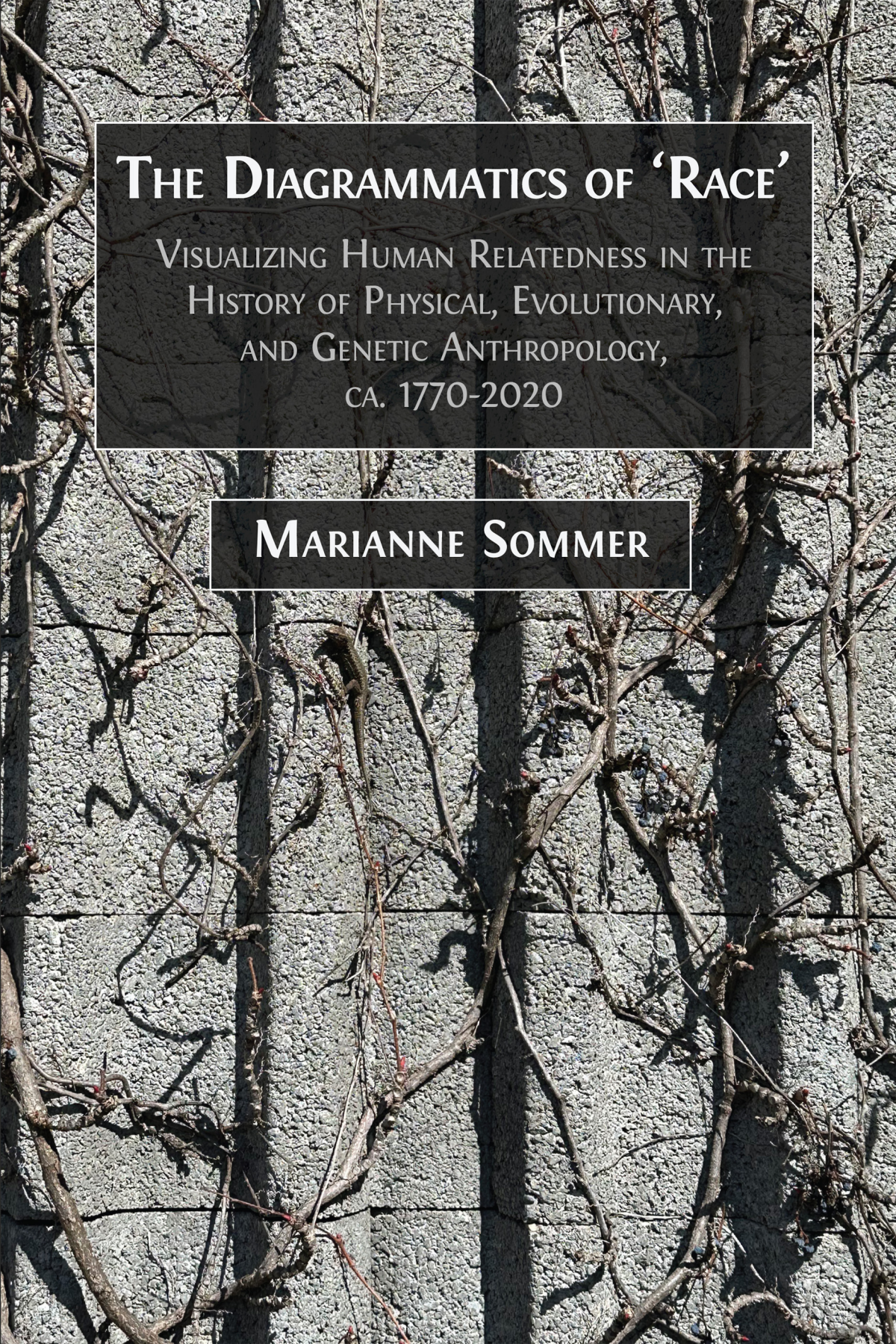

The Diagrammatics of 'Race'

Visualizing Human Relatedness in the History of Physical, Evolutionary, and Genetic Anthropology, ca. 1770-2020

Marianne Sommer

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8. Map, Scale, and Tree in Darwin, Haeckel and Co.: The Genealogy of the Human Species

Desmond and Moore have shown that "[h]uman genealogy was more than a metaphor for Darwin's common-descent evolution. It was the prototype explanation" (2009, 375), that "racial unity was his starting point for explaining the common descent of all life using a pedigree approach" (126). Thus, like Buffon and others before him, Darwin worked with the concept of genealogy; for him, the application of family genealogy and the family tree to human history and kinship and beyond was more than metaphoric.[1] However, in spite of Darwin's strong reliance on genealogy, I argue that he was less interested in "a chartable pedigree of the whole of life" (Desmond and Moore 2009, 141) than in the mechanisms that shaped that pedigree. Furthermore, where the diagrammatics of relatedness are concerned, Darwin's use of language suggests that he was still strongly influenced by the great chain of being. In fact, Darwin does not use the word 'tree' in the sense of a genealogical tree in *The Descent of Man* (1871ab), and he very rarely draws on tree-related metaphors such as 'branch' or 'stem'. These are mostly contained to his discussion of primate phylogeny. Interestingly enough, Darwin drew a phylogenetic tree of the primates in the context of his work on *Descent*, but he did not include it in the book (Voss 2010, 243).

That Darwin did not omit his tree of the primates due to a general disregard for the value of images in the generation and communication

1 Arthur J. Thomson has noted that already Kant "speaks of 'the great Family of creatures, for as a Family we must conceive it, if the above-mentioned continuous and connected relationship has a real foundation'" (1909, 6).

 https://doi.org/10.11647/OBP.0396.10

of knowledge becomes clear from their importance to his work. Scholars like Julia Voss (2010) have shown the enormous epistemic power the production and use of images had for Darwin. They have also brought to light the relations to the arts and the wider context of Darwin's visual culture (e.g., Donald and Munro 2009; Smith 2009). Against this backdrop, it comes as a surprise that there are no images of humans in *Descent* (1871ab), except of a human embryo and ear, even despite the book's main title. The imagery that is mostly taken from publications of other authors – such as Alfred Brehm's *Tierleben* – largely concerns Darwin's reasonings on sexual selection in animals. Regarding *Descent*, Voss (2010, Ch. 3) thus mainly focuses on the famous pictures of (the ornaments on) the Argus pheasant's feathers. More specifically regarding my interest, scholars have studied Darwin's diagramming in the context of his scientific practice, in the context of thinking about phylogenies (Priest 2018). So why not publish the phylogeny of the primates that he drew when working on *Descent*?

The omission of the tree diagram from the publication seems all the more significant considering Heather Brink-Roby's argument with regard to Darwin's famous foldout 'tree-like' diagram in *On the Origin of Species* (1859) that the seriality of written language made naturalists like Darwin recognize the necessity for diagrams to convey their novel understanding of natural relations as non-linear (Brink-Roby 2009). At the same time, it has become clear that naturalists devised diagrams other than tree structures for nonlinear conceptions, that branching structures did not have to stand for evolutionary relations, and that these could still represent mostly linear and progressive models. Furthermore, as Redfield's earliest trees that include the human 'races' indicate, tree thinking and iconography may produce 'racial hierarchies'. As we will see, the tree structure can even be seen as reifying what Darwin is said to have combated: polygenism. So how exactly did Darwin capture the descent of 'man'?

In the first chapter of *Descent*, Darwin elaborated from comparative anatomy, comparative embryology, and rudimentary organs that 'man' descended from the animal kingdom. In the process of reconstructing man's genealogy – or "pedigree" (Darwin 1871a, 213), as he also called it – he employed words from the semantic field of the *scala naturae*. He tried to establish hierarchies of infinite gradations, specifically with regard to mental powers, throughout the animal kingdom and within humankind:

> We must also admit that there is a much wider interval in mental power between one of the lowest fishes, as a lamprey or lancelet, and one of the higher apes, than between an ape and man; yet this immense interval is filled up by numberless gradations. Nor is the difference slight in moral disposition [...] and in intellect, between a savage who does not use any abstract terms, and a Newton or Shakspeare [sic]. Differences of this kind between the highest men of the highest races and the lowest savages, are connected by the finest gradations. Therefore it is possible that they might pass and be developed into each other. (Darwin 1871a, 35)

As we have seen, the *scala-naturae* concept and image stem from a time before Darwin and predate an evolutionary conception of the living world (Lovejoy 1964), but the associated notions of a complete chain, a series without gaps, and a hierarchy of infinite gradations have a strong presence in Darwin's wordings, as is further exemplified in these phrases: "the animals which come next to him ['man'] in the series"; "[i]n the vertebrate series"; "some animals extremely low in the scale"; "the ascending organic scale" (1871a, 36, 46, 106). From a reasoning in terms of a scale in matters of instincts and mental faculties, Darwin consequently conveyed the evolution of cultural traits such as 'religion' along similar lines: "The same high mental faculties which first led man to believe in unseen spiritual agencies, then in fetishism, polytheism, and ultimately in monotheism, would infallibly lead him, as long as his reasoning powers remained poorly developed, to various strange superstitions and customs" (68).

One of the basis of evidence for Darwin's gradual scale of physical, mental, and cultural development was the use of ontogeny as an analogy for phylogeny:

> In a future chapter I shall make some few remarks on the probable steps and means by which the several mental and moral faculties of man have been gradually evolved. That this at least is possible ought not to be denied, when we daily see their development in every infant; and when we may trace a perfect gradation from the mind of an utter idiot, lower than that of the lowest animal, to the mind of a Newton. (Darwin 1871a, 106)

Even though Darwin turned what appeared to him to be contemporary developmental and 'racial' scales into progressive evolutionary lines of descent, the way in which the parallel between ontogeny and phylogeny was conceptualized had undergone a change. Karl Ernst von Baer's

(1828–37) description of ontogeny as a process of differentiation and individuation had been analogized to the view of evolution as a system of divergent development. Thereby, the ideal (*Naturphilosophie*) and/or non-evolutionary (Cuvier, Richard Owen, von Baer) notion of archetypes of taxonomic groups such as fish, reptiles, birds, and mammals had been turned into real common progenitors, even if their fossil bones had not yet been found.[2] As we have seen, Cuvier worked with a system of *embranchements* to arrange the animal kingdom, and his writing that Darwin had taken onto the *Beagle* was one site where the latter met with the idea of "the various branches of the great family of mankind" (Cuvier 1827, 155). Now Darwin integrated von Baerian embryology and a view of evolution as a process of divergence in a recapitulationist framework. Already in the notebooks of the late 1830s, he had embraced recapitulation theory; in *On the Origin of Species* (1859), he argued:

> As the embryonic state of each species and group of species partially shows us the structure of their less modified ancient progenitors, we can clearly see why ancient and extinct forms of life should resemble the embryos of their descendants, – our existing species [...] Embryology rises greatly in interest, when we thus look at the embryo as a picture, more or less obscured, of the common parent-form of each great class of animals. (449–50)

The von Baerian principle of differentiation suggested not a linear scale as the natural system but a tree structure. In his scandalous, because transformationist, *Vestiges of the Natural History of Creation* (1844), Robert Chambers had actually deduced an evolutionary tree-like diagram from embryological reasoning (see Figure II.17; Archibald 2014, 68–69). According to this diagram, the fetus of all the classes advances up to point A, then the embryological path of the fish diverges, the same is true for the reptiles and birds at later stages in the advance to the mature mammals. Chambers prompted his readers to continue the diagram in their heads, adding more and more ramifications as they included the orders, tribes, families, genera, and so on in the diagram "of the affinities of genealogy" (Chambers 1844, 212–13; quote from Chambers 1845, 73; see also Bowler 2021, 55).

2 On recapitulation theory see Russell 1916; Ospovat 1976; Gould 1977; Sommer 2005a, 238.

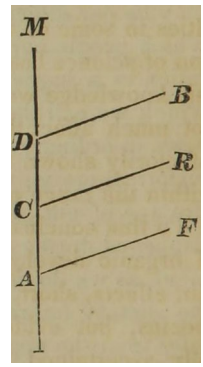

Fig. II.17 "Diagram". Robert Chambers, *Vestiges of the Natural History of Creation* (London: John Churchill, 1844), p. 212. Public domain.

The tree structure could also solve another problem that appeared when adding a time-dimension to the animate world: some living animal groups seemed not to have been modified as much as others. As Darwin wrote in *Descent*: "Some old forms appear to have survived from inhabiting protected sites, where they have not been exposed to very severe competition." Only within the structure of a tree can such 'old' contemporary forms not only be explained, but also provide insights into phylogeny, for "these often aid us in constructing our genealogies, by giving us a fair idea of former and lost populations" (1871a, 212). There appeared to be a simultaneity of the non-simultaneous visible in the current organismic diversity, a phenomenon that complicated kinship and could only be accommodated by the tree model. In the conclusion to the sixth chapter of *Descent*, Darwin once more expressed the importance of von Baerian embryology for this kind of genealogy of the living world:

> The best definition of advancement or progress in the organic scale ever given, is that by Von Baer [sic]; and this rests on the amount of differentiation and specialisation of the several parts of the same being, when arrived, as I should be inclined to add, at maturity. Now as organisms have become slowly adapted by means of natural selection for diversified lines of life, their parts will have become, from the advantage gained by the division of physiological labour, more and more differentiated and specialised for various functions [...] But each organism will still retain the general type of structure of the progenitor from which it was aboriginally derived. In accordance with this view it seems, if we turn to geological evidence, that organisation on the whole

> has advanced throughout the world by slow and interrupted steps. (Darwin 1871a, 211)[3]

Thus, the model of differentiation from the homogeneous to the heterogeneous, from the simple to the complex, though taking the form of a tree, still allowed for progress in the "organic scale". Correspondingly, Darwin's sixth chapter is about the "Position of man in the animal series" and at the same time about the proof that "The natural system [is] genealogical" (Darwin 1871a, 185). In fact, despite the renewed reference to the series, this chapter relates to the tree of primates that Darwin drew on 21 April 1868, but did not publish in *Descent* (see Figure II.18). J. David Archibald (2014, 106–112) provides a close reading of the diagram and reconstructs the steps through which it possibly went. In the following, I focus on how far it corresponds with the passages in *Descent*, and it seems that said Chapter 6 is the verbal consequence of the drawing experiment with ink on paper.

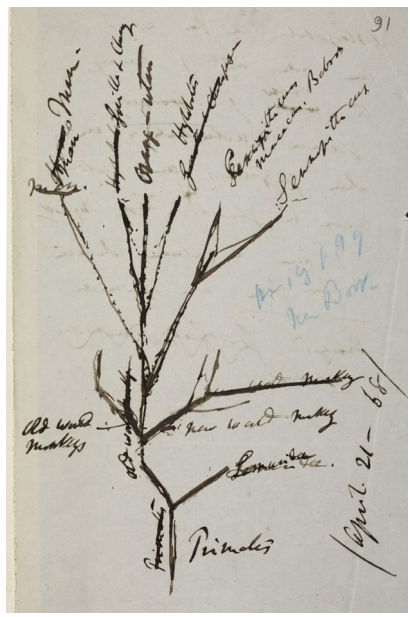

Fig. II.18 Tree of primates by Charles Darwin (Cambridge University Library MS DAR 80; B91r, https://cudl.lib.cam.ac.uk/view/MS-DAR-00080/227, all rights reserved). Reproduced by kind permission of the Syndics of Cambridge University Library.

3 Note that one of Darwin's unpublished pages from the 1850s actually shows his experimenting with combining comparative embryology and phylogeny in the construction of genealogical trees (Priest 2018, 162–64).

Darwin agreed with Linné and Thomas Henry Huxley that humans did not constitute a separate order from the primates. He suggested that it was a question of how to weigh which characteristics. Darwin had worked with the "simile of tree and classification" for some time (Darwin to Hooker, 23 December 1859, in F. Darwin 1887, Vol. II, 247), and following the metaphor of the tree, he could now speculate about some branches growing faster than others in the tree of the primates:

> If we imagine three lines of descent proceeding from a common source, it is quite conceivable that two of them might after the lapse of ages be so slightly changed as still to remain as species of the same genus; whilst the third line might become so greatly modified as to deserve to rank as a distinct Sub-family, Family, or even Order. But in this case it is almost certain that the third line would still retain through inheritance numerous small points of resemblance with the other two lines. (Darwin 1871a, 195)

Although attaching most importance to the great modifications, and thus providing 'man' with a special place would be "the safest", the many little similarities seemed to suggest that integrating 'man' within the primates was "the most correct as giving a truly natural classification" (Darwin 1871a, 195).

As visualized in Figure II.18, Darwin went further than Huxley (1869, 99) and concluded that "under a genealogical point of view it appears that this rank [of a Sub-order] is too high, and that man ought to form merely a Family, or possibly even only a Sub-family" (Darwin 1871a, 195). Also in agreement with his drawing of the tree, he suggested that a group resembling the progenitors of the *Lemuridae* "branched off into two great stems" (213), old world monkeys and new world monkeys. And via the progenitors of the *Lemuridae*, one could connect the primates to "forms standing very low in the mammalian series" (202). Again "under a genealogical point of view", 'man' was "an offshoot from the Old World Simian stem" (196). Humans belonged to the branch of the anthropoid apes (in the image labelled "Gorilla&Chimp", "Orang-utan", "Holybates") that was separate from the branch of *Semnopithecus* on the one hand and that of *Macacus* ("Cercopithecus", "Macacas", "Baboons" on the tree) on the other. "[S]ome ancient member of the anthropomorphous sub-group gave birth to man" (197), and because – as evident in the tree – the gorilla and chimpanzee were closest to 'man', one could speculate on an African origin of the human stem (199).

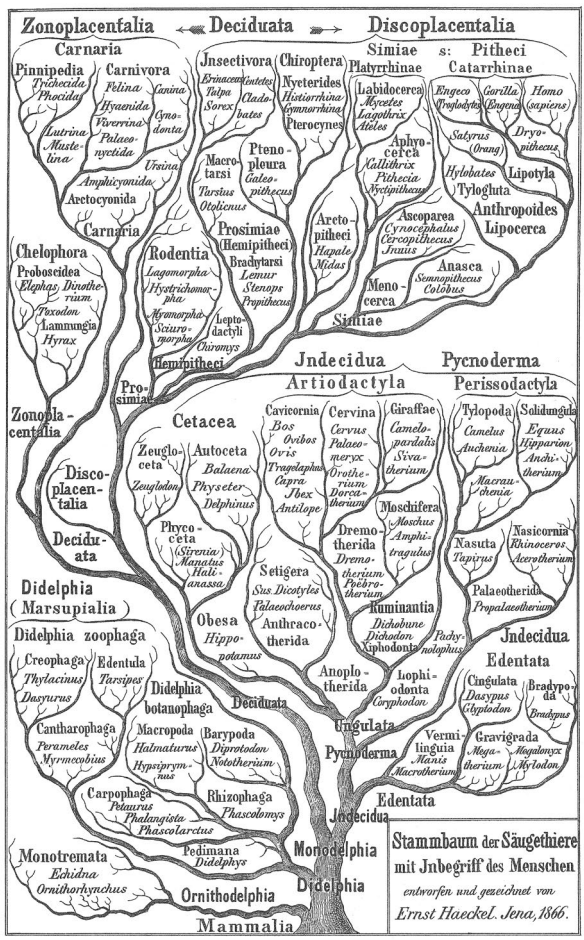

Fig. II.19 "Stammbaum der Säugethiere mit Inbegriff des Menschen" [Family tree of the mammals including humans]. Ernst Haeckel, *Generelle Morphologie der Organismen* (Berlin: Walter de Gruyter, 1866), Vol. II, Plate 8, appendix. Wikimedia, public domain, https://commons.wikimedia.org/wiki/File:Ernst_Haeckel_-_Stammbaum_der_S%C3%A4ugethiere_mit_Inbegriff_des_Menschen_(1866).tif

However, although Darwin verbally drew his tree of the primates, using language such as 'stock', 'common source', 'stem', 'diverge', 'branch (off)', 'lines (of descent)', 'offshoot', etc., he simultaneously relied on the metaphor of the chain of being, as when he wrote about "[t]he great break in the organic chain between man and his nearest allies, which cannot be bridged over by any extinct or living species […]" (1871a, 200).

This again shows how the thinking along the lines of scales and chains that form linear hierarchies was carried over to a certain extent into the novel understanding of evolution as divergent also by Darwin. As we have already seen, he certainly used vocabulary denoting progress: "In accordance with this view it seems, if we turn to geological evidence, that organisation on the whole has advanced throughout the world by slow and interrupted steps. In the great kingdom of the Vertebrata it has culminated in man" (211–12).[4]

As discussed in the preceding chapter, when Darwin wrote *Descent*, tree-like images to capture classifications of fossil and extent forms, even such that included humans, were no longer a novelty. In fact, there already existed trees to represent understandings of phylogeny. Prior to the drawn tree of primate evolution, Darwin himself had experimented with tree-like structures on more than a dozen sheets of paper, among them an earlier and more rudimentary version of a primate phylogeny – none of which he published, however, with the exception of the one diagram that entered *On the Origin of Species* (1859) (Archibald 2012; 2014, 80–112). Francesca Bigoni and Giulio Barsanti (2011) have also drawn attention to the evolutionary primate trees of 1865 and 1867 by the British zoologist St. George Mivart that included *Homo* and predated Darwin's tree in question here, and on which Darwin drew with regard to his "genealogy of man" (1871a, 185, 196–97, quote from title of Ch. 6).

However, those who preceded Darwin with the application of antiquity and evolution to humankind, and to publications of whom Darwin referred in the introduction of *Descent* (1871a, 4), did not include human phylogenies therein: Huxley (1863), Lyell (1863), Carl Vogt (1863ab), Wallace (1864), John Lubbock (1865), Friedrich Rolle (1866), Ludwig Büchner (1868), and others.[5] The exception was Haeckel,

4 On the ambiguities in Darwin's thinking that found expression in the metaphor of the tree that could encompass teleology and hierarchical judgment as well as accommodate social inequality, see also Hellström 2012.

5 In their influential books, Huxley, and to a lesser extent Lyell, made use of the kinds of diagrams that we have found introduced into anthropology in Part I in order to establish hierarchical ('racial') series (for example superimpositions of skulls), including the 'fossil races', but they did not provide phylogenies. Huxley had published an article in which he included a diagram to show his classification of the human stocks on the basis of hair structure, skull shape, and skin and hair color (1865, 269). He did not discuss this in terms of phylogeny, however. Darwin

whom Darwin (1871a, 4) singled out from among his precursors with regard to human evolution. Haeckel had published eight phylogenies in the form of trees in *Generelle Morphologie der Organismen*, among them a "Stammbaum der Säugetiere" [family or genealogical tree of the mammals] that contained *Homo* at the upper right hand of the image, in 1866 (see Figure II.19 above), the year Emma Darwin wrote into her diary "Prof. Haeckel came".[6] Darwin reported to Haeckel that Agassiz "was very savage at [Haeckel's] genealogical tables", which is in line with the above observation that Agassiz was aware of the support the tree diagram could lend to evolutionary theories (theories that Agassiz opposed).[7] Unimpressed by critics, Haeckel followed up with tree-like genealogies in *Natürliche Schöpfungsgeschichte* (1868), and, with *Anthropogenie* (1874), there would soon be the famous "Stammbaum des Menschen" [family tree of man] in the form of an oak with humans as the crown (Haeckel 1874, Table 12).[8]

Darwin informed Haeckel that he had shortened in his manuscript of *Descent* some of the subjects that Haeckel had treated, instead referring his readers to Haeckel. And indeed, Darwin did refer to both *Morphologie* and *Schöpfungsgeschichte* in the chapter on human genealogy in *Descent* (1871a, 199, 203; Darwin to Haeckel, 23 June 1870, in *Ernst Haeckel Online Briefedition*, Ernst Haeckel Haus Jena, https://haeckel-briefwechsel-projekt.uni-jena.de/de [hereafter EHA Jena], A 9877). So why not follow Haeckel also with regard to publishing the primate phylogeny? Why did Darwin use words to draw his primate tree but did not publish the diagram? In fact, Darwin considered Haeckel's trees too speculative, and when Haeckel had sent him a "genealogical tree" by letter, he expressed disagreement with aspects of it (Darwin to Haeckel, 30 March 1868, EHA Jena, A 9870). Later that year, Darwin had written the following to Haeckel, after struggling with *Morphologie* and while

(1871a, 229) drew on this paper in *Descent* to connect his evolutionary to the monogenist perspective.

6 21 October 1866, Emma Darwin's Diary 1824–82, entry for 1866, CUL-DAR242[.30] (in Wyhe 2002). It appears to have been their first personal encounter (Darwin to Haeckel, 20 October 1866, in *Ernst Haeckel Online Briefedition*, Ernst Haeckel Haus Jena, https://haeckel-briefwechsel-projekt.uni-jena.de/de [hereafter EHA Jena], A 9864).

7 Darwin to Haeckel, 4 July 1867, EHA Jena, A 9868.

8 For reproductions of Haeckel's trees, also from other than first editions, see Pietsch 2012, 98–122.

"reading a good deal" in *Schöpfungsgeschichte*, the style of which was "beautifully clear and easy" (Darwin to Haeckel, 19 November 1868, in F. Darwin 1887, Vol. 3, 104; see also EHA Jena, A 9873):[9]

> Your boldness, however, sometimes makes me tremble, but as Huxley remarked some one must be bold enough to make a beginning in drawing up tables of descent. Although you fully admit the imperfection of the geological record, yet Huxley agreed with me in thinking that you are sometimes rather rash in venturing to say at what periods the several groups first appeared. (Darwin to Haeckel, 19 November 1868, in F. Darwin 1887, Vol. 3, 105)

Similarly, in the fifth edition of *On the Origin of Species* (1869 [1859], 515) of around that time, Darwin adopted Haeckel's term 'phylogeny', but considered Haeckel's actual drawings of the lines of descent "bold[]" and "in the future" of classification. It is also noteworthy that in the letter to his "dear Haeckel" quoted above, Darwin used the word 'tables' instead of 'trees', again referring to an older tradition of visualizing natural affinities. As stated at the beginning of this chapter, the word 'tree', in the sense of phylogenetic tree, is absent from *Descent*, and on the reverse side of the paper on which Darwin drew the never-published primate family tree, he wrote: "Arrangement as far as I can make out by comparing the ~~work~~ views of ~~Huxley~~ various naturalists as

9 However, Darwin later wrote to Haeckel, after having received the fourth edition of *Schöpfungsgeschichte* of 1873, that he had never been able "to read it thoroughly in German" (Darwin to Haeckel, 25 September 1873, in F. Darwin 1887, Vol. 3, 180). *Morphologie* was never translated and *Schöpfungsgeschichte* only appeared in English in 1876. Of course, Darwin would have had no problems studying the images. The answer to the question of how well Darwin was acquainted with the text of *Schöpfungsgeschichte* is further complicated by what Darwin wrote about it in the introduction of *Descent*: "If this work had appeared before my essay had been written, I should probably never have completed it. Almost all the conclusions at which I have arrived I find confirmed by this naturalist, whose knowledge on many points is much fuller than mine. Wherever I have added any fact or view from Prof. Häckel's [sic] writings, I give his authority in the text, other statements I leave as they originally stood in my manuscript, occasionally giving in the foot-notes references to his works, as a confirmation of the more doubtful or interesting points" (1871a, 4). While Darwin had obviously been first with his evolutionary theory and very much welcomed Haeckel's great support in campaigning for it, Haeckel had applied an evolutionary perspective to humans prior to Darwin, and even though Darwin paid tribute to this in his introduction to *Descent*, Haeckel felt he could have referenced his work more.

in whose judgment much reliance can be placed – For myself I have no clues whatever to form an opinion" (Cambridge University Library MS DAR 80; B91v, cited in Archibald 2014, 112).

In short, although for Darwin tree drawing obviously constituted an important technique of mental experimentation on evolutionary mechanisms as well as organismic relations, he was cautious with regard to fleshed-out phylogenies, and indeed hardly ever entered the names of taxa into his nearly twenty unpublished tree-like sketches (for a discussion and reproductions of the drawings, see Archibald 2014, 80–112). In the context of his paraphrasing the tree of primate phylogeny in *Descent*, Darwin hinted at his reservations about attempts at reconstruction beyond the mammals:

> In attempting to trace the genealogy of the Mammalia, and therefore of man, lower down in the series, we become involved in greater and greater obscurity. He who wishes to see what ingenuity and knowledge can effect, may consult Prof. Häckel's [sic] works. I will content myself with a few general remarks. (1871a, 203)

With reference to Haeckel's genealogical diagrams in *Generelle Morphologie* (1866) and, with regard to 'man', in *Natürliche Schöpfungsgeschichte* (1868), Darwin in this passage of *Descent* once more brought to the fore the force of the tree as an icon that can combine a dendritic pedigree with serial or linear progress. The imagery in the quote appears geological, with the strata lower in the series being less illuminated. This coalesces nicely with the notion that Darwin himself would dare only a few remarks on a subject largely in the dark, so that Haeckel's so-called "ingenuity" seems to denote 'inventiveness'. As already alluded to, specific phylogenies by Haeckel were contested by others,[10] and Darwin was not alone in criticizing Haeckel's bold speculations – Rudolf Virchow, for one, even called him a "fanatic" with regard to his construction of overall concrete

10 E.g., Wilhelm Olbers Focke to Haeckel, 1 July 1867, EHA Jena, A 1840; Wilhelm Heinrich Immanuel Bleek to Haeckel, 25 May 1869, EHA Jena, A 7050; Wilhelm Breitenbach to Haeckel, 20 September 1895, EHA Jena, A 5951; Wilhelm Breitenbach to Haeckel, 18 March 1908, EHA Jena, A 6043.

systems of descent in the form of family trees (my translation from Virchow to Haeckel, 25 January 1868, EHA Jena, A 43743).[11]

Haeckel was obsessed with family genealogy as well as evolutionary phylogeny, which were often more or less humorously linked in his correspondence (see, e.g., his correspondence with Max Fürbringer, EHA Jena; Ernst Haeckel to Charlotte Haeckel, 8 February 1868, EHA Jena, A 38707). But could it be that Darwin also thought of Haeckel's trees as too progressive and even teleological, as too hierarchical, and, in some cases, as too focused on humans? After all, Haeckel put Darwin's theory on a par with Lamarck's and Johann Wolfgang von Goethe's, thus emphasizing the inheritance of acquired characteristics and particularly his biogenetic law, the very strong expression of the notion that ontogeny recapitulates phylogeny. In Haeckel's work, the merging of the *scala naturae* with the branching structure is obvious in his derivation of the tree from the line: the ontogeny and evolution of one species are progressive and linear processes; the tree form that mirrors the natural classification system only results from comparative embryology and paleontology. Haeckel referred to this phenomenon as the three-fold parallelism, a parallelism in tree structure. It allowed humans to remain the apex of evolutionary history (Haeckel 1868, 227–58; on Haeckel's tree building, see Dayrat 2003; Sommer 2015b, 40–45).

For Darwin, to the contrary, if 'man' was the apex of the living world, as many passages in *Descent* suggest, then this was the result of contingence and could only be seen in retrospect, by this very being who had acquired a high degree of intelligence and who tended to form the world in its own shape:

> Thus we have given to man a pedigree of prodigious length, but not, it may be said, of noble quality. The world, it has often been remarked, appears as if it had long been preparing for the advent

11 Darwin had generally cautioned Haeckel against expressing his views too loudly and attacking other opinions too forcefully. It seemed to him "doubtful policy to speak too positively on any complex subject however much a man may feel convinced of the truth of his own conclusions" – in contrast to such an approach, Darwin saw the merit of his own work in "the large accumulation of facts by which certain positions are I think established" (Darwin to Haeckel, 12 April 1867, EHA Jena, A 9866). Again, it seems that statements like "I [...] admired the boldness of your expressions" might have been polite talk (Darwin to Haeckel, 19 July 1864, EHA Jena, A 9857).

> of man; and this, in one sense is strictly true, for he owes his birth to a long line of progenitors. If any single link in this chain had never existed, man would not have been exactly what he now is. Unless we wilfully close our eyes, we may, with our present knowledge, approximately recognise our parentage; nor need we feel ashamed of it. The most humble organism is something much higher than the inorganic dust under our feet; and no one with an unbiassed mind can study any living creature, however humble, without being struck with enthusiasm at its marvellous structure and properties. (1871a, 213)

While the analogy to family genealogy (of the Victorian aristocracy) seems particularly strong in this passage, we find a cacophony of images and messages: 'an ignoble pedigree' versus 'the ascending links in the chain of being'; 'there is always one lower down this chain' versus 'every organism needs to be valued on its own terms'. But one thing seemed clear: the world had only been prepared for 'man' in 'man's eyes'. Maybe this 'illusion' was one of the pitfalls of tree building. Phylogenetic trees focused on the outcome rather than the process or even the history of evolution. They tended to obscure the false starts, stutters, reversals, and the crisscrossing. Voss (2010, Ch. 2) has situated Darwin's diagrams that culminated in the one in *On the Origin of Species* in the attempts to capture the natural order in drawing during this time, and she emphasizes the importance Darwin put on a visual language for the unpredictability and irregularity of the process that brought about 'that order'. Obviously, Darwin had not freed himself entirely of the notion of progress that was associated with the scale of nature. At the same time, the phylogenetic trees in circulation might have occurred to him as still too strongly associated with this concept, even if they also expressed the idea of divergence. So, while Desmond and Moore (2009) are certainly right in that Darwin strongly relied on notions of genealogy, pedigree, and descent, it seems that he considered phylogenetic trees with caveats – and such caveats are most expedient when the tree icon is used to convey intra-human phylogeny (Sommer 2021, 48–54).