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A drive to develop and progress - Friedrich Blumenbachs "Bildungstrieb" in the context of the dawn of enlightened anthropology

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The German term *Bildungstrieb*, coined 1780 by Friedrich Blumenbach, contains a somewhat complex mesh of multiple meanings, which prove difficult to translate if one wants to uphold their ambiguity. The German *Trieb* can be translated as an “effort”, an “urge”, a “drive”, or - more lustful - a “desire” to do something. That something is *Bildung*, which means “development”, “formation”, and - at the same time - “education”. In the article he wrote 1780 for the *Göttingisches Magazin der Wissenschaften und Litteratur: Über den Bildungstrieb (Nisus formativus) und seinen Einfluß auf die Generation und Reproduction*, Blumenbach uses a Latin translation for *Bildungstrieb: nisus formativus* (Blumenbach 1780). With the Latin expression - translatable as an “effort, a struggle to form, to develop” - it becomes clear that Blumenbach uses the term in an apparent biological sense. Nevertheless, we should keep in mind the other possible meaning: A “striving for education”, the *Bildungstrieb* in a strictly human, a societal-cultural sense.

After his article in the *Göttingisches Magazin*, Blumenbach published a monograph first in 1781, and then in second edition 1789, and in third edition 1791, where he explains his concept of the *Bildungstrieb* in greater detail: In *Über den Bildungstrieb und das Zeugungsgeschäfte*, he describes his discovery of the *Bildungstrieb*, which he found by simply observing his surroundings. These observations made him rethink some of the doctrines he himself had believed and taught before: namely the theory of the preformation of all living beings, their development out of preformed, miniature versions of themselves, which existed inside eggs and seeds, sperms and ova practically since the beginning of time. The supporters of preformationism included Blumenbachs predecessor and teacher Albrecht von Haller and Italian priest Lazzaro Spallanzani (Blumenbach 1791, p. 26).

However, Blumenbachs private observations and experiments told him otherwise: A friend suffered a deep flesh wound, and the observation of its healing process prompted Blumenbach to reflect upon some simple biological experiments he had done on hydras earlier this summer, and which now appeared in a new light to him. It led him to speculate that every living creature - a polyp just like a human being - contains the same life force, an energy that creates and forms after a detailed plan and, in case of maiming, strives to reconstitute this ideal form (Blumenbach 1791, p. 31). Therefore, the *Bildungstrieb* is based on a three-staged principle: Following Blumenbach, all life is generated through procreation, through preservation (upkeep by means of nutrition), and through renewal, or rather, replication of the form in case of damage or injury. Following Blumenbach, all living beings grow in a certain, predetermined, but also highly individual way, the reproduction of cell tissue replace destroyed parts as precisely as possible as before, but never *exactly* like before. The *Bildungstrieb* as a force of life and growth takes effect in different directions. In every genus, every species, every individual it manifests differently, because the source material, the material of procreation, is different every time. That does not change the fact that it is always the same energy working - because all living creatures are separated from lifeless things by reason of their vitality, and that the base material differs depending on the genetic predisposition (Blumenbach 1791, p. 91). Though achieved

through partly experimental, scientific observation of nature, the *Bildungstrieb*, as Blumenbach describes it, is a *qualitas occulta* - it is not possible to prove it scientifically nor to study it in detail (Blumenbach 1791, p. 33; Heinz 2011, p. 181).

Together with the *vis cellulosa*, the *vis muscularis (irritability)*, the *sensibility* and the *vita propria*, the *nisus formativus* fundamentally distinguishes living organisms from inanimate things (Bäumer 1996, p. 203). Describing a self-organizing life force, Blumenbach's hypothesis of the *Bildungstrieb* is, at its core, a vitalistic principle (McLaughlin 1982). It seeks to refine and complement the theses of *irritability* and *sensibility* made by his predecessor in Göttingen, Albrecht von Haller, and the hypothesis of the *vis essentialis* by Caspar Friedrich Wolff, pioneer of epigenesis (Blumenbach 1791, p. 40). Blumenbach does not abandon these concepts altogether, but he disassociates his own theory from them rather explicitly: His ideal, he states repeatedly, is a prudent, an impartial, a reliable and somewhat versed scientific observation (Blumenbach 1791, pp. 58 and 68). As mentioned above, the *Bildungstrieb* is a result of direct observation of nature, of empirical procedures. At the same time, it cannot *explain* anything *per se*, and it does not give cause or reason. It is therefore remarkably self-conscious about its own role as a concept - and the accompanying limitations. To draw that line of thought even further: its self-awareness about its restricted insights can be interpreted as an expression of a self-reflexion of the scientist, of their own point of view.

In the context of the disputes of his time, between supporters of (pre-Darwinistic) evolutionary concepts, of preformationism, of epigenesis; in the context of new and improved technologies such as the microscope; of the new insights in embryology and physiology made in his time, Blumenbach's *Bildungstrieb* delivers an intermediary that fills the gap between a purely theoretical systematic approach on nature and its observing, empiricist counterpart. It presents itself as the answer to the question what it is, that divides the living and the not-living, and what in consequence makes the leap possible from inorganic to organized beings, and how this could be featured and represented in an enlightened philosophy of nature (Blumenbach 1791, pp. 79 and 80). In this way, it is able to conciliate between the theories of Linné (his systematic classification of all creatures) and Buffon (his compelling tracing of evolutionary development in natural history) and manages to sneak a historical view on nature itself into the ideas and conceptions (McLaughlin 1982, p. 361). With that comes the concept of development, not only of individuals, but also of species.

Not to be mistaken: Blumenbach himself did not have a modern evolutionary view on life or on the development of species. This was roughly 150 years before morphogenesis, and 200 years before a proper evolutionary developmental biology. Nevertheless, what hides behind the *Bildungstrieb* is the beginning of a comprehension of the underlying historicity, of a continual change of life after specific, natural, evolved guidelines (Dougherty 1996, pp. 155 and 159). Only on the base of the natural historical theories of the 18th century, a theory of evolution in 19th century could be hypothesized and proven (Bäumer 1996, p. 256).

Here, two points are important: First, like stated before, it is remarkable how self-aware of its own intermediary role the concept of the *Bildungstrieb* like Blumenbach presents it is. Though vitalistic and simultaneously based on mechanistic principles, Blumenbach's concept manages it to be surprisingly modern by evading its incorporation into a motionless, classified system with an applicability that demands to be accepted as universal. Blumenbach himself distinguishes between nature, as it presents itself to the scientist: a universal, helping, constructive force, that might never be grasped in its whole complexity by a human, purely theorizing, ungainly science - thus, the order that the scientist forces upon nature, after observing it.

Second, to widen the scope: though there is a limited, scientific, biological background Blumenbach himself intended and wrote his theories in, another important aspect opens up, if one follows the career the term *Bildungstrieb* had at the end of 18th century (Heinz 2011).

Namely, writers like Georg Forster, Friedrich Schlegel, Immanuel Kant, Friedrich Schelling and others reinterpret the term and avail themselves to the variety of meaning it harbors. Forster emphasizes especially the dynamic principle of an individual force of life that is different and peculiar in every creature it manifests itself in (Forsters Werke, Achter Band, p. 187). This applies to every single living being but is - in context of 18th century anthropology - most interesting with regard to human beings; and here, in particular, to human intellectuality. There is a metaphorical, metaphysical leap in Forsters reflections that is most notable: The vitalist aspect of the *Bildungstrieb* concentrates on the distinction of living and inanimate things; the natural historical part allows the tracing of the emergence, the succession and the extinction of species and lies therefore the groundwork for an evolutionary perception of nature. In the wake of 18th century anthropology, however, the concept of a striving to develop with regard to the human mind becomes another argument in favor of human (intellectual) superiority and exceptional evolution, of human perfectibility. Furthermore: it becomes self-aware in the human context and hence has an active component to it - human beings reflect upon their own stance in their own classification, upon changing their position by enforcing a further progression. In *Von der Weltseele*, Schelling discusses the speculative aspect of the term as its merit and makes it available for the approach and interpretation of a more idealistic, romantic philosophy of nature (Schelling 1798).

It is at this point that I would like to evoke the difficulties I had at the beginning with translating the term of the *Bildungstrieb*: Considering the emphasis the enlightened thinking put on the general progress of human society, on universal education and critical reflection, it could be used to reconcile the two concepts that clash in 18th century anthropology - that of humans in their biological, natural restrictions and that of humans as self-aware, metaphysical beings with an urge to educate themselves and to develop even further. This urge to know and to progress would be a universal human aspect, collective and common in all people. Therefore, it could unify and be used as a base for communication and discussion, a bridge concept. A bridge concept, one might like to add, is what is searched for anew - or rather, still! - to reconcile humanities and social sciences with natural and engineering sciences (e.g. Weizsäcker 1989).

The question of development is one of many problems of modern biology and bioethics that have their roots in the debates of 18th century and the scientific controversies of the newly enlightened world (Robert 2004). Against this backdrop, the terminology of the philosophy of nature and the history of biology - or rather, the historicisation in biology - and in this context, the *Bildungstrieb*, proves to be interesting and still relevant.

References

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