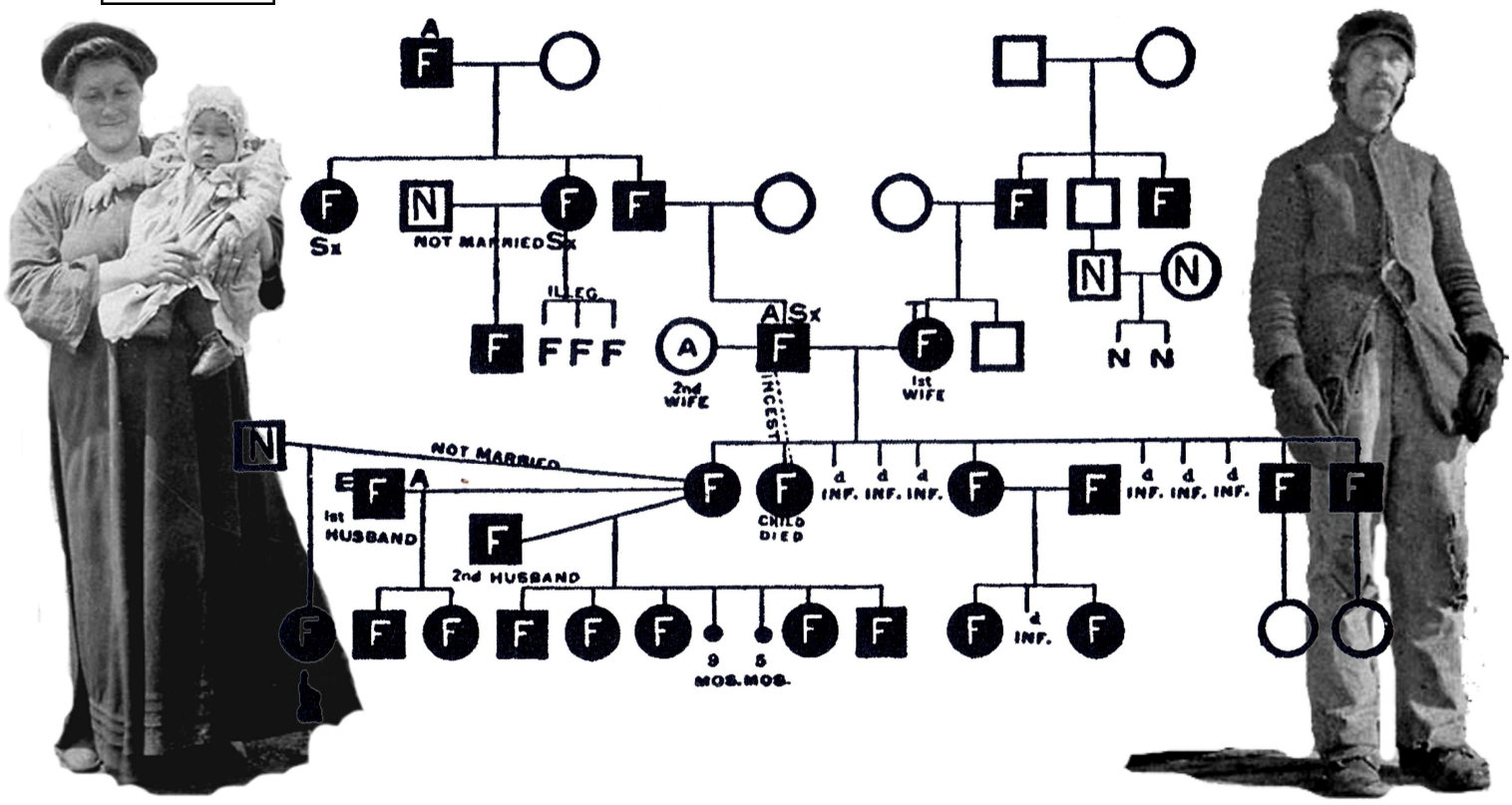
FACT • OR • FAUX



Charles Davenport & the Prospects of Genetics

DOUGLAS ALLCHIN

ABSTRACT

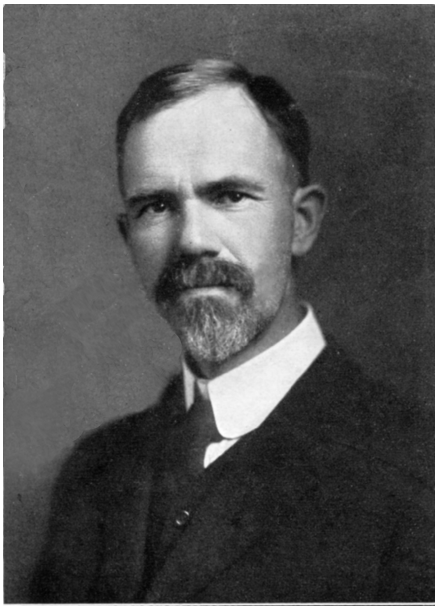
The Fact-or-Faux series addresses misinformation and science media literacy. Here, we delve into the case of eugenics, when bogus scientific claims gained a foothold in the public view in the early 1900s. By engaging with the historical context, students develop strategies to protect themselves from efforts by ideological interests to misappropriate trust in science.

Keywords: Charles Davenport; genetics; pedigrees; eugenics; feeblemindedness; immigration laws

This is an interactive story about eugenics, exploring how purportedly scientific claims gained substantive and influential public support in the early 1900s. Appeals to science were used inappropriately to justify now-notorious sterilization laws, enact laws to limit immigration, and to perpetuate social injustice. It is a cautionary tale of how misinformation can sometimes outstrip good science in the public sphere. Fortunately perhaps, the lesson can fit comfortably as an extension to a standard unit on Mendelian genetics, rendering the science in a cultural context while addressing social bias and misconceptions about genetic reductionism.

We focus on the work of Charles Davenport (Figure 1), who led the Eugenics Record Office (ERO) at the prestigious Cold Spring Harbor Laboratory from 1910 to 1934. The narrative begins with the original promise of eugenics. Its prejudicial class-oriented pretensions appear only gradually. Students engage in inquiry — addressing problems about good evidence, public scientific claims, and ideologically biased science in a historical context — thereby developing competencies in sorting fact from faux in the media. The inquiry-style narrative is scaffolded through a series of student questions (bulleted in italics below).

[A prepared presentation (PPT or PDF) is available at http://shipseducation.net/misinfo/davenport.htm]



The promise of eugenics and the puzzle of pedigrees

Charles Davenport came to genetics via the study of experimental evolution — viewing evolution (somewhat teleologically) as a mechanism to achieve progress. He readily subscribed to the visions of *eugenics* ("good origins"): the effort to improve humans and society, as was done for corn and race horses: through careful breeding. The newly rediscovered Mendelian principles seemed to help clarify that process. What remained was to characterize the various beneficial and detrimental traits in humans and to document their Mendelian patterns, as a basis for informed policy.

Davenport found a wealthy patron, Mary Harriman, the widow of a railroad tycoon. In 1910 she generously funded the establishment of a new research institute, the Eugenics Record Office, including a 75-acre estate outside New York City (Kevles, 1985). Davenport promptly produced a textbook, *Heredity in Relation to Eugenics* (1911). There he presented the genetic basis for several traits, as illustrated in pedigrees (see opening image).

Pedigrees were a standard tool for visualizing and tracing inheritance. Davenport used them again in 1916 in a debate about the cause of pellagra, a disease then prevalent in the rural southern United States (Figure 2). One theory attributed pellagra to infection; another, to lack of proper nutrition. One pair of researchers blamed poor diet, but further contended that it was ultimately the post-Civil War disparities of wealth that meant that some farmers could not even afford to grow fresh vegetables for themselves. Davenport (1916), by contrast, contended that pellagra was *genetic*. And in an appendix to a major report, he presented several pedigrees to bolster his claim (Figure 3) (for more on the pellagra episode, see Allchin, 2016).

Here, students are invited to reflect:

- *What do pedigrees tell us about Mendelian inheritance specifically?* Namely, *given the alternative explanations for pellagra, how might the pedigrees document something other than genetic traits? How so?*

In this case, the charts could obviously equally indicate unhealthy sanitary conditions or poor diets in succeeding generations. Entire rural populations might be persistently impoverished and vulnerable to disease for social reasons, not genetic ones. Ask:

- *What additional evidence would be needed to distinguish between these possible interpretations?*

This insight becomes critical for interpreting other scientific claims as the story unfolds, so you may dwell on it for emphasis.

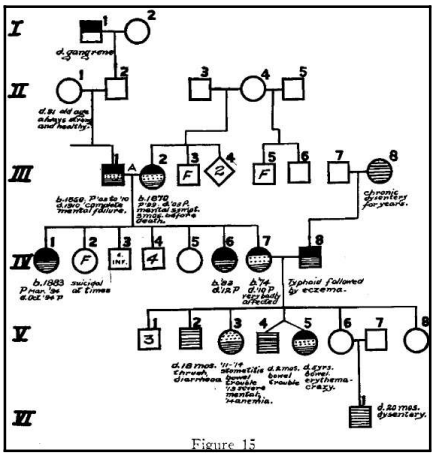


Figure 15

Feeble-mindedness (and other "socially undesirable" traits)

Davenport's 1911 book described a wide range of traits as heritable. Some were quite standard: eye color, hair color, stature, some blood diseases, memory, epilepsy, polydactylism. But it also included other conditions that we might at first deem developmental, or based on environmental factors: for example, handwriting, temperament, criminality, insanity, narcotism, calculating ability, musical ability, and pauperism (poverty). All were equally genetic, he said.

We'll focus on *feeble-mindedness* (Figure 4). Davenport did not define this trait clearly. It was some sort of "neuropathic taint." He assumed it was obvious for the reader. Some people have great mental ability (geniuses), while others do not (for example, idiots and imbeciles, categories established by the IQ test). The "defective" condition, he asserted, clearly followed the law of

inheritance. Davenport saw mental degeneracy in large swaths of the population, and among immigrants from certain countries. And he regarded them as a "grave danger." The need to sustain them, he said, was burdensome on society's resources. Again, he appealed to the pedigrees as indicating genetics was the root of the problem (see the opening image, where "F" designates feeble-minded).

Here, we may ask again:

- *Did the numerous pedigrees that Davenport presented count as decisive evidence that feeble-mindedness was genetic? How else might one justifiably interpret the multi-generational patterns?*

For his part, Davenport dismissed these alternative explanations as simply ill-informed. For him, one only needed common-sense observations.

Davenport presented his work on "Heredity in Nervous Disease and its Social Bearings" at the 1912 meeting of the highly regarded American Association for the Advancement of Science (AAAS), and his remarks were published in the renowned *Journal of the American Medical Association*. The non-scientist might easily construe this context (along with his position as Director of the ERO) as indicating Davenport's expertise.

According to the published account, attendees at the AAAS presentation eagerly endorsed Davenport's claims. For example, Dr. Woods Hutchinson of New York commented:

> As Dr. Davenport says, the more carefully these defectives are studied, the more the hereditary element comes out in them. ... the criminals, prostitutes, insane, epileptics, feeble-minded and inebriates.

He referred to his work with criminals in Indiana, his investigation of a notorious pair of labor activist saboteurs, and the study of feeble-minded at a school in Vineland, New Jersey. Six other physicians also concurred that Davenport's views reflected their experience and data. Did that indicate a consensus?

All the same, some fellow geneticists took issue with Davenport's claims (Allen, 2011). For example, Thomas Hunt Morgan (who would later win a Nobel Prize) noted:

> Family pedigrees in which an unusual number of individuals [mentally] below par are present undoubtedly give the impression that something is inherited, but until all the social conditions surrounding the childhood of the individual are examined and given proper weight, serious doubts will arise as to what form of inheritances is producing the results. It is quite probable that there are extraneous factors involved in such pedigrees.

Criticism from David Heron, a British geneticist, was much sharper. He noted that the field workers often determined the mental ability of ancestors without any solid evidence. He also observed that they were specifically instructed to search for instances that confirmed Mendelian patterns and not record others. Namely, they "cherry-picked" the data. The ERO may have gathered "data," but they were scientifically worthless. Even though the "findings" aligned with the investigators' expectations, this was hardly genuine confirmation. The results did not test the hypothesis in any meaningful way (for example, by

National Park Service: Statue of Liberty National Monument

ruling out alternative explanations).

So: there appeared to be professional controversy. Invite student analysis:

- *How should the average citizen or consumer, not schooled in genetics, have interpreted this apparent disagreement among experts?* (See Fact-or-Faux, January, 2026.)

In this case, the specific criticisms of a few experts helped expose the flaws and blind spots of *other* experts (assuming all were indeed trustworthy experts). Agreement with Davenport seemed quite superficial, based on impressions and "experience," not concrete evidence or rigorous analysis. Even an outsider who was not an expert could easily discount some of the testimony as presumably biased. Students may reflect:

- *Why could Davenport and his supporters have been blind to their biases, which seem so clear to us?*

Namely, social prejudice may seem invisible to those whose status or privilege is based on it.

Genetics and immigration

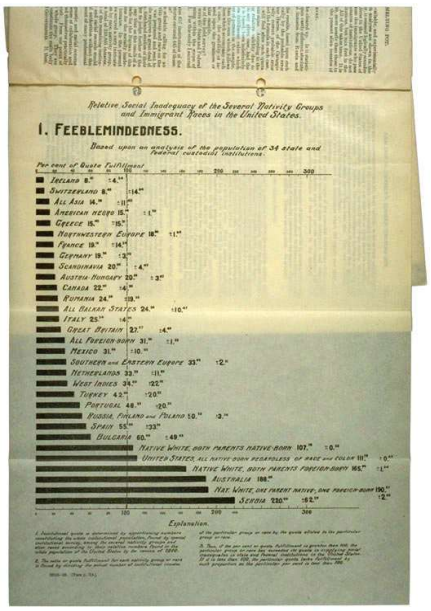
The ERO continued on its path. Harry Laughlin, in his role as Superintendant of the ERO, was particularly active in spreading unwarranted claims as science. In his view, one could use genetics to characterize whole populations based merely on their nationality or place of origin—notably, in a negative sense. Genetics could thus justify (for him) views about limiting immigration from certain countries (mostly Eastern Europe) (Figure 5).

Although not trained as a scientist, Laughlin was appointed as a "eugenics expert agent" to the U.S. Congress. He helped to draft immigration legislation, and collected data on recent immigrants, reporting the frequency of feeble-mindedness, "degeneracy," crime, epilepsy, and tuberculosis—again, all assumed to be genetic and therefore "natural" features of each population (Figure 6). Students can consider whether the charts provide truly scientific or relevant evidence, as claimed by Laughlin (1922). First, perhaps:

- *What questions should we be posing about these claims? Are surveys of recent immigrants an appropriate measure of the original native population? (In what ways might there be important differences?) Can one fairly characterize whole populations as uniformly exhibiting the same individual trait? Is there adequate evidence that these traits are inherited, rather than reflecting the social conditions of new immigrants?*

We can combine the students' assessments with several contextual questions:

- *What assumptions governed Laughlin's whole approach? Why focus on these specific*


Relative Social Inadequacy of the Several Nativity Groups and Immigrant Races in the United States.

I. FEEBLEMINDEDNESS.

Based upon one-quarter of the population of 34 state and federal custodial institutions.

Truman State University. Noncommercial, educational use only.

traits, and not the social contributions of immigrants, say? How might these data exhibit (yet also hide) the types of prejudices visible in the cases of Davenport's pedigrees of pellagra and feeble-mindedness? What does it mean to present these "measures" as scientific?

This analysis of the science allows students to reflect on how Laughlin and others appealed to science in order to give authority to their cultural views. Students may now step outside the science to consider how a non-scientist would interpret and address the claims purportedly based on science. (Here, the case epitomizes the significance of a consumer-citizen learning how to sort fact from faux.) Laughlin was presented as an expert witness. *As a member of Congress, how should you respond to Laughlin's testimony? As a biologist at this time, how should you respond to Laughlin's testimony? If you agree, should you endorse it publicly? If you disagree, do you have a responsibility to criticize it in public media?*

In 1924 Congress enacted the Immigration Act, which restricted immigration by over 80%. Immigration levels would remain limited for over half a century. In subsequent years, the influence of eugenics waned as its inadequacies became more widely acknowledged. In 1935, the major funder of the ERO, the Carnegie Institute, concluded that the research had no scientific merit. Several years later, it withdrew its funding, and the ERO was forced to close.

Table 1. Traits proposed as genetic by Charles Davenport.

insanity	feeblemindedness
temperament	pauperism (poverty)
narcotism	criminality
memory	handwriting
hysteria	general mental ability

Noticing and interpreting bias

A consideration of eugenics is not complete, however, without also understanding how it managed to secure its "scientific" status among so many and to maintain it for so long. Here, students may revisit Davenport's 1911 book for clues.

First, recall that Davenport described pellagra (and tuberculosis, too) as genetic. The first is a nutrient deficient; the other, a bacterial infection. However, both were prevalent among the impoverished and socially disadvantaged.

- *What does it mean to attribute these conditions to genetics, rather than (as many of Davenport's peers did) to other environmental or social factors?*
- *Apply your analysis to other traits Davenport focused on* (Table 1).
- *Whose interests might be served by viewing these conditions as genetic, rather than as caused by an individual's developmental environment or by social context?*

Davenport's views embodied a form of strict *genetic reductionism*: the notion that external social or cultural factors could be "reduced" to fixed "internal" factors (namely, genes). It also implied that the conditions were "natural," inevitable, and not open to change. Notably, when you attribute causes in this way, you also shift how you think about possible solutions, and who might be responsible for solving them. By labeling non-genetic traits as genetic, eugenicists could escape any perceived need to address the uncomfortable disparities of economic privilege or the politics of social injustice. But it was not scientifically justified.

Davenport (1911) characterized the conditions to be "solved" by eugenics as desirable or undesirable (Table 2):

- *How would you describe Davenport's vision of an improved society? What does it mean to regard these values as scientific labels?*

Here, Davenport endeavored to *naturalize* his cultural ideology as an inherent feature of nature. Once inscribed into the fabric of the world, it would become rhetorically resistant to challenge. The naturalizing error is an error of science — and a danger lurking

Table 2. How Davenport classified traits (presumed to be genetic).

Desirable ("*acceptable*")	*Undesirable* ("*defective*")
industry	indolence
ambition	listlessness
foresight	licentiousness
abstinence	alcoholism
self-control	social burden
	cost to the state

whenever someone pursues science with distinctly political endpoints already in mind, as Davenport and Laughlin did (Allchin & Werth, 2017). That's one of the chief lessons of the story of eugenics. When questions of power, profit, or privilege are at stake, one needs to sharpen one's critical eye of scientific claims in the media. One needs to probe the interests of whoever is advancing the claim, and exercise corresponding rigor in the standards of evidence.

Davenport's pedigrees, in particular, failed that more stringent test. For many in the early 1900s, eugenics *looked like* science. But a savvy consumer learns how to sort fact from faux in such fraught issues.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

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