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The Naming of the Human Family: A Brief History of Hominid Taxonomy

As creatures that strive to order the perceived variety of organisms in the world that they inhabit, human beings from the cultural tradition of the West have attempted to linguistically define differences between separate organisms and classify these beings into a system in which they can discuss distinct categories of organisms and their relationships to one another. This ordering of the world's organisms is known as the science of taxonomy and the most basic unit of this systemization is called a species. For much of recorded human history in the West, what defined a species was fairly simple, as humans were able to distinguish between groups of organisms based on their physical characteristics and these groups were thought to be reasonably immutable and unchanging. This classificatory clarity became increasingly diminished when attempting to define the differences between the various human groups that surrounded the Westerners, and questions arose as to whether or not these groups constituted separate species of their own. As Western knowledge, culture and society evolved, the differences between seemingly distinct groups of organisms became less demarcated with the establishment of the world's antiquity and the evolution of life on earth. The rigid application of distinct lines between organisms became increasingly obscure, and the discoveries of fossilized bones that seemed to be part ape, part human further complicated Western understandings of where the lines between species should be drawn. These complications inform the core considerations and controversies of hominid taxonomy in physical anthropology and particularly paleoanthropology, and debates on these hominid taxonomic matters persist into the present day.

The roots of hominid taxonomy are found in ancient Greek literature. Though Greco-Roman scholars such as Herodotus did not distinguish outsiders such as the dark-skinned Aethiopians as a separate species, as later 18th and 19th century scientists did, others did employ concepts of a separate

human species known as “homo monstrous”, which was purported to exist at the margins of their known world in places such as India and Africa (Spencer 1986:5). This species designation persisted in Western thought throughout the medieval and renaissance period, and although many creatures assigned the *H. monstrous* designation were mythical, others were merely *Homo sapiens* with congenital malformations. The notion of human like monsters continued to persist under the new designation of *Homo sylvestris* or “wild man” (Spencer 1986:5), which was initially a likely chimpanzee described by Nicolas Tulp in 1641 (Spencer 1986:49).

Carolus Linnaeus created the modern science of taxonomy in his 1740 work *Systema Naturae*, which classified and named living things according to hierarchical categories of similarity (Stanford, Allen & Antón 2006:23). This was the first major breakthrough in hominid taxonomy as the Linnaean hierarchy created a systematized way of ordering the organisms of the world, including humans. By 1758, Linnaeus included humans within the order of Primates and classified the genus *Homo* into several different groups of the species *sapiens* including *ferus*, *americanus*, *europaeus*, *asiaticus*, *afer*, as well as the previously mentioned *monstrous*. Linnaeus also designated the species *H. troglodytes*, which included the subspecies *nocturnus* and *sylvestris*. The descriptions of the subspecies exemplified the Eurocentric racism of the time as Linnaeus described *H. sapiens americanus*, *asiaticus* and *afer* using words such as “obstinate”, “severe”, and “negligent” respectively, while *H. sapiens europaeus* was by contrast “gentle” and “inventive” (Spencer 1986:77-78). The subspecies *H. sapiens ferus* was Tulp’s earlier *H. sylvestris* “wild man” reclassified by Linnaeus while *H. sapiens monstrous* included the reported giants of Patagonia and some genetic aberrations. The species *Homo troglodytes* referred to a supposed creature with golden eyes that only went out at night (Spencer 1986:77-78). In 1760 Christianus Hoppius, a student of Linnaeus’ added another species, *H. caudatus*, who was tailed, related to humans by reason and labeled by Hoppius as Lucifer (Spencer 1986:94).

By 1795, Johann Blumenbach rejected *H. sapiens ferus* and *H. monstrous* as species and dismissed “troglodytes and tailed men as imaginary creatures” (Spencer 1986:105). But Blumenbach

maintained Linnaeus' four geographical varieties of *Homo* adding a fifth Malaysian variety. Despite maintaining this variety, Blumenbach "stressed that his division of humankind was arbitrary since…'you cannot mark out the limits between them'" (Spencer 1986:105), and went so far as to suggest that all living humans belonged to the same species *H. sapiens* (Tattersall & Schwartz 2000:35). Despite Blumenbach's contention that the separation of humanity was arbitrary, further division continued as later scholars such as Jean Baptise G Bory de Saint Vincent and Antoine Desmoulins publishing in the 1820's advocated splitting humanity into several subgenera and fifteen or sixteen species based on such arbitrary characteristics as hair texture and color (Spencer 1986:136-7).

In 1856, the discovery and recognition of the fossilized bones of an as yet unknown type of human in the Neander Valley of Germany denoted a second major development in hominid taxonomy, as well as the beginning of paleoanthropology. The fossilized skull of the human like creature was found by workmen and identified by schoolteacher Johann Fuhlrott as an ancient human unlike any known modern human. The fossil was presented to the scientific community by biologist Hermann Schaaffhausen as a skull with a "natural conformation hitherto not known to exist, even in the most barbarous races" that "belonged to a period antecedent to the time of the Celts and Germans" (Trinkhaus & Shipman 1993:50). The discovery and later acceptance of this human like fossil established human antiquity to be far older than the generally accepted restriction to the recent post-glacial geological epoch (Spencer 1984:5), and was the first suggestion that humanity had a deep and complex evolutionary history. In 1864 British scientist William King proposed to name the fossil *Homo neanderthalensis* to distinguish it from *H. sapiens* and Fuhlrott concurred (Spencer 1986:227). Although King later retracted the designation stating that the specimen was "not only specifically but generically distinct from man" (King 1864:32), a genera was never suggested and the species designation and its antiquity persisted despite the views of some scholars such as Prunner-Bey who suggested that the remains were that of a recent Celt (Spencer 1986:232).

Another major development in hominid taxonomy and a key development in the natural sciences occurred in 1858 with the publication of Darwin's evolutionary theory. In 1871 Darwin published *The Descent of Man* in which he proposed that natural selection explained the development of humanity from an unidentified hominoid ape in the distant past and likely from Africa (Spencer 1986:140). Concepts of the evolution of humanity began to appear in the literature yet Linnaeus' Eurocentric sentiments in species categorizations persisted. Ernst Haeckel suggested in 1868 that humanity was descended from a hypothetical intermediate ancestor named *Pithecanthropus alalus*, the speechless ape-man (Spencer 1984:9). This creature evolved to become *Homo primigenius*, or primitive humanity, which split into the various races, with the Indo-Germanic race deviating furthest from the primeval condition toward "higher mental development" (Spencer 1986:156).

Although discussions of human origins focused almost exclusively on the European continent (Spencer 1986:244), Haeckel's hypothetical *Pithecanthropus* led Dutch physician Eugene Dubois to search for fossils in Java in the early 1890's. Dubois discovered several fossilized bones including a skullcap in 1891 and a femur in 1892. Dubois began referring to the specimens as *Anthropopithecus*, a name used for living chimpanzees in the 19th century (Meikle & Parker 1994:36). Dubois' examination of the thighbone concluded that "Javanese *Anthropopithecus* stood and walked in the same upright position as man" and so he concluded that it was "quite possible that man ha[d] developed from this Early Pleistocene *Anthropopithecus erectus*" (Dubois 1892:39-40). Dubois renamed the specimens *Pithecanthropus erectus* in 1894 after the name Haeckel suggested (Meikle & Parker 1994:36). Alfred Nehring suggested two years later that *P. erectus* should be placed within the genus *Homo* (Spencer 1986:249), though it would be some time before the scientific community concurred with Nehring's classification.

With more Neanderthal remains being discovered in Europe, and Dubois' *P. erectus* discovery, Gustav Schwalbe proposed a new evolutionary scheme, now based on fossil evidence, where *H. neanderthalensis* was the intermediary form between *P. erectus* and *H. sapiens* (Spencer 1984:9). In the

meantime, Ludwig Wilser attempted to reclassify *H. neanderthalensis* as *H. europaeus primigenius* in reference to Haeckel's earlier designation of primitive humanity. Wilser's designation was widely accepted at the turn of the twentieth century (Spencer 1986:244). Along with Neanderthal and *P. erectus* remains, the discovery of new types of fossils persisted. In 1907, a hominid mandible was found near Heidelberg Germany. Otto Schoetensack described the fossil as showing "a combination of characteristics hitherto found in neither a recent nor a fossil human mandible" (1908:42). As the mandible was unlike any of the Neanderthal remains recovered, and the fauna associated with the remains were considerably older geologically than any known Neanderthal site, Schoetensack casually designated the specimen as *Homo heidelbergensis* (Meikle & Parker 1994:41).

Hominid fossils continued to be discovered in Europe, including the infamous Piltdown skull by Charles Dawson in 1912. This skull possessed a "full blown human brain and an almost completely chimpanzee jaw" and was designated *Eoanthropus dawsoni* (Hooton 1937:57). The fossil created enormous problems for evolutionary phylogenies until it was revealed as a hoax, some 40 years later (Le Gros Clark 1955:80). Nevertheless, actual fossils continued to contribute to the hominid taxonomic record. In 1921, Arthur Smith Woodward of the Natural History Museum in London announced the discovery of a complete skull and some other bones from what is now Zambia, Africa (Meikle & Parker 1994:47). Woodward thought that the specimen from the Rhodesian cave resembled Neanderthal man but suggested that "the shape of the brain-case and the position of the foramen magnum [were] so different that we may hesitate to refer the two skulls to the same race" (1921:50). Woodward therefore named the specimen *Homo rhodesiensis* after the British colony in which it was found (Woodward 1921:50). The first discovery of hominid remains in Africa was significant for evolutionary phylogenies as it began to imply that hominids developed outside Europe. The linguistic overlap of race and species in Woodward's explanation for the separate species designation was also notable as it indicated that scholars had still neglected to distinguish between the two. An adequate definition of what constituted a species was still lacking and this was to create many later problems for hominid taxonomy.

Another new hominid fossil was discovered in Rhodesia at Taung (now South Africa) three years later. The cranial remains were that of a child and was identified and described by Raymond Dart as belonging to "an extinct race of apes *intermediate between living anthropoids and man*" (1925:55 emphasis in original). As with Woodward, race is still used interchangeably with species. Though the claim of being intermediary was hardly new, *Pithecanthropus erectus* had a similar intermediate designation, Dart suggests this specimen is unlike Pithecanthropus because it does not "represent an ape-like man" but rather a "man-like ape" and he accordingly proposes to designate a new genus and species name *Australopithecus africanus* (1925:62). Although some accused Dart's analysis of the remains as "hasty" and suggested this specimen was not bipedal and therefore not a hominid, Dart maintained confidence in his analysis of the "relative forward placement of the foramen magnum" that allowed the creatures to place "great reliance on their feet for walking", freeing their hands for other tasks (Dart 1959:15). Dart's confidence remains warranted and his naming of this genus is significant in that it was "the first new generic name in paleoanthropology which was eventually generally adopted and still continues in use today" (Meikle & Parker 1994:52).

Further complicating hominid evolutionary phylogenies was the discovery of more hominids in Asia. Following the discovery of a hominid at Zhoukoudian China in 1927, Davidson Black created the genus *Sinanthropus* (Spencer 1986:447). Debates continued to occur as to which continent modern humans evolved in. With the new discoveries, researchers suggested new phylogenies. Reginald Gates concurred with Franz Weidenreich that the fossil record represented "a continuous line of evolution from *Pithecanthropus* and *Sinanthropus* through Neanderthal to the modern type of man" (Gates 1944:290). Linnaeus' Eurocentric racism had also persisted in evolutionary phylogenies as Gates further theorized that the fossil record represented a parallel evolutionary model in which the specimens on particular continents had evolved into the modern races, with some more primitive than others, and that the modern races should therefore be separated into distinct species (1944).

Meanwhile, Dart's colleague in Southern Africa, Robert Broom attempted to find the remains of more fossilized hominids. In 1936 he discovered an adult skull at Sterkfontein, which he described as *Australopithecus transvaalensis*, though he later decided that the shape of the skull was so different that he assigned it to a new genus *Plesianthropus* (Broom 1938:65-6). Broom discovered yet another skull in 1938 in nearby Kromdraai and gave it the name *Paranthropus robustus* (Broom 1938:68). Broom continued to work in the area and discovered another fossil at Swartkrans in 1949, which he felt was most "allied to *Paranthropus*", but left the debate open stating, "when a skull is discovered it may prove to belong to a new genus; but provisionally we may call it *Paranthropus crassidens*" (Broom 1949:73). Broom's tendency was to split hominid taxonomy into not only many species, but also many genera. This is further evidenced in his statement on another find in the area by Dart named *A. prometheus*. "I am of the opinion that the being belongs not only to a new species but also to a new genus" (Broom 1949:73). Later taxonomists lumped *P. crassidens* with Broom's earlier *robustus* finds (Meikle & Parker 1994:71) and *A. prometheus* is now usually lumped with *A. africanus*. Broom however continued to discover more fossil hominids and created new hominid genera with many successive finds. He published again in 1949 with John T. Robinson on another find from Swartkrans, which they named *Telanthropus capensis* (Meikle & Parker 1994:74). Broom and Robinson consider that the fossilized jaw is "in structure intermediate between *P. crassidens* and *Homo*" (1949:77). Most scholars now consider *T. capensis* as some species of the genus *Homo* (Meikle & Parker 1994:74). Following Broom's example, splitters continued to dominate the literature. With the discoveries of hominid fossils at Laetoli in Tanzania in the 1930's and 40's, Hans Weinert utilized another new genus in 1950, *Meganthropus* founded by von Koenigswald for material in Java (Meikle & Parker 1994:78). This genus failed to become widely utilized, and scholars such as Robinson accuse Weinert of giving "no cogent reasons for using the generic name" (1953:1). Weinert then used *africanus* as the species name, which violated taxonomic rules since Dart already used the species name *africanus* in a different genus (Meikle & Parker 1994:78).

By 1950, at least one researcher had had enough. Ernst Mayr, an ornithologist, found in hominid taxonomy a "bewildering diversity of names" and proposed "an effort should be made to give the categories species and genus a new meaning in anthropology, namely, the same one which…has become the standard in other branches of zoology" (152-3). The confusion in anthropology as to what constituted a species had finally surfaced and Mayr contended that since anthropologists were concerned with only a very small fraction of the animal kingdom, they attempted to express the slightest difference in morphology with a new name (1950:152-3). Mayr therefore "proposed to classify fossil and recent hominids tentatively into a single genus (*Homo*) with three species (*transvaalensis, erectus, sapiens*)" (167). Despite Mayr's plea, the diversity of names in both species and genera continued to expand. Louis Leakey discovered a skull at Olduvai Gorge, Tanzania in 1959 and proposed to designate the specimen *Zinjanthropus boisei*, despite its affinities to the robust material in South Africa (Meikle & Parker 1994:85). Leakey admitted that the "skull ha[d] a great many resemblances to the known members of the sub-family of Australopithecinae" (Leakey 1959:87), but he believed "that it [was] desirable to place the find in a separate and distinct genus" (Leakey 1959:89).

In 1963 George G. Simpson echoed Mayr's call for hominid taxonomic revisions. Simpson describes hominid nomenclature as notoriously "chaotic" and condemns those who have complained of the chaos as contributing to it (176). Simpson suggests that the chaos is due to "faulty linguistics", as opposed to "zoological disagreements", that "stems either from ignorance or from refusal to follow rules and usages" (177). Simpson continues and questions the scientific rigor of hominid researchers, regarding physical anthropology as "the only field of science in which those who do not know and follow the established norms have…[had] the opportunity to publish research that is…incompetent" (177). Simpson then proceeds to lay out the proper way to classify organisms, perhaps in an attempt to goad the anthropologists into becoming more scientific in their hominid taxonomies.

The *Zinjanthropus* find increased interest and funds for paleoanthropological research in Eastern Africa (Meikle & Parker 1994:85), and Leakey, along with Tobias and Napier, discovered another type of

hominid at Olduvai Gorge in 1964. Following this find, Leakey et.al. recommended that the genus *Australopithecus* contain sub-genera – *Australopithecus*, *Paranthropus* and *Zinjanthropus* (1964:94). Leakey et.al. further suggested that it had "become necessary to revise the diagnosis of the genus *Homo*" (1964:95). They stated of the cranial capacities of the distinct hominid genera "the lower part of the range of capacities in the genus *Homo* overlaps with the upper part of the range in *Australopithecus*" (1964:95). This article was significant in that it created a "careful, formal structure of the taxonomic and nomenclatural sections" unlike prior articles on new hominid finds (Meikle & Parker 1994:93). Perhaps in an effort to appease Simpson's chastisement, the article also attempted to formalize and systematize the classification of the hominid. It further heeded Mayr's advice of lumping some fossils together, rather than simply naming each fossil as a new genus and species, which had been the convention until that time. The new species proposed by Leakey, Tobias and Napier was called *Homo habilis* (1964:96), which continues to enjoy broad acceptance in the current literature (Meikle & Parker 1994, Stanford et.al. 2006).

Nevertheless, the critique of the state of affairs in hominid taxonomy continued. In 1965 Bernard Campbell published *The Nomenclature of the Hominidae* in which he counted 60 different specimens made into types of new hominid taxa. "These named taxa include[d] 19 new genera and 55 new species and subspecies" and this was not including those taxa that were named improperly, which included another 49 specific names (231). Echoing Simpson, Campbell states that it was not that "early workers were 'splitters', in the taxonomic sense, but that they were ignorant of the meaning of the concept of species, and used binomial nomenclature as a system of labeling" (231). Campbell suggests that no new taxa should be proposed unless the new find fell "well clear of the range of variability of existing taxa, and that range should be computed by comparison to living species" not fossil specimens (232). Campbell proposed that hominid taxonomy follow zoological taxonomic conventions for the range of variation within a species and then explained the art of taxonomic revision, advocating a new far simpler classificatory scheme. In 1967, J.T. Robinson notes the troubles of creating a taxonomy based on the paleontological record due to its incomplete nature. He then detailed many of the fossil hominid

specimens and attempted to reclassify them into fewer genera and species. He noted that he was not critical of others for not having made a "clear distinction between the genus and species levels", as he himself made the same mistake with Broom on *Telanthropus* (1967: 140-1).

Thus it would appear as though the haphazard naming conventions of hominid taxonomy and its dizzying array of perceived organisms, particularly in paleoanthropology, had finally come to an end by the late 1960's. But despite these suggestions to lump more of the fossils, splitting continued with many new finds. Arambourg and Coppens designated a new skull as *Paraustralopithecus aethiopicus* in 1968. Groves and Mazák named a mandible and other fragments *Homo ergaster* in 1975 (Meikle & Parker 1994). In 1978 Johanson, White and Coppens proposed that all the gracile Australopithecine specimens from Hadar and Laetoli in Eastern Africa, which had been referred to as *Australopithecus* aff. *africanus*, be designated to the new species *A. afarensis* (128) following the discovery of the complete skeleton of "Lucy" (Tattersall & Schwartz 2000:85). And Alexeev classified a skull as *Pithecanthropus rudolfensis* in 1986 (Meikle & Parker 1994). Even so, in 1986 Ian Tattersall argued that there was "a tendency to *underestimate* species diversity in the fossil record" and that lumping had become a "liability to [the] interpretation of the substantial morphological diversity that exists in the human fossil record" (Tattersall 1986:252 emphasis added). Tattersall therefore argued in favor of recognizing more hominid species than the four species of *Australopithecus* (*afarensis, africanus, robustus,* and *boisei*) and the three species of *Homo* (*habilis, erectus,* and *sapiens*) presented in many of the introductory textbooks of the day (Meikle & Parker 1994:239).

Tattersall's call for greater hominid species diversity in introductory textbooks has been heeded as evidenced by the inclusion of *A. anamensis*, *A. bahrelghazali*, and *A. garhi* to the Autralopithecine genus in Stanford, Allen and Antón's 2006 *Biological Anthropology*. There is however little consensus as to how to deal with the genus *Homo* following *H. habilis* and *H. erectus* as they are referred to merely as Archaic and Anatomically Modern *Homo sapiens* (Stanford et.al. 2006). Yet other types of *Homo* continue appear in the literature as well, including *H. rudolfensis* (McHenry & Coffing 2000), *H.*

neanderthalensis and *H. heidelbergensis* (Conroy 2005:321). Tattersall's concern that hominid species diversity would be underestimated appears somewhat unwarranted given the historical tendency of paleoanthropologists to create a new species and genus for many new finds. As Tattersall indicated that lemur diversity may be due to taxonomic inflation (2007), might not hominid variation be due to a similar problem? Given the recent naming of possible hominids *Sahelanthropus tchadensis*, *Orrorin tugenensis*, *Ardipithecus ramidus, Ardipithecus kadabba*, as well as likely Australopithecine *Kenyanthropus platyops* (Stanford et.al. 2006), it would seem as though Tattersall's concerns were completely unfounded and that it was Mayr's concerns in 1950 that may be warranted once again.

Simpson pointed out in his 1963 critique of paleoanthropology that "classification is not an exact science and is not likely soon to become one" (191), and this certainly appears to be the case with hominid classification. At the core of the debates in hominid taxonomy are how one defines a species and what the acceptable range of diversity is within a species. Mayr's biological species concept is the most widely utilized and defines a species as "groups of actually or potentially interbreeding natural populations which are reproductively isolated from other such groups" (Stanford et.al. 2006:113). Put simply in the paleoanthropological case, if populations of isolated distinct ancient hominid species did interbreed, then the classificatory schemes of many hominid taxonomic 'splitters' would be false, while if they did not then the 'lumpers' would be incorrect. This is extraordinarily problematic because it is highly unlikely, even with genetic evidence, that anyone will ever know for certain whether ancient hominids from currently distinct taxa actually interbred or potentially were able to interbreed or not. The classification of human races becomes equally problematic under this definition, as it seems unlikely given the geographical distance and the available technology that Mesoamericans were breeding with Africans for quite some time. They were once isolated naturally and not interbreeding, does that imply that they were separate species once like the lion and tiger? Now that they are not naturally isolated does that suggest that they are no longer distinct, if they ever were? How much time must pass for an isolated population to become a species? Thus it becomes necessary to defer to Campbell's notion that no new

taxa should be proposed unless the new find fell “well clear of the range of variability of existing taxa, and that range should be computed by comparison to living species” not fossil specimens (1965:232). This use of measurement has been applied to fossils, even down to the subspecies level (see Guy, Brunet, Schmittbuhl & Viriot 2003; Rak 1985). But with this definition, the range of variability within what Blumenbach had considered an arbitrary division back in 1795 becomes problematic, as any demarcation is entirely subjective, even in living taxa. Further complicating the subjective demarcation problem is anagenic speciation where one taxa gradually becomes another. How can one species be differentiated from another if the two species in question evolved gradually from one into the other? If the lines drawn are arbitrary and subjective, then debate is bound to continue indefinitely. Thus it would seem that the controversy will continue unless a better definition of a species is proposed, and one that incorporates time and the rigid utilization of morphology. And yet perhaps the argument is entirely semantic, and further than Simpson would suggest, in that the concept of distinct species is an entirely antiquated and mythical human construction. It has become increasingly clear that nature resists conformation to the rules of humans and that human lines drawn between organisms are mere fabrications, and this is certainly true when discussing the evolution and classification of the natural human family.

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