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GENETIC ENGINEERING AND THE SPECIATION OF SUPERIONS FROM HUMANS

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Using ideas from evolution and postformal stages of hierarchical complexity, a hypothetical scenario, premised on genetic engineering advances, portrays the development of a new humanoid species, Superions. How would Superions impact and treat current humans? If the Superion scenario came to pass, it would be the ultimate genocidal terrorism of eliminating an entire species, Homo Sapiens. We speculate about defenses Homo Sapiens might mount. The tasks to relate two species (systems) constitutes a postformal, Metasystematic task. Developing a system of discourse to prevent destruction requires postformal Paradigmatic-stage tasks. Implications are twofold: species survival and sufficient evolution to survive.

KEYWORDS: Genocide, speciation, species-cleansing, Superions, terror.

This article presents a hypothetical scenario in which a new humanoid species, which we will call Superions, is created, and eventually current human species, Homo Sapiens, dies out. Because the extinction would be caused by the creation and repercussions of Superions' existence, it could not be considered "natural" per se, but closer to species cleansing. Our purpose is to examine the processes and impacts that may come into play if a new species were genetically created from current humans. Creating life forms with particular characteristics is already taking place. As a result it seems likely in the near future that some scientists will begin to genetically engineer human beings with much more superior capacities than have yet been attempted. The scenario uses ideas from evolutionary psychology (Buss, 1999) and the Model of Hierarchical Complexity to project into the future these interesting challenges.

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We would not predict that Superions would set out to deliberately extinguish Home Sapiens, yet it could be an eventual result of their creation. This possibility could exist because Superions' superior behavioral performances would be more successful at occupying the niche that humans currently occupy.

Generically, we call this species cleansing. Why could it be legitimate to characterize events in this scenario as terrorism? The United Nations Office for Drug Control and Crime Prevention (2002) defined terrorism as the equivalent, in peacetime, of war crimes being committed. Genocide is war crime. It is also one form of terrorism, where a religious, political, or ethnic group is deliberately and systematically destroyed by another group of some kind (Becker, 2002). In this hypothetical scenario, the genocide would be carried out against the entire species of Homo Sapiens. Therefore, it could be viewed as the ultimate form of terrorism.

WHENCE COMETH THE SUPERIONS?

For probably interesting psychological reasons beyond the present scope to discuss, many parents want their children to be born and mature as "perfectly" as possible. In Western societies, people with the financial means to do so are already making genetic selections that ensure their children are born with the desired gender (Fugger, Black, Keyvanfar, and Schulman, 1998) and without certain genetic defects (Baker, 1999) that science has thus-far been able to engineer for.

More sophisticated means of performing genetic selection for many more characteristics would likely have its research funded by wealthy individuals and/or groups. Early on, this would not be an organized endeavor, but individually sought out. We would expect that scientists thus-equipped would begin to advertise, as fertility clinics already do. Instead of having crudely discriminated embryos implanted, parents could consult a long list of possible traits and pay for the design of embryos with those traits. Such embryonic engineering is possible by inserting the correct genes to produce the traits. This idea is not unique. Silver (cited in Danovsky, 2000) has already predicted that high-end baby making will be available in fertility clinics, and Stock (2002) believes such germline engineering is inevitable.

GENETICALLY ENGINEERED BIOLOGY

With the mapping of human genome, the foundations for this future are laid ("About the Human Genome Project," 2002). Individual genes' locations and characteristics are already archived in growing database form. This will enable this historic social change to become more prevalent, more rapidly: a gene is just a database search away. Finding information about a gene now takes only minutes, compared to the former method of finding out about a gene, PCR (Polymorase Chain Reaction), which would take about six hours.

Even so, just acquiring the locations and characteristics of genes is not enough. A great deal of additional information exists and is needed, which is not available from inside genes. More than genes are involved, because a larger portion of

the human DNA is not genes, but rather instructions on when genes should be activated (e.g., Plomin and Colledge, 2001). Furthermore, because the whole process underlying the heritability of behavioral traits is very complex (McGuffin, Riley, and Plomin, 2001), it is not well enough understood to actually engineer it in a controlled, predictable manner yet.

Even so, this science is progressing rapidly, such that we believe it is not so distant in the conception of future humans. Most such research is done with other animals, only some with humans. Johnson and Harding (2001) reported the birth of the first genetically modified non-human primate: a rhesus monkey with a jellyfish gene (which controls the ability to fluoresce) inserted into its DNA. To correct infertility problems, Barritt, Brenner, Malter, and Cohen (2001) transferred a small amount of genetic material from a fertile woman into the egg cells of infertile women. The material is detectable in the cells of the resulting, healthy offspring. Blaese et al. (1995) initiated some of the first human gene therapy, which involved two children. It was designed to treat severe combined immunodeficiency that stemmed from a mutation in the adenosine deaminase gene. Although the therapy did not produce the ideal results intended, it demonstrated that such gene therapy was possible.

Genetic engineering has become ubiquitous. Rather than forecasting bans on it, it is more realistic to note that there is so much of it happening already that government regulations are unlikely to be able to stop it. Depending on who pays whom for what, governments may just look the other way. Beyond that, there is such demand for some of the beneficial effects, the work will continue. In the market of customers likely to be most interested in this, financial means are currently ample.

In the conception we present here, the new species is developed rapidly. Scientists and their sponsors could select a whole complex of beneficial genetic traits, from a variety of cultures, to engineer it. Superions will be engineered more efficiently with superfluous parts eliminated and organs designed for easy transplant and upgrades. The expected result is that all of this expertise, paired with human motivations to innovate, would result in an extremely smart species of Superions. We predict they would be smarter than humans by at least 3 standard deviations, healthier and longer-lived by 30–60 more years, and more attractive, emotionally stable, creative, and yet still genetically diverse. With the benefits of gene splicing and other acceleration techniques, the entire species could be developed in 20 years, with the following caveat. Gene manipulation alone would not be enough to create Superions. In addition, an interdisciplinary range of scientists would have to apply what is known about environmental influences in order for Superions to turn out with the perfection intended for them.

Genetic engineering of humans is just part of evolution. People think of it as artificial selection, but because we were created through natural selection anything we do to genetically engineer ourselves is also part of natural selection. Extracting and modifying DNA is just another mechanism for adapting to one's environment. Humans are applying to themselves the same type of engineering they have done with other species.

THE EFFECTS OF SPECIES-SEPARATION OF SUPERIONS AND HOMO SAPIENS

An assumption of this scenario is that creators of Superions may have the generation of a separate species as their objective. Such a species would be unable to breed with humans, just as humans cannot breed with other species either. To create a new species, they would insert or delete whichever genes could make it impossible to reproduce with humans. For example, they might design an allergy to human sperm into Superion women, or render Human/Superion crosses infertile.

What impacts could be hypothesized for humans if such a new species were developed? It would depend on the designed-in characteristics of Superions. If militant low-stage functioning Superions were even developed, and happened to be in power, they would likely just kill the humans off, much like humans' ethnic genocides. However, in this scenario we are proposing the most beneficent case. Even in that case, the future for humans may not necessarily be all positive. Superions would be genetically superior, and they would compete more effectively for the resources that humans currently control. Superions would occupy the niche of the humans more effectively than humans have, without a need to be violent, competitive, or unethical. Their capacities would simply make them be more successful.

The transition of humans to a more advanced form, as proposed here, has a basis in the evolution of Homo Sapiens. Although historically the evolution of Homo Sapiens has resulted in only one hominid species, there were many earlier hominid species throughout the previous six or so million years of human evolution. Even as recently as 35 thousand years ago the Neanderthal co-existed with Homo Sapiens (Brown, 2001). At some point, only one species remained, although there is not enough information yet to know how that came to be the case.

Various causes could contribute to the extinction of Homo Sapiens. Easiest to imagine is that during draught, for example, competition for food would intensify between humans and Superions. The evolutionary superiority of the latter predicts they would win out in the end. For example, they may be more creatively adaptable in conserving water and other resources while still producing bare essentials, coping more successfully with effects of climate change worldwide. The wiping out of humans may be inadvertent. For example, Superions might be resistant to diseases to which humans are not, because scientists could design-build disease-resistance (see Leal and Zanotto, 2000). Finally, humans might still die out even if Superions did everything possible to prevent it. The more benevolent Superions might want to save the humans, but the evolutionary problem could be the lack of a role for humans.

BEHAVIORS PREDICTED FOR SUPERIONS

To attempt predictions of how Superions would behave, we use the Model of Hierarchical Complexity. It enables us to consider the kinds of actions they could take in a Superion–human co-existence, depending on their stage of development.

The *average* (although not highest possible) stage of development attained by humans worldwide is probably formal operations. However, we predict this would be the lowest stage at which Superions would be created because it is pragmatically useful. Genetic engineering could also enable Superions functioning at postformal stages of development. It would ensure these stages of performance would be available in all domains: problem solving, moral reasoning, beneficence toward others, and so on. This breadth of hierarchical complexity would help Superions take healthier perspectives on the conditions and eventual extinction of humans than human have taken toward other species' extinctions.

At the formal operational stage, responses to another species and what should happen to them may only be considered in terms of simple one variable causal systems. For example, if humans are having a hard time surviving impacts of climate change, fighting over water or sharing land they are crowded onto, Superions, if they tried to solve this dilemma at the formal operational level, might do the same kind of thing that humans do at this stage for others. They would design a solution they considered beneficial, such as provide well-supplied, segregated conditions. This might mean placing humans into some kind of a protected or controlled environment (a reserve or a zoo-like situation). They might hire humans to perform personal services and other manual labor jobs, just as the rich already do with members of other demographically distinguished groups.

It seems unlikely, however, that Superions would address this dilemma at the formal operational stage. At the systematic stage, Superions would not act as if there was continuity from one species to the other. Thus, Superions would not judge that they and humans had similar rights for similar reasons. Their solution-finding for humans' issues would be much like humans' prevalent methods: coming up with solutions without real consultation with *all* stakeholders. For instance, they might decide there would be separate elections for the humans, divorced from elections systems developed for the Superions. Likewise, there might be separate systems for due process. As do others with similar assumptions, the Superions would grant themselves more rights because of their inherent superiority (Colby and Kohlberg, 1987).

Just as humans begin to develop methods to provide seriously and justly for the rights of other systems at the Metasystematic stage, so also would Superions begin to take the rights of the human species seriously at that stage. The reason for this is that people begin to feel that they must treat others as they themselves would like to be treated in the same situation (Rawles, 1971). Such societies do not kill retarded people or those of other ethnicities, for example, whereas less morally developed societies may, and do. Superions would be compassionate and devise education and other support systems to help humans adjust to their changed status in the world.

Approximately 14 percent of the Superions would perform tasks at the Paradigmatic stage 13 (if each stage of hierarchical complexity is one standard deviation). At that stage, we would expect them to influence and improve processes for dealing with humans—and how humans could deal better with themselves. We would expect these high-stage Superions to be in positions of influence and creative leadership. Although they would be a minority, they would exercise

significant positive influence. Even if the culture as a whole is not yet functioning at the paradigmatic stage this minority population of Superions would ensure that humans—and Superions—co-constructed multi-perspectival framework[1] (each one a metasystem; see Ross, 2006a, 2006b, 2007) to help them ensure they developed ways for humans to co-exist with them without detriment. Such frameworks would be developed to have deliberative discussions of central issues that could impinge on humans' survival and just treatment. These would surely include apartheid, majority rule, distribution of labor, and other economic considerations. A key question throughout such discourses would be: What role for humans?

SUPERIONS' NEW TECHNOLOGICAL PRODUCTS

Superions may become proficient in developing cyborgs, a cybernetic organism that adds to its in-built abilities by using technology. Fictional cyborgs are frequently portrayed with a fine mixture of organic and non-organic parts, such as the Borg in Star Trek. Cyborgs' partially organic composition makes them less versatile than robots for certain tasks. Humans have not succeeded yet to create very sophisticate robots, but it is likely that Superions will master the innovations required. A robot is a device that can perform either under the guidance or direct control of humans, or autonomously and independently of humans—or Superions. Robots may function in environments that neither humans nor Superions could; for example, deep-space or deep-earth resource mining.

Superions may create new robots or androids to adapt to such hostile environments. Androids are just robots that resemble humans. Because they look human, people may treat androids as human. They will be independent so that they resemble humans. Although androids would not necessarily pose a threat to humans' existence, Superions may find androids easier to co-exist with than humans. As humans die out, androids may take whatever functional place in society Superions had had with humans.

To develop such technologies, Superions may significantly elevate the state of nanotechnology. This may allow uploads to the brain—of only Superions, or also humans?—of any information or problem solving process. Thus, one sitting at a Learning Center may allow one to learn the "lingua franca," how to do calculus, or how to think in more hierarchically complex ways.

CONCLUSION

It is natural to expect that the notion of a new species like Superions could be met with fear and negative judgments. However, such a new species could introduce positive improvements more rapidly and without unintended consequences, something Homo Sapiens does not do very well. Some positive implications include eradicating most disease and genetic defects. Such benefits developed for Superions would be extended to benefit humans. If Superions were developed to function at least at the Metasystematic stage, with some members of the new species at even higher stages, local to global progress would be accelerated and applied to solving many contemporary issues. Perhaps the damage to the Earth wrought by

humans to date could be reversed and sustainable modes of production become the harmonious norm.

NOTE

1. Such discourse methods are discussed in two other articles in this issue. See "Applying Hierarchical Complexity to Political Development" and "Evolving to Address Global Climate Change."

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