

13. Thierry Hoquet, *Buffon: histoire naturelle et philosophie* (Pars: Champion, 2005).

14. On Newtonian analogy in epigenesis, see: A.E. Gaissinovich, "Le rôle du Newtonianisme dans la renaissance des idées épigénetiques en embryologie du XVIIIe siècle." In *Actes du XIe Congrès International d'Histoire des Sciences* (1968) Vol. 5, 105-110; T.S. Hall, "On Biological Analogs of Newtonian Paradigms," *Philosophy of Science* 35 (1968), 6-27.

15. Haller, *A Dissertation on the Sensible and Irritable Parts of Animals*, in Shirley Roe, ed., *The Natural Philosophy of Albrecht von Haller* (NY: Arno, 1981), 651-691. See: Shirley Roe, "The Development of Albrecht von Haller's Views on Embriology," *Journal of the History of Biology* 8 (1975), 167-190, Roe, *Matter, Life and Generation: Eighteenth-century Embryology and the Haller-Wolff Debate.* (Cambridge: Cambridge University Press, 1981); Amor Cherni ...

production of organic matter out of inorganic matter in regular and empirically demonstrable patterns.[16]

From the beginning, Kant proved acutely sensitive to this whole constellation of concerns in both its methodological and its metaphysical aspects. Already in his *One Possible Basis for a Demonstration of the Existence of God* (1763), Kant addressed the new twist toward epigenesis introduced by Maupertuis and Buffon, declaring it far-fetched and doomed as a scientific theory, since it ascribed far too much power to mere matter, which Kant dismissed as "hylozoism."[17] I believe he found persuasive the strong rebuttal developed by Haller (and his ally, Bonnet) in the 1760s in response first to Maupertuis and Buffon and then, more fundamentally, to Caspar Friedrich Wolff. As Günter Zöller characterizes the Bonnet-Haller reformulation, "preformationism is primarily a theory concerning the generation of distinct parts (organs) in the growing embryo. It maintains that growth is *quantitative* growth of preexisting parts... no qualitative embryological growth or formation of new parts."[18] The historical issue for interpreters of Kant, such as Mensch and myself, concerned with the history of science, not just philosophy, is whether this revision dissolves any difference between preformation and the "*generic* preformation" that became Kant's preferred sense of epigenesis by 1790. Certainly for the empirical scientists involved, there was still some contest within embryology between

16. C. F. Wolff, *Theorie von der Generation in zwei Abhandlungen erklärt und bewiesen (1764). Theoria generationis (1759)*, ed and intro: Robert Herrlinger. (Reprint: Stuttgart: G Fischer, 1966). See: Shirley Roe, "Rationalism and embryology: Caspar Friedrich Wolff's theory of epigenesis." *Journal of the History of Biology* 12 (1979), 1-43; R. Mocek, "Caspar Friedrich Wolffs Epigenesis-Konzept – ein Problem im Wandel der Zeit," *Biologisches Zentralblatt* 114 (1995), 179-190.

17. Kant, *Der einzig mögliche Beweisgrund zu einer Demonstration des Daseins Gottes* (1763), AA:2, 63-164. Epigenesis as an empirical scientific theory had *no* prospect of realization for Kant, because he held firm to the conviction that "one is incapable of rendering distinct the natural causes which bring the humblest plant into existence." [AA:2:138] Thus, for Kant, the hypotheses of Buffon and of Maupertuis were *not* scientific but only fanciful or metaphysical, i.e., *ganz willkürlich erdacht*. Kant allowed no prospect, notwithstanding the purported superiority of the scientific *motivation* of their enterprise, of any real scientific *method* or evidentially warranted *explanation*. What was it that made these hypotheses appear irredeemably fanciful to Kant? The answer is *hylozoism*. Kant insisted that the ancient hypothesis of Epicurus and Lucretius of "blind chance" in the "swerve of atoms" to account for motion was an "absurdity and deliberate blindness." [AA:2:125] But it was just as important to deny the modern reassertion of such ideas associated with "Spinozism." Spinoza's God was tantamount to atheism: "Possessing neither cognition nor choice, it would be a blindly necessary ground of other things and even of other minds, and it would differ from the eternal fate postulated by some ancient philosophers in nothing except that it had been more intelligently described." [AA:2:89]

18. Günter Zöller, "Kant on the Generation of Metaphysical Knowledge." In *Kant: Analysen – Probleme – Kritik*, ed. H. Oberer and G. Seel. Würzburg: Königshausen & Neumann, 1988, 71-90, citing 79.

preformation and epigenesis. I want to stress the issue of an extra-material intervention in preformation, which epigenesis on the line from Buffon to C. F. Wolff to J. G. Herder abjured, but which Kant clung to. In that sense, "generic preformation" is *preformation* first and foremost, and epigenesis is constrained by it, that is, by transcendent interventions (at creation, not at each instance of reproduction). That was the whole point of Kant's theory of *Keime* and *Anlagen,* as he made pointedly clear in his critique of Herder.[19]

When Kant turned to questions of life science in his first essay on race, 1775/77, he clearly believed that he could *advance* the field by formulating the *mechanism* of adaptation and variation – the great weakness of earlier preformation theories. He also affirmed the *genealogical* principle of "natural history" in its Buffonian formulation, which Haller and other German life scientists, deeply aligned with Linnaeus, could not bring themselves to accept.[20] Here, I think we need to take Kant's pretensions as a *Naturforscher* quite seriously. That is, Kant believed he could improve on the three greatest life scientists of his day – Linnaeus, Haller and Buffon – from his armchair. In his first essay on race, Kant articulated the term *Anlagen* to signify "'conditions of a certain development ... in so far as the latter only concerns the size and the *relation* of parts' ... [as] opposed to *germs* (*'Keime*'), which are conditions for the development of new parts."[21] That is, the role of *Anlagen* could be construed in a quasi-mechanistic fashion; the essential *metaphysical* principle guaranteeing species difference (and persistence) was assigned to *Keime*.

I find thoroughly disingenuous Kant's account of his theory of *Keime* and *Anlagen* as "merely advancing an 'idea' intended for 'useful academic instruction,' a mere preparatory exercise contributing to an enlarged 'pragmatic knowledge of the world,'" as Mensch receives it. (99) She herself notes: "According to Kant, *the only way to explain environmental adaptation* was to suppose the preexistence within species lines of 'germs' for new parts and 'natural dispositions' for proportional changes to existing parts." (11, my italics) That was a *scientific* hypothesis, and Kant reacted fiercely in the 1780s to

19. Kant, *Recensionen von J. G. Herders Ideen zur Philosophie der Geschichte der Menschheit. Theil 1. 2.* (AA:8, 43-66), 62-63.

20. Kant, "Von den verschiedenen Races der Menschen," AA:2:429-443.

21. Ibid., 434.

defend it as such. As his controversies with Herder and above all Forster betoken, Kant defended what he regarded a *scientific* claim, not just a pedagogical gambit. We can only make sense of Kant's response to Forster in this light.[22] Kant still insisted on the scientific validity of his theory of *Keime* and *Anlagen* up through his third *Critique* and beyond.

In any event, by the time he published the first *Critique* in 1781, Kant considered himself sufficiently adept in the theory of generation to offer a telling analogy to his theory of knowledge.

> «I understand under the "Analytic of Concepts" ... the still little investigated dissection of the capacity of the understanding itself, in order thereby that we search into the possibility of *a priori* concepts, seeking them out in the understanding alone, *as their source of birth* ... We will therefore *follow the pure concepts up to their first germs and capacities [Keimen und Anlagen] in the human understanding, in which they lie predisposed, until they finally, on the occasion of experience, develop* and through exactly the same understanding are displayed in their purity, freed from their attending empirical conditions».[23]

This analogy of 1781, as Phillip Sloan has established, is crucial to any assessment of the more famous analogy of 1787 to epigenesis.[24] How are we to construe this language? Is it preformationist or epigenetic? Is it metaphorical or metaphysical? The concepts lie "predisposed" in the understanding; they are not produced, they are occasioned. Here there is room, I think, for disagreement. I am inclined to side with Sloan, against Mensch, that this is preponderantly a preformationist analogy. The crucial absence of the term epigenesis (especially in contrast to 1787) seems important to me.

Even more important, and directly connected to the *metaphysical* issues that are Mensch's primary concern, Kant meant to suggest something else in the analogy that

22. Kant, "Über den Gebrauch teleologischer Principien in der Philosophie," AA:8, 157–84. See my "History of Philosophy vs. History of Science: Blindness and Insight of Vantage Points on the Kant-Forster Controversy," in *Klopffechtereien - Missverständnisse - Widerspruche?*, ed. Rainer Godel and Gideon Stiening (Paderhorn: Fink, 2011; actually 2012), 225-244.

23. Kant, *Critique of Pure Reason*, A66.

24. Sloan, "Preforming the Categories: Kant and Eighteenth-Century Generation Theory," *Journal of the History of Philosophy* 40 (2002): 229–53.

would be central to his thinking throughout. Just as *Keime* and *Anlagen* were inaccessible to ultimate derivation except as *dogmatic* metaphysics ("a science for gods, not men," as Kant put it to Forster in 1789), so too the concepts of the understanding were simply givens behind which we could not seek.[25] The clearest formulation is in the revised version (1787) of the first *Critique*:

> «This peculiarity of our understanding, that it can produce a priori unity of apperception solely by means of the categories, and only such and so many, is as little capable of further explanation as why we have just these and no other functions of judgment, or why space and time are the only forms of our possible intuition».[26]

If we can agree that Kant was insisting that reason could not be naturalized, to borrow the language of Hilary Putnam, it is not clear how firmly he wished to press an *ontological generation* of reason.[27] His concern, I suggest, was with the *autonomy,* not autochthony of reason -- above all denying its emergence from matter (or experience).

Mensch suggests that long before 1781 Kant had become convinced of the centrality of *epigenesis* for his transcendental argument. The crucial evidence, for Mensch, is a note dated to the mid-1770s: *Reflexion 4275*. It reads: "Crusius explains the real principles of reason according to the *systemate praeformationis* (from subjective *principiis*), Locke according to *influxu physico* like Aristotle, Plato and Malebranche according to *intuitu intellectuali*, we according to *epigenesis* from the use of natural laws of reason..."[28] What Mensch finds crucial is Kant's repeated conceptualization of alternative positions from the history of philosophy in situating his own project. These positions could be formulated in terms of a "mystical" intellectual intuition of the concepts (Plato, Malebranche – and Leibniz), an empirical inference to the concepts (Aristotle, Locke), and a third option, the self-constitution of the concepts, which Kant associated with *epigenesis*, and took for his own. Notably, Kant inserted into this schema in

25. Kant, "Über den Gebrauch teleologischer Principien in der Philosophie," AA:8, 157–84, ...

26. Kant, *Critique of Pure Reason*, B145-6.

27. Hilary Putnam, "Why Reason Cannot be Naturalized," in Putnam, *Realism and Reason: Philosophical Papers,* Vol 3 (Cambridge: Cambridge University Press, 1983), 229-247.

28. Kant, *Reflexion 4275*, (AA:17:491-2).

Reflexion 4275 yet another option: the recourse to *preformation* in the argument from Crusius. Starting with Crusius and the analogy of preformation rendered plausible the introduction of epigenesis for his own position.

What was at stake in this *Reflexion*, Mench suggests, is the question of the *origin* of pure concepts. Mensch offers us a genesis story for reason, hence a thoroughly *metaphysical* Kant, and she calls this story "from original acquisition to the epigenesis of knowledge." (80ff) Many Kant scholars have thought that the critical Kant was concerned strictly with the *epistemological* or *procedural nature* of the concepts – that is, their argumentative force in the space of reasons. But Mensch suggests that Kant was concerned to ground this force in a far more ontological conception of the nature of reason, namely its self-constitution. Her argument is that he achieved confidence in the *epigenetic* constitution of reason by the mid 1770s, when he established that "the concepts of the understanding express all the *actus* of the powers of the mind..." (Kant's words, cited 91) That is, the set of logically possible judgments exhaustively entailed the set of categories; which "classify themselves by their own nature," as Kant explained in his 1772 letter to Herz.[29] The problem that remained for Kant was not the self-constitution of the concepts (or reason through them), but rather their applicability to the matter in sensory intuition: "Kant was still clear regarding the epigenetic origin of concepts, concepts whose source lay 'in the nature of the soul,' but he had yet to discover a basis for connecting these to sensible objects," Mensch writes. (90) That is, Kant had no problem with "the generation of concepts from innate laws," but only with establishing their authoritative applicability to sense intuition. (88)

I confess that I have never been comfortable with Kant's notion of "original acquisition" as a theory of the *source* of reason, and even were I to go along with Mensch's replacement of "original acquisition" with "epigenesis of knowledge," I would still be tempted to cite a Kant passage that is usually very bitter in my mouth, for its condescension toward Johann Gottfried Herder, but that seems quite apposite, here: is this not "to explain that which one does not comprehend by that which one comprehends even

29. Kant to Herz, 1772, (AA;10:132).

less?"[30] Should Mensch be right about Kant's metaphysical adventure with reason, here, I would still be left with two problems. First, there is the *historical* problem of why Kant did not employ this crucial phrase, "epigenesis of pure reason," already in 1781. We need to ask why the epigenesis analogy did not appear until 1787 if it was full-formed in Kant's mind already in the silent decade. Second, there is the *metaphysical* problem of how to ground the reality of reason. I will make no effort to resolve this second conundrum. I will be satisfied to consider two less lofty matters: first, what did Kant have in mind in 1787 when he *did* employ the phrase at B167 of the first *Critique*, and second, how did he carry that notion forward into the third *Critique* and his discussion of the very possibility of life science?

2. The *Critique of Pure Reason* B167.

Let us consider the famous passage at B167 in the 1787 version of the first *Critique*. The argument of §27 of the Transcendental Deduction in B (which includes the passage at B167) is an elaboration of the argument of §36 of the *Prolegomena* (1783). Both arguments offered a purportedly disjunctive judgment: either experience generates the categories or the categories generate experience. In both arguments, Kant stipulated that we *already knew* that the categories had to be *a priori*. Therefore, only the second option was really available. In the *Prolegomena* Kant called the first simply "self-contradictory." In the B Deduction, however, he brought it into analogy with *generatio aequivoca* – spontaneous generation – already an exploded idea in the natural science of the day.

The fundamental analogy structure at B167 invokes the disjunction: *either spontaneous generation or epigenesis*. *Preformation* is introduced as a misguided endeavor to insert a third, intermediate position. Kant had added a footnote to the passage in §36 of the *Prolegomena*: "Crusius alone thought of a compromise: that a spirit who can neither err nor deceive implanted these laws in us originally." In the B Deduction, this afterthought was elaborated at length and in the main text (but without mentioning Crusius):

30. Kant, *Recensionen von J. G. Herders Ideen zur Philosophie der Geschichte der Menschheit. Theil 1. 2.* (AA:8, 43-66), citing 53-4.

> «A middle course may be proposed between the two above mentioned, namely, that the categories are neither *self-thought* first principles *a priori* of our knowledge nor derived from experience, but subjective dispositions [*Anlagen*] of thought, implanted in us from the first moment of our existence, and so ordered by our Creator that their employment is in complete harmony with the laws of nature in accordance with which experience proceeds – a kind of *preformation-system* of pure reason».[31]

Kant's whole point against the intermediate position of Crusius was that we need a stronger bond between the categories and experience if we are to take seriously the *necessity* that is the essence of transcendental grounding. *Spontaneity* of the categories was not sufficient for Kant's transcendental deduction; he also needed their *constitutive sovereignty* over experience. The core of Mensch's interpretation is: for Kant that bond could only be achieved if concepts were *self-formed*, not endowed, even by God. "Only ... appealing neither to experience nor to God but only to itself, could [reason] serve as the true ground of experience." (139) "Only once intellectual concepts and the ideas of reason could be traced back to their birthplace in reason, only after reason could itself be identified as 'self-born' and containing the 'germs of its self-development,' only then could knowledge be secured and the dogmatist and the skeptic alike refuted." (139) To emphasize this *metaphysical* impulse at the close of Kant's B-version of the Transcendental Deduction is the most provocative claim in Mensch's study, from the vantage of orthodox Kant-interpretation. It raises two crucial issues. First, is that what Kant was in fact doing in the key passage? And, second, could such a project accomplish its aim? I am persuaded that Mensch offers a better case for an affirmative answer to the first question than we have had before. As to the second issue, I simply do not know. I will hasten accordingly to my own concern, namely with Kant's pursuit of epigenesis in the life sciences in his third *Critique*.

3. The Place of *Epigenesis* in Life Science.

Günter Zöller makes the point that Kant distinguished in his *Reflexionen* between an *epigenesis psychologica* and an *epigenesis intellectualis*, and it was really the latter, the

31. Kant, *Critique of Pure Reason*, B167.

CON-TEXTOS KANTIANOS International Journal of Philosophy
N.º 1, Junio 2015, pp. 195-214; ISSN: 2386-7655

origin of the categories, that was at issue at B167.[32] This is altogether correct, yet what concerns me here is not the origin of the *categories* or of the *soul* but rather the way in which Kant conceived of epigenesis of *bodies* as a concern of *empirical science*. In his *Metaphysics Lectures*, Kant made the point succinctly: "The system of epigenesis does not explain the origin of the human body, but says far more that we don't know a thing about it."[33] My point in referring to these *Metaphysics Lectures* is that Kant was hardly endorsing epigenesis. Kant made clear what he took to be the essential problem with epigenesis. In terms of the educt/product distinction, it was *too* spontaneous, ascribing too much generative power to mere matter.[34] That is, the metaphysical issue with epigenesis was hylozoism, or "spontaneous generation."[35]

Kant's treatment of biology was always subsidiary to larger systematic concerns of the "critical philosophy" as a whole. As a philosopher of science he supported the *methodological program* of seeking reduction to mechanical explanation even in life science. However, he argued that just here the methodological program would come up against an insuperable *epistemological* stumbling block –in the limitations of human reasoning, not in the "order of nature" itself. Driven to admit that it was impossible for man to see organisms other than as "natural purposes," Kant held that this necessity lay in *our* limitation, not *their* nature. This is the famous argument of Kant's *Critique of Teleological Judgment* in the third *Critique*, and his resolution was that in order to make

32. Günter Zöller, "Kant on the Generation of Metaphysical Knowledge," 80–84.

33. Kant, *Vorlesungen über Metaphysik*, AA:29, 761.

34. Kant *Vorlesungen über Metaphysik*, AA:28, 684; AA:29, 760–61.

35. Kant denied that we could think of nature as alive (hylozoism): "the possibility of living matter cannot even be thought; its concept involves a contradiction, because lifelessness, *inertia*, constitutes the essential character of matter." (Kant, *Critique of Judgment*, §73:242.) He elaborated: "life means the capacity of a substance to determine itself to act from an internal principle, of a finite substance to determine itself to change, and of a material substance to determine itself to motion or rest as change of its state." (Kant, *Metaphysical Foundations of Natural Science*, p. 105). Kant took Maupertuis to be an exemplary "hylozoist." I suggest that Maupertuis was the early Kant's paradigmatic instance of a modern hylozoist. Kant's *Dreams of a Spirit-Seer* treats him in exactly that context: "*Hylozoism* invests everything with life, while *materialism*, when carefully considered, deprives everything of life. Maupertuis ascribes the lowest degree of life to the organic particles of nourishment consumed by animals; other philosophers regard such particles as nothing but dead masses, merely serving to magnify the power of the levers of animal machines." [AA:2:330] See: Zammito, "Kant's Early Views on Epigenesis: The Role of Maupertuis," in *The Problem of Animal Generation in Early Modern Philosophy*, ed. Justin E. Smith (Cambridge: Cambridge University Press, 2006), 317-354. There is some contention about whether this is a fitting characterization of Maupertuis. That is a matter for debate, but not, I think, that Kant took him for one. Here, I do not believe that Mensch has understood my position correctly. See Mensch, *Kant's Organicism*, 181, n124.

organic forms intelligible at all we had to have recourse to the *analogy* of purpose or design. "The concept of a thing as in itself a natural purpose is ... no constitutive concept of understanding or of reason, but it can serve as a regulative concept for the reflective judgment, to guide our investigation about objects of this kind by a distant analogy with our own causality..."[36] Technically, Kant had to deny that teleology could *explain* anything in phenomenal nature. It was even less than an empirical *conjecture*. Teleology merely offered an *analogy* of some *heuristic* (primarily restrictive) methodological utility. Moreover, it was an *inept* analogy. What an organism could do was "infinitely beyond the reach of art," Kant wrote in *Critique of Judgment* §64.[37] And he developed this realization more extensively in §65. "We say of nature and its faculty in organized products far too little if we describe it as an *analogon of art*, for this suggests an artificer (a rational being) external to it."[38] Kant recognized that organisms organized themselves. Yet, as Hannah Ginsborg puts it, "the question remains of how we can even coherently *regard* something both as a purpose and as natural."[39] The "appeal to analogy does not overcome the difficulty," she continues.[40] Kant himself admitted it: "Strictly speaking, ... the organization of nature has nothing analogous to any causality known to us," that is, "*intrinsic natural perfection*, as possessed by those things that are possible only as *natural purposes* and that are hence called organized beings, is not conceivable or explicable on any analogy to any known physical ability, i.e., ability of nature, not even – since we belong to nature in the broadest sense – on a precisely fitting analogy to human art."[41]

That implied drastic epistemological inaccessibility. All organic form had to be fundamentally distinguished from mere matter. "Organization" demanded separate creation. Eternal *inscrutability* was preferable to any "speculative" science.[42] In the third

36. Kant, *Critique of Judgment*, AA:5:375.

37. Ibid., AA:5:371.

38. Ibid., 374.

39. Hannah Ginsborg, "Kant on Understanding Organisms." In Eric Watkins (ed.), *Kant and the Sciences,* Oxford & NY: Oxford University Press, 2001, 236.

40. Ibid., 238.

41. Kant, *Critique of Judgment*, AA:V:375.

42. Ibid. 424. See my "'This inscrutable principle...'"(above, note 6).

Critique Kant would twice insist that no human would ever achieve a *mechanist* (he meant, as well, a *materialist*) account of so much as a "blade of grass."[43] Kant remained adamant that the *ultimate* origin of "organization" required a *metaphysical*, not a physical, account: "How this stock [of *Keime*] arose, is an assignment which lies entirely beyond the borders of humanly possible *natural philosophy*, within which I believe I must contain myself," Kant wrote in 1788.[44] Environmental material factors could be occasions, but not direct causes of changes that could be inherited through generation. What Kant was arguing was that biology could *never* be an empirical science; it was, as Clark Zumbach has discerned, a *transcendent* science, and in that measure, not a *natural science* at all.[45] The philosophical problem, Kant insisted, allowed only one solution: a transcendent creator. In Kant's words, "Nature is no longer estimated as it appears like art, but rather in so far as it actually *is* art, though superhuman art."[46] This conjecture of a Nature-for-God came to formulation via the analogy of purposiveness.

Kant postulated that we must think of organisms on the analogy of an intelligent creation, and that when we do so we face alternatives that can best be grasped *in terms drawn from metaphysics* (i.e., the obverse of the analogy at B167). The categories Kant offered were: *occasionalism* and *prestabilism*.[47] He dismissed occasionalism as curtly as he had dismissed spontaneous generation (though, of course, for different reasons), and in turning to "prestabilism" he distinguished two subsets: *individual preformation*, which he identified with the "theory of evolution" (i.e., encapsulation) and termed an "educt," and *generic preformation*, which Kant suggested was the proper sense of *epigenesis*. That is, while a "product," epigenesis "still performed in accordance with the internally purposive predispositions that were imparted to its stock."[48] What attracted him to epigenesis, Kant averred succinctly, was that it entailed "the least possible application of the supernatural"

43. Ibid., 378.

44. Kant, "Über den Gebrauch teleologischer Principien in der Philosophie," AA:2:179.

45. Clark Zumbach, *The transcendent science: Kant's conception of biological methodology* (The Hague: Nijhoff, 1984).

46. Kant, *Critique of Judgment*, AA:5:311.

47. Kant, *Critique of Judgment*, AA:5:422.

48. Ibid., 423.

in scientific theory.[49] The crucial point is that, even as he was prepared to admit *epigenesis*, Kant set stark limits upon it: ultimately this was still strictly "generic *preformation*," i.e., it, too, required the prior intervention of a *transcendent* causality. In short, intrinsic purposiveness, as the empirical capacity for epigenetic self-formation, never proved viable for Kant as a theoretical concept in life science. It was only a heuristic analogy.

I submit that Kant's language of *Keime* and *Anlagen* and his acceptance of the idea of a *Lebenskraft* as exemplified by Blumenbach's *Bildungstrieb* committed him to a conception of life science entailing the *objective actuality* [*Wirklichkeit*] of forces which could not be reduced to those he admitted in his "Newtonian" order of physics. With epigenesis, the "order of nature" became greater than the order of Kant's version of physics, and the paradigm for science necessarily exceeded the "Newtonian" constraints Kant wished to impose upon it. Epigenesis incites a fundamental erosion of Kant's boundary between the constitutive and the regulative, between the transcendental and the empirical: a naturalism beyond anything Kant could countenance, though his own thought carried him there. Of course, Kant's escape was to suggest an epistemological evasion of this unpalatable ontological prospect. Kant transposed his metaphysical problem into an epistemological constraint: "nature [i.e, the *order of nature* as a system] can only be understood as meaningful if we take it at large to be designed."[50] By formulating this as a *heuristic for inquiry*, not an *ontology of nature*, Kant preserved the "purity" of his critical philosophy from "dogmatism." In Kantian terms, there was a subjective necessity – a "need of reason" – for this move, but no objective basis evident in the matter at hand (the order of nature).

4. Concluding Contentious Remarks.

In light of the foregoing, I am not disposed to think, as Jennifer Mensch and many others do, that Kant can serve as a significant resource for current philosophy of science, and *a fortiori* not for philosophy of biology. Peter McLaughlin makes the claim that

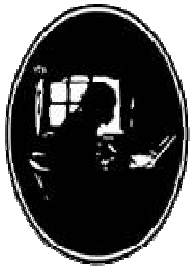
49. Ibid., 424.

50. R. E. Butts, "Teleology and scientific method in Kant's Critique of Judgment," *Nous* 24 (1990), 1-16, citing 5.

sciences ought to define for themselves what constitute appropriate projects and practices, and that it is the role of philosophy simply to assess the "metaphysical cost." He writes: "The self-understanding of an empirical science, biology ... is for biologists to decide. A philosopher can only analyze the metaphysical costs of the various options."[51] I endorse this naturalist stance. No less than Kant, a naturalist is concerned with the "limits of human understanding," but those limits apply across the board in empirical science; biology is not uniquely disqualified. That is, *all* natural science must be taken to be empirical in the radical sense of contingency and fallible approximation; biology does not warrant special targeting. To characterize their object of inquiry, empirical biologists must consider processes of intrinsic dynamism. *Organism* has long been their master-concept for such inquiry; *function* is a more recent term for such processes. If biologists not only do but must use concepts of *self-organization*, then that seems an essential feature of their science. If biology must conceptualize self-organization as actual in the world, Kant's regulative versus constitutive distinction is pointless in practice.

While Kant continues to attract attention in current philosophy of biology, I see Kant more as an impediment than as a facilitator for that important pursuit. Kant set a hard and fast boundary marker between attainable science and speculative metaphysics. But did he mark the boundary properly? Need we halt there? Have we halted there? Intrinsic purposiveness -- what Kant discerned but then "domesticated" into the language of intentional action -- is the starting point of actual biological science and perhaps ultimately of a naturalist philosophy of mind. What if, against Kant and from a naturalist stance, *self-organization* simply betokens – that is, can be intersubjectively discerned to possess, empirically, as ineliminable features of the actual natural world -- such propensities of systemic, open-ended dynamism? What if for empirical judgment humans are *first* such organisms, and *consequently* capable of judging? For empirical-biological science and its knowledge claims, humans would be products of nature, their process of judging would be an instance and extension of that process of self-organization already actual in other organisms. Kant's characterization of reason would not be just a metaphor: reason parallels organismic form because it *is* an expression of organismic self-regulation. In short, my view is that Kant was by far not organicist *enough*!

51. Peter McLaughlin, *What Functions Explain: Functional Explanation and Self-Reproducing Systems* (Cambridge: Cambridge University Press, 2001), 190.



CON-TEXTOS KANTIANOS **International Journal of Philosophy**
N.º 1, Junio 2015, pp. 195-214; ISSN: 2386-7655