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NOT SO HUMAN, AFTER ALL?

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In the future described in the *Red Rising* trilogy, many Golds believe they *deserve* to rule over the other Colors. They believe this, at least in part, because of the *biological* differences introduced by the use of genetic engineering. As described in the books, Gold women and men are on average faster, stronger, longer-lived, and (on their view) more "intelligent" than the other Colors. It with this in mind that Adrius "The Jackal" suggests that the Reds really do form a different species (*homo flameus*) from either the *homo sapiens* from which they descended or the Golds that dominate them. Later, he claims that Darrow is "not even evolved enough to have a Color...Just a *homo sapiens* playing in the realm of the gods" (MS, p. 439). Again, the suggestion is that individual Colors represent different species, with the Golds representing the "highest" species.

The books suggest that the Jackal's view about the relationship between the Colors might be, at least to some extent, an idiosyncratic one, reflective of his own warped view of reality. Darrow, for one, argues that the Jackal is "just a man." Moreover, even powerful highColors such as Octavia au Lune and Quicksilver talk about the human "species" in ways that suggest they see it as a single community (even if Octavia thinks that Golds are uniquely qualified to lead the community). However, none of these people actually offer an *argument* against the Jackal's claims concerning the biological relationships between the various Colors. It is easy enough, of course, to show that the Golds are not literally gods. However, this doesn't get to the heart of the Jackal's claim that the Golds really are different from the other Colors, and that these differences provide a justification for the Golds' treatment of them. In this respect, it seems that the Jackal's claim is merely an exaggerated version of what many Golds already accept. Moreover, it has clear parallels with the way that high status groups in our own world have often tried to "justify" their treatment of other groups.

With this background in mind, I'll be taking a more serious look at the Jackal's claim, which will require thinking carefully about what exactly

species are. As it turns out, this is by no means a simple problem. In the end, I'll suggest that our concepts of biological species are not well-suited to deal with the sorts of claims that the Jackal makes, and that we ought to be very careful when using claims about biology to support political and ethical conclusions.

ARISTOTLE'S ESSENTIALISM

In our day-to-day lives, we frequently distinguish between species of animals by looking for some "unique" characteristic that distinguishes them from otherwise similar species. Squirrels, for example, have bushy tails while chipmunks do not; American robins have red breasts while blackbirds are black; humans have the ability to speak languages that chimpanzees cannot. In the future described in the *Red Rising* series, it seems as though an average adult could probably do the same with regards the various Colors, given their distinctive appearances and physical characteristics. The size and color of an Obsidian, for example, makes it unlikely that she will be confused for a Red or Pink.

Aristotle, the so-called "father of biology," based his account of species on just this sort of idea. In particular, he proposed that an organism's biological species was fixed by its having—or failing to have—the properties *essential* to that species, and which served to differentiate that species from other species in the same genus. Aristotle defined humans, for example, as the "rational animal," since he thought it was our human capacity to *reason* (which included the use of language) that served to distinguish us from the larger group of animals.

Aristotle's account holds that the borders between species are both clear cut and immutable, which fit well with the later idea that each had been created by the separate act of an all-powerful God for a specific purpose. It also suggested a theory of what it meant to be a *good* or *successful* human (one ought to be as rational as possible), and to the relationship between humans and other species (animals, for example, were meant to be used by humans). It also seems to fit well with the Jackal's claim that the Colors represent different species. The Colors, after all, were specifically designed by genetic engineering to fulfill distinctive tasks: Reds to mine, Pinks for pleasure, Silver to deal with money, Golds to rule, and so on. The Jackal would be especially pleased to learn that Aristotle himself proposed that some humans were "natural slaves," who could fulfill their human potential only by allowing themselves to be governed by the reason of *someone else*.

Happily, Aristotle's claims about natural slaves, and about the essential nature of species, find little support in post-Darwinian biology. As it turns out, because of genetic variation, it is frequently impossible to find any

property (or group of properties) that perfectly distinguishes one species from another. Not every human is more intelligent than every chimp, for example, just as not every Red is shorter than every Gold. Moreover, the last 150 years of biological research has shown us that species themselves change and evolve over time, with some species going extinct, and others (slowly) emerging. For example, the mere fact that Golds were originally “designed” to rule and Reds “designed” to mine doesn’t provide any reason for thinking that these roles can’t change, or that society might not be better off if Reds were given an equal voice in government. Biology, it turns out, is not destiny.

SPECIES AS INDIVIDUALS

In contrast to Aristotle’s view that species were abstract *types* or *categories* of organisms, many contemporary biologists and philosophers of biology tend to think of species as *individuals*, in somewhat the same way that organisms are individuals. So, just as many individual cells make up an individual human body, many individual humans make up the species *homo sapiens*. This view, unlike Aristotle’s, does not presuppose that there is any characteristic that serves to differentiate the members of the species from all others. Species are simply groups of related organisms (or “lineages”) that live (or lived) in particular times and places.

Of course, claiming that species are lineages doesn’t actually answer the question: “Where does one species end and another begin?” It doesn’t, for example, tell us whether Reds and Golds are separate species, or whether either (or both) of these are the same species as current-day *homo sapiens*. As it turns out, contemporary biologists and philosophers have proposed many different answers to this question. Here, we’ll take a look at three popular species concepts: one based on interbreeding, one based on shared ancestry, and a final one based on adaptations to the surrounding environment. In the real world, of course, new species usually emerge slowly, perhaps over millions of years. In the Red Rising universe, by contrast, the widespread use of genetic engineering has made things considerably different, as evidenced by the “Carved” creatures they can create.

The most widely known species concept is probably Ernst Mayr’s biological species concept (BSC), which holds that species are groups of organisms that are capable of interbreeding with each other, but which are reproductively isolated from other such groups. On this view, for example, horses and pigs are separate species, since they are incapable of breeding at all. However, it turns out that horses and donkeys are *also* separate species, since their hybrid offspring (such as mules) are themselves sterile. When applied to the Red Rising universe, this view suggests that Golds and Reds really might form separate species, just as Adrius claims. After all, the results of past genetic engineering have left Gold-Red pairs incapable of reproducing “naturally,” as evidenced by the significant

efforts that Sevro's parents took in order to conceive him. Moreover, these formidable physical barriers to reproduction are supplemented by additional social and environmental ones, not the least of which is their Society's violent reactions to "hybrids" and their parents. These sorts of barriers preventing gene flow between Golds and Reds all have analogues in the natural world, where species are isolated from one another by geography and mating rituals, and not just by their reproductive physiology.

For all its simplicity, however, the BSC has a number of drawbacks. First, as Sevro's example makes apparent, the barriers preventing one group of organisms from interbreeding with another are often less than perfect. Because of this, we have to make decisions about just how much isolation is "good enough" to count as a new species. It seems likely that Darrow and Adrius may disagree on how this applies to the differences between the Colors. Second, this concept doesn't apply *at all* to beings that don't reproduce sexually. In our world, these organisms (which form the majority of all life) consist primarily of bacteria, but in the world of Red Rising, things are considerably different. It is suggested, for example, that Pinks may be permanently sterile. If this is the case, then they may well reproduce by asexual means (perhaps they are clones grown in vats, or implanted in surrogate mothers?). If this were the case, the BSC would hold that Pinks do not belong to *any* species, even if all of the other Colors do, as Adrius claims. This result is, to put it mildly, a bit disconcerting.

ALTERNATIVES TO THE BSC

The phylogenetic species concept (PSC) represents a prominent alternative to the BSC. According to this concept, biological taxa (including species, but also genus, family, and so on) should include all and only those organisms descending from a common ancestor. In the context of Red Rising, this concept might give a variety of answers to the species question, depending on *which* ancestor you start from. For example, Golds and Reds both descend from an ancient human common ancestor, and so we might plausibly count all three groups (Gold, Reds, "old" humans) as being members of the species *homo sapiens*. However, given his dedication to highlighting differences between the Colors, the Jackal might well choose to focus on more recent ancestors, who were themselves Golds and Reds. By this, definition, Golds and Reds would again be separate species. Unlike the BSC, the PSC can also account for asexual species, so Pinks (and bacteria) would no longer be a "problem" case for Adrius.

Just as with the BSC, however, the PSC runs into problems. First, it has a problem in dealing with splinter groups that break off from a larger group, and form new species. For example, let's suppose that the Jackal is right, and that Golds really are a different species than the other colors. However, let's complicate things a bit, and pretend that Silvers, at some

point, broke off from the early Golds. So, perhaps the early Golds decided to design a new Color, and (as a starting point) used the DNA from one or more Golds. According to the PSC, this leaves us with a dilemma regarding the relation of the Golds living after the Gold-Silver split with those living before it. If Adrius wants to claim that he (and other current Golds) are the *same species* as the old, pre-split Golds, the PSC will force him to admit that the Silvers are NOT a different species, since both groups descend from the same common ancestor (a pre-split Gold). By contrast, if Adrius wants to claim that the current Golds and current Silvers really are different species, then he *also* has to admit that the current Golds are a different species than the pre-split Gold. The one thing the PSC will absolutely not allow is for Adrius to claim that he is both (1) the same species as the old Golds and (2) a different species from modern Silvers. Confusing, right?

This same problem appears in a different way when we consider the (presumably widespread) genetic engineering of the Red Rising Society, and the way this allows genetic information to flow back and forth between the Colors. Suppose, for instance, scientists discover that certain genes are linked to increased strength in a certain tribe of Obsidians. They might (reasonably) use this information to alter Golds to make *them* (and their offspring) stronger. As a consequence, the new, stronger generation of Golds can trace their genetic descent not just from their Gold parents, but also (indirectly) from the Obsidians and *their* ancestors. Now, we are left with a puzzle: “Does this prove that Obsidians and Golds the same species, after all?” We might be tempted to say “yes,” until we remember that this sort of horizontal gene transfer need not involve a closely related group, but could have come from a far different sort of organism, such an insect or a fish. So, it seems like the PSC cannot definitively answer our question after all.

A third concept of species, the ecological species concept (ESC), identifies species with those lineages adapted to specific environmental niches. Reds, for instance, are adapted to working in cramped mines, while Blues are “made” to live in spaceships. Moreover, the differing demands of these environments play a key role in explaining *why* the groups stay separate. So, for example, it seems like the genetic makeup of each Color was originally *designed* for optimal performance in its respective niche, and that subsequent evolution has, if anything, pushed the Colors further and further apart, as subsequent generations of Blues have genomes rendering them ever more suitable for spaceflight, while Reds’ genomes makes them better and better miners. Unlike the BSC or PSC, this makes no assumptions about Reds’ and Blues’ capacities to interbreed with one another, nor about precise relationships among their ancestors. On this view, again, it seems as if the Jackal may have won the day.

Just as was the case with the first two species concepts, however, there are reasons to be skeptical of the Jackals’ claim, as the ESC can quickly lead

to strange conclusions. Not all Reds, for instance, live on Mars: some might live on the Luna, or on the moons of Jupiter. Moreover, while their niche in these places may still involve mining, this may occur under far different conditions: the gravity may be weaker, the atmosphere different, and so on, all of which will plausibly lead to genetic differences in future generations (especially given the aggressive applications of genetic engineering techniques). However, it would be very strange to think of these Reds as different species from Mars Red, especially if they shared a common descent with other Reds, and are capable of interbreeding. A much more radical change in the Reds' niche is suggested by Darrow's and Mustang's success, which will free future Reds to do much more than they ever have. When one takes account of all of this, one is again pushed toward the idea that "they are all just humans, after all." Again, though, it seems that ESC is not capable of deciding one way or other.

WHY SHOULD WE CARE?

In the end, then, it seems as if our concepts of species aren't really designed to answer the question "Are the various Colors really different species?," or at least can't do so without much more data. They neither provide definite support for the Jackal's claims, nor provide an easy method for refuting him. Darwin himself argued that this sort of phenomena was much more widespread than people recognized. Among other things, he suggested that there was often no clear line between what counted as *species* and what counted as a *variety* within a species, and that nature simply didn't match up with humanity's demands that the living world be divided neatly into discrete species. This wasn't merely a problem of our ignorance, but of the way the world is. If Darwin is right, it simply might be that the argument between Adrius and Darrow has no single, objectively correct answer, in part because our normal ways of thinking about what species are don't work well when applied to scenarios described in *Red Rising*.

So, what does this mean for the society of *Red Rising*, and for us? First, it is important to recognize the *irrelevance* of the biological distinctions being debated here to the sorts of moral and political questions that lie at the heart of the Jackal's and Darrow's disagreements. Even if the Golds were a different species, for example, this doesn't mean that they have justification for treating the Colors in the way they do. This would be the case even if Adrius were *correct* in thinking that the Golds are (on average) stronger and smarter than the other Colors. The philosopher Peter Singer, among others, has forcefully argued that it is a mistake to think that the moral *equality* between individuals depends on their being equally intelligent or physically capable. Instead, moral equality derives from the fact that other people—regardless of their gender, race, disability status, cognitive ability, or anything else—have interests, just the same as we do. The reason it is wrong for the Golds to enslave the Reds is because Reds, just like Golds, want something better from their lives.

A second, related point concerns the importance of things *besides* biology in creating and maintaining distinctions between the Colors. Being born a Gold, for instance, provides one with much different (and much more advantageous) education and upbringing than being born a Red. Gold children are brought up learning they are “meant” to rule, while Red children are taught they are “meant” to be miners. These sorts of differences are present in almost every aspect of their lives—the jobs they work, the way they raise their children, the religions and stories they are exposed to, and so on. These non-biological differences are, without a doubt, at the heart of the reason that Adrius finds his proposed system of biological classification so attractive: he just *knows* that Golds are meant to rule, and he is determined to find biological differences that make the distinctions he is already committed to making. It should not be too surprising that, when he goes looking for some sort of biological differences between Colors, he can (sort of) find them. However, it’s crucially important to keep in mind that Adrius’s proposed classification wasn’t arrived at by a disinterested consideration of the biological evidence, and that it certainly doesn’t support his belief that Golds are superior to the other Colors. Again, this holds lessons for the real world: we ought to be especially skeptical when we “discover” that biology provides support for our preexisting biases.

The final point to note is that, in the end, we should recognize that the “correct” way to make biological distinctions will frequently depend on what we are trying to do. Biologists, for example, often use the different concepts of species described here to measure the “biodiversity” of an environment, so that this research can guide efforts to maintain or protect this diversity. Given this sort of goal, the fact that there is “no single right answer” to the question “how many species are there?” need not pose any difficulty. Each species concept provides us with valuable information about the diversity of life, all of which might be relevant to us. In the case of *Red Rising*, the challenge facing Mustang and Darrow at the end of the books is a very different one: how can they help create a society that treats *all* of its citizens (regardless of their Color) fairly and equitably? Biological research may well have a role to play in helping to bring this about; however, it can do so effectively only if accompanied by the wisdom to interpret its findings in ways that allow them to overcome the particular barriers they encounter.

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