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What is ‘human’ in human evolution: Reconnecting philosophical anthropology and human evolution

Introduction

Helmuth Plessner remarked in 1969 that:

> Our knowledge of man has changed, to a great extent, because of the discovery of pre-historic and early historic skulls, because of a cultural anthropology deepened by psychoanalysis, and above all because of behavioral research. Only philosophy has played no part in this development. But in the long run philosophy cannot avoid the obligation of recognizing these facts, since the question of the nature of man has always been central to it (Plessner 1969, 497/GSVIII, 353).

Plessner’s remark appeals to the partial and sometimes defensive reception of discoveries and facts concerning human (pre)history within philosophy itself. At the same time, we may inquire how the sciences Plessner references – palaeontology, cultural anthropology, and behavioural sciences – should relate to philosophy. From a philosophical point of view, anthropological questioning[1] becomes reflexive (see Lindemann 1999; 2005), while from the scientific perspective the theory and practice of science must consider methodological questioning that necessarily takes them beyond the confines of their own disciplinary limits, including on ontological terrain. Plessner was perhaps one of the first in the philosophical-anthropological tradition to comment on this dynamic interrelation between science and philosophy. This means avoiding both a scientistic reductionism and a philosophically-minded neglect of science; more positively formulated, Plessner’s philosophical anthropology is situated against the backdrop of a “multiplicity of reality” (Plessner 2019a, 30) which is the outcome of the more or less independent development of the disciplinary sciences. Plessner’s metatheoretical note is that set against this multiplicity, methodological decisions with respect to the categorization of ‘humanity’ cannot be resolved within the disciplinary frameworks of the sciences themselves. As Plessner notes with respect to evolutionary biology, claims about the point within the ‘descent of man’ at which we can

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[1] In this case two-fold; in the philosophical anthropological paradigm (how do we study human evolution from an epistemological anthropocentric perspective?) and a as a sub-discipline (how do we define ‘the human’?).

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speak of human existence in the full sense require reflection on what specifically human characteristics might be (Plessner 2019a, 37). This leads directly to the terrain of philosophical anthropology, which asks itself the fundamental question of what constitutes human existence. As we discuss below, within the philosophical-anthropological tradition there have been essentialist as well as non-essential approaches to 'the human': it can be stipulated as a timeless ontological given or explored as an open question (see Plessner 2018) in the historical-ontological sense (see De Mul 2004, 146–159). In order to stay true to Plessner's non-reductionist ambition in recognition of the mutual need philosophical anthropology and the sciences of human evolution have of each other, what we describe above as dynamism and reflexivity needs to be sought out and theorized. The resulting position can be phrased, again following Plessner, as a "metabasis" (2019a, 37): a shift to another dimension of inquiry from which we can reflect on implicit and explicit scientific-philosophical positions and assumptions. For the purpose of the present contribution, we are concerned with the category of 'the human' as an implicit or explicit reference point within the sciences of human evolution, as these share a biological orientation with philosophical anthropology while also standing in need of conceptual clarification.

Despite several key publications (e.g. Cartmill 1990; Corbey 2005; Corbey & Roebroeks 2001; Delisle 2006; King 1994; Marks 2015; Ruse 2012; Stoczkowski 2002) addressing the general epistemological framework of human evolution from various angles, the metatheoretical framework has remained largely unchanged. Many issues that have been repeatedly addressed over the last thirty years persist to this day. The field of human evolution still seems to be plagued by conceptual issues, Cartesian dualisms, and metaphysics that are reminiscent of Enlightenment philosophy and the colonial origins of the discipline (Corbey 2005; Porr & Matthews 2019). In this essay we will address these issues from both an inside perspective from the field of human evolution, and an outside perspective, namely that of philosophical anthropology.

As Corbey (2005, p. 94) writes; "In many cases, *hominitas* (being human in the sense of belonging to the biological genus *Homo*) and *humanitas* (being human in the colloquial, moral, and philosophical sense) have not coincided. In contemporary anthropological literature, "human" is still a remarkably random term and a continuous source of confusion". We will argue that this is also the case today in the theoretical framework of human evolution; its many subdisciplines (e.g. evolutionary/biological anthropology, palaeolithic archaeology, ancient DNA studies) seemingly operationalise different conceptualisations of the 'human', which are, often, to a degree mutually exclusive. In other words; although each subdiscipline is looking for 'human' origins, yet there are vastly different understandings between the traditions as to what precisely a 'human' is (or is supposed to be). We hope that more contact between human evolution and anthropological philosophy will help to overcome such problems.

In an attempt to make a clearer distinction between the different groups of 'humans', scholars often use an adjective that is often more heuristically and arbitrarily defined based on some kind of essentialist trait; e.g. 'anatomically modern human';

‘behaviourally modern human’; ‘archaic human’; ‘transitional human’ etc. This corresponds to a ‘naïve realism’ about humanity, which is also reflected in the trajectory of philosophical anthropology itself. Plessner notes the distinction in terms of his own distance from his erstwhile senior colleague, Max Scheler: for instance by noting how the question inquiring after the ‘human place in the cosmos’ (the title of a lecture by Scheler, which arguably became the founding document of philosophical anthropology) is overly demanding even in its terminology (‘cosmos’), which harks back to a now-lost “precise meaning (…) in the Greco-Christian tradition” (Plessner 1969, 497 / GS VIII, 353). For Scheler, the cut-off between non-human animal life and human existence is captured in terms of a notion of *Geist* or spirit which is supposed to guarantee the distinction as a kind of *deus ex machina*, without itself becoming revisable in terms of scientific discovery. For that reason, Plessner speaks of Scheler’s conception of the human in terms of a timeless ontology rather than a full-fledged philosophical anthropology (Plessner GS VIII, 39). Within the disciplinary sciences, similarly non-reflexive, reductionist or essentialist conceptualizations of the human are invoked, even or perhaps especially where they are not explicitly conceptualized. To such rigid conceptualizations of the human, we oppose Plessner’s programmatic scepticism, which according to Plessner can only be realized as philosophical anthropology in the reflexive sense (Plessner GS VIII, 41; see also Marquard 1995, 149–150) and for that reason counteracts reductionism and essentialism as a matter of principle.

We make three different distinctions in how the term ‘human’ is (implicitly or explicitly) roughly conceptualised in the discourse of human evolution research based on three different research traditions; biological anthropology, archaeology and genetics. These subdisciplines respectively study human remains, material and features found in excavations, and finally genetic sequences. Genetics is a relatively new addition to the discipline and is more rooted in chemistry and biology than archaeology and biological anthropology. The latter two have historically always been at the core of human evolution and have a more intertwined research history. First, we will discuss the ‘human’ as everything that falls within the genus *Homo.* Therefore, by extension, the conceptualisation of the genus must be closely examined. Second, we will discuss the cultural definition operated by archaeologists; a ‘human’ is defined by a set of (cultural) behavioural traits, regardless of species or population. Finally, we will discuss the conceptualisation of the ‘modern human’ (as opposed to the ‘archaic human’ as conceptualised by paleogeneticists) and how this has impacted the species concepts within human evolution; geneticists tend to work with populations, not with species. We would like to emphasise that these conceptualisations should be seen as a spectrum. While these conceptualisations all function differently and have some inherent incompatibilities, they do interact and borrow from each other. We will do our best to present a nuanced overview. We will also discuss the research history of these conceptualisations, which will of necessity be a partial account (a full review is beyond the scope of this paper, as the literature on human evolution is multiparadigmatic); we have made a selection of literature that we have found to cover and demonstrate these conceptualisations well). While most of these definitions do share a common history, they have arrived at a fragmented understanding of what is meant by a ‘human’ in the different subdisciplines and research traditions.

We see these findings as contributing to an active involvement of philosophical anthropology in human evolution research. While we are in favour of interdisciplinarity and a connection between a ‘humanities’ perspective from a philosophical angle and more naturalistic-scientific approaches to human evolution, we think the specifics of the case are at least as important. We aim to establish that the conceptualization of the human within human evolution stands to benefit from including philosophical anthropology to respond to the question of what it means to study human evolutions as humans.

Human evolution: *in lieu* of a historical background

Before we describe the different manners in which the term ‘human’ is operated today, we would like to discuss some key points related to human evolutionary research, with the aim of both emphasising the multi-faceted history of the field and contextualising where some ideas (i.e. those that lead to diverging conceptualisations of the ‘human’) find their origin. More extensive epistemological and/or historical accounts regarding metaphysics (Corbey 2005), the effect of *a priori* beliefs and imagination on human evolution (Stoczkowski 2002), general paleoanthropological history and epistemology (Corbey & Roebroeks 2001; Delisle 2006) can be found elsewhere. We will now start by discussing some general research history, before we address the different conceptualisations per subdiscipline.

The term *Homo sapiens* for present-day humans was first coined by the Swedish biologist Carl Linnaeus (1707–1778) as part of formalising binomial nomenclature in the 10th edition of his *Systema Naturae* (Linnaeus 1758). Predating Darwin’s *On the Origins of Species* (1859) by about a century. Linnaeus’ main concern was, based on the Great Chain of Being, categorising God’s work by means of comparative characteristics. As such, Linnaeus’ work should be seen as inherently essentialist, as species, in his view, were immutable. He is generally considered the ‘father of modern taxonomy’, as his system of naming species is still operated today. In the 10th edition, Linnaeus categorised the Orang-Outang (as well as some other primates) in the same genus as humans as *Homo sylvestrus orang outang* (Corbey 2005, p. 44). In the 1770s, Blumenbach, a German professor in medicine, separated the genus *Homo* from the other apes, due to “the uncomfortable closeness of human and ape” (Corbey 2005, p. 50). While in the late 18th and early 19th century, the Chain of Being was largely abandoned, mainly due to the rise of comparative anatomy and later the rise of transformism (a precursor to evolutionary theory), the concept of hierarchy persisted; many of the metaphysical ideas of the Chain of Beings were adopted and transformed by early 19th French naturalists such as Cuvier, Geoffroy and de Blainville (Appel 1980). Darwin was relatively modest in applying hierarchy (Darwin wrote “Never use the word higher and lower” Corbey 2005, p. 66–67) in his theory of natural selection (Darwin 2009; first published in

1859). However, his European followers, of which the most notable was Ernst Haeckel, who immensely contributed to the influence of evolutionary thinking in Europe, did persist in applying hierarchy. Haeckel was a proponent of a polyphyletic evolution of humankind; all humans had a common ancestor in the *Pithecanthropus alalus*, but then evolved into separate species depending on their geography. Human groups that European colonists discovered were, in Haeckel’s eyes, evidence for the gradual evolution of humankind; Australians and Papuans were the closest living relatives of the *Pithecanthropus* (Levit & Hossfeld 2019). What is interesting to note here, is that the *Pithecanthropus alalus*[2] (‘the mute ape-man’) is a species that was hypothetically formulated. At the time there was no empirical evidence for such a species. This is one of many examples of a postulated ‘missing link between apes and man’[3]; a metaphor directly derived from the Great Chain of Being, an intermediate between humankind and its ape ancestors (Kjærgaard 2011). This should be considered as one of the major formative periods in human evolution discourse as it confronted scholars explicitly with the question where the boundary between the ‘human’ and the ‘non-human’ lies[4]. This has a continuity (or reoccurrence) in modern discourse; Nee (2005) exposes our need to (still) see ourselves as the pinnacle of creation, drawing direct parallels between current discourse and theological models from medieval times. Similarly in current discourse we see other hominin species as such; “While we regard them as basically human, we still try to distinguish ourselves as human beings and use these proximate others [other hominins] to define and redefine our own self-image” (Peeters & Zwart 2020, p. 33). Peeters & Zwart (2020) write in their investigation of current Neanderthal discourse, “Neanderthals are praised or disqualified in terms of their conformity to a concept of the ‘fully human’, but affirming full humanity can never go without redefining the model, that is grounded in the exclusion of a vast number of beings, deemed nonhuman or not fully human.” This discourse is reminiscent of Plessner’s critique of Scheler; this discussion about ‘humanness’ seems firmly imbedded in

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[2] Fossils for this then-hypothetical species were discovered in 1892 by the Dutch anatomist Dubois on Java. These fossils, together with regional varieties of morphologically similar fossils (such as the *Sinanthropus* from China, and the *Atlanthropus* in North Africa), would be folded into the genus *Pithecanthropus* and were eventually all sank into the *Homo erectus* species by Mayr in 1950 (Wood 2000).

[3] Stoczkowski (2002) notes that much of Darwin’s original nuance is lost in later models; of the twenty-four historical models of human evolution (between 1820–1986) Stoczkowski has analyzed, it becomes apparent that only a small number of them mention a common ancestor of humans and great apes. The rest more or less state that humans are descended from apes. He explains this as constructing the ‘human’ in such a way that it is in binary opposition to the almost imaginary ape; “(…) if the ape does not think or cooperate or hunt, it is simply because humans do think, cooperate and hunt” (Stoczkowski 2002, p. 44). Stoczkowski notes that the list of ‘human’ attributes has changed little over the last 150 years, since the ‘human’ is not defined on empirical terms, but on antithetical terms; the human is everything that ‘the animals’ are not.

[4] Cartmill (1990) and others after him (e.g. Corbey 2005) have referred to this as ‘policing the animal-human boundary’. The discussion of what counts and does not count as a human had become a largely symbolic and metaphysical one.

ontology, instead of manifesting itself on valid scientific and/or philosophical notions. While operating within an ontology is of course inescapable, the idea of the 'human' as the essential exception (or simply put being 'special') is often the axiomatic assumption in formulating research questions (Cartmill 1990). In our opinion, this ontology has often gone unchallenged, without becoming an object of analysis itself (Plessner (2019b), p. 25: "At its heart stands the human. Not as the object of a science, not as the subject of a consciousness, but as object and subject of his life- that is, in the way in which he is object and center to himself").

After this formative period in the nineteenth century, the period around the turn of the century was relatively uneventful, although an increasing number of fossil discoveries did shift the paradigm more towards phylogeny instead of comparative anatomy (Delisle 2006; Dennell 2001). Around the Second World War human evolutionary research went through drastic changes due to a combination of circumstances.

Firstly, the debate of the place of origin was largely resolved; scholars up until this period had hotly debated whether the place of human origin was in Africa or Asia (Delisle 2006; Dennell 2001). Most research before the 1940s had been centred in Europe and Asia, where Asia was considered to be the most likely candidate for the 'birthplace of humankind'. Dennell (2001) identifies four explanations for this paradigm shift; the australopithecines were put forward as direct ancestors of humans; in 1953 the Piltdown hoax was definitively discredited, which allowed the bipedalism to take precedence over brain mass as a human trait (which in turn added to legitimising the Australopitecines as human ancestors. They had small brains but did have largely bipedal locomotion). Thirdly, the British 'old guard' of paleoanthropologists simply passed away without any successors; either they died of old age, pursued different careers, or simply stopped contributing to the field in way or the other (Dennell 2001, p. 56). Lastly, the famous family of paleoanthropologists, the Leakey's, were very successful in unearthing early hominid fossils in East Africa, again strengthening the hypothesis of Africa as the place of human origins.

The second major turning point was the political and ideological aftermath of the War itself (Dennell 2001). The (British) 'old biology' which heavily focussed on studying racial diversity fell largely out of favour due to the atrocities committed by the Nazi regime. The (American) 'new biology' however was quick to incorporate modern techniques such as biometrics and genetics, making it the new dominant paradigm (See also Haraway 1988). The New Biology shifted focus towards human origins, as it found the differences between races trivial. In addition, in 1950 UNESCO published a document called *The Race Question* in which it stated that all extant humans belonged to *Homo sapiens* and are equal before the law. Corbey (2005, p. 100) notes here about this period: "Gradations within 'humanity,' synchronically as well as diachronically were suspect – which is yet another example of a *humanitas*-ideal influencing the taxonomy of hominids." It morally condemned racism, and generally summarised what was known about 'race' in a scientific sense.

In 1950 the Harbor Symposium on Quantitative Biology was held with the theme *Origin and Evolution of Man.* One of the major contributors of this symposium and one of and proponent of this new paradigm was the German-American biologist Ernst Mayr. Mayr (1950) criticised paleoanthropologists on the grounds of seemingly arbitrarily attributing fossils to species up until that point. He collapsed all hominid fossils in one genus; *Homo* (largely based on adaptational/ecological factors) and urged paleoanthropologists to adopt a biological meaningful approach to accurately create taxonomic categories. As White (2009, p. 338) puts it “The anthropologists and anatomists involved in the study of human evolution were thus pulled under the umbrella of the modern synthesis (…)” (but see Delisle 2006, pp. 303–305); palaeoanthropology was quickly brought up to speed on modern biology (see also de Queiroz 2005). This, among other things, also led to a formalisation of what a constitutes a ‘human’ in the biological sense; scholars began to look for unique hominid adaptations, with bipedality as the main driving force behind human evolution (Wolpoff 1971, p. 601). Mayr (1950) also suggested applying the competitive exclusion principle to human evolution; meaning that at one point in time, there could only be one species of hominid. This later resulted in the single species hypothesis (Brace 1967; Wolpoff 1968, 1971) the idea of a single unilinear evolving human species lineage, although most scholars at that point maintained that there always have been more species of hominids throughout human evolution (Delisle 2006 p. 336).

However, the ’hard data’ approach propelled by the ‘New Biology’ was also not immune to metaphysics, as is demonstrated by Corbey (2012), who made a meticulous analysis of Tobias’ (Tobias 1965) discourse about the *H. habilis* (currently the oldest *Homo*). While Tobias contributed immensely to the field, Tobias’ controversial attribution of *H. habilis* was in no small part guided by moral and philosophical – in our terms, timelessly ontological as opposed to historically ontological – notions of humanness (humanitas). Tobias’ reasoning is reminiscent of the 19th century evolutionists; *habilis* ascended to a fully-fledged human and thus was able to “set itself free from Nature” (Tobias 1965, p. 113).

In the context of its research traditions, and the incredibly low amount of data from the period of the conception of our genus, there is a limit to a responsible interpretation of empirical data (Smith & Wood 2017); researchers should take heed of the subversive metaphysical baggage that the genus *Homo* still carries with it, albeit under the surface. Corbey (2012, p. 114), in discussing Tobias’ interpretation of the *H. habilis* however bids us caution; we should neither underplay nor overplay the effects that contextual and theoretical constraints have in interpreting the ‘humanness’ of fossils, and in a broader sense, any presuppositions that researchers may have of the concept of ‘humanness’.

In roughly the same period, some problems with the conceptualisations of ‘species’ and human taxonomy became apparent (Dobzhansky 1944; Simpson 1963); the biological species concept (i. e. the species concept based on interbreeding populations) is hardly useable when dealing with fossils. Instead, Simpson describes the morphological conceptualities of a species on how it is in practice mostly operated:

> Evidence that the definition [of 'species'] is met is largely morphological in most cases, especially for fossils. The most widely available and acceptable evidence is demonstration of a sufficient level of statistical confidence that a discontinuity exists not between specimens in hand but *between the populations inferred from those specimens.* (Simpson 1963, p. 7)

What is perhaps most important a 'common root' of the conceptualisation of the 'human' in current human evolution research is the shifting focus after the Second World War towards the search for 'human origins'; scholars began looking for the trait that made us 'human' (Cartmill 1990 p. 175–178; Dennell 2001). Human evolution scholars seem to step away from Darwin's gradualism; the idea that the human must be explained through a biological evolutionary mechanism. For example, White (1940, p. 453), actively took a stance against Darwin's idea that the difference between humans and other animals was a matter of quantity, not one of quality., writes: "There is a *fundamental* difference between the mind of man and the mind of non-man" (italics in original text). The discussion of the evolution of humans (categorising and grouping, creating phylogenies, etc.) became a discussion not of human evolution (how did we became what we became?[5]); but the search for the essential human trait, and as such involves an ahistorical or timeless ontology, whether implicitly or explicitly. It is also at this point that the theoretical frameworks started to more noticeably disintegrate into separate sub-disciplines.

We discuss three different domains in which the concept of 'the human' is operated separately in the following sections, based respectively on the identity of the genus *Homo*, identifying human behaviour, and identifying human genetics.

The genus Homo as 'human': the anatomical definition of human

A relatively pragmatic way to approach the conceptualisation of 'human' is simply to call everything that falls into the genus *Homo* 'human', as practised by some physical anthropologists[6][7]. However, if one takes a closer look at the genus, it seems that this merely displaces the problem as the status of the genus *Homo* is still debated today.

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[5] Although we feel that it is necessary to point out here that by framing the question like this the issue of "What are we?" is implied and remains unanswered, illustrating exactly what is at the core of the problem addressed in this essay. While the subfields of human evolution essentially focus on 'origins' without a unified determination, Plessner's structural analysis arguably has the opposite shortcoming: see our concluding remarks. Uniting synchronic and diachronic approaches while doing justice to both remains a monumental task.

[6] Typically in journal publications physical anthropologists operate jargon (i.e. taxonomic names) to avoid calling something explicitly 'human' (an exception might be Wood & Collard (1999b), who refer to the 'human genus', however, it is unclear whether they mean if the genus *Homo* consists of 'humans', or it is simply the genus that 'humans' (i.e. 'modern humans') belong to. In another paper (Wood &

One of the core debates centres around the transition of the *Australopithecines* into the genus *Homo.* Kimbel & Villmoare (2016) for example, have argued that the transition between *Australopithecines* and *Homo* are less clear than previously argued. Early *Homo* seems anatomically more similar to the *Australopithecines* than to later *Homo.* They argue this on the size of the brain, and perhaps more so based on tool use (but see Haslam et al. 2016; Proffitt et al. 2016). They put even more weight on the tool use (and perhaps manufacture) of *Australopithecines.* While they are careful in their phrasing (“(…) the ‘transition’ from Australopithecus to Homo may not have been that much of a transition at all.”), this does challenge the status of *Homo*’s place in nature. This is reminiscent of Stoczkowski’s (2002) remark that the human is identified in antithesis to something else; the *Homo* makes tools, because the *Australopithecines* do not. The *Homo* has increasing endocranial capacity, because the *Australopithecines* do not. However, as Kimbel & Villmoare (2016) argue, the data is starting to tell a different story. Some authors have gone even further and have suggested based on DNA analysis that the *Homo* genus should include certain great apes (Curnoe & Thorne 2003; Watson et al. 2001).

Collard & Wood (2015) on the other hand seem to take the opposite approach revisiting an earlier question; “Is genus *Homo* a “good” Genus?” (Collard & Wood 2015; Wood & Collard 1999a; 1999b). Due to the similarities between ‘early’ *Homo* (specifically *H. habilis* and *H. rudolfensis*) and Australopithecines, they reason in the other direction; the genus *Homo* is too big. They operate firmly on the basis of skeletal remains and find the concept of ‘culture’ not particularly useful or reliable in defining the genus *Homo* (Wood & Collard 1999a). Collard & Wood observe a rather concerning trend in assigning fossils to a genus:

> [T]he course of action followed by most researchers appears to have been to assign new specimens to a fossil hominin genus on the basis of a subset of the diagnostic traits that the researchers in question deem to be key, and to then redefine the other traits of the genus in the light of the morphological and functional attributes of the new specimens. (Collard & Wood 2015, p. 2114)

As such, the definition of the genus *Homo* has often been stretched based on whichever trait takes precedent in the scholar’s view at that time. Attribution to the genus *Homo* is often ad hoc and relatively arbitrary, according to Collard & Wood (2015, p. 2114). The *Homo habilis* is an example of this; before the conception of the taxon in 1965 (Leakey et al. 1965), researchers generally agreed that the minimum cranial size of a *Homo*

Smith 2022) the terms ‘human’, *Homo*, and hominin seem to be used interchangeably, although ‘human’ in this sense is only used in the title, referring to the ‘human’ fossil record. While remaining implicit, similar interchangeability can be found in other works (J. H. Schwartz & Tattersall 2005; Strait et al. 2016; Trinkaus 1990). We find that the term ‘human’ often refers to the genus *Homo* in a colloquial manner. In formal settings physical anthropologists stick to the scientific jargon.

[7] We use the term ‘physical anthropology’ here more or less interchangeably with ‘palaeoanthropology’. We simply wish to indicate researchers who study human skeletal remains from a biological perspective.

would be no less than 750cc. However, to be able to incorporate *H. habilis* the minimum would be lowered to 638cc (the smallest cranium of the *H. habilis*). This decision remains controversial today (Collard & Wood 2015). Collard & Wood argue for a strictly monophyletic cladistic approach; the genus should be defined on a set of shared traits derived from the most recent common ancestor that distinguishes the clade (the 'branch' in the tree of life) from other organisms. However, there are still some discussions on the application and interpretations of these taxonomic systems in human evolution (Cartmill 2012; J. Schwartz 2016; Villmoare 2018). A more recent example that reignited the debate about the variation within *Homo* phenotype has been the discovery of *Homo naledi* (Berger et al. 2015; Schroeder et al. 2017). This relatively recent *Homo* (236 – 414 kya; Dirks et al. 2017)) discovered in the Rising Star Cave, South Africa, has an even smaller average cranial capacity than the *Homo habilis* (Hawks et al. 2017) ranging from 460 – 610 ml, yet it seems quite 'modern' in morphology. In addition, there has been suggested that this *Homo* buried their dead and made cave art (Berger et al. 2023) making this taxon not only human in the '*hominitas*' sense, but also in the '*humanitas*' meaning of the word, as it would challenge *Homo sapiens* as the sole practitioners of such behaviours. However, these claims are still highly contested (e. g. Martinón-Torres et al. 2023).

The behavioural definition of archaeologists

As opposed to the previous definitions which are firmly embedded in a *sec* biological framework, in the archaeological narrative behaviour takes precedence in what constitutes as 'human'. Archaeologists look for artefacts as a proxy for behaviour. One of the earliest archaeologists who attempted a clear demarcation of humanity based on 'modern' behaviour and cognition was the South African archaeologist Glynn Isaac, a contemporary of Tobias, who roughly operated in the same paradigm (Isaac 1972). According to Isaac, *Homo habilis* and *Homo erectus* should be considered behaviourally human, on the basis of uniquely human adaptations such as bipedalism (although this of course falls into the biological anthropological domain), tool making, complex social structures and a capacity for culture and language.

Although Isaac later moderated his tone placing the dawn of modern humanity to about 100kya, Binford (1985) still found Isaac's interpretation of the data too idealist and 'dehumanised' these earlier hominins (Isaac 1972; Corbey 2005, p. 107), laying the foundation for the *Human Revolution* model (most notably propelled by Klein 1995; Mellars 1989; Mellars & Stringer 1989; Noble & Davidson 1991).

Subsequently the discussion has centred on primarily the concepts of 'Modern Behaviour' (e. g., Bednarik 2011; Binford 1985; Donald 1991; Klein 1995; Lindly et al. 1990; Mellars 1989; Noble & Davidson 1991), and more recently a core component thereof, 'Symbolic Behaviour' (e. g. Bushozi 2020; d'Errico et al. 2005; Finlayson et al. 2012; Henshilwood et al. 2009; Hoffmann et al. 2018; Rodríguez-Hidalgo et al. 2019; Sehasseh et al. 2021; Zilhão et al. 2010). In a sense, these concepts should be seen as a narrower definition of 'culture'; Klein (1995) for instance, capitalises 'Culture' denoting some sort of discontinuity with 'non-modern modern people'. The people with a capacity for Culture in this case are only *Homo sapiens.*

The concept of Modern Behaviour is mostly present in the context of the *Human Revolution* model and the continuity thereof. The idea of this model is that somewhere around 100kya and 50kya an event happened that led to 'cognitive modernity' or Modern Behaviour, effectively transforming 'Anatomically Modern Humans'[8] (hominins that have the general *Homo sapiens* morphology but are supposedly not capable of Modern Behaviour; the oldest fossil to date with a 'modern' morphology is dated to about 300kya (Hublin et al. 2017)), to fully fledged Modern Humans.

The basis of this theory was the observation that there was a seemingly large shift in behaviour in the archaeological record, best summarised by Mellar's 'modern package' (see Mellars 2002 for an overview). These included among other things; a shift from flake to blade technology, the emergence of personal ornaments, representational art, the development of styles in tool production, the exploitation of a broader variety of food sources, the development of more complex technology, and the use of a broader range of raw materials (see for example Mcbrearty & Brooks (2000 p. 491–493) for a more detailed set of traits). The *Human Revolution* model (Mellars & Stringer 1989) was particularly popular in the late 80s and the 90s of the last century, although there were some criticisms on the concept (or; more generally speaking, on the essentialist discourse of archaeologists and paleoanthropologists (Cartmill 1990; King 1994)).

The model started to falter in the early 2000's, most notably by the publication of Mcbrearty & Brooks, (2000), which convincingly argued that the model is largely based on the European archaeological record, while it ignores most of the African record. The African record, according to Mcbrearty & Brooks, shows that the 'modern package' is in fact more of a gradual assembly on the African continent, stretched over long distances of space and time. As such it took away the 'revolutionary' part of the *Human Revolution.* However, this did not dispel the notion of Modern Behaviour as such, since it was supposedly still unique to *Homo sapiens.* In the years thereafter scholars began to argue that also the Neanderthals were capable of certain aspects of Modern Behaviour (Finlayson et al. 2012; Rodríguez-Vidal et al. 2014; Roebroeks & Soressi 2016; Zilhão 2006; Zilhão et al. 2010). It is important to emphasize here, that the morphology and the behaviour of what is considered 'human' are in this scenario decoupled. As such, in the archaeological context, it is Modern Behaviour that effectively is a proxy discussion of what we consider to be '(fully) human'.

In this behavioural definition, there has been argued by some scholars that Neanderthals should be considered as 'humans' (Zilhão et al. 2010), or at least that the two material cultures these hominins left in the archaeological record are indistinguishable in a cognitive sense (Villa & Roebroeks 2014, but see Wynn et al. 2016). The *human rev-*

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[8] This term is currently still in use, but in current discourse it is simply used to indicate hominins that fall within a 'modern' *Homo sapiens* morphology according to physical anthropologists.

olution being not quite so revolutionary, with the added problem that some of these behaviours did not seem exclusively limited to *Homo sapiens* (then generally considered to be the only 'human') raised an important question; which of these traits should be considered to be at the core of Modern Behaviour (and thus by extension) as a marker for 'humanness'? Nowell (2010) writes, in reviewing the concept of Modern Behaviour, "(…) there is some sense that what researchers are trying to define is when our species became human in all senses of that word – something that takes us beyond the biological landmarks of bipedality and the like and gets to the essence of what it means to be human.". This definition is almost reminiscent of concepts such as the 'human soul' and is neither descriptive nor explanatory of what a human is on any scientific way. Nowell (2010) argues that for most scholars, it is a symbolic capacity that generally defines Modern Behaviour. However, as Coolidge, Overmann & Wynn (2024) argue elsewhere, that concept is problematic in its own right. Symbolic Behaviour (or symbols in the Peircean sense) is per definition based on social conventions which are not reconstructable in the context of human evolution, because of low resolutions, a lack of continuity and the fact that symbols are per definition arbitrary. Yet there are such behaviours (such as ornamentation, or the burial of the dead) that are heuristically defined as such.

In addition, there is the problem of generalisation and double standards: not all *Homo sapiens* populations express what scholars call Modern Behaviour. Scerri et al. (2021) for example, describe a case where a Middle Stone Age (generally considered to last from 300–30kya, and considered cognitively 'archaic' as opposed to 'modern') persisted until 11kya, dispelling the notion of a unilinear, species wide move to a 'modern package'. On the other hand, when indication are found for a capacity for Modern Behaviour in other 'archaic' populations, they are heavily scrutinised (Corbey & Roebroeks 2001); there is there underlying axiomatic assumption that *Homo sapiens* will somehow in a unilinear fashion develop towards 'modernity' (or has an innate capacity for it in the 'anatomically modern human'), while the same is not assumed for other hominins. This manner of thinking is heavily criticised for being a remnant of the colonial origins of paleoanthropology; Modern Behaviour assumes a linear progression of development based on European conceptions of 'modernity' e.g. needs to go after (Porr 2010; Porr & Matthews 2017).

Paleogenetics and the 'modern human'

In recent years, there have been some major breakthroughs in the study of ancient DNA (aDNA) revolution which has some drastic effects on the narrative of human evolution. Green et al. (2010) managed to sequence an entire sequence of a Neanderthal genome (created from three individuals), which they then compared with genomes of five contemporary humans. Their results demonstrated that some current day human populations carry a small amount of Neanderthal genome with them. Most notably, the Swedish geneticist Svante Pääbo and his team have published influential works in this field (e. g. Hajdinjak et al. 2021; Pääbo 2015, 2020). In his book *Neanderthal Man: in Search of Lost Genomes* first published in 2014, Pääbo (2020) sketches the following image; there was a ‘replacement crowd’ that about 50kya swept across the globe and replaced all other living hominins (or human populations). This includes the Neanderthals and the Denisovans. However, it has been demonstrated that there was (at that time[9]) incidental gene flow between these groups, which leads Pääbo to coin the term ‘metapopulation’ (earlier suggested by Harding & McVean 2004); the term traditionally is used in ecology, meaning spatially separated populations of the same species. He (Pääbo 2015, p. 313) refers to “limited, but intermittent or sometimes perhaps even persistent” gene flow between ‘modern humans’ and Denisovans and Neanderthals. As geneticists deal in populations, and not species, they rarely use the term *Homo sapiens*, instead replacing it by the non-taxonomic term ‘modern human’. Pääbo (2015) as such here makes the dichotomous distinction between ‘modern humans’ (humans that are ancestral to *all* humans living today) and ‘archaic humans’ (the rest, among which Neanderthals and Denisovans). In later publications by geneticists (e. g. Chen et al. 2020; Hajdinjak et al. 2021), the ‘modern’ in modern human is often omitted. It is simply ‘Human’, ‘Neanderthals’ and ‘Denisovans’. Ackermann et al. (2016 p. 7) address this; they plea for an elimination of the term ‘modern human’ and prefer that all hominins of this metapopulation are referred to as *Homo sapiens* as a complex lineage. While Pääbo seemingly embraces this discourse in his ‘metapopulations’ concept, he still distinguishes these groups as ‘modern’ and ‘archaic’ populations. They suggest avoiding referring to Neanderthals and Denisovans as distinct species (*Homo neanderthalensis* and *Homo Denisova* respectively) but refer to them as ‘human ancestors’ with regional specific names; ‘Denisovans’ and ‘Europeans’. Yet, the current discourse still seems to operate the dichotomous ‘modern’ vs. ‘ancient’ human definitions (e. g. (Bergström et al. 2021). While the remain separate subdisciplines, the population discourse seems to also find its way into the taxonomic discourse as exemplified by Bergström et al. (2021) who describe the ‘origin of modern ancestry’ as (p. 229); “ (…) *H. sapiens* (the fossil lineage that includes modern humans – we make no allusions to species status by the use of these terms)” (…). Here, Bergström et al. use taxonomic nomenclature, yet do not commit to taxonomic clarity (i.e calling *Homo sapiens* as a species), making the use of the nomenclature epistemically ambiguous. Similarly, Finlayson et al. (2023) argue for a population approach recognising the “muddling of scientific and heavily charged vernacular names has continued to the present” (Finlayson et al. 2023, Appendix 1); inconsistencies in referring to certain groups of hominins are illustrated by referring to “*Homo neanderthalensis*, Denisovans and Modern Humans (sometimes *H. sapiens*) in the same context” (Finlayson et al. 2023, Appendix 1). If *Homo sapiens* and *Homo neanderthalensis* are not taxonomic species, it makes little sense to maintain this nomenclature.

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[9] Recent evidence suggests that multiple instances of gene flow have taken place between Neanderthals, Denisovans and modern humans; (Bergström et al. 2021; Chen et al. 2020; Hajdinjak et al. 2021)

As such, it remains unclear what the term 'human' in paleogenetics exactly means, apart from indicating 'us' and 'our direct ancestors', which seems to serve little other purpose than to define 'us' antithetically to something else. Peeters & Zwart (2020) address this, again using the Neanderthals as an example; the fundamental and leading question of Pääbo's (2020) research is 'what is the difference between modern humans and Neanderthals?':

> Among the few differences one would expect to find in the Neanderthal genome, there must be those that set us apart … Those few differences must form the biological foundations of the radically new direction our lineage took with the emergence of modern humans: the advent of rapidly developing technology, of art in the form we today immediately recognise as art, and maybe of language and culture as we now know it. If we could study Neanderthal DNA, all this would be within our grasp. (Pääbo 2020, p. 4)

Yet, if anything paleogenomics has in recent years effectively blurred the lines between these groups in accordance with the metapopulation concept (Bergström et al. 2021; Groucutt et al. 2021; Scerri et al. 2019), although some scholars still maintain a strict boundary between species (Meneganzin & Bernardi 2023).

Concluding remarks

In summary, in most Human Evolution sub-disciplines the term 'human' (and all its adjectives) seems to fail to create a unified meaningful scientific concept that can be studied interdisciplinary. Not only do each of the subdisciplines operate a different 'working definition' of what a human is, or is supposed to be, the definitions are completely incompatible.

For example, the genetic definition of the 'modern' human seems directly in opposition to the archaeological, behavioural definition. This is exemplified by the remark by Ackermann et al. (2016, p. 7): "(…) referring to e. g. Neanderthals versus 'modern humans' gives the incorrect impression that certain human groups living today are less modern than others." This is a purely genetic definition set off against a seemingly metaphysical and/or behavioural definition that is reminiscent of the concept of the 'human' that the archaeologists operate (similarly Stringer (2016) states on *Homo sapiens:* "Furthermore, although other researchers, particularly archaeologists, include behavioural factors in their diagnoses of modern humans/H. sapiens, I will not do so here."). There is no doubt that every archaeologist would agree that all current-day humans are behaviourally modern. Yet the genetic definition of the 'modern human' means something completely different. While this may seem like a semantic issue at first glance, as we have hopefully successfully demonstrated, all the concepts of the 'human' discussed in this essay are not without conceptual problems.

Firstly, the physical anthropologists refer to anything (when not using jargon) that falls within the genus *Homo* as 'human'. *Homo sapiens* is referred to as 'modern human'. While this definition seems relatively straightforward, there is a lot of debate (historically and currently) on which taxa belong to the *Homo* clade, and which do not. In other words, if *Homo* and ‘human’ are interchangeable, and it is not quite clear which species are *Homo*, and which is not, by extension it is unclear what a ‘human’ is.

Secondly, archaeologists use the term ‘human’ to denote a set of behaviours that would indicate a certain degree of ‘cognitive complexity’ often referred to as Behavioural Modernity. Recent archaeological debates have been focussing on the behaviour of neanderthals, which according to some scholars should also ontologically be classified as ‘Human’ due to its supposed capacity for symbolism and other complex behaviours.

Finally, there are the geneticists, who refer to ‘human’ as *Homo sapiens.* This actively excludes other hominins from being labelled as ‘human’. There is however, the species problem, which prevents palaeogeneticists from referring to ‘humans’ as ‘*Homo sapiens’.* While this in of itself is not problematic, the operationalisation of the term in this manner causes major contradictions with the other two definitions. While it does make sense from a geneticist’s perspective, there are again underlying metaphysical connotations, which in this context to the work of excluding for example Neanderthals and Denisovans from being ‘human’.

While great advances have been made in methodology in the sciences of human origins, which in turn produce impressive amounts of data, we would like to once again make a strong argument to actively involve the humanities in the field of human evolution.

While operating a ‘working definition’ as a means to interpret data within the subdisciplines of human evolution is not problematic per se while remaining within said sub-disciplines, the lack of a clear overarching determination does become problematic when communicating outside of them. These working definitions also invite shifting conceptualisations based on traits that are perceived as essential or qualitative (Cartmill 1990), further driving the theoretical content and conceptual framework in the sub-disciplines apart. As such, while Human Evolution in various ways answers the diachronic question of ‘how did we become what we are?’, it seems to struggle with the question with what we precisely are.

These problems will persist if the field of human evolution does not reflect on its own premises in a way that can be attached, implicitly or explicitly, to philosophical anthropology. The inverse problem also exists: Plessner’s philosophical anthropology, in laying out a ‘material a priori’ for the ‘vital categories’ of different life forms, with the inclusion of human beings, ends up presenting mostly a synchronic perspective. It thereby loses contact with diachronic questions (see De Mul 2014, 17–18; Nauta 1991) concerning the evolutionary coming-to-be of the categories which it describes. This is in part a methodologically as well as politically motivated metatheoretical decision; but if philosophical anthropology seeks to heed Plessner’s own advice and learn from the sciences of human origins and development, the next question seems to be how the findings of the latter – including their shortcomings in defining the terms of ‘humanity’ by themselves – shifts the terms of philosophical anthropology itself.

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