

Enter, Genetica

In recent times, science has been making leaping advancements in the realm of genetics. The first step has been the identification of the chromosomes and genetic strands responsible for birth defects and other complications that occur later in life. The next step, still in the development process, is the implementation of programs that would try to prevent such maladies through the use of gene therapy. This would involve the process of removing such “damaged” genes and replacement with newer, more healthy genes. The third step, which is being viewed by members of society with both good wishes and apprehension, will be the altering at whim of the genetic code to make children into whatever the parents wish them to be: models, quarterbacks, nuclear physicists, or anything else the heart desires. This is where people become scared.

Visions of Utopian societies where everybody is an equal have been written about in abundance in past times, never leaving the reader with a good impression of what such a society would be like. Brave New World, by Aldous Huxley, depicts a bleak, emotionless world, where anybody different from anyone else is persecuted as a “savage.” Such diverse writers as Kurt Vonnegut and George Orwell have also written about such worlds, and the view is never anything but dark.

But is this a fair assessment? Is there an example in everyday life that can be looked upon as a warning of what may occur if the genetic code becomes something alterable at the slightest thought? At this point, a version of such manipulation is being practiced through the use of screening, whereby two individuals planning on having children are tested and it is determined by looking at either the chromosomes or the genes themselves what possible genetic disorders may arise from such a pairing. In this way, the parents may decide if they really want to risk the creation of a genetically imperfect child. At first, this may sound like a very intelligent idea: the avoidance of complication. But after mulling it over, one can see that there is more to the picture than is obvious, especially if it is taken into account that this procedure, selective breeding, has already been used with disastrous results in two different animals, dogs and fish. Using these two as examples, it becomes more clear that using genetic tests to show who should breed with who may not be the good idea that it would appear to be.

In the tropical fish breeding industry, selectively weeding out “unfit” specimens has been the status quo for centuries, dating back to the first goldfish that were purposely bred with mutated goldfish in Japan almost a thousand years ago. In the theory of evolution, it is taught that every

species selects its weaker members and allows them to be left out of the breeding pool, either through death or by simple unattraction. This is what is known as natural selection. But, when man begins breeding fish on its own, it is no longer up to the fish to find a partner with genes necessary for survival of the young; instead, it sees the partner it is given, since there is rarely an opportunity for breeder fish to select their partner, and breeds with it just for the sake of continuance of the species. Also, when breeders see a beautiful fish that has descended from a beautiful parent, there seems to be little or no care for the consequences of inbreeding. For instance, this quote was taken from a hobbyist magazine: “... that special female can be mated with her father! Whereas in most other animals this practice will produce offspring that have a variety of defects, this is not so in [fish]”¹ This misguided idea is widespread throughout the fish breeding world, and this is where problems occur.

The goldfish that have been bred for so many years have become primarily four strands that find it very difficult to survive. One, the bubble eye, is so prone to infections that most shipments to aquarium stores arrive either highly infected or already dead. The bubble-eye has been bred to contain sacs of air underneath each

¹Higgins, Christopher, “Fancy Guppies,” Aquarium Fish Magazine, Feb. ‘92, pg. 32.

eye, making it already difficult for it to compete with other fish for food; one can visibly see it struggle to bring its mouth to the surface to swallow food. The other varieties of goldfish all have some form of disability which has made it “precious” to fish buyers: the oranda has no dorsal fin, making just remaining upright a laborious task for the fish; the telescope, which has its eyes protruding three-fourths of an inch or more out from its head, making them susceptible to damage from even the fishkeeper's net; and the veiltail, which is bred to have a long flowing tail that is a sight to behold, but provides no thrust when needing to swim, which is necessary to obtain food. These are all genetic problems that arise because the fish are not able to choose their own mates; they are forced to do what is, by nature, wrong. Fish in nature would not choose these traits because they are not conducive to the continuation of the species, and thus are poor mates.

Elsewhere, the problem is even more prevalent. Guppies tend to die off at a rate of 90% during the first week after delivery. The constant breeding for beauty and not species variation, coupled with uneducated inbreeding, has made them a hopeless breed that was once well known for its durability. Only now, through mixing with wild stock (which has some breeders appalled and flabbergasted), are remedies being attempted². Mollies, another once durable fish, are now limited in how they can breed because a popular variety called the “lyretail” has such elongated fins, including the

² Alderman, D., “*In Vitro* Testing of Fisheries Chemotherapeutants”, Journal of Fish Diseases, Issue 5, pgs. 113-123.

gonopodia (used exclusively for mating), that breeding has become impossible, narrowing the field of fish that may be chosen as a good mate. The Betta, or Siamese Fighting fish, is well known for its beauty, but is also well known to be a prime example of the faults that lie in inbreeding and the selective breeding by humans. In the October '95 issue of Freshwater and Marine Aquarium, Gene Lucas writes that he sees “positive outcomes” in inbreeding. However, in the same article, he notes a brood of twelve betas: four out of these twelve were born with fin deformities, one without any fins at all! Later in the article, he makes note that the remainder lived between one and three years; it should be well noted that wild specimens may live up to fifteen years in areas of less than 1/2 gallon in Thai rice ponds.³ This should make fairly clear that if fish are able to live out their lives much fuller in nature than they can with human intervention, that there may be a problem with meddling with breeding.

When looking at dogs, man's best friend, it becomes even more obvious that humans still have much to learn about nature. Once again, manipulation of the gene pool, deciding which dog should breed with which dog, has led to restricted genetic diversity, which in turn has caused inbreeding and a loss of genes that once kept the dogs in good health. In fact, 25% of American purebred dogs have at least one severe genetic disorder.⁴ Some of the examples are horrifying when viewing

³ Lucas, Gene A., “Bettas ... and More,” Freshwater and Marine Aquarium, Oct. 95, pgs. 120-128.

⁴ Lemonick, Michael D., “At What Price Beauty?”, Time, Dec. 12, 94, pg. 65.

the extent that man has destroyed the different breeds, breeding for certain looks with a complete disregard for the health and needs of the animals themselves.

For example, the collie, the vibrant, energetic dog made famous in Lassie, now has genetic eye problems afflicting 70% of its species. Golden retrievers run a 60% rate of having hip dysplasia, a crippling illness. Shar-Peis, the famous “wrinkle dogs” of China, have been so inbred that a skin condition causing large, red boils all over the skin has become prevalent, and is basically accepted as a necessary evil to obtain the good stock that is sold to the consumer. This constant focus on beauty and not on what the dogs consider good parental traits has caused the unhealthy to reproduce, essentially a “survival of the unfittest.”⁵ The focus on beauty has even stretched to the point that what is considered beautiful is also many times something so unnatural, it warps all natural processes. The bulldog, for instance, is considered by breeders to be beautiful if it has a large head. Naturally, the breeders then began breeding for bigger and bigger heads. Now, some bulldogs are bred with such large heads that they need to be removed via cesarean section.⁶

What makes this even more deplorable is the sense that the American Kennel Club, long regarded as the upholder of canine health and true breeding, has done nothing to prevent this from becoming commonplace, and it is now to the

⁵ Lemonick, Michael D., “At What Price Beauty?”, Time, Dec. 12, 94, pg. 66.

⁶ Lemonick, Michael D., “At What Price Beauty?”, Time, Dec. 12, 94, pg. 68.

point that it would be a long, laborious task to re breed these animals to create a healthy stock again. At least in the dog world, as opposed to the fish world, the industry has begun to see the light and is attempting to make changes. It is still unfortunate, however, that the breeders are still attempting to breed such characteristics as the collie's long snout and close-set eyes, when most veterinarians agree that the gene responsible for those characteristics is also very likely to blame for the retinal disorder. Maybe it is still soon enough to fix this problem, one that man should not even have to bring itself to face.

Using these examples, it becomes easy to see that using genetic testing is not really the answer to creating a more genetically perfect species. But when applied to humankind, the layperson looks upon it still as a God-send, and refuses to believe that man could become the same as the aforementioned fish and dogs. However, as genetic alteration becomes a reality, and then a convenience, the human race would very likely fall into the same downward spiral as the previous two species. First off, with genetic alteration, most people would originally want to erase any illnesses from their children. This would naturally come with complete disregard for the beneficial purposes these same genes may hold when the non-malignant portion lies in a dormant, recessive state. Then, once parents have begun to alter that, they would begin alteration of hair color, eye color, muscular stature, intelligence, anything that they could get their hands on that is malleable.

As has been seen throughout history, if man can do it, man does it. At this point, human genetic codes would begin narrowing to that one, singular idea of beauty; humans would begin looking like Greek gods. Now, how far apart are the genetic codes? Every time someone wants to have a child, is that child now the result of inbreeding, and is that child now susceptible to a whole new barrage of genetic disorders that may appear once the current crop has been erased? As the Homo Sapiens track record may prove, no matter what ailments humans have defeated, nature has invented another in a vain effort to keep the population in check. It has even begun answering with more powerful and resistant viruses. Therefore, the application of gene therapy may be nothing more than a temporary eraser, covering up the current illnesses, only to fail when a new batch arises. It may be too late for some fish, and it may be too late for some dogs, but it is not too late for humans, and it may be a good idea for scientists to begin researching this problem before they once again create a technology without looking at the circumstances that may occur.

But using this information, it should be more than obvious that society is not ready for any form of genetic manipulation, and should consider leaving it aside, allowing evolution to take its course naturally. There are alternatives to purposeful manipulation of the genetic code. Instead of narrowing humankind to a specific form, maybe the species should broadcast over the spectrum and allow nature to pick and choose the strongest descendants. For example, the most common genetic disease among those of African

descent, sickle-cell anemia, is unknown in those of European descent. On the other hand, cystic fibrosis, common in whites, does not exist in blacks. Therefore, if a black individual and a white individual have a child, it would not be able to contract either disease, as both need the paring of two recessive genes to activate...impossible in such a case.⁷ This would be a much better and more effective version of genetic distribution, and would avoid cases such as the Amish, who have Ellis-van Creveld syndrome built into their genes by generations of inbreeding; every individual with this disorder can trace their ancestry to the founder of the Amish community, Samuel King.⁸ This very well could be the consequence of unwise genetic manipulation, and it is utterly avoidable. We, as humans, the most dominant species on this planet, have a lot to learn from dogs and fish.



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⁷ Jones, Steve, "A Brave, New, Healthy World?" Natural History, June 94, pg. 74.

⁸ Jones, Steve, "A Brave, New, Healthy World?" Natural History, June 94, pg. 74.