

## Chapter 6

# What Are Human Beings (That You Are Mindful of Them)? Notes from Neo-Darwinsim and Neo-Aristotelianism

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**Abstract** The task of ascertaining whether and how human beings are unique presupposes that we know what human beings are: if we cannot identify human beings, we are unable to compare them against non-human beings. Traditionally, the answer to the question of what things *are* refers to their essences. However, for many decades since the 1950s, there has been a pervasive scepticism that any such essences exist, certainly for biological kinds, if not more broadly. Recently, there have been attempts to salvage biological essentialism, both by philosophers of biology and by neo-scholastic metaphysicians. In this paper, I argue that these attempts to defend biological essentialism are insufficient for the purposes of getting the quest for human uniqueness off the ground. From a theological standpoint, ‘human being’ should not be conflated with ‘*Homo sapiens*’.

**Keywords** Definition • Essence • Essentialism • *Homo sapiens* • Human being • Human evolution • Human nature • Human uniqueness • Species concept • Theological anthropology

To answer the question of whether human beings are *unique* requires answering the question of what human beings *are*. This is either because the two questions are really the same question (Glock 2012), or – as I prefer – the latter is a precondition of the former. That is, the question of whether human beings are unique is an empirical one – a question about what human beings are like, relative to other beings – which requires some prior conceptual (viz., definitional) work.<sup>1</sup> To elaborate, the method for ascertaining the reality and locus of human uniqueness requires us first

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<sup>1</sup>As we shall see, definitional work often involves empirical investigation: that is, the distinction between knowing what something *is* and knowing what it is *like* is not a hard one. The movement between definition and description is iterative.

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to *identify* human beings. Only having identified which organisms count as human beings can we examine them to learn about what they are like (e.g., what they are able and unable to do). Having obtained an adequate description of what human beings are like, we can then compare them with other beings, to see if human beings differ from non-human beings in any significant ways.

In practice, we rarely think very much about the first step (i.e., definition) at all. Instead, we take the U.S. Supreme Court Justice Potter Stewart's famous approach, which he used to define 'hard-core pornography': we simply assume that we know a human being when we see one. We look around the world, and find that there are beings very much like us, and that they – and we – are able to do things like use language, transmit culture, do mathematics, and so forth. And then we notice that such phenomena are conspicuously absent among other beings, beings that aren't like us. Occasionally, however, we notice that these other beings can do things that are kind of like the things that we can do, and this generates a flurry of excitement and heated discussions about how similar these abilities are after all. Can Kanzi the bonobo chimpanzee *really* communicate like we do? Do New Caledonian crows *really* engage in mental time travel? Are elephants *really* aware of their mortality? These are all difficult questions, and answering them requires onerous empirical work, typically done with brilliance and diligence by many different kinds of experts who study different aspects of human and non-human life. Furthermore, this comparative work does not merely involve enumerating similarities and differences; judgements eventually have to be made about what counts as a sufficient or sufficiently important difference for claims about human uniqueness. As interesting as all this is, however, it is not with the descriptive and comparative aspect of the project that I am presently concerned. Rather, it is with that oft-neglected first step: that of defining what human beings are to begin with.

## Human Beings, *Homo sapiens*, and Us

Our concern with whether human beings are unique is, of course, a concern with whether *we* are unique. However, insofar as it is not a wholly solipsistic or egotistical exercise, the quest for human uniqueness requires an account of who 'we' are, and not just who 'I' am. Being rightly wary of restricting humanity in such ways as to exclude, for example, women and non-Europeans, it is now *de rigueur* to delegate the definitional responsibility to biologists: human beings are *Homo sapiens* (or perhaps *Homo sapiens sapiens*). Science, it is tempting to believe, can do the metaphysical heavy lifting here.

The assumption seems to be that there are scientific – by which we, rightly or wrongly, mean objective, or at least non-arbitrary – criteria for identifying *Homo sapiens*, and thus, human beings. But what might these criteria be? In the good old days before the Darwinian revolution, and all that – so the commonly told story

goes (e.g. Hull 1965)<sup>2</sup> – we believed that things, including biological classes, had *essences*, such that all and only all the members of a biological kind possess the essence proper to that kind. Thus, to be a human being, one had to have a human essence; all human beings are similar in that they share this essence. To ascertain whether something was a human being or not, all we had to do was to find out whether it possessed the right kind of essence. There is an attractive simplicity to this view. However – and regardless of whether anyone was really an essentialist in this sense – essentialism in general and biological essentialism in particular has certainly been out of favour since the 1950s (e.g. Ghiselin 1974; Hull 1978; Mayr 1959; Popper 1945; Quine 1951, 1966).

In the place of essentialism about biological kinds have come two views: individualism and nominalism. The individualist view denies that species (and possibly other biological taxa) are kinds or classes at all; rather, species are spatio-temporally bounded *individuals* (e.g. Ghiselin 1974; Hull 1976). On this view, species labels work like proper names: species cannot be defined so much as ostensibly designated.<sup>3</sup> The nominalist view similarly denies that there are biological kinds, but also has no need for the mereological summation of individual organisms into individual species; only individual organisms exist, and species labels are merely convenient conventions.<sup>4</sup> Neither of these views automatically provides means for non-arbitrary species definition or designation, though, as we shall see, they may draw from other modern species concepts to do so. Even more recently, however, there has been some pushback against these deflationary accounts: there has been an essentialist revival, which has taken diverse forms, some of which are even compatible with the individualist view (Boulter 2013; Boyd 1999; Devitt 2008; Griffiths 1999; Kripke 1980; Oderberg 2007; Putnam 1970; Walsh 2006; Wilkins 2010). Before we consider these more closely, however, it is good to bear in mind what we need for our purposes, so as not to be unnecessarily distracted by metaphysical quandaries.

## Natural Kinds and Essences

All we want is a way to identify human beings. For any individual we encounter, we want to be able to sort it, either as a ‘human being’ or as a ‘non-human being’. Furthermore, we do not want our sorting to be arbitrary: in other words, we want the

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<sup>2</sup>The details of this story are currently under debate, but this need not detain us. Those interested may consult Amundson (2005), Atran (1990), Wilkins (2009), and Windsor (2003, 2006)

<sup>3</sup>Ghiselin (1974) and Hull (1978) seem to think that individualism defeats biological essentialism *tout court*, and not just essentialism about biological kinds. I cannot see why this is so: after all, individuals can have essences.

<sup>4</sup>To clarify, it is possible to be sceptical about some taxa, and not others. As we are most interested in *Homo sapiens*, we are most concerned with whether or not biological species form natural kinds. A nominalist about biological species might well be a realist about higher order taxa; she could certainly also be a realist about the distinction between living and non-living things.

distinction between ‘human being’ and ‘non-human being’ to be *real* and *objective*, not just made up by us. Given our goals, it is not obvious that we need full-fledged *natural kind essentialism*, which is the doctrine briefly described earlier, that ‘human being’ is the name of a class of individuals, all of which share an essence. For example, we do not need ‘human being’ to be the name of a *kind*: we could just as well be individualists, and treat each of us (and our conspecifics) as a part of the individual human species rather than a member of the human species class.<sup>5</sup> If so, we just need a way to mark out the boundary conditions of the individual *Homo sapiens*. We shall return to this later. Even if we wanted *Homo sapiens* to be a natural kind, we might not need all its members to share an essence, depending on what we mean by ‘essence’.

The philosophical literature on essentialism is both enormous and confusing. It is not always clear what counts as an essence; it is not always clear what is essential to essentialism, if you like. Most philosophers agree that essences are properties (or clusters thereof) of things, but there is wide disagreement over what kinds of properties they are.<sup>6</sup> Essential properties are often contrasted against accidental properties – a distinction we inherited from Aristotle – but here again there is no strong consensus on what the difference is. Mumford (2005), for example, claims that there is no need to speak of essential versus accidental properties at all, if all we want are properties that characterize a kind. All we need for that are *universal* properties, shared by all and only all members of the kind. Others want essential properties to do more work than to provide similarity within a kind (and differences between kinds). Sometimes, the difference is cashed out in modal terms: essential properties are those universally instantiated in all and only all members of the kind in all possible worlds, whereas universal accidentals might be thus instantiated in this world, but not in others. Increasingly commonly – again inspired by Aristotle – essential properties are also expected to fulfil some explanatory function. For the moment, however, we can take Mumford’s (2005) minimalist view: all we need is to be able to reliably distinguish human beings from non-human beings in the actual world (as opposed to other possible worlds): universal accidentals will do just as well as essential properties.

It would be very convenient for us if there were as few essential properties as possible, and that they were as detectable as possible. It would, for example, be great if we could define human beings as ‘featherless bipeds’, as Plato allegedly did. Of course, Diogenes then infamously presented to him a plucked chicken, necessitating the addition of ‘with broad, flat nails’ to this definition.<sup>7</sup> There are a few

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<sup>5</sup>This is not to deny that the kind vs individual debate is an important and interesting one. For example, on the view that we need natural kinds to have laws of nature, the individualist view excludes species from being subjects of such laws (e.g. Lowe 2006). We might additionally want *Homo sapiens* to be subject to laws of nature, but that is a separate issue from the one currently under consideration.

<sup>6</sup>As we shall see later, neo-scholastic metaphysicians object to this characterization of essences as properties (Boulter 2013; Feser, 2014; Oderberg 2007).

<sup>7</sup>This story appears in *Lives and Opinions of Eminent Philosophers*, Book VI.20.

problems with this reliance on detectable – we might say *superficial* – properties, not least that these sorts of definitions are seemingly inevitably found either to be too promiscuous, or to be too restrictive. Even Aristotle’s more influential definition of human beings as ‘rational animals’ is often accused of falling for this problem, inciting umbrage from people who think that he is dehumanizing the intellectually disabled. The typical response to the moral outrage against Aristotle’s conception of what it means to be human is to talk about *capacities* or *potentialities*. On this view, all it takes for an individual to count as a human being is to have the capacity for rationality. One way to think about this is to bring in counterfactual scenarios: if only the accident didn’t happen, or if only there was a more nurturing developmental environment, or if only her genes were ever so slightly different, she would be rational. Let’s therefore not count her lack of rationality against her humanity. The problem with this response is obvious: if we let in some counterfactually rational entities, what’s stopping us from letting in all manner of counterfactually rational entities? After all, perhaps if a New Caledonian crow had slightly different genes, she might be rational too.

An alternative response is to move away from surface-level features, and toward identifying essences with whatever produces those features. We are now closer to the Aristotelian emphasis on the explanatory role of essences: the essence of a thing makes it what it is, and explains what it is like. Thus, it is not featherlessness or reasonableness<sup>8</sup> that is essential to being human, but whatever deeper causes there are of featherlessness and reasonableness. The virtue of this view is that even when the surface-level properties are absent, these deeper properties might still be present: this in turn places the counterfactual scenarios proposed earlier on firmer ground. At least since Putnam (1970) and Kripke (1980) the focus has been on *microstructural properties*, the discovery of which they take to be the main business of science. The classic example is gold. What makes an atom a gold atom is that its nucleus contains 79 protons: possessing 79 protons is a necessary and sufficient condition for a substance being gold. If its nucleus contained one fewer proton, it would be platinum; if its nucleus contained one more proton, it would be mercury. Not only does an element’s atomic number make it the element that it is and differentiate it from other elements, but it is also the cause of many of the element’s other properties. In a neutral atom, the number of protons determines the number of electrons, and the number of electrons, particularly in the valence shell, determines many of the element’s chemical and physical properties, such as its malleability and electrical conductivity.

Human beings are, of course, not chemical elements, even though we are physically constituted by them. Rather, we are, perhaps among other things, biological entities. Thus, having seen what chemical essentialism looks like, we might want to know what biological essentialism looks like. Here, the classic examples are lemons

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<sup>8</sup>By ‘rational’, Aristotle and his inheritors do not mean ‘reasonable’, if that just refers to a particular cognitive style. The common accusation against Aristotle’s definition, that it leaves out the intellectually disabled, is misguided by this errant conflation of a trait and the essence from which it flows. We shall return to this point later in considering neo-scholastic positions.

(from Putnam 1970) and tigers (from Kripke 1980). Just as what makes gold gold is its atomic number, what makes lemons lemons is their genotype (or ‘genetic code’, as Putnam 1975: 240 has it): lemons have lemon genes that feature as causes of lemons’ properties, and the same applies to tigers and *E. coli* and *Homo sapiens*. The problem with this view is that there are – according to biologists – no such things as lemon genes, or for that matter, human ones.

Now, just because there are no *genetic* essences does not entail that there are no biological essences at all. It would be convenient if there were genetic essences, just as it would have been convenient if there were more easily detectable ones (i.e. without the need for gene sequencing technology), but the quest for human uniqueness does not need the task of identifying human beings to be easy, just possible. However, with a few notable exceptions to which we will return, the consensus view among philosophers of biology is that biological essentialism of any kind is antithetical to Darwinism. But why does Darwinism preclude essentialism?

## Darwinian Objections to Essentialism

There are four common objections to essentialism from evolutionary biology.<sup>9</sup> The first is that the very fact of evolution poses a problem: that is, biological essentialism is tied to the doctrine of the fixity of species (e.g. Mayr 1959). This is simply mistaken. There is no problem, for example, with the idea that I might fail to pass the essence of humanity down to my children: they would just not be humans. It is true that in this case it would not be the species itself that evolves, but the population of individuals, but so much the worse for the idea that it is the species that evolves (see also Sober 1980).

The second common objection is from the fuzziness of taxonomical boundaries: at least on a gradualist theory of evolution, species (and other taxonomical) categorization is difficult because there will be problem cases that are intermediates between two species within a lineage. This is inconsistent with biological essentialism because biological essentialism requires sharp boundaries. This point is not entirely mistaken, but too much is made out of it. It is true that, on biological essentialism, individuals must belong to one or another biological kind. But it does not follow that we have to be able to infallibly identify all individuals as members of their kinds. In other words, we can just be agnostic about the problematic cases, while accepting that there are essential differences between the species on either side.<sup>10</sup> Applied to the human case, we can at last begin to ask and answer questions about human uniqueness, even if there is some doubt about what we might think of as the edges of humanity.

<sup>9</sup> See also Boulter (2012); Wilson et al. (2007).

<sup>10</sup> Oderberg (2007) makes this point in drawing the distinction between epistemological and ontological vagueness; he correctly notes that essentialism can only accept the former but not the latter.

The third objection concerns the explanatory role of essences. Recall that one view of essences is that they are properties that explain other properties: the atomic structure of gold explains various physical and chemical properties. The objection to this view in the biological case is that there are no such properties, whether genetic or otherwise. In other words, biologists have no need for essences in their explanatory theories. This position has become more controversial in recent years, as philosophers have begun working on the implications of evolutionary developmental biology for the metaphysics of biology. As we shall see later, some philosophers have argued that there may be room for developmental essences in biology (e.g. Boulter 2012; Walsh 2006).

The fourth objection is from current taxonomic practice. Just as biologists allegedly have no need for essences in their explanatory theories, they also have no need for essences in their taxonomic efforts. They have abandoned the search for shared intrinsic properties, instead relying on relationships, particularly reproductive relationships. We shall return to this later too, as some philosophers have proposed that biological essences need not be intrinsic properties, but may be historical and/or relational ones, which fits better with current taxonomic practice.

## Another Darwinian Objection Against Essentialism

My own argument against biological essentialism is a sort of extreme version of the argument from fuzzy boundaries. On the argument from fuzzy boundaries, species are like clouds; not *real* clouds, perhaps, but at least our cartoonish idealizations thereof. Clouds have uncontroversial centres, where the water vapour is most densely packed. At the edges, however, the water molecules get less and less dense; but how far nearby do water molecules have to be to count as being a part of the same cloud? The problem can be seen if we are just considering a single cloud in an otherwise clear, blue sky, but it is more acute if we consider two adjacent clouds. Here, we seem to have two uncontroversial centres, each with fuzzy boundaries contiguous with one another. But when does one cloud end and the other begin? As I alluded to briefly earlier, however, we can be agnostic about fuzzy boundaries: sometimes when we are asked, ‘Is this a human?’, we should allow ourselves to plead ignorance.

My contention is that this ‘species are like clouds view’ assumes a false – or, at least, controversial – description of evolutionary history. The standard view of evolutionary history – phyletic gradualism – is that populations evolve gradually over time. This is opposed to a *saltationist* view, in which speciation occurs relatively rapidly, though not necessarily within a single generation. Note that just as saltationism is not limited to *single-step* speciation, neither is gradualism committed to the idea that evolution happens at the same rate for every population, and that this rate is constant. On a gradualist view, biological taxa are not like clouds, but like rivers, flowing continuously, occasionally branching (i.e. cladogenesis), sometimes even reemerging, but often just changing in various ways over time (i.e. anagenesis).



In this scenario, in which there is both anagenesis and cladogenesis, how do we draw species boundaries? One way we might be tempted to do this is by ostensibly *fixing* a centre, at least for cases of anagenetic evolution. For example, we might stipulate that *we* are the prototypical human beings. We can then work our way backwards genealogically, until we arrive at ancestors who are too different from us to count as members of our species: perhaps we might fall back to the biological species concept, determining species membership in terms of viable reproduction. We can do the same for future generations too. The problem with this method is that it is totally arbitrary. Why, after all, should *we* be the prototypical human beings? Why not our grandparents or grandchildren? Why not our great- great- great-grandparents or great- great- great-grandchildren? Depending on where we fix the centre, the boundaries are bound to move too. So, unless there is an objective way to fix the centre of a species, our species concept is going to be arbitrary, even egocentric.<sup>11</sup>

Consider, furthermore, the way we identify *extinct* species. What happens in practice is that we find some fossil evidence, and we compare it to other fossil evidence that we already have or to extant species. The discovery of fossil evidence is, of course, largely a matter of historical accident: there are, for example, political constraints over where palaeontologists may excavate. Say that a palaeontologist unearths fossil evidence of two individual organisms –  $O_1$  and  $O_4$  – both from the same lineage, and the former being the ancestor of the latter. Say, further, that they differ significantly from one another, morphologically, genetically, and otherwise. We might, based on our taxonomic criteria, categorize them as members of different species on the basis of these morphological, genetic, and other differences. This seems reasonable enough. However, imagine that instead of  $O_1$  and  $O_4$  the palaeontologist unearthed  $O_2$  and  $O_3$ , the former being a descendent of  $O_1$  and the latter being an ancestor of  $O_4$ . And now imagine, as is plausible, that  $O_2$  and  $O_3$  are *not* sufficiently different to count as different species. We would, in this case, make a different taxonomic decision. Of course, it's possible that we have *four* different species here. But imagine further, as is plausible, that  $O_1$  and  $O_2$  are also insufficiently different to count as different species, as are  $O_3$  and  $O_4$ . What this shows is that our taxonomic decisions are highly historically contingent, and even dependent on such things as geopolitical climates. Furthermore, it illustrates how talk of 'transitional fossils' can be misleading. It is not the case that there are regular species on

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<sup>11</sup> A comparison with music notes and colour categories might be useful here. There is not just one way to carve up sound wave frequencies and their corresponding pitches into pitch classes: different scales contain different numbers of pitch classes. Colour categorization seems to be more (but not entirely) psychologically universal, but even here, it is likely a contingent fact about how our eyes (e.g., rods, cones) and visual cortices (e.g., extended V4) work that determine how we categorize colours. There is, in other words, nothing special and objective – independent of us – about electromagnetic radiation with the wavelengths (approximately) 740nm and 625nm, such that they are objective boundaries. To most human beings under appropriate lighting conditions, these frequencies mark out the colour *red*, but that tells us more about human colour perception than about whether or not there is an objectively correct way to divide up a continuous colour spectrum into colour categories.



one hand and transitional species on the other: all species are transitional.<sup>12</sup> In our example,  $O_2$  is transitional between  $O_1$  and  $O_3$ , while  $O_3$  is transitional between  $O_2$  and  $O_4$ .<sup>13</sup>

## Biological Rejoinders on Behalf of Essentialism

The objection I have just described assumes a gradualist view of evolution. The obvious way to defeat it is to deny gradualism, in favour of saltationism. If, as I have argued, fuzzy boundaries are not decisive against essentialism, the essentialist does not even need the extreme saltationist view that species evolve in large single steps. Eldredge and Gould's (1972) theory of punctuated equilibrium might suffice.<sup>14</sup> On this view, evolutionary history is not best characterized by smooth or gradual changes over time, but by long periods of evolutionary stasis (e.g. five to ten million years for marine invertebrates; Eldredge 1985) punctuated by periods of relatively rapid change (five to fifty thousand years for the same; Eldredge 1985).<sup>15</sup> Adjudicating the disagreements between gradualists and saltationists goes beyond the scope of this paper, but defenders of biological essentialism might need to persuade the rest of us of the virtues of the latter.

Several recent attempts at defending biological essentialism do seem to involve saltationism, though not always explicitly so. Consider, for example, Stephen Boulter's suggestion that biological essences are to be found in 'species specific developmental programmes', at the centre of which are *developmental control genes* that control the expression of other genes. Thus, two individual organisms are members of the same species if and only if they possess the same developmental control genes. Small changes in such genes, Boulter argues, lead to dramatic phenotypic changes. This allows Boulter to accept that gene frequencies may change gradually over time while maintaining a saltationist view with respect to phenotype. Indeed, Boulter's view is *very* saltationist, given that speciation may turn on the

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<sup>12</sup> Oderberg (2007) tries to recruit the reality of intermediate or transitional *species* for the cause of essentialism, and he would be right in saying that if there were such species then 'there must be determinate [species] relative to which the indeterminacy is measured'. There are, however, so many intermediate species; there just seems to be us, observing as we do only extant biodiversity directly, and extinct biodiversity in patches only.

<sup>13</sup> As far as I know, only Devitt (2008: 374-375) explicitly deals with such cases, in his discussion of arbitrariness and anagenesis. He writes 'Clearly, there would be a deal of arbitrariness about this choice. But we should not exaggerate how much'. It is not at all clear to me how he quantifies the amount of arbitrariness involved here.

<sup>14</sup> Proponents of this theory take issue with characterizing it as a saltationist view, but this seems to be a protest against mischaracterizations by creationists and intelligent design theorists. The theory of punctuated equilibrium is a saltationist view in that it is not a gradualist one.

<sup>15</sup> Both Eldredge (1985) and Ghiselin (1987) also consider the theory of punctuated equilibrium and the view of species as spatio-temporally bounded individuals as mutually reinforcing. For them, the periods of rapid change are where individual species begin and end. A similar view may also be found in Hull (1978).

mutation of a single developmental control gene: we seem to be back at unique lemon genes. Despite Boulter's claim that this view is gaining traction among evolutionary developmental biologists, I judge it implausible on empirical grounds. Biologists will be better placed to adjudicate our disagreement, as they will be on the matter of gradualism versus punctuated equilibrium.

Similarly, Denis Walsh (2006: 444-445) has posited *organismal natures*: 'goal-directed capacities of organisms to develop and maintain viability, given the material resources at their disposal'. Again drawing from evolutionary developmental biology, Walsh points out that biological ontogeny is typically characterized by plasticity and persistence. Development is plastic in that there are multiple ways to arrive at the same end state; it is persistent in that, given perturbations, there are compensatory mechanisms available to maintain or resume a developmental trajectory toward an end state. Unlike Boulter's more explicitly gene-centric proposal, Walsh's view is more plausible. However, it is unclear how this notion of organismal natures can help us demarcate between biological taxa. As Walsh admits, biological development is *modular*: there is not, for any given organism, one single plastic and persistent developmental trajectory, but many. Which aspect of our ontogeny makes us specifically human? Furthermore, Walsh also admits, in his discussion of the role of organismal natures in the recurrence of traits across individual organisms, that '[r]elated organisms, members of the closely related lineages, exhibit a considerable amount of phenotypic similarity ... [as] a consequence of the buffering of development by the plasticity of organisms' (2006: 443). If so, how are we meant to distinguish between these 'closely related lineages'? Walsh's theory might be able to give us essentialism with respect to higher taxa (e.g. vertebrates), but it seems unlikely to give us species like *Homo sapiens* unless we assert, with Boulter, that organismal natures evolve in leaps and bounds. Tellingly, Walsh (2006: 432) agrees with deflationists and pluralists that '[a]ny account of biological kinds that is committed to a single criterion of species membership is inconsistent with scientific practice'. This is not a problem for him because his interest in essentialism is in its explanatory potential, not in its taxonomic function. As explanatory essentialism does not entail taxonomic essentialism, Walsh's account is of little use in helping us identify human beings.

There are several other recent versions of essentialism (e.g. Devitt 2008; Wilkerson 1995) or quasi-essentialism (e.g. Boyd 1999), but they share common limitations: they are unable to non-arbitrarily identify species like *Homo sapiens* without sneaking in an implausible saltationism. Devitt's (2008) theory of intrinsic biological essentialism, positing essences that are 'largely genetic' (but not necessarily exclusively so), does not quite require Boulter's saltationism, but nevertheless faces familiar problems on a gradualist view, particularly in the cases of anagenetic speciation.<sup>16</sup> It is unclear if Boyd's (1999; see also Wilson et al. 2007) theory of *homeostatic property clusters* (HPCs) should count as an essentialist theory, but if so it is, like Walsh's (2006), an explanatory theory that does not provide us with

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<sup>16</sup>As I have mentioned earlier, however, Devitt is likely to disagree with me on this. I have not been able to adjudicate the disagreement (see footnote 6).

means to identify species like *Homo sapiens* in any straightforward way. There are also a variety of proposals that tolerate taxonomic pluralism, despite claiming to be realist (e.g. Dupré 1981) or even essentialist (e.g. Beebee 2013; Dumsday 2012) about biological kinds. Even if such proposals are right, we are left with the problem of how to choose between the varieties of valid classificatory schemes. We shall return to some of these projects soon, but first let us turn to versions of essentialism that seem more directly helpful for our purposes of identifying *Homo sapiens*.

## The Phylogenetic Species Concept and Historical Essences

The conception of species that has most enthusiastically been embraced by taxonomists is the cladistic (Ridley 1989) or phylogenetic species concept (PSC; e.g. Eldredge and Cracraft 1980).<sup>17</sup> Cladists draw species boundaries by working out ancestral relations: a species is a lineage between two phylogenetic branch points (or between a phylogenetic branch point and an extinction event; or, for extant species, *from* a phylogenetic branch point).<sup>18</sup> Notably, PSC simply ignores how much change has occurred within a lineage: if there is no speciation event, the lineage remains the same species. ‘Cladistic species may undergo infinite evolution’ (Ridley 1989: 10). In other words, anagenesis is ignored. The moment a speciation event occurs, however, we suddenly have *three* species: the original pre-speciation lineage, plus the two post-speciation lineages. This is so even if one of the post-speciation lineages is otherwise indistinguishable from the pre-speciation lineage.

The cladistic species concept does seem to provide a neat, principled – that is, non-arbitrary – classification scheme. Applied to our specific case, *Homo sapiens* refers to the lineage that goes from the most recent speciation event in hominid evolution to present-day humans, until another future speciation event occurs. The main problem with the cladistic species concept is that it does not itself provide an account of speciation. The method of identifying speciation events, or more generally phylogenetic branching events, is a matter of contention: applying different criteria produces different phylogenetic ‘trees’, and therefore different definitions of species membership. The cladist may apply some *other* species concept – ecological, morphological, genetic, or whatever – to do its diagnostic work, but different species concepts can and do produce different diagnoses. If the diagnostic criteria are too strict, we get very long and diverse lineages; if they are too lax, we get many very short lineages that resemble one another. In real life, the current problem seems to be the latter: biologists have begun worrying about the role of cladistics in ‘taxonomic inflation’, the frequent elevation of subspecies to the level of species (Isaac et al. 2004; Zachos 2015; though see Sangster 2009).

<sup>17</sup>Mayden (1997) distinguishes between these, and also describes *three* phylogenetic species concepts. These differences are not significant for our purposes.

<sup>18</sup>This provides a response to my charge of arbitrariness: we are not the prototypical *H. sapiens*, just the most recent in the lineage.

As far as I know, no one has suggested that subpopulations of human beings should be considered different species, though there is disagreement over how to identify phylogenetic branching events in hominid evolution. *H. neanderthalensis* may or may not be a subspecies of *H. sapiens*; our most likely common ancestor, *H. heidelbergensis* may or may not be a subspecies of *H. erectus* or even *H. sapiens*. As I have already argued, however, ambiguity in the border cases is not necessarily a problem for our purposes. The bigger problem is that there may be no non-arbitrary way to pick between different criteria for identifying phylogenetic branching events. It would be absurd to pick a method that identified different nuclear families as different species, but there is nothing in cladistic or phylogenetic species concepts that rules this out. Say, for example, my descendants and my brother's descendants became reproductively isolated, just as a matter of contingent fact: a mix of cultural squeamishness about consanguinity and geographical separation, perhaps. Cladists could put these two lineages in different clades; cousins would therefore fail to be conspecifics.

A further problem with putting cladistics and/or phylogenetic species concepts on a metaphysical pedestal is that they ignore anagenesis: this would be fine if anagenesis was irrelevant for our purposes, but that is not a safe assumption to make. Recent evidence does suggest that there was more branching than perhaps previous generations of evolutionary theorists thought (e.g. Dobzhansky 1944; Mayr 1950; cf. Arsuaga 2010), but the picture is also becoming muddier – indeed, Hawks (2016) compares hominid evolution to a *muddy delta*, as opposed to the traditional picture of a branching tree. Hominid evolution is not straightforwardly monophyletic, as cladists would prefer. It is not the case that, for example, *Homo sapiens* and *Pan troglodytes* share a common ancestor, from which we diverged, never to meet again. There is evidence of inter-breeding, in the early days for example with Neanderthals and Denisovans (e.g. Hawks 2013; Hawks and Cochran 2006; Patterson, Richter, Gnerre, Lander and Reich 2006).

Despite these problems, there have been defenders of the notion of *historical* or *relational essences* (e.g. Okasha 2002; Griffiths 1999) that, explicitly or otherwise, take the PSC as their point of departure. It is somewhat contentious to call these *essences*, seeing that they tend to depart from the prototype of *intrinsic* properties shared by all and every members of a kind. However, if all we want is some set of necessary and sufficient conditions for something to count as a member of a species, then the kind of historical relationships that form the basis of cladistics seems to fit the bill, so long as we can decide on a non-arbitrary way to identify phylogenetic branching events. What is a human being? Any individual within the *H. sapiens* lineage that begins with, say, the splitting of *H. heidelbergensis* into *H. neanderthalensis* and *H. sapiens*. Luckily, there doesn't seem to be massive intra-specific variation in this lineage: so, generalizations about our species may be possible, or at least sufficient to get the quest for human uniqueness off the ground. This might not just be a matter of *luck*, however. Paul Griffiths, for example, argues that groups defined by common descent are also likely to share other properties (e.g. morphological, physiological, behavioural) because of various sources of *phylogenetic inertia*. Some traits are unlikely to change over the generations, insofar as their

development is linked to the development of other traits, particularly if the development of those traits is robust against both genetic and environmental variation (e.g. if there are genetic redundancies). These *generatively entrenched* traits can be said to form the essence of a taxon, in that they are microstructural properties that explain other ‘superficial’ properties. This part of Griffiths’s view is a version of Boyd’s (1999) homeostatic property cluster account, which we have already briefly encountered. Boyd’s account simply begins with the observation that there are correlated properties within a population. Some of these correlated properties form homeostatic clusters: they are not just accidentally correlated, but there are underlying causes that hold them together, which he calls *causal homeostatic mechanisms*. These causal homeostatic mechanisms are the essence of the population. To identify clusters and individuals within them, we do not have to know exactly what the causal homeostatic mechanisms are, just that there are some. In other words, all we have to do is to identify non-accidentally correlated properties. At least in practice, this puts HPC close to traditional morphological species concepts, in which superficial traits are the criteria for kind membership. In HPC, it is the causal homeostatic mechanisms that are the essences, but if we are ignorant of them, we have to rely on observable properties, phenotypes. However, HPC does not give us anything like strict criteria for species membership because property correlation is a matter of degree in two senses (indeed, this is generally treated as a feature of the theory, rather than as a bug). First, it is not clear how highly correlated traits have to be to count as members of the property cluster. Second, it is not clear how many correlated traits an individual needs to possess to count as members of the species. For example, say there are six identifiable traits – *a, b, c, d, e, f* – in the HPC for a species *S*, bound together by causal homeostatic mechanisms. How many of these traits need to be instantiated in any given individual for it to count as an *S*? Any answer seems arbitrary. Furthermore, if an individual only needs some but not all traits to count as a member of *S*, members of *S* might look very different from each other.  $I_1$  might instantiate traits *a, b*, and *c*, while  $I_2$  might instantiate traits *d, e*, and *f*; both might be members of *S* (if three traits is deemed to suffice), but they would not be very similar at all.

It is easy to see how Griffiths’s and Boyd’s accounts play nicely together here. Griffiths provides a diagnostic criterion: something is a human being if and only if it is a member of a particular lineage of hominids that began at a speciation event in which (say) *H. neanderthalensis* and *H. sapiens* split up. (It is not crucial for now that this story about hominid evolution is accurate: what the example shows is that the delineation of species is possible.) What Griffiths needs is some account of how genealogical relations can come with meaningful phenotypic and genotypic similarity: enter Boyd’s account of causal homeostatic mechanisms that bind together property clusters. Conversely, by itself, Boyd’s account does not give us a way to identify species, so it needs the historical essence account to do that, which Griffiths’s historical essentialism provides.

The combination of a phylogenetic species concept, a view of historical essences *à la* Griffiths, and a mechanism for intraspecific coherence *à la* Boyd, seems to provide the best way to define human beings biologically; however, this is only so

if there is a non-arbitrary way to identify phylogenetic branching points. This is a big if. Furthermore, we have now come a long way from essentialism as it is traditionally construed. Perhaps this is too bad for traditional essentialism, but recent developments in neo-scholastic metaphysics are worth our consideration.

## What Are Essences?

The most significant difference between the received version and what David Oderberg calls ‘real’ essentialism is that the latter rejects the former’s view of essences as properties, superficial or otherwise, necessary or otherwise (e.g. Oderberg 2007, 2011). The essence of a thing, for the neo-scholastic metaphysician, is given by its substantial form; from a thing’s form flows its properties. Thus, the form of a thing explains the unity of its properties, whether within or among individuals: applied to biological kinds, the essence of a biological kind is that which accounts for the similarities across individual members of that kind. This ‘not a property’ view entails that although the essence of a thing is a *part* of it, it is not a part alongside other parts: rather, it pervades all aspects of the thing. As Oderberg amusingly puts it, ‘there is as much dogginess in Fido’s nose and tail as in Fido as a whole’ (2007: 70). Thus, the hunt for essences will not simply end at the identification of special features of things, even features that play an important role in explaining intraspecific homogeneity (e.g. microstructural features). Rather, at best, those features merely indicate the existence of an essence.

We have actually already seen one neo-scholastic position, from Stephen Boulter, and found it wanting. However – encouraged by his own claims – I interpreted Boulter as identifying a species’ essence with some genes (viz. developmental control genes), and this seems inconsistent with real essentialism as I have just briefly described it. Regardless, Boulter is not too worried about the failure of his particular suggestion. ‘[I]f this particular suggestion does not hold up to scrutiny, something else will have to be found to play the role of essences *if evolutionary biology is to meet its self-imposed explanatory objective*’ (2012: 113, emphasis added). This is a common argumentative strategy among neo-scholastic metaphysicians on the topic of essentialism for biological kinds: they do not defend any particular proposal, but just that biological essentialism must obtain given some of our other assumptions or desiderata (e.g. explanatory objectives, scientific realism). This is in part because of the neo-scholastic view of essences as being given by substantial forms. Essences are not physical parts, but metaphysical parts. Consequently, there is no empirical test for essences, or as Oderberg puts it, ‘no magic test, no piece of metaphysical litmus paper’ (2007: 48). It is therefore a better argumentative strategy to demonstrate that *some* essence is needed, even if we cannot yet identify it.

Boulter mounts two such arguments. The first begins with the premise, allegedly accepted by evolutionary biologists, that biological diversity is the product of *real* speciation events: thus, species must be *real* and ‘not illusory’, nor ‘simply a function of our naming conventions’. If species are to be real, then they must have essences.



Even setting aside the complication that biologists disagree – theoretically and methodologically – about biodiversity (Maclaurin and Sterelny 2008), the obvious rejoinder is to deny the premise. It is true that any account of biological diversity ‘presupposes that change is a real feature of the living world’ (Boulter 2012: 109), but *pace* Boulter, we need not presuppose that ‘distinct species really do come into and pass out of existence’. The view, indeed held by all evolutionary biologists, that populations of organisms evolve over time, does not require the reification of these populations into natural kinds.

Boulter’s second argument begins with the uncontroversial premise that evolutionary biologists are interested in discovering adaptations; he rightly infers that, for any given trait, the adaptationist project requires us to know something about its phylogenetic history. He then correctly notes that for most evolutionary biologists, phylogenetic histories are described using phylogenetic trees. Then, the error enters. Boulter asserts: ‘For a phylogenetic tree to be genuinely illuminating it must represent real relationships obtaining between natural species’ (2012: 110). It is not at all clear to me that this is so, nor is it clear to me that cladists would agree: a poll needs to be done on the latter question, but the disagreements over phylogenetic species concepts suggests to me that most cladists are anti-realists about phylogenetic trees (or they are promiscuous realists, à la Dupré, which Boulter rejects anyway). Of course, nothing metaphysical follows from sociological facts about what biologists do, but Boulter needs to tell us why we should be realists about our cladograms before he can get his argument for essentialism off the ground.

Oderberg (2007) and Feser (2014) have more general arguments for essentialism, biological or otherwise. Feser (2014: 212), for example, begins with the bold assertion that it is just obvious that things have natures, and therefore ‘it would be absurd to try to prove that things have natures’. Prudently anticipating that this approach will fail to impress, he then mounts a ‘no miracles’ argument à la Putnam’s argument for scientific realism: the unity of a thing (e.g. a kind) would be a miracle were there not a *unifier*. This unifier just is the substantial form that gives us the thing’s essence. This argument assumes that there is unity to be explained, but this is precisely what is in question. Feser’s (2014: 212) example is illuminating: ‘This oak tree, that one, and the other one are united in the way they are not united to stones, dogs, or people’. Here, Feser simply begins with an identified class (i.e. the three trees): it is precisely this move that is under contention. The move from natural kinds to essentialism may or may not be straightforward, but it would be premature to assume that there are biological natural kinds.

Similarly, Oderberg asserts that there are ‘determinate species, i.e. species whose members are determinately members’ (2007: 229), in contrast to indeterminate ones. This is as odd claim, given that even on the ‘species are like clouds’ view, all species are plagued with fuzzy boundaries. More to the point, however, this view is in stark opposition to my ‘species are not like clouds’ view. As evidence, Oderberg (2007: 229) says of *Canis lupus*, ‘we recognize it when we see it’.<sup>19</sup> Similarly, of

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<sup>19</sup>This is reminiscent of Feser’s (2014) arguments, above. This is no coincidence, as Feser credits Oderberg as a major influence.



human beings, Oderberg confidently asserts, ‘We all know what counts as a paradigmatic human being, or a stereotypical human’ (2007: 50); on the contrary, as I have argued, we have just decided *ex cathedra* that we are the paradigmatic human being. In bygone times – and perhaps still, in some cultural contexts – this decision would have led to a definition of human being that excluded ethnic minorities. In any case, with this reliance on intuition, we seem to be back to hardcore pornography and the U.S. Supreme Court Justice. I have no trouble believing that we *think* we recognise a member of *Canis lupus* (or *Homo sapiens*) when we see one – indeed, there is an entire research programme dedicated to the psychological underpinnings of such folk biological intuitions (e.g. Atran 1990) – but the veracity of these intuitions is precisely what is under interrogation, and therefore cannot simply be assumed or asserted: essentialists and non-essentialists disagree on this key premise, absurd as it may seem to Oderberg. It cannot be denied that Oderberg’s assertion carries a lot of intuitive appeal. However, our intuitions are wrong, and the source of the error – as I have diagnosed it – is our inability to observe biodiversity diachronically. We see only extant biodiversity and a gappy fossil record, and we mistake our historically accidental observations for good bases upon which to infer real categories.

## Can the Metaphysics of Human Being Be Naturalized?

It will not come as a surprise that I am sceptical of attempts to naturalize the metaphysics of human being, at least insofar as this metaphysical work is intended to be foundational for grander projects, such as the quest for uniquely human traits. There are, however, shades of naturalism. To reject, as I do, the theological adoption of biological scientific categories – to treat ‘*Homo sapiens*’ as a synonym for ‘human being’ – is not to reject wholesale attempts to do theological anthropology at least in part from the ground up, from empirical observations. To their credit, contemporary neo-scholastic metaphysicians like Oderberg, Feser, and Boulter avoid both Platonic rationalism on the one hand and naïve scientism on the other: being good Aristotelians, their essentialist project begins with empirical observations, even while they deny that there are empirical tests for essences. The problem, as I have argued, is that our observations are limited by our temporal location: we see only extant biological populations and the occasional fossil, and we are led to form our biological categories around what we can see, failing to realize that this makes our categories perniciously historically contingent.

All is not lost, however, if cladists can work out a non-arbitrary way how to identify phylogenetic branching events, and if saltationists can solve the analogous demarcation problem anagenesis. This might still be dissatisfying to neo-scholastic metaphysicians, however, who insist on there being *intrinsic* essences, and not historical or relational ones. For the neo-scholastic project to work, Oderberg’s supposition that ‘[w]e all know what counts as a paradigmatic human being’ (2007: 50) has to be true. Science can provide no solace, then; from a purely scientific perspective, Oderberg’s supposition is false. However, we might have good non-scientific

reasons to stipulate what counts as a paradigmatic human being. Perhaps there is warrant for what I have dubbed the egocentric option of fixing ourselves as the prototypical human beings; we had just better avoid ethnocentrism if we pursue these options. Alternatively, we can be overtly Christocentric: we can identify Jesus of Nazareth as the paradigmatic human. These are options, but they all require theologians to do theology – or, more generally, metaphysicians to do metaphysics – rather than delegating that responsibility to scientists *qua* scientists.

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