DISCUSSING WORKS ON KANT & GERMAN IDEALISM

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Jennifer Mensch—Kant's Organicism. Epigenesis and the Development of Critical Philosophy (University of Chicago Press, 2013)

In this issue of *Critique*, **Angela Breitenbach** and **Hein van den Berg** subject Jennifer Mensch's interpretation of Kant's view on epigenesis to a critique.

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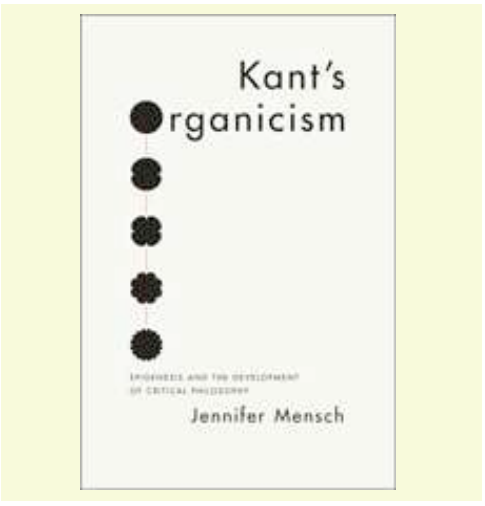
Précis of *Kant's Organicism. Epigenesis and the Development of Critical Philosophy*

By Jennifer Mensch



It is hard to say where intellectual history belongs at present. It has almost entirely disappeared from the history departments in the USA, and the anti-historical bias of philosophy departments there is of course well-known. Indeed, the sign Gilbert Harman put on his door at Princeton —"History of Philosophy: Just Say No!"—has become the stuff of legend. This attitude on the part of analytic philosophers has perhaps softened in recent years, but it has not changed the fact that scholars doing intellectual history are now more likely to be found in English and German departments than anywhere else. Even in these settings, however,amidst the intellectual energy and fun you generally find among the eighteenth-century studies crowd, the history of science captures only a marginal interest. "You're doing history of science?", a friend from the history department once said, "now that's a real *ghetto!"*

When I began to think about a book on Kant and the life sciences, the idea that Kant would ever have been influenced by the ideas coming out of this field seemed impossible to believe. In fact I spent an entire Summer determined to prove that my thesis was wrong. The problem was, I kept finding evidence in support of it (fully one third of *Kant's Organicism* is devoted to a glut of historical research filling up the endnotes, research stemming, for the most part, from an initial disbelief in my own hypothesis). The majority of the scholars who had considered this connection before me had had their training in the history of science. My situation was different, I had been trained in philosophy. I knew my Descartes but I had never read Harvey; I had written on Locke but I had never heard of Ray.

The lacunae only grew, once I began to look at the eighteenth century,

now with eyes chastened by the faintness of their sight. I was a Kant specialist: I knew all about Kant's 'love affair with metaphysics', his break from Newton and Leibniz, the 'Critical turn' in the letter to Herz, and on and on. But I had never heard of Buffon—despite the fact that Kant had referred to him over and over again in his works—and I had certainly never thought that anything important might be found for understanding the theoretical writings in either his physical geography lectures or the *Anthropology*. It turns out that I was wrong.

The task of *Kant's Organicism* is to open up a new perspective on Kant, to broaden both the scope and the intellectual resources available for philosophers who are working on this period. The starting point for the book is the enormous transition occurring in the life sciences between the seventeenth and eighteenth centuries regarding the proper aim of natural history (Ch. 1). The pivotal figure here is Georges Buffon, since it was he who finally managed to wrest natural history from the province of the taxonomists. Under Buffon's hand, natural history became devoted instead to a description of the history of nature, and it advanced a new method of inquiry altogether (Ch. 2). Investigations should be filled with the content of experience, Buffon argued, but they must be led by a speculative gaze. This was all big news in the 1750s, and it certainly reached the ears of Kant. In the chapter 'Kant and the Problem of Origin', I describe the manner in which Kant was specifically interested in questions of origin, in cosmological origin—Buffon too opened his natural history with an account of this—but in theories of biological origin as well (Ch. 3).

Few scholars have noted that Kant owned an exceedingly rare copy of Maupertuis' *Versuch von der Bildung der Körper*, or that he mirrored his physical geography course on the first two volumes of Buffon's *Allgemeine Historie der Natur* (1752, trans. A. G. Kästner). These turn out to be important facts actually, for they make sense of the seeming digressions one finds in the *Only Possible Proof* essay of 1763, and they certainly provide a different set of coordinates for understanding Kant's approach to the topography of space in 1768 (in *Concerning the Ultimate Ground of the Differentiation of Directions in Space*).

In Chapter 4, I make the case for Kant's appeal to epigenesis as a model for cognition. Questions regarding the status of this model will be the focus of my exchange on this blog with Angela Breitenbach. My second commentator, Hein van den Berg, joins Breitenbach in questioning the reasons for Kant's turn to this model. In response, I emphasize the epistemic context within which Kant became interested in epigenesis for thinking about the 'original acquisition' of concepts, since only attention to this context will make sense of the continued appeal that epigenesis would have for Kant throughout the 1770s (Ch. 5). In Chapter 6, I outline the difficulties Kant faced once Tetens published his account of cognition, an approach relying on the *Evolution durch Epigenesis* of the soul. Reading Tetens forced Kant to become explicit regarding his own anti-nativism.

The final chapter of the book suggests a rereading of the *Critique of Pure Reason* and of the Transcendental Deduction in particular. This account begins with the Architectonic, taking it to be the *Bauplan* for the whole, and proceeds to show the interpretative possibilities opened up by attention to the organic vocabularies in play throughout the *Critique*. Although this chapter is entirely focused on the first *Critique*, I point beyond this text to Kant's later works throughout the endnotes. The book ends with a consideration of Kant's legacy, comparing his cautious approach to the life sciences with the stance taken by his intellectual successors (Epilogue).

In closing, I just want to point to the surprising turn that has recently been taken in the life sciences today. We have, it seems, entered a post-genomic era. Only ten years ago researchers could still rely on the gene, or at least the information conveyed by that name—as Ernst Mayr observed: development may be epigenetic, but inheritance of type depends on the gene—but today the very notion of a 'genetic programme' is under attack, and preformationism in the guise of the gene has been demoted, as researchers turn instead to the supervenient field of epigenetics. It is hard to imagine that Kant would not have appreciated the possibilities for thought opened up by these discussions. The least tenable model has suddenly become the most plausible one for imagining the irreducible quality of the organism, one demanding our amazement not because of the intricate operations of its parts, but because we have been forced to acknowledge the primacy of the living organic context, within which such parts can emerge in order to mechanically function at all. This was precisely the kind of organic model that Kant had in mind when trying to grasp reason, and it is what locates him as a genuine forerunner of the organicism of both his day and our own.

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Unity in Reason and Nature

By Angela Breitenbach

Jennifer Mensch's book Kant's Organicism is a study of the influence that natural history of Kant's time had on his theoretical philosophy. Recent years have seen a growing interest in Kant's more empirical work such as his philosophy of the physical and biological sciences and its connections with his metaphysics and epistemology. Kant's Organicism takes this venture a step further, by asking how Kant's attention to theories of organic development shaped his account of cognition. This is an intriguing question to which Mensch offers a stimulating answer. Mensch presents much detail of historical interest that I shall have to leave aside in my comments. I begin with some general remarks on the overall claim of the book, before raising a few more specific questions on how the organicism that Mensch attributes to Kant is to be interpreted.

Organicism as Key to Kant's Theoretical Philosophy

Mensch proposes the bold claim that 'Kant should be fitted into a framework […] that can be called […] "organicism"' (Mensch, p. 1). Organicism is the view that nature is a living organism and that natural processes are irreducible to mechanical operations. Mensch understands this view in tandem with the embryological theory of epigenesis. According to epigenesis, living beings gradually develop from preformed germs or seeds. Epigenesis contrasts with eighteenth century creationism, the theory that the development of organisms consists in the unfolding of miniature, fully formed beings. On Mensch's proposal, however, fitting Kant into an organicist framework does not mean portraying him as a defender of epigenesis as a biological theory. It means understanding Kant's non-biological work, in particular his theory of cognition, against the background of an organicist-epigeneticist conception of nature. Mensch thus aims to establish the thesis that core arguments of Kant's theoretical philosophy, including the transcendental deduction of the categories, must be read in light of his engagement with natural history.

Mensch spells out key parallels between the development of organisms and that of reason and cognition. On the epigeneticist account, organisms are generated according to a 'two-step model' (Mensch, p. 81), first, by the pre-formation of capacities and, second, by spontaneous development in accordance with those capacities. Mensch argues that in the same way cognition is achieved on Kant's account, first, on the basis of innate laws and, second, by the spontaneous development of concepts in accordance with those laws. Moreover, on the epigeneticist account, organisms do not evolve mechanically but, given certain original capacities, generate themselves. Mensch claims that, similarly, reason for Kant determines itself in accordance with its own laws. It is in this sense, she argues, that we should understand Kant's notion of the 'self-birth' of reason: reason has an epigenetic beginning, operating in line with a 'reflexive or organic logic according to which its unity must be viewed as both cause and effect of itself' (Mensch, p. 9).

On Mensch's account, the organicist framework is crucial for distinguishing Kant's theory of cognition from competitor theories. By presenting concepts as generated in accordance with innate laws, Kant's theory of cognition provides an alternative, on the one hand, to Leibniz' appeal to a supernatural or preformationist origin of intellectual ideas and, on the other hand, to Locke's insistence on the sensible basis of all ideas. Mensch thus argues that eighteenth century debates in the life sciences hold the key to understanding Kant's theoretical philosophy.

In highlighting the intimate connection between Kant's natural philosophy and his theory of cognition, Mensch has identified a fascinating and potentially fruitful perspective on Kant's theoretical philosophy. Although she is by no means the first to comment on Kant's notion of the 'epigenesis of pure reason' (B167),[1] the distinctive feature of her approach is the focus on the intellectual and scientific historical context that culminated in Kant's epigeneticist theory of cognition. To this end, her short book manages to weave together a diverse and compelling collection of historical material. I would have been interested in a more detailed discussion of the implications of Mensch's historically motivated thesis for philosophical debates in the current Kant literature. What does the organicist framework mean, for example, for Kant's rejection of nativism, the associated normativity of cognition, and the unity of practical and theoretical reason? However, contributing to such debates is not the aim of the book. In my view, Mensch's proposal should therefore be read, in line with the author's own introduction of her thesis, as a general framework for interpretation rather than a fully developed reading of Kant's theoretical philosophy. My focus in the following remarks will be on the question of how exactly to construe this framework.

The epigeneticist model

According to Mensch, Kant employs the theory of epigenesis as a 'model' for reason and cognition (e.g., Mensch, p. 9 and p. 53). What is the status of this model?

A first and, I think, compelling answer is to construe it as having metaphorical or analogical import. The development of reason and cognition, on this reading, is understood by analogy with the epigenesis of a living being. This analogical interpretation would be in line with Kant's presentation of reason in the introduction to the first *Critique* (Bxxii ff.) and the 'Architectonic of Pure Reason' (A832/B860). There, Kant offers an analogy between reason and organism by drawing parallels between the systematic and purposive relation of the capacities of reason and the arrangement of the parts in 'an animal body' (A833/B861). Following this, one might understand Mensch's suggestion in a similar manner as the proposal that the development of reason, its concepts and judgements, should be understood on the epigeneticist model as having analogical or metaphorical status. And yet, Mensch maintains that epigenesis has not 'merely a metaphorical appeal' (Mensch, p. 144), for 'Kant would take the epigenesis of reason to be real' (Mensch, p. 124). What, then, is implied by construing the epigeneticist model as real rather than metaphorical?

In response to this question, one might offer a second interpretation of the epigeneticist model as spelling out a naturalistic conception of reason. On this reading, just as organisms develop through organic processes from preformed germs, in the same way reason is the result of an entirely natural process of development. Organisms as well as reason are part of nature and governed by its laws. This naturalistic account would fit less well with Kant's contrast between the natural and the rational and with his conception of reason as free from determination of the laws of nature. Mensch consequently rejects this interpretation. In her discussion of empirical psychology in Tetens and Kant, she argues that it is Tetens, by contrast with Kant, who construes the epigenesis of the human intellect naturalistically. Only Tetens, not Kant, gives a thoroughly naturalistic account of human reason along organicist lines.

If, then, the epigeneticist model is to be understood on Mensch's account as neither analogical nor naturalistic, how should we understand it? In what sense can the model be a real representation of reason without portraying reason as a natural entity? According to Mensch, Kant understands 'the epigenesis of reason to be real [...] only in a *metaphysical* sense' (Mensch, p. 124, her italics). My worry is that this metaphysical sense, a third interpretation of the epigeneticist model, is not sufficiently explored. If 'metaphysical' in the Kantian context is to be understood as relating to 'the science of the extents and limits of knowledge' (Mensch, pp. 8, 53), as the author also tells us, then saying that the epigeneticist model is real in a metaphysical sense tells us only that epigenesis is real as a model for the investigation of the extents and limits of knowledge. But Mensch seems to imply more. In particular, on her account the epigeneticist model of reason refers to a nonnatural reality. As she puts it, 'Kant [...] was in the end a metaphysician, and his own species of organicism would therefore have to be nonnaturalistic when it came to reason and the processes of cognition' (Mensch, p. 124).

The character of this non-naturalistic species of organicism might be clarified by specifying the conception of spontaneity on which Mensch relies for her interpretation. In the introduction, she promises the reader an interpretation of Kant's organicism that would present the unity of reason and the origin of cognition as 'neither supernatural nor empirical but spontaneous' (Mensch, p. 12). Mensch thus contrasts the spontaneity of reason with the supernatural origin of cognition. As she points out, cognition for Kant does not rely on concepts preformed and implanted into the human mind by God, but on concepts that are generated by reason out of its own capacity. If Kant's species of organicism is, on Mensch's account, to be of a non-naturalistic kind, however, then we should expect the spontaneity that grounds reason's self-development to consist in a nonnatural capacity itself. I am not entirely sure whether Mensch intends to draw a distinction between a nonnatural and a supernatural capacity. A more specified notion of spontaneity would here have been illuminating.

In particular, I wonder whether Mensch conceives of the spontaneity required for cognition as a distinctly theoretical capacity, or whether she wants to identify it with the free causality of practical reason. Is the spontaneity of reason a theoretical, that is, cognitive spontaneity, realised in the original synthesis of sensory input? If so, I worry that this capacity would not, or not obviously, be sufficient to ground the 'self-birth' of reason that is so central to Mensch's interpretation. Or is the spontaneity of reason a practical spontaneity that, perhaps more in line with the metaphysical context of Mensch's interpretation, consists in a free and end-directed causality? If so, this would give a more robust

account of the self-determining and self-developing character of reason, but it would rely on the strong and more controversial claim that cognition depends on practical reason.

However one may construe the precise nature of spontaneity, it is uncontroversial that the idea of reason as spontaneous and as endowed with free causality has a central place in Kant's theoretical philosophy. Insofar as these capacities are nonnatural, however, it is hard to see how the embryological theory of epigenesis could provide a realistic model for them. The appeal of Kant's organicist imagery seems rather to offer an indirect, analogical way of representing such non-empirical ideas of reason as those of spontaneity and free causality.

As Kant argues in the *Critique of Judgement*, analogies are the only means of representing concepts that cannot be represented directly, that is, by means of examples or schemata. Symbolic representation is made possible, Kant explains, by judgement performing 'a double task, first applying the concept to the object of a sensible intuition, and then, second, applying the mere rule of reflection on that intuition to an entirely different object, of which the first is only the symbol' (CJ, 5: 352). By applying the concept of systematic organisation to an empirical object, such as an organism for example, we can transfer the way we think about organisms to our conception of reason, an object that cannot itself be given in experience. In contrast with Mensch, I find this analogical or metaphorical reading of the epigeneticist model compelling. I believe it is a model Kant employs to portray reason, its unity and development, in the only terms in which non-empirical ideas can be intuitively presented on his account, namely by analogy with empirical objects.

Organicism and the organism

Towards the end of the book, Mensch briefly addresses the connections of Kant's organicist framework with his philosophy of biology. As she points out, Kant denied the epigeneticist model 'determinate efficacy in the *physical world* of organisms' (Mensch, p. 144). This is because the systematic organisation and end-directed development of living beings, on Kant's account, cannot be explained according to the theory of epigenesis; we cannot cognise teleological, spontaneous, self-propagating processes in the natural world. Instead, Mensch argues, organisms can only be regarded by analogy with the free causality of reason. As an account of Kant's organicism this may be somewhat surprising. Rather than understanding reason and cognition on the model of the organism, Kant conceives of organisms on the model of reason.

Even if this may be an unexpected turn of Kant's organicism, I believe Mensch is right to ascribe it to Kant. She points out, in my view correctly, that on Kant's account our analogical conception of organisms 'had to rely on reason and the kind of demonstration of free causality that it provided in the moral sphere' (Mensch, p. 143). According to Kant's 'Critique of Teleological Judgement', we can only conceive of living beings by reading ideas of reason into our experience of living nature.[2]

This does not imply, however, that Kant cannot also employ the analogy between reason and organism in order to give a sensory and symbolic representation of the unity and development of reason. Kant's explicit parallels between reason and organisms in the first *Critique* seem to have precisely this role. They are meant to illustrate an idea of the systematic unity of reason by reference to empirically accessible objects. Even if we cannot conceive of living beings without projecting teleological ideas on to them, such beings may nevertheless provide an indirect symbolic representation of those ideas. Read in this way, Kant's organicist framework would be an organicism that played a role for Kant's thinking about reason as well as organic nature.

Jennifer Mensch aptly draws our attention to a fascinating question. How are we to understand the connections between Kant's engagement with the natural history of his day and the structure and character of his theoretical philosophy? The organicist formulation Mensch offers us, while in my view not definitive, is a provocative answer to this question.

Notes:

[1] See for example W. Waxman, *Kant's Model of the Mind* (Oxford University Press, 1991); H. Ingensiep, 'Die biologischen Analogien und die erkenntnistheoretischen Alternativen in Kants Kritik der reinen Vernunft B §27', *Kant-Studien* 85 (1994), 381–93; S. Meld Shell, *The Embodiment of Reason* (Chicago University Press, 1996); and P. Sloan, 'Preforming the Categories: Eighteenth-Century Generation Theory and the Biological Roots of Kant's A Priori', *Journal of the History of Philosophy* 40 (2002), 229–53.

[2] I argue for this thesis in A. Breitenbach, *Die Analogie von Vernunft und Natur* (Berlin/New York: Walter de Gruyter, 2009), and A. Breitenbach, 'Teleology in Biology: A Kantian Perspective', *Kant Yearbook* 1 (2009), 31–56

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Epigenesis and Transcendental Philosophy

By Hein van den Berg

In her Kant's Organicism, *Jennifer Mensch argues that the eighteenth-century life sciences had a profound systematic and methodological impact on Kant's transcendental philosophy. Mensch provides an impressive historical account of how developments in the life sciences shaped Kant's philosophical development up to around 1780. On the basis of this account, she argues that Kant adopted an epigenetic conception of reason that lies at the heart of his theory of cognition articulated in the* Critique of Pure Reason *(see van den Berg [in press]). In short: Mensch claims that the eighteenth-century theory of epigenesis is of fundamental importance to Kant's transcendental philosophy.*

Mensch's book contains a wealth of impressive historical research. It is rich in content, concise, and very well written. I therefore recommend the book to anyone who is interested in Kant's philosophy and the history of biology. I was not, however, convinced by its main thesis. In the following, I identify some challenges to the view that epigenesis is of fundamental importance to Kant's transcendental philosophy. These challenges suggest that for Kant epigenesis did not have the systematic importance that Mensch assigns to it.

The paper is structured as follows. In the first section, I introduce the notion of epigenesis and describe some of Mensch's main ideas. In the second section, I identify, using the work of John Zammito, some problems for Mensch's interpretation of epigenesis. In the third section, I question the scope of Mensch's interpretation.

1. Kant and Epigenesis: Some Stage Setting

The main thesis of *Kant's Organicism* is that models employed within the eighteenth-century life sciences had 'a deep methodological impact' on Kant's critical system (p. 144). Mensch argues, more specifically, that the theory of epigenesis grounds Kant's philosophical views on the origin and nature of cognition as articulated in his *Critique of Pure Reason* (see van den Berg [in press]). This is why the notion of 'organicism' is applied to Kant's philosophy. Mensch characterizes her enterprise as follows:

> I want to investigate the degree to which Kant—and not just as he was appropriated through the third *Critique*—can be located within a period defined by its organicism in order to discover in what manner Kant too would be attracted to the model offered up by 'epigenesis' for thinking about questions of origin and generative processes in general. For it is my sense that epigenesist models had a significant role to play for Kant's theory of cognition, for what one might even go so far as to describe as his epigenesist philosophy of mind. (p. 2)

In order to fully understand this project, we need to answer three questions. First (i), what is epigenesis? Second (ii), why was Kant attracted to epigenesis? Third (iii), how should we understand the claim that epigenesis shaped Kant's theory of cognition? In the following, I briefly sketch how Mensch answers these questions, while also taking into account the views of other authors on these topics. This will provide the background to my criticisms developed in the following sections.

(i) *What is epigenesis?* This question is notoriously difficult to answer. Many historians recognize that in the modern period the term 'epigenesis' was used in a bewildering variety of ways (Zammito 2003:89; Mensch, 2–7). Nevertheless, epigenesis is often characterized as an *embryological* theory according to which organs are *progressively formed* from some originally *undifferentiated* and *homogenous* material (Smith 1976:264; Zammito 2006a:317). Epigenesis thus provides an account of embryogenesis (Richards 2000).[1] It is often taken to involve the idea that nature is capable of *self-organization*, as well as the idea that embryogenesis involves the emergence of a genuinely *novel* product (Zammito 2003:87, 90–2, building on Genova 1974). These aspects of epigenesis distinguish it from *pre-existence* or *preformationist* theories of embryogenesis, which roughly held that embryos (or parts thereof) pre-exist and are preformed (see Mensch 2013: 3, 156; see also the classic Roger 1997).

Throughout history, biologists and philosophers have articulated different epigenetic and preformationist theories. Philip Sloan, building on the work of Roger, has distinguished four main variants (two preformationist theories and two epigenetic theories):

(a) *Strong pre-existence theories*. According to these theories, organisms have been 'created in their essential properties by God at the creation of the world' (Sloan 2002:233). For example, according to the encasement (*emboîtment*) theory, articulated by Malebranche, embryos are fully (pre-)formed and encased within each other in the ovaries or

spermatozoa (ibid.; Mensch, p. 156, n.3). Organisms are encased within each other just as Russian dolls are.

(b) *Preformationist theories postulating pre-existent germs.* According to these theories, adopted by Haller and Bonnet, embryos develop from pre-existent germs after fertilization. As Sloan explains, these theories, in contrast to theories of type (a), did not take individual organisms to be completely preformed. Germ theories postulated 'a preformation only of the primordia of the embryo, pre-existing as *germs* that unfolded in time' (Sloan 2002:236). For example, Haller took the (essential) parts of an embryo to be preformed and to pre-exist. However, the arrangement of these parts, as it appears in an adult animal, was not preformed and was brought about by various different causes (ibid.; cf. Sloan 2002:233, 235–6).

(c) *Mechanistic epigenesis*. Epigenetic theories took embryogenesis to involve a gradual organization of *unorganized* matter (Sloan 2002:233). *Mechanistic* theories of epigenesis took the formation of embryos to proceed in some kind of mechanical fashion. As Sloan explains, these theories 'dated from the efforts of René Descartes to explain the formation of the embryo purely from the assumption of a particular conception of matter, contact forces, vortices, and the three laws of nature' (Sloan 2002:233-4). Descartes's theory failed. However, modified versions of mechanistic epigenesis were later articulated by Maupertuis and Buffon (Sloan 2002:234; Mensch, p. 5, and Ch. 2).

(d) *Vitalist epigenesis*. Vitalist theories of epigenesis stressed, again, that organisms are not preformed but gradually obtain their organization during embryogenesis. However, in contrast to mechanistic theories, this process of gradual organization was taken to be guided by some kind of 'vital power' (Sloan 2002:233; Mensch 2013:5, 216-17n.289). This kind of theory is sometimes attributed to Caspar Friedrich Wolff and to Johann Friedrich Blumenbach, although interpretations of these authors greatly differ (see Lenoir 1989; Richards 2002; Zammito 2012).

This brief list provides a rough classification. It does not capture all the relevant differences between individual epigenesist and preformationist theories. Moreover, it is debatable how we should precisely understand the difference between mechanistic and vitalistic theories of epigenesis, and whether Wolff and Blumenbach are actually vitalists. Many more problems could be mentioned. However, for our present purposes this list will suffice.

(ii) *Why was Kant attracted to epigenesis?* This question is also difficult to answer. It presupposes that Kant was actually attracted to this theory. It further seems to imply that Kant accepted some version of epigenesis. Mensch suggests that all of this is the case. Why else would 'epigenesist models' significantly impact Kant's theory of cognition? (p. 2) However, some authors have argued that epigenetic theories of organic generation posed significant *problems* for Kant's philosophy. One can also doubt whether Kant fully endorsed theories of epigenesis of the types (c) and (d).

I return to these problems in the next sections. For now, we may note that Kant was often sceptical of preformationist theories. In his *Only Possible Argument* of 1763, Kant rejected preformationist theories of type (a), claiming that the idea that *individual* organisms are directly formed by God is arbitrary (AA 2:115; see Mensch, pp. 61–4). At times, Kant seems to hint at accepting epigenesis, even though he rejected Buffon's and Maupertuis's epigenetic theories (AA 2:115). Whatever his stance on epigenesis was in 1763, it is clear that in the following decades Kant edged closer to fully endorsing epigenesis. In the third *Critique* (1790), Kant praised Blumenbach's theory of epigenesis. He noted that reason is 'favorably disposed' to epigenesis because it

> considers nature, at least as far as propagation is concerned, as itself producing rather than merely developing those things that can initially be represented as possible only in accordance with the causality of ends, and thus, 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). (AA 5:424; cf. Mensch, p. 144)

On Kant's reading, Blumenbach's theory treated nature as self-organizing, it minimized the appeal to the supernatural, and it did not venture into (metaphysical) speculation on first causes. For these reasons, Kant evaluated epigenesis positively.

(iii) *How did epigenesis shape Kant's theory of cognition?* According to Mensch, questions regarding the *origin* or *generation* of cognitions were central to Kant's thinking on philosophy from the 1760s onwards:

> As he [Kant] now took on the job of re-creating metaphysics as a science, the first task concerned questions regarding the origins of knowledge. Was it the case, as rationalists had it, that true ideas were like seeds implanted in the soul by God—a strategy in some sense parallel to that adopted by the preexistence theorists—or were empiricists correct instead when identifying the senses as the true origin of ideas? (pp. 72–3)

This emphasis on questions regarding the *origin of ideas* may puzzle some orthodox Kant scholars. However, Mensch persuasively argues that such questions were

important to Kant. It is because questions concerning the *origin* of ideas or concepts were central to his metaphysical project that Kant turned to epigenesis, Mensch claims. Epigenesis provided a theory that allowed Kant to understand how certain ideas or concepts were *generated*. In the following, I briefly describe some of the ways in which Mensch substantiates this claim.

In Chapter 4, Mensch argues that in the Inaugural Dissertation (1770) Kant asked whether intellectual concepts, such as 'possibility' or 'cause', and the concepts of space and time are *connate* or *acquired* (AA 2:406; cf. Mensch, p. 78). Kant's answer is that these concepts were not empirically acquired, nor connate, but 'originally acquired', i.e., they are 'generated by the mind itself' (Mensch, p. 78). The question facing Kant, Mensch notes, was how this 'original acquisition' of concepts should be interpreted (p. 80). This question was difficult to answer. According to Mensch, Kant criticized Leibniz's *preformationist* theory of innate ideas because it appealed to supernatural grounds. Yet Kant also rejected Locke's idea that all ideas have an empirical origin (pp. 80–1).

On the basis of an analysis of Kant's 1769 course on metaphysics and of a set of notes composed shortly after the Inaugural Dissertation, Mensch concludes that epigenesis provided a model for understanding this 'original acquisition' of concepts. In these notes, Kant identified epigenesis 'with the theory of "original acquisition" for explaining the generation of sensitive and intellectual concepts' (p. 83). In support of this reading, Mensch cites the following passage:

> Crusius explains the real principle of reason on the basis of the *systemate praeformationis* (from *subjective principiis*); Locke on the basis of *influxu physico* like Aristotle; 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; quoted in Mensch, p. 83)

Mensch concludes, paraphrasing Darwin, that around 1770 Kant 'at last got a theory by which to work' (Mensch, p. 83), i.e., a theory that sheds light on the problem of the origin and generation of cognitions. In the remainder of the book, Mensch further substantiates her interpretation by arguing that epigenesis shaped Kant's conception of reason as a spontaneous and self-generating faculty, and that this epigenetic conception of reason grounds some of the core arguments of the *Critique of Pure Reason*. Hence, it is no surprise that in the second edition of the *Critique* Kant described his philosophy as a 'system of the *epigenesis* of pure reason' (B167).

2. Kant and Epigenesis: Some Problems

Let me turn to my critique. In the previous section, we noted that according to some authors epigenesis posed significant problems for Kant's philosophy (see, most emphatically, Zammito 2003, 2006a, 2006b, 2012). Kant explicitly rejected mechanistic versions of epigenesis as developed by Maupertuis and Buffon (theories of type [c]; cf. Mensch, pp. 62–3). Scholars have further argued that Kant *should* have rejected vitalist theories of epigenesis (theories of type [d]). The reason is that Kant's regulative teleology does not allow one to postulate the existence of some teleological 'vital power' that guides embryogenesis (Richards 2000). We are therefore faced with the question: Did Kant actually accept epigenesis?

The answer appears to be that, at least before Kant became acquainted with the theory of Blumenbach, this is not really the case. Rather, as Mensch also notes (p. 6), Kant often adopted an intermediate position between the theories of preformation and epigenesis (Sloan 2002:239).

Why did Kant adopt an intermediate position? Zammito has persuasively argued that Kant rejected *mechanistic* theories of epigenesis, at least in part, because he related these to materialism and hylozoism, *metaphysical* doctrines that he strongly denounced (Zammito 2003, 2006a). Kant was confronted with *vitalist* theories of epigenesis through the works of Herder in the 1780s (Zammito 2003:86). Herder, influenced by Caspar Friedrich Wolff, took embryos to be organized by the action of *organic forces* (Sloan 2002: 242). In addition, Herder's epigenesis allowed for the *transformation of species*. Throughout his entire philosophical career, Kant never accepted the transformation of species (Zammito 1992:214–19; van den Berg 2014, Ch. 8).

In order to secure the constancy of species, Kant accepted elements of germ preformationism (theories of type [b]). For the majority of his career, he accepted the existence of (species-specific) pre-existent germs that underlie specific organic parts and 'predetermine a range' of possible developmental outcomes (Sloan 2002:239–40). Grene and Depew, discussing Kant's theory of race, aptly summarize Kant's position: '[G]erms keep ontogeny within species boundaries, but heritable predispositions (*Anlagen*) keep races adapted to specific environments' (Grene & Depew 2004:120). Pre-existent germs thus secured constancy of organic form. Even in the third *Critique*, Kant described his epigenetic position as a form of 'generic preformation', stressing that organic form is (at least to some minimal extent) preformed (AA 5:423).

Mensch will probably agree with most of what I have said. She is thoroughly familiar with the works of Sloan and Zammito, on which the above account is based, and describes Kant's epigenetic position as a compromise: 'Form was indeed supernaturally conceived, but while this generically maintained the stability of the species lines, the work of generating individuals actively belonged to nature' (Mensch, p. 6). Yet, if this is the case we are faced with the following questions: Why did Kant construct an analogy between epigenesis and transcendental philosophy? Why did Kant take a theory that he was, at least to a certain degree, critical of as a *model* for his transcendental philosophy?

If we take a closer look at this analogy, more difficulties arise. Let me highlight some of them by discussing the work of Zammito. In Zammito (2003), Zammito discusses the issue of epigenesis in Kant. He stresses Kant's long-time acceptance of preformationist theories of type (b), noting that Kant came to affirm epigenesis only in the course of the 1780s. He then turns to the use of biological analogies in the first edition of the *Critique of Pure Reason* (1781). Kant states:

> I understand by an analytic of concepts not their analysis, or the usual procedure of philosophical investigations, that of analyzing the content of concepts that present themselves and bringing them to distinctness, but rather the much less frequently attempted analysis of the faculty of understanding itself in order to research the possibility of a priori concepts by seeking them only in the understanding as their birthplace and analyzing its pure use in general […]. We will therefore pursue the pure concepts into their first seeds [germs] and predispositions [*Keimen und Anlagen*] in the human understanding, where they lie ready, until with the opportunity of experience they are finally developed and exhibited in their clarity by the very same understanding, liberated from the empirical conditions attaching to them. (A65–6)

As Zammito notes, this analogy uses *preformationist* terminology (Zammito 2003:84): Kant uses concepts taken from preformationist germ theories of type (b). Hence, Zammito reads the passage above as providing fundamentally a preformationist analogy. This seems right. How can we square this finding with Mensch's assertion that, since the 1770s, epigenesis significantly impacted Kant's transcendental philosophy?

Zammito further interprets Kant's analogy to make the *negative* point that, just as we cannot understand the ultimate origin of germs and predispositions, we cannot understand the ultimate origin of the categories (Zammito 2003:84–5). He cites the following remark, made by Kant in the second edition of the first *Critique*:

> But for the peculiarity of our understanding, that it is able to bring about the unity of apperception a priori only by means of the categories and only through precisely this kind and number of them, a further ground may be offered just as little as one can be offered for why we have precisely these and no further functions for judgment or for why space and time are the only forms of intuition. (B145–6)

Orthodox Kantians have sometimes interpreted passages such as these to imply that Kant did not want to engage in any speculation concerning the psychological or, more broadly, natural origins of the categories. On such a reading, which Mensch seems to reject, questions concerning how the categories were precisely acquired, what their precise (psychological or biological) *origin* is, and so forth, do not belong to transcendental philosophy. Transcendental philosophy proper identifies and justifies the necessary conditions of (scientific) knowledge.

Zammito points out that Kant's use of the preformationist analogy supports this orthodox reading. Indeed, Mensch's *own* interpretation of Kant's use of biological analogies seems to support such a reading. If, as Mensch claims, Kant's generic preformationism (epigenesis) implies that he took organic form to be supernaturally conceived, then the ultimate origin of organic form is incomprehensible for humans. If, then, Kant drew an analogy between what he calls generic preformationism (epigenesis) and his account of the origin of cognitions (space, time, the categories), we would expect that he also took the ultimate origin of cognitions to be incomprehensible. Appeals to generic preformationism (epigenesis) appear to have no explanatory force whatsoever when it comes to questions regarding the origin of cognition. This result is the opposite of what Mensch intends to argue for.

Zammito's reading allows us to identify certain problems that need to be answered before we accept Mensch's claim that epigenesis had a 'deep methodological impact' on Kant's Critical philosophy. Mensch briefly discusses the position of Zammito (and Sloan) in footnote 13 to the Introduction. There, she *questions* the assumption that 'Kant's attitude toward epigenesis in biological organisms is the key to interpreting his account of the epigenesis of reason' (p. 159). She dissociates Kant's views on epigenesis as a biological theory from his 'epistemic' and 'transcendental' reflections captured by the term epigenesis. Throughout the book, Mensch therefore also speaks of epigenesis as a *metaphysical* theory. This interpretative stance, somewhat ironically, also allows Mensch to accept that Kant was highly critical of epigenesis as a biological theory:

> […] although Kant 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 actually at work in the generation of actual organisms. (p. 141)

But if this is the case, why construct an analogy between epigenesis and transcendental philosophy in the first place? Analogies are based on similarities between items. There are, to be sure, important similarities between epigenesis as a term referring to biological theories and epigenesis as a term used by Kant to characterize his transcendental philosophy (or reason). However, there are also fundamental differences, as we have seen. These lead me to question the strength and importance of the analogy. Is it really the case that Kant adopted a biological theory of epigenesis of which he was often critical, used this theory as a model for his philosophy, while also strongly dissociating his philosophical concept of epigenesis from epigenetic theories in biology and denying these theories any explanatory force in natural science? If so, I would think that Kant used the term epigenesis simply to *illustrate* some aspects of his philosophy without assigning the term much systematic importance (Ingensiep 1994).

Let me conclude this section by briefly pointing to one methodological issue. The interpretations of Kant's views on epigenesis and his use of biological models, as provided by Sloan and Zammito, are primarily based on Kant's *published* writings. By contrast, Mensch's interpretation is, to a large extent, based on the interpretation of (lecture) notes and Kant's *Nachlass*. This gives rise to the following question: Can we assign as much systematic importance to Kant's remarks on epigenesis in the (lecture) notes and *Nachlass* as to the ones made in his published work, given that these remarks do not always seem to cohere with Kant's remarks in his published writings?

3. The Scope of Kant's Organicism

In this final section, I will consider the scope of Mensch's interpretation. Next to arguing that epigenesis shaped Kant's philosophy, Mensch makes the stronger claim that Kant's epigenetic conception of reason grounds the *necessity* of the transcendental principles of experience. The *Critique of Pure Reason* is interpreted as a work in which 'the necessity ascribed to the rules of experience becomes a matter of *genealogy*' (p. 12). Mensch adds: 'Only the "self-birth" of reason, or as Kant would later add, the "epigenesis of reason" (B167) could finally secure the coherence of experience' (p. 13). In short: epigenesis *grounds* transcendental philosophy.

I do not think Mensch provides sufficient support for this idea. In the following, I provide two brief objections to this idea by discussing Mensch's use of the concept of physiology and her interpretation of Kant's deduction of the *ideas* of reason. These objections are intended to show that the scope of Kant's organicism is more limited than Mensch recognizes.

As we have seen, Mensch repeatedly claims that questions regarding the origin of cognitions are central to his transcendental philosophy. It is for this reason, she thinks, that Kant elucidates his transcendental philosophy by appealing to epigenesis. A different way of putting the point is that Kant provides a *physiological investigation* of pure reason: an investigation into the origin of concepts (Mensch, p. 122). According to Mensch, Kant's project does not differ all that much from that of other so-called *physiologists*, such as Locke or Tetens, even though Kant presented his project in a different manner. She remarks:

> Kant too was deeply concerned with the 'question of fact' regarding the origin of concepts; indeed their epigenetic generation had been a central component of his developing theory of cognition since 1770. Kant needed something to distinguish his account from that of the physiologists—by this definition, Locke, Tetens, even Leibniz—besides an attention to the question of origin, and it was for this reason that he had worked in the deduction of the categories of experience to balance the importance of the question of their origin with their transcendental capacity to provide objectively valid knowledge. As for the specter of physiology, Kant's solution had been to rehabilitate a redefined 'rational physiology'—while still criticizing Locke and others as physiologists—as a respectable alternative to empirical physiology given rational physiology's attention to the transcendental grounds of experience. It was in this sense that Kant could say, 'Metaphysics, in the narrow meaning of the term, consists of transcendental philosophy and physiology of pure reason' (A845/B873). (p. 123)

As I understand this passage, Kant is taken to *redefine* a traditional notion of physiology. The term 'physiology' (in this traditional sense) is taken to refer to the inquiry into the origin of concepts. Kant adopted a *rehabilitated* notion of 'rational physiology'. The term 'rational physiology' primarily refers to the investigation into the transcendental grounds of experience. Thus, Kant redefined the notion of physiology in order to stress the *transcendental* nature of his Critical philosophy. Nevertheless, Kant never abolished the traditional conception of physiology, according to Mensch. After briefly analyzing the notion of 'rational physiology', she concludes that Kant's proposed distinction between questions of fact regarding the origin of knowledge (traditionally studied in physiology) and questions of right regarding the justification of knowledge (studied in

transcendental philosophy) was 'inconsistent with the work done in the *Critique of Pure Reason*' (p. 124).

I submit that Kant's notion of 'rational physiology' has little, if anything, to do with the notion of physiology as an investigation into the origin of concepts. Kant here uses the term 'physiology' in the classic sense: he is simply referring to the study of nature (*physiologia*). It is for this reason that 'rational physiology' contains *rational physics* (briefly, study of matter) and *rational psychology* (briefly, study of the soul) (A847/B875). The idea of physiology as an investigation into the origins of concepts appears to have little bearing on Kant's notion of 'rational physiology', nor, more generally, on his account of the structure of metaphysics (on the latter topic, see Falkenburg 2000).

Let us take a closer look at Kant's metaphysical writings in order to further substantiate this point. Kant developed his *rational physics* (a part of rational physiology) in his *Metaphysical Foundations of Natural Science* (1786). There, Kant provided a priori (metaphysical) foundations of kinematics, dynamics and mechanics. In this work, he argued, for example, that the extension and (relative) impenetrability of matter derive from fundamental (attractive and repulsive) forces (Carrier 2001), and that the laws of motion are constitutive of the concept of true motion (Friedman 1992).

In short, we find many analyses concerning the *presuppositions* of (proper) natural science. It is very questionable whether questions regarding the origin of concepts are central to Kant's concerns in the *Metaphysical Foundations*. If we consider writings such as the *Metaphysical Foundation*s, I think it becomes clear that questions regarding the origin of concepts are not as central to Kant's system as Mensch claims, and that appeals to epigenetic accounts of generation add little to our understanding of these writings.

We can criticize Mensch's reading of Kant's deduction of the ideas of reason on similar grounds (see van den Berg [in press]). In the *Critique of Pure Reason*, Kant argues that the origin of the ideas of reason ('soul', 'world', 'God') is traced to the form of syllogisms studied in logic. Commentators have therefore often tried to understand how these ideas are related to the forms of categorical, hypothetical, and disjunctive syllogisms. Whether this strategy has been successful or not, it seems clear that Kant's views on logic are central to his thought. Mensch agrees, but adds:

> In the same way, therefore, that Kant had shown that the logical table of judgments gave rise to the concepts when the judgments were applied to sensible intuition, Kant would next argue that logical inferences could be discovered as a point of origin for the ideas of pure reason (A312/B378). In each of these cases […], Kant appealed to logic because it could provide a 'genealogical tree' with respect to the question of origin. (p. 136)

My main problem with this reasoning is that it is not clear what the use of biological (organic) terminology adds to our understanding of Kant's deduction of the ideas of reason. What explanatory force does the appeal to biological terminology have when we try to make sense of an argument that is fundamentally based on a particular eighteenth-century conception of *logic*? We may also question the *adequacy* of the biological analogies in this context. Much of the content of eighteenth-century logic books can be properly presented and understood in the form of trees. But we should not understand these trees as genealogical trees: concepts and propositions do not reproduce in a biological sense (at least according to most eighteenth-century logicians). I conclude, therefore, that the scope of biological analogies in Kant's philosophy is more limited than Mensch claims.

Conclusion

I have presented some objections to Mensch's view that epigenesis is fundamental to Kant's transcendental philosophy. We have seen:

(i) that one can doubt whether Kant actually accepted the concept of epigenesis; (ii) that it is not clear why Kant took epigenesis, a theory which he often criticized, as a model for his transcendental philosophy; (iii) that one can doubt whether the appeal to epigenesis actually provides insight into the origin of cognition; (iv) that the significance of Kant's analogy between epigenesis and transcendental philosophy is limited if one, as Mensch does, strictly distinguishes between epigenesis as a biological theory and epigenesis as a philosophical notion; (v) that the scope of Kant's biological analogies and metaphors is more restricted than Mensch allows for.

Mensch has nicely documented the influence of the eighteenth-century life sciences on Kant's philosophical development. Her book is therefore a significant contribution to Kant scholarship. However, I would suggest that Kant's use of biological analogies and metaphors in his philosophical writings are simply meant to *illustrate* his philosophy.

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Note:

[1] Notice, however, that epigenesis is often not understood as just an embryological theory. Blumenbach, for example, developed an epigenetic theory based on the notion of the

Bildungstrieb that was also supposed to explain nourishment and regeneration (Richards 2000:18).

☞

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Reply to Breitenbach

By Jennifer Mensch

I want to thank Angela Breitenbach for taking the time to read and review my book Kant's Organicism. *I found her remarks insightful and indeed helpful for honing in on the central challenge facing any epigenesist reading of Kant's theory of mind. As Breitenbach rightly asks at the outset of Section 2 of her commentary, 'what is the status of this [epigenetic] model' for Kant? If it is functioning as something other than an analogy for him, how should we understand it?*

Apart from this question regarding the status of epigenesis as a model for Kant's theory of cognition, Breitenbach is also worried that I have 'not sufficiently explored' or developed enough my claim that the epigenesis of reason is metaphysically but not biologically real according to Kant. Regarding this latter point, I

think that Breitenbach is in fact right, and so I appreciate the opportunity here to better lay out the problem as I saw it when I was writing the book.

Kant's Anti-Nativism

Lets begin by clearing up the issues surrounding the status of the biological model since this will take us to the more general concern. There have been a number of writers over the years to worry about what this particular model might have meant for Kant. Most are of course aware that Kant urged epistemic caution regarding the various speculative hypotheses coming out of the life sciences at that time, so the immediate problem is to ask how it is that Kant—who was ready to dismiss the claims being made by generation theorists in the 1760s as not only uncertain, but unlikely—could nonetheless have been ready to repeatedly identify his own developing theory of cognition with epigenesis during the 1770s?

The fullest answer has a number of parts, even stages, in terms of Kant's developing system and that is why I laid out the central argument of *Kant's Organicism* as I did (the main work and citations for what follows lie in Chapters 4–6). For the purposes of this exchange I am going to have to be brief and so will just say that we can do away with one possible interpretive line from the start. For it is certainly not the case that Kant took himself to be investigating an empirical claim about our physical brains (hence Kant's dismissal of Tetens' position regarding this; see *Kant's Organicism*, Ch. 6). In making this point it is important to remember the epistemic context within which Kant's investigation was operating, and the significance, therefore, of the fact that he typically juxtaposed his own epigenetic theory with the 'preformation' system proposed by Leibniz and Crusius, on the one hand, and the 'physical influx' position advanced by sensationalists like Locke, on the other (Ch. 4 and also Ch. 5, p. 109). Once we remember that this is indeed the context within which epigenesis became an interesting third option between innatism and empiricism for Kant, we can begin to address Breitenbach's point.

Kant's Appeal to Epigenesis

It is possible for us to track the manner by which epigenesis became increasingly comprehensive in Kant's approach toward cognition as he worked on precisely this issue of "original acquisition", but before describing this I want to first just briefly rehearse three interrelated characterizations of epigenesis that are especially important for understanding the use Kant would make of the theory for his own purposes. The *first* characterization comes from a seventeenth century English physician named William Harvey. Harvey was interested in distinguishing the radical transformations taking place during 'metamorphosis' from the more gradual series of transformations that occurred during 'epigenesis'. In the latter case, Harvey tracked the manner by which a chick embryo developed, describing the process as the embryo's transition from an initially homogeneous state to one that was increasingly heterogeneous with respect to its parts.

The *second*, though related, characterization of epigenesis concentrated on the capacity of organic structures to be self-organizing during their development, growth, and repair. Although this capacity was oftentimes linked to either spontaneous generation or vitalism, there was in fact no consensus position regarding the nature of either the origin or the self-organisation of organisms. In the early decades of the eighteenth century the vitalist Peter Stahl, for example, attributed formation to an *anima* but distinguished his mechanistic conception from Leibniz's panorganic *entelechy*. In the 1760s, Casper Wolff understood epigenetic growth in terms of the organism's transition from liquid secretions to solidified parts, a vegetative process that was driven in some manner by a life force or *vis essentialis*. And by the 1780s, epigenesis had come to be identified with Blumenbach's *Bildungstrieb*, although Wolff was highly critical of this later iteration, insisting that force was in and of itself incapable of supplying also form.

The *third* characterization of epigenesis that would appear in Kant's writings understood epigenesis as a theory regarding the 'generic preformation' of form or species types in nature. In the 1780s, generic preformation was identified with Blumenbach's position insofar as the *Bildungstrieb* was said to be responsible for the realization of an ideal or generic form in the living, organic individual. Kant had in fact already envisioned a version of this in 1763 (*The Only Possible Proof of the Existence of God*), for as he saw it, generic preformation offered the most satisfying theoretical approach to the problem of understanding not only individual generation but the organizing principles at work within natural history as a whole. When speculating on the matter Kant thought that the generic forms had to be supernatural in origin, but he also found it preferable to believe that once this initial organization of nature into types had been accomplished, divine interference was at end: nature was expected to be actively involved in the generation of individuals—in their *erzeugen* as opposed to their mere *auswickeln*—an involvement which alone could

explain the existence of variation within nature.

These separate though related characterizations of epigenesis were applied differently by Kant depending upon whether he was thinking about cognition or biological organisms. For the most part, commentators have begun with Kant's statements regarding generic preformation—comments found alongside an endorsement of Blumenbach in the *Critique of Judgement*—and have sought to read Kant's theory of cognition and the epigenesis of reason through them. But while Kant's comments in 1790 demonstrate an underlying continuity in his thoughts regarding biological organisms since the 1760s, they do not in fact add anything to our understanding of what he meant by the epigenesis of reason. To really understand the distinctive role played by epigenesis for Kant's theory of cognition, therefore, we need to detach 'generic preformation' from the other two characterizations of epigenesis that were in play for Kant.

The Epigenesis of Reason

In order to discover the internal grounds for this detachment we need only remember again the specific epistemic context within which Kant's work on cognition began: his overriding desire to reorient, and thereby protect, metaphysics from the Humean challenge. Though initially conceived in terms of overcoming the problem of 'subreptive axioms', Kant had soon realized that the real task was instead to provide an account of cognition that could avoid scepticism without recourse to innatism. It was at this point that epigenesis provided 'a theory by which to work' for Kant. This was not epigenesis as generic preformation; that theory relied on supernatural forms to keep the species lines intact and was thus akin, for Kant, to both the 'mysticism' of Plato and the 'preformationism' of Leibniz.

In 1770, Kant wasn't entirely sure what to use as a replacement, but he was sure about one thing: innatism had to be rejected and so the original generation of the intellectual concepts would have to be emphasized instead. In the Dissertation, Kant relied on the mental laws for logical subordination as the basis for this generative work, while also leaving the origin of these laws unspecified. In 1781, Kant relied on these laws again, with the Metaphysical Deduction serving as the updated version of the older account's description of the 'real use' or means by which concepts could be generated. In the Critique, Kant explained that the logical table of judgement served as the metaphysical 'clue' for understanding the origin of the intellectual concepts because the latter were in fact those same judgements, only applied now to sensible intuitions. Having announced the isomorphic connection between the forms of judgement and the categories of experience, by 1781 Kant was also ready to be specific regarding the question of origin. Like all the heterogeneous faculties which together make-up the so-called 'transcendental apparatus', logic too had its origin in Reason. And Reason? Reason, as Kant explained in both the Transcendental Deduction and the Architectonic, was itself epigenetic or 'self-born' (see *Kant's Organicism*, Ch. 7).

This might sound radical, but before we get distracted by that, lets focus on the main point. Kant has a specific epistemic goal, the avoidance of scepticism and the achievement, thereby, of some kind of experiential certainty in the physical (if not the biological) sciences. Transcendental idealism, with empirical realism as its special yield, accomplishes precisely that. But it does so on the basis of a story that is being told about the formative control enjoyed by the mind in the case of experience. The transcendental conditions for the possibility of experience rely on the central faculties—reason, understanding, judgement—and their accomplishment of particular tasks. Kantians, on the whole, are not prepared to entertain questions regarding the ontological status of these mental faculties; if pushed, they might remember to quote Kant's line that 'the proud name of an ontology [...] must give way to the modest one of mere analytic of the pure understanding' (B303/A247). They will, moreover, emphatically reject a nativist reading of the faculties, even if they feel less confident in rejecting a supernatural origin altogether given the kinds of passing remarks one finds in the *Religion*. The safest interpretive route, most feel, is to just stick with Kant's agnosticism on the point.

In my own treatment of the matter, I described Kant as a 'metaphysician' in order to distance him from the consequences of identifying him as a nativist. I also said that he took the epigenesis of reason to be 'metaphysically real' in order to make it clear that he was not providing a biological account of the brain. But there is more to this assessment than a simple contrast. Kant takes the mind to be whole. As in Harvey's model, however, this original unity becomes increasingly heterogeneous, as logically distinct faculties emerge or become realized in the face of the various cognitive tasks required of it (*Kant's Organicism*, Ch. 7). As for Reason itself, the word Kant used for describing it is in a class of its own within his works: spontaneity. There is neither textual conflict nor indeed controversy regarding spontaneity as a basic definition of Reason, for Kant was clear in the *Critique of Practical Reason* regarding the

ontological identity between reason in either its theoretical or practical guise (Ch. 7), and if, by the end of the *Critique of Judgement*, he seemed to have relegated speculative reason to a lesser position in comparison to the free causality of practical reason, it was only because moral teleology had by then displaced the investigatory aims of physico-theology for Kant, making the clearer formulation of rational faith all the more pressing.

Reason, as Breitenbach nicely puts it for me, is 'self-determining and self-developing' and it is only as such that it could ground both the certainty of cognition within the sensible realm and our duties and character in the moral realm. And so it is in light of all this that I am hesitant to say that the biological theory of epigenesis functioned merely as an analogy for Kant. For after reviewing all the evidence surrounding Kant's use of epigenesis in cognition, he seems, in the end, to have thought of Reason as something that was in fact spontaneous and free, a self-born activity that was both cause and effect of itself. Despite the radicality of Kant's claim, it is easy to see that *only* such a claim could guarantee both morals and certainty against the threat of scepticism so far as Kant understood the stakes of Hume's challenge. Indeed, it was not the autochthonous status of Reason that Hegel criticized in Kant—it was the checks Kant put in place on Reason's power (*Kant's Organicism*, Ch. 7, n. 282).

In closing, let me just thank Angela Breitenbach once more for her review. I have not had the opportunity to read her book, *Die Analogie von Vernunft und Natur*, but given the interesting suggestion at the end of her commentary regarding the role of the symbol for thinking more clearly about the relationship between reason and nature, I am certain that I will profit from a careful reading of it. Finally, in light of Breitenbach's interest 'in a more detailed discussion of the implications of [the book's] historically motivated thesis for current debates', I will just mention a recent set of remarks made by Robert Hanna in a review essay dedicated to my book.[1] Although Hanna does begin by briefly outlining the main points in my *Kant's Organicism*, the bulk of his essay is devoted to issues that are perhaps closer to Breitenbach's own interests here.

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Note:

[1] R. Hanna, 'Kant's Anti-Mechanism and Kantian Anti-Mechanism', *Studies in History and Philosophy of Science, Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* (2014), in press.

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Reply to van den Berg

By Jennifer Mensch

In the Spring of 2002, Phillip Sloan, an expert on the history of the eighteenth-century life sciences—and on the French naturalist Georges Buffon in particular—published a paper on Kant in the Journal of the History of Philosophy.[1] *As an historian, Sloan was interested in fitting together various statements scattered across Kant's works that seemed to be making use of vocabulary borrowed from the life sciences. There were a number of candidates for investigation, but in this paper Sloan focused especially on three areas: on Kant's use of* Keim *and* Anlage *in his anthropological writings, on his appeal to 'generic preformation' for understanding species fixity in the third* Critique, *and most significantly for our purposes here, on his use of the terms 'epigenesis',* generatio aequivoca, *and 'preformation' in the reworked centrepiece discussion of the second edition* Critique of Pure Reason *(1787), namely the 'Transcendental Deduction of the Pure Concepts of the Understanding'.*

In his piece, Sloan carefully laid out the historical background necessary for appreciating the different generation theories in play during Kant's day. After gathering the evidence, he concluded that Kant's theory of cognition demonstrated 'a strongly limited version of epigenetic theory', according to which the categories, while not 'individually specific and implanted at the creation by an external deity', were nonetheless significantly constrained. When Kant identified his own account with epigenesis, Sloan argued, he never intended to endorse a 'a full-blown epigenetic thesis of some kind that overtly rejected the theory of preformed *Keime* and *Anlagen*', because *this* sort of thesis would 'mean that there would be no a priori structuring of the course of development, and all developing properties would be only as determined by a dynamic, plastic, vital force. This would undermine the fixity and determinate character of the categories and the stability of the species' (all citations 2002:245).

Generic Preformation and Epigenesis

Sloan's rationale for this interpretation importantly relied on his sense that Kant's appreciation for 'generic preformation'—a term that was used interchangeably by Kant with 'epigenesis', when introducing Blumenbach as the author of just such a theory for understanding species fixity in nature—would have

to be integrated into any account of Kant's use of epigenesis, that indeed it should serve as the interpretive lens for viewing epigenesis in the case of cognition.[2] The key textual evidence for Sloan in support of this came from a passage introducing the 'Analytic of Concepts' in the first *Critique*. In this section, Kant announces that he will be attempting to dissect the understanding itself

> in order to research the possibility of a priori concepts by seeking them only in the understanding as their birthplace and analyzing its pure use in general; for this is the proper business of a transcendental philosophy; the rest is the logical treatment of concepts in philosophy in general. We will therefore pursue the pure concepts into their first seeds and predispositions [*Keimen und Anlagen*] in the human understanding, where they lie ready, until with the opportunity of experience they are finally developend [*entwickelt*] [...]. (A66/B90–1)

Now it is not entirely clear how much use would have been made of Sloan's paper given the relatively few scholars looking at the use of biological language in Kant at the time. There was an excellent paper on the topic by Günter Zöller that had come out—unnoticed, so far as I can tell—in 1988, and in 2001 Claude Piché had discussed the epigenesis of experience in a collection of essays put together by Tom Rockmore, but these were two of only a dozen or so pieces explicitly concerned with the issue.[3]

But then, fate intervened for Sloan's interpretation. For in the years prior to Sloan's piece there was a great deal of work on Kant being done by another excellent historian of science, John Zammito. And for Zammito, the question of an integrated approach to Kant's biological vocabulary had remained long unsettled. When Sloan's essay appeared in 2002, it seemed to have resolved the issue for him, however, and from that point on, in paper after paper, Zammito endorsed Sloan's interpretation. And as my commentator here, Hein van den Berg, makes clear, he too is a dedicated fan. In the last few years, Zammito has in fact revised his own endorsement; as he put it in his reader's report on *Kant's Organicism* for the University of Chicago Press in the Fall of 2011: 'I can still cling to my view that Kant was never quite comfortable with epigenesis, but as a theory of nature, while I will concede with alacrity that he may well have been far more enamoured of it as a basis for metaphysics than I had conceived.'

Generic Preformation Versus Epigenesis

The key to understanding this concession is to recognise Zammito's new acknowledgement of the need to separate Kant's discussion of epigenesis as a kind of generic preformation at work in nature from the use Kant makes of it when formulating his theory of cognition. By 1765, Kant understood that any significant rehabilitation and defence of metaphysics would require its complete reformulation. The grounds for this reformulation centred on Kant's developing theory of cognition, a theory that would need to be capable of not only avoiding the spectre of subreption, but also meeting the great challenge that had been laid down by Hume. This is the epistemic context within which Kant began to formalise his theoretical programme in the 1760s, and it was against the backdrop provided by his first real attempt at such a theory, his Inaugural Dissertation of 1770, that Kant became ready to identify his own position with epigenesis as a position against the preformation system he took to be endorsed by Leibniz.

Sloan is thus quite right to see that Kant would never have endorsed the strong preformation theories held by von Haller or Bonnet. But when it came to cognition, Kant was not interested in a weaker version of preformation either so long as that entailed even a mild recourse to innatism. Sloan's worry that without this we 'undermine the fixity and determinate character of the categories', is thus misjudged. To make this clear we need only turn once more to the key passage for Sloan's interpretation, which I quoted above. As Sloan reads this passage, the language of A66 yields a 'preformationist appeal to the grounding of the categories on inborn *Keime* and *Anlagen*' (Sloan 2002:245). Does it? At A66/B90–1, Kant tells us that he will locate the birthplace of the categories in their first seeds and predispositions. What seeds are these? Sloan doesn't speculate, but we actually don't need to guess at all since the answer is provided by Kant in the very next section, namely 'The Clue to the Discovery of All Pure Concepts of the Understanding'.

In this section and what follows, Kant is clear regarding the manner by which the table of judgement grounds the table of the categories; it is indeed only because of this that the former can serve as a 'clue' in the first place, but it is also for this reason that we can do away with Sloan's worry over the determinate character of the categories. The proper focus for Sloan's interpretation should thus be on whether Kant takes the laws for logical subordination to be inborn. Sloan would have to say 'yes', given that he believes that Kant's reference to the epigenesis of reason at B167 must still somehow accommodate a weak version of preformation theory. Here though, the textual evidence works against Sloan's interpretation.

For Kant is relatively clear when it comes to the relationship between the faculties. He is clear that the understanding, for all its spectacular success when it comes to the construction of a coherent field of appearances, is nonetheless dependent upon Reason. To be specific, it is 'dependent' upon Reason in two significant ways: as is well known, Reason provides the principles which can alone unify and guide empirical investigations, but Reason is also taken by Kant to encompass the understanding and thus to serve as its seat. Although van den Berg does not seem to have made much sense of it, I do lay out a rather lengthy argument for this in Chapter 7 of my book, where I focus on Kant's account of transcendental affinity as the key to understanding the precise manner by which an epigenetic Reason is ultimately necessary for the success of the Transcendental Deduction.

Because van den Berg has followed Sloan's (and thus Zammito's) interpretation so fully, I have found it best to focus my response on the original piece. To put the whole matter in brief: the historians of science need to detach Kant's treatment of generic preformation in nature from the use he makes of epigenesis with respect to cognition. The primary textual resources for the latter stem primarily from the 1770s —the so-called 'silent decade'—and they are gathered from Kant's letters, his lectures, his notes, and the marginal notations he made alongside the textbooks he used for his classes. Many scholars such as Wolfgang Carl, Paul Guyer, Beatrice Longuenesse, Patricia Kitcher, have relied on these materials for making sense of Kant's theoretical programme during the silent decade. For researchers interested in Kant's biological vocabulary, however, attention during this decade has gone instead to Kant's published essays on race.

Kant's Epistemic Programme in Relief

By the end of the 1790s, that is, with the Critical system plainly in view, there are a number of published remarks pointing us toward the importance Kant placed on an organic approach toward Reason. It is helpful, nonetheless, to see the consistent manner in which Kant aligned his position with epigenesis in the *Nachlass* leading up to the publication of the *Critique of Pure Reason* in 1781. Indeed these notes indicate a separate problem for the interpretive approach taken by Sloan and his followers, and that is their failure to recognise the epistemic context within which epigenesis initially became attractive as a model for Kant theory of cognition in the first place. Kant left the 1760s determined to reorient metaphysics by way of attention to a new theory of mind. Central to this was Kant's sense that scepticism could only be avoided so long as the theories under attack by Hume—those held by the innatists and the empiricists in their various stripes—were also avoided. It was at precisely this juncture in Kant's development that epigenesis became a theory which seemed to offer an entirely different account of the generation of concepts.

This story regarding Kant's intellectual development—Kant's negotiation between rationalism and empiricism—is standard fare in any undergraduate course on the history of Modern philosophy, and it is so because it fits: it makes sense of Kant's work in the 1760s and 70s to formulate an epistemological programme, and it makes both the goals and the achievement of transcendental idealism all the more clear. Reading Kant's notes during the 1770s, it thus makes sense to see that even despite the seeming intrusion of biological vocabulary amidst the worries over logical subordination or the tasks allocated to the various faculties, Kant is consistent whenever it comes to the cast of characters he's up against: Plato, Leibniz, and sometimes Malebranche, grouped together by Kant as mystics, preformationists, supporters of involution, and believers in intellectual intuition; Aristotle, Locke, and Crusius on the other side, supporting 'physical influx' or *generatio aequivoca*; and Kant's own position in the middle, as an epigenesist. The 'real principle of reason', as Kant puts it early on, rests 'on the basis of epigenesis from the use of the natural laws of reason' (Refl., AA 17:492, cf. AA 17:554, 18:8, 18:12, 18:273–75).

Notes:

[1] P. R. Sloan, 'Preforming the Categories: Eighteenth-Century Generation Theory and the Biological Roots of Kant's A Priori', *Journal of the History of Philosophy* 40 (2002): 229–53.

[2] Taking Kant's attitude toward epigenesis in biological organisms as the key to interpreting his account of the epigenesis of reason is the approach taken by the majority of commentators. This is certainly true of John Zammito's several discussions indebted to Sloan's interpretation on this point, including most notably his article '"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, also referenced by Hein van den Berg in his commentary. Marcel Quarfood reaches different conclusions than

Sloan and Zammito regarding Kant's supposed attitude toward preformation, but he follows the approach starting with Kant's biological discussions when considering the epigenesis of reason; see his *Transcendental Idealism and the Organism. Essays on Kant* (Stockholm: Almqvist & Wiksell, 2004). This is also the case in Helmut Müller-Sievers's discussion of Kant in *Self-Generation: Biology, Philosophy and Literature around 1800* (Stanford: Stanford University Press, 1997), and in François Duchesneau, 'Épigenèse de la raison pure et analogies biologiques', in Duchesneau et al (eds) *Kant Actuel. Homage à Pierre Laberge* (Montreal: Bellarmine, 2000): 233–56.

[3] Compared to many of the issues surrounding Kant's theoretical philosophy, there has not been a great deal of work on Kant's appeal to epigenesis in the *Critique of Pure Reason*. The best short essays remain Günter Zöller, 'Kant on the Generation of Metaphysical Knowledge', in H. Obererer and G. Seel (eds) *Kant: Analysen-Probleme-Kritik* (Wurzburg: Königshausen and Neumann, 1988), pp. 71–90, and Claude Piché, 'The Precritical Use of the Metaphor of Epigenesis', in T. Rockmore (ed.) *New Essays on the Precritical Kant* (NY: Humanity Books, 2001), pp. 182–200. Hans Ingensiep's discussion in 'Die biologischen Analogien und die erkenntnistheoretischen Alternativen in Kants Kritik der reinen Vernunft B §27', *Kant-Studien* 85,4 (1994): 381–93, to which both Breitenbach and van den Berg refer, is significant for its attention to the distinctive philosophical requirements of the transcendental account. Here we should also note Ingensiep's response to the Sloan-Zammito interpretation: 'Organism, Epigenesis, and Life in Kant's Thinking', *Annals of the History and Philosophy of Biology* 11 (2006): 59–84, esp. pp. 70–3. An older essay offering definitions of the biological vocabulary used by Kant in the B-Deduction is provided by J. Wubnig, 'The Epigenesis of Pure Reason. A Note on the Critique of Pure Reason, B, sec. 27, 165–168', *Kant-Studien* 60,2 (1969): 147–52. A. C. Genova, also referenced by van den Berg, focuses on the epigenesis of reason in the B-Deduction, but primarily through the lens of Kant's later remarks regarding the epigenesis of organisms in the *Critique of Judgement*; see his 'Kant's Epigenesis of Pure Reason', *Kant-Studien* 65,3 (1974): 259–73.

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Varia

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