

# Hein v.d. Berg on Jennifer Mensch's "Kant's Organicism"

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Critique

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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 (*emboîtement*) 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" (B 167).

## 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. (A 65–6)

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. (B 145–6)

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 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 Foundations*, 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 (A 312/ B 378). 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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[1] Note, 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 Hein van den Berg