

Eugenics and Animal Science: Two Birds of a Feather or a Horse of a Different Color

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This article analyzes the relationship between animal science and the eugenics movement in the United States. It covers the eugenics movement in the early twentieth century. The article begins with a brief explanation of the importance of animal science, especially selective breeding, in the course of human history. It describes influential scientists whose work was embraced by eugenicists. It focuses on animal science techniques and applications embraced by the eugenicists and were later applied, at least theoretically, to human beings. The article concentrates on the close relationship between the eugenics movement and the Animal Breeders Association in the United States. It shows how eugenicists were heavily influenced by animal science and how they believed that these practices could effectively be carried out on humans. This article also focuses on some of the flaws in the eugenicists' application of these techniques to humans. In short, this article is an attempt at highlighting the influence and association animal science had and continued to have on the American eugenics movement during the early twentieth century.

Eugenics, the pseudo-science concerned with creating better humans, has its roots in a practice humans have been practicing on plants and animals for millennia. This practice is selective breeding. Selective breeding in animals, especially dogs has been performed by humans as early as 32,000 years ago in South China.¹ Geneticists believe that all dogs come from one wolf ancestor but humans were successful in breeding these wolves in such a way to provide services to humans.² Today the Federation Cynologique Internationale (FCI), also known as the World Canine Organization, recognizes 343 dog breeds.³ Humans have selectively bred almost every animal that has been domesticated but the focus has been on dogs, horses, chickens, pigs, cows, sheep, and goats. The selective breeding of plants and animals proved to be essential for the development of humankind. Plants and animals were selectively bred to help maintain a stable food supply, produce clothing, provide transportation, offer protection, and a number of other services.⁴ Humans of the past were very successful in attaining these goals through genetic manipulation or selective breeding.

With the great success of humans in selectively breeding dogs and other domesticated animals, it is no wonder that eugenicists assumed they could improve the human race with some of the same techniques. Eugenics is the controversial science that deals with the improvement (as

¹ Carl Zimmer, "Wolf to Dog: Scientists Agree on How, but Not Where," *The New York Times*, November 14, 2013, accessed January 10, 2014, http://www.nytimes.com/2013/11/14/science/wolf-to-dog-scientists-agree-on-how-but-not-where.html?pagewanted=all&_r=0.

² Ibid.

³ "For Dogs Worldwide: Introduction," Federation Cynologique Internationale, accessed January 10, 2014, <http://www.fci.be/presentation.aspx>.

⁴ Edward O. Price, *Animal Domestication and Behavior*, (Wallingford, Oxon, UK; New York, NY: CABI Pub., 2002), accessed January 10, 2014, <http://web.a.ebscohost.com/ehost/detail?sid=2cd9dd92-3633-4d7a-b964-ac4f74d1a123%40sessionmgr4004&vid=1&hid=4112&bdata=JnNpdGU9ZWlhvc3QtbGl2ZQ%3d%3d#db=nlebk&AN=87366>.

by control of human mating) of hereditary qualities of a human population.⁵ Eugenacists used techniques and research developed in animal science, especially selective breeding, in their own misguided experiments and procedures to try and “improve” humans. Eugenacists were heavily influenced by heredity experiments performed by prominent scientists such as Gregor Mendel and Thomas Hunt Morgan and animal science techniques for selective breeding that led to a close connection between the eugenics movement and established animal breeding groups such as the American Breeders Association in the United States during the early twentieth century. Eugenacists, however, did not appreciate the difference in breeding traits such as strength in horses versus musical ability or intelligence in humans.

Eugenacists and animal scientists found much of their inspiration in the work of Gregor Mendel, an Augustan friar, known as the father of heredity for his work in the field between 1856 and 1863. Mendel used pea plants to study heredity and meticulously cross-bred certain plants so he was able to breed the specific type of pea plants he wanted. The knowledge of selectively breeding plants and animals had been widely used by farmers and herders for thousands of years but Mendel made this knowledge scientific. Mendel helped show how dominant and recessive genes were passed down from generation to generation and provided a testable model to illustrate heredity. Mendel’s experiments showed that mathematically dominant genes have a phenotypic ratio of three to one over recessive genes making it easy to predict offspring for simple organisms such as pea plants that have just a few traits to study and interpret. The traits that Mendel desired to breed in the pea plants were things such as the color of the flowers and peas, the height of plants and the shape of the peas (round or shriveled). Eugenacists believed that Mendel’s experiments demonstrated that favorable human traits, such as intelligence, could also be selected and bred.

Eugenacists such as Harry Laughlin, Charles Davenport and others belonging to the Eugenics Record Office (ERO), the most influential American eugenics institution in the early twentieth century, failed to realize that a pea plant and breeding physical traits in animals is much less complex than a human being. Charles Davenport made great strides for genetics. He and his wife wrote several papers that correctly applied Mendelian ideas to human traits such as hair and eye color. Davenport published a work titled, “Heredity of Eye Color in Man,” which still serves as the basic model for understanding human heredity for simple traits.⁶ Davenport became more devoted to eugenics and began to apply his beliefs to many human traits that are not strictly hereditary. Davenport is quoted as saying, “Although, not strictly within the scope of experimental work the necessity of applying the new knowledge (laws of heredity) to human affairs has been too evident to permit us to overlook it.”⁷ This implies that even though Davenport was applying Mendelian ideas to his work he understood that there was not a great enough knowledge to

⁵Merriam-Webster, s.v., “Eugenics,” accessed March 11, 2013, <http://www.merriam-webster.com/dictionary/eugenics>.

⁶ Richard A. Strum and Tony N. Frudakis, “Eye Colour: Portals into Pigmentation Genes and Ancestry,” *Trends in Genetics* 20 (2004): 327-32, accessed January 10, 2013, <http://www.evergreen.edu/upwardbound/docs/eyecolor.pdf>.

⁷ Oscar Riddle, “Biographical Memoir of Charles Benedict Davenport, 1866-1944” [presented at The National Academy of Science, Autumn Meeting, 1947], National Academy of Sciences Online. <http://nasonline.org/publications/biographical-memoirs/memoir-pdfs/davenport-charles.pdf>.

adequately apply it to humans. Davenport began to incorrectly represent Mendel's science when he began applying the principles to more complex human traits including mental disease and pauperism.⁸ Pauperism we know today has nothing to do with heredity in a biological sense. Mental disease, such as schizophrenia, is a topic that is still not fully understood by physicians but Davenport applied the simple Mendelian heredity techniques to it. Davenport had a good understanding of Mendel's work but the fault of both eugenics and Davenport's work is that many of the traits believed to be solely hereditary, such as feeble-mindedness, were not connected to a single trait, but to thousands and were also influenced by the individual's environment.

Thomas Hunt Morgan is another very influential figure in the development of the field of heredity. Morgan is best known for his experiments with fruit flies and using them to study heredity. He was not necessarily using fruit flies because he wanted to understand fruit flies better. Instead, he used them to study heredity as a whole because of their quick reproduction rate and the simplicity of their hereditary traits, such as their wings and eye shape or color, which could be easily observed. Eugenicists, however, took the evidence of being able to genetically alter fruit flies as proof that humans could be manipulated as well. Eugenicists understood all traits, whether speed in horses, milk production in cows, or intelligence in humans, to be strictly hereditary.⁹ The thought behind this kind of assumption is flawed. Physical characteristics such as height, eye color, and hair color are hereditary. Characteristics such as musical ability, intelligence, and morality are also influenced by the environment. An individual can have blue eyes regardless of where or how he is raised, but his moral values will be influenced by his environment and are more malleable. The same can be said about an individual and musical ability, if the individual is never exposed to an instrument there is no way the individual could display musical ability.

Eugenicists did not receive encouragement from Morgan to use these techniques with humans. Morgan, in fact, shunned eugenics as a vulgar and unproductive science.¹⁰ Morgan was a long term and vocal critic of eugenics and even published articles in the 1920s that noted his reservations about the practice.¹¹ Morgan criticizes eugenics in his article, "The Inheritance of Mental Traits," by writing:

The case most often quoted is feeble-mindedness that has been said to be inherited as a Mendelian recessive, but until some more satisfactory definition can be given as to where feeble-mindedness begins and ends, and until it has been determined how many and what internal physical defects may produce a general condition of this sort, and until it has been determined to what extent

⁸ Arthur H. Estabrook and Charles B. Davenport, "The Nam Family: A Study in Cacogenics," Cold Spring Harbor Laboratory's The Image Archive on the American Eugenics Movement [hereafter Eugenics Archive], (ID #1418).

⁹ "Inherited Characters in Man," The Harry H. Laughlin Papers, Lantern Slides, Brown Box, 832, Truman State University, Eugenics Archive, (ID#991). <http://www.eugenicsarchive.org/html/eugenics/static/images/991.html>.

¹⁰ Eloy Carlson, "Scientific Origins of Eugenics," Eugenics Archive, <http://www.eugenicsarchive.org/html/eugenics/essaL2.html>.

¹¹ Thomas H. Morgan, "The Inheritance of Mental Traits," Cold Spring Harbor Laboratory's DNA Learning Center [hereafter DNA LC], <http://www.dnalc.org/view/11832--The-Inheritance-of-Mental-Traits-from-Evolution-and-Genetics-by-Thomas-H-Morgan-an-early-criticism-of-eugenics-in-an-important-text.html>.

feeble-mindedness is due to syphilis, it is extravagant to pretend to claim that there is a single Mendelian factor for this condition.¹²

Raymond Pearl, a biologist was another scientist critical of eugenics. Pearl was one of the first scientists to publicly denounce eugenics in his article, "The Biology of Superiority." In the article Pearl writes, "The founder of the science of eugenics as it exists today did his splendid pioneer work without the benefit of the exact knowledge of the mechanism of inheritance...."¹³ He also states, "It would seem to be high time that eugenics cleaned house, and threw away the old-fashion rubbish which has accumulated in the attic."¹⁴ Pearl criticized eugenics for trying to assign single genes to things such as madness and poverty in the same manner as fruit flies and eye color.¹⁵

Eugenicists ignored these criticisms in pursuit of their goal to "make better humans" and found plenty of support from others in the scientific community. Many scientists at the time were supporters of eugenics. Scientists often came from upper class and privileged families and it was common for them to believe in eugenics.¹⁶ Notable scientists at the time, such as Charles Davenport, Paul Popenoe, and Edwin Conklin joined the American Eugenics Society.¹⁷ Scientists chose to do research in eugenics partly because of the amount of money available from the Eugenics Records Office in research. The ERO spent almost \$80,000 on an experiment with thoroughbred horses and genetics in 1940.¹⁸ The eugenicists obviously wanted their theory to work, so they were willing to disregard the guidance scientists such as Pearl and Morgan to legitimize their own position. The scientists that were involved with the eugenics movement used evidence such as diseases running in certain families to support the idea that Morgan's research could be applied to humans. This was indeed the case; however, the eugenicists began applying the same evidence to characteristics such as insanity and poverty which were not hereditary for the most part. The eugenicists adopted the research conducted by Morgan and believed it to be applicable to humans not because of Morgan himself, but because of the geneticists who were also eugenicists.

Animal breeders were another source of legitimacy and inspiration. The use of pedigrees in animal breeding influenced eugenicists, such as Laughlin and Davenport, to promote pedigrees to track traits in human families as well. Horse breeders and chicken farmers are just two types of animal breeders that utilize pedigrees. Pedigrees are used by animal breeders to track certain traits, good or bad, through a family to determine whether or not to breed that particular animal. Horse

¹² Ibid.

¹³ Raymond Pearl, "The Biology of Superiority," *American Mercury*, 47 (1927): 257-266.
<http://www.unz.org/Pub/AmMercury-1927nov-00257>.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Jonathan Marks, "The Eugenics Page," <http://personal.unc.edu/jmarks/eugenics/eugenics.html>.

¹⁷ Terry Melanson, "The American Eugenics Society-Members, Officers, and Directors Activities Database Eugenics Watch," 2005, Internet Archive, https://archive.org/details/The_American_Eugenics_Society_Members_Officers_And_Directors_Activites_Database.

¹⁸ "Notes on the History of the Eugenics Record Office," American Philosophical Society, ca. 1940, Eugenics Archive, (ID# 483).

breeders use pedigrees to track traits such as speed and susceptibility to injuries.¹⁹ The use of pedigrees in chicken breeding tracked traits such as egg production and the color of feathers the chickens had.²⁰ The use of famous race horses' pedigrees, such as Man o' War, and horses prone to injuries, such as the Ultimus line, by eugenicists contributed greatly to the idea that pedigrees could be used in humans to track favorable and non-favorable traits.²¹ Davenport and other eugenicists began using pedigrees to track traits such as albinism and color blindness which was potentially legitimate. Davenport and others, however, also used pedigrees to track traits that were not necessarily hereditary and associated with a single allele. Davenport tracked a wide range of traits in humans including musical ability, insanity, and a tendency to be poor.²² The pedigree became an easy and convincing way for eugenicists to prove that certain traits ran in a family, without addressing the environment or other alternative explanations or influences. It was hard to refute the eugenicists' arguments when they had convincing evidence such as the pedigree to "scientifically" support their claims. The pedigree was a powerful tool, borrowed from animal breeders, in the eugenicists' arsenal to deter criticism of the eugenics movement.

The eugenicists were very connected to and influenced by the animal science and breeding world in both practice and organizations. These worlds were so intermingled that in 1906 the American Breeders Association (ABA) created a section for eugenics at their yearly meetings.²³ The ABA was an organization focused on scientific agriculture.²⁴ Prominent eugenicists such as Charles Davenport were influential members in the ABA; in fact, Davenport was one of the founders of the ABA in 1903 and he served as secretary of the animal breeding section in 1909.²⁵ The leader of the ABA, Willet Hays, envisioned the ABA as standing on "a broader base with animal breeders, plant breeders, physicians, preachers, teachers, publishers, and others interested in eugenics."²⁶ As shown in the program from the eighth annual ABA meeting eugenics occupied a whole section on two separate days.²⁷ Speakers included Alexander Graham Bell, W.M. Hays, Dr. William White, Frederick A. Rhodes, and Henry Cotton.²⁸ The speakers at the meeting were highly educated people, many were physicians and Hays was the United States Assistant Secretary

¹⁹ "Pedigree of Man o' War," Truman State University, ca. 1928, DNA LC, <http://old.dnalc.org/ddnalc/ben/index.html?id=912>.

²⁰ "An Example of Mendelian Heredity," Chicken Breeding," American Philosophical Society, ca. 1920, DNA LC, <http://www.dnalc.org/view/10469--An-example-of-Mendelian-heredity-chicken-breeding.html>.

²¹ "Hereditary Unsoundness of Ultimus Family," about horse genetics," Truman State University, [ca. 1928], DNA LC, <http://www.dnalc.org/view/10893--Hereditary-unsoundness-of-the-Ultimus-family-about-horse-genetics.html>.

²² "Pedigree for Feeble-mindedness," American Philosophical Society, [ca. 1925], DNA LC, <http://www.dnalc.org/view/10364-Pedigree-for-feeble-mindedness.html>.

²³ Barbara Kimmelman, "The American Breeders' Association: Genetics and Eugenics in an Agricultural Context, 1903-1913," *Social Studies of Science* 2 (1983): 163-204, accessed January 20, 2014, <http://www.jstor.org/stable/284589>.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

²⁷ "Program of the 8th Annual Meeting of the American Breeders Association," American Philosophical Society, 1911, DNA LC, <http://www.dnalc.org/view/10396-Program-of-the-8th-annual-meeting-of-the-American-Breeders-Association.html>.

²⁸ Ibid.

of Agriculture. Most of the physicians worked with the insane and their speeches at the meeting concerned such topics as “Eugenics from the Physicians Point of View” and “New Studies on the Inheritance of Insanity.”²⁹ The eugenicists at the meeting were pushing the idea that unfavorable traits such as insanity were hereditary in nature and that scientists could perhaps rid humans of insanity through selective breeding. Hays spoke of “Constructive Eugenics” in a general session meant for all ABA members to attend.³⁰ H.H. Goodard presented a paper in the general session titled, “Heredity of Feeble-mindedness: A Social Danger.”³¹ Ten out of twenty-nine presentations at the eighth annual meeting had a topic related to eugenics.

Instead of increasing speed, strength, or the ability to lay eggs, eugenicists were concerned with creating a better human by making humans who are more intelligent, physically fit, and morally righteous. Family pedigrees collected by the ERO demonstrate that eugenicists tracked traits such as musical ability in humans in much the same way a horse breeder would track champion offspring.³² Musical ability, however, is a very different thing to measure than the speed of horses. Musical ability is determined by a multitude of factors, some of which have nothing to do with heredity. These factors include things like the availability of instruments the amount of practice time the individual had, the quality of the teacher, and how early the student began learning. Speed in a horse, on the other hand, was relatively straightforward and there were few variables to consider. Breeders could accurately and easily measure the speed of a horse; the horse was either fast or the horse was slow. It is much more difficult to measure or quantify musical ability. Eugenicists had to rely on family pedigrees for research data because human beings could not be “bred” under controlled conditions.³³ The eugenicists failed to realize that unlike the hair color of guinea pigs, the traits they wanted to breed in people are affected by so many variables that pedigrees are inaccurate predictors at best and possibly completely irrelevant. The eugenicists’ pedigrees are suspect a few reasons. Some of the traits eugenicists created pedigrees for such as musical ability and poverty are traits that are not just affected by heredity and cannot be simply breed like traits for animals. Eugenicists’ pedigrees searched for humans that would fit their research and would make pedigrees for families in which musical ability or poverty was a trait of most of the individuals but there was no scientific backing for these pedigrees. The pedigrees of the eugenicists’ were concerned with traits that were relative. Musical ability is a trait that is relative to whoever is listening, while a trait such as a dog’s strength in pulling a cart can be quantified accurately. It is one thing to breed a fast horse and yet another thing entirely to create an intelligent human being through heredity.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

³² “Student Study of Inheritance of Musical Ability, including Pedigree,” American Philosophical Society, ca. 1935, DNA LC, <http://www.dnalc.org/view/10040-Student-study-of-inheritance-of-musical-ability-including-pedigree-1-.html>.

³³ “Contemporary Genetics - Eugenics and the Ethical Issues of Genetic Breeding,” *JRank Science & Philosophy*, accessed March 14, 2013, <http://science.jrank.org/pages/9488/Contemporary-Genetics-Eugenics-Ethical-Issues-Selective-Breeding-1900-1945.html>.

Unsurprisingly, eugenicists also sought to use the tools of animal breeders. There are certain techniques that are common to animal selective breeding that eugenicists later applied to humans. The main objective for selective breeding in animals was to make the animals better at whatever they were supposed to do for humans. The goal of eugenics was to improve the human race by using selective breeding techniques. Selective breeding takes all “unfit” or “unworthy” organisms out of the breeding pool in order to keep them from reproducing. There are three ways that animal breeders remove animals from the gene pool: killing, sterilizing, and isolating. All three of these techniques were advocated, in varying degrees, by eugenicists in an attempt to make the human race “better.” These techniques were used by eugenicists, because if it worked for animals, they believed, it should also work for human beings.

Eugenics was heavily influenced by animal science and breeding. The two fields were both influenced by the same famous scientists, including Thomas Hunt Morgan and Gregor Mendel. The two fields also had similar objectives in trying to make certain organisms better. Members of the American Breeder’s Association and the eugenics movement overlapped significantly and regularly-met at annual meetings. The eugenicists used animals to conduct experiments like Harry Laughlin’s chicken experiments they thought they could apply to humans. The most important influence, however, that the science of animal breeding had on eugenics was the ways that were used to deal with the organisms deemed “unfit” to reproduce. Many eugenicists advocated for sterilization or isolation of the “unfit” to control the gene pool and try to make it better in their eyes, even after being strongly advised against these practices by a number of leading scientists. While its advocates saw animal breeding and eugenics as birds of a feather, clearly they are horses of a different color.

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