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RESEARCH NOTE

ABSTRACT The eugenics movement during the first half of the 20th century has been described as a transnational social movement because of the way it flourished on different continents between World Wars I and II. Political opportunity structure is a term used to explain the social rules and resources that enable such a movement to emerge seemingly simultaneously in diverse settings. One opportunity structure in the eugenics movement that requires further exploration is the university. Since US agricultural scientists were so prominent in the transnational eugenics movement, it is especially relevant to document the initiation and persistence of eugenics courses in the US Land-Grant University (LGU) system. By examining course-offerings at LGUs through the 20th century, we demonstrate that eugenics courses were available at prominent US research institutions not only prior to World War I, but also after the end of World War II, when eugenics was considered bad and inappropriate science.

Keywords agricultural sciences, eugenics, genetic engineering, Land-Grant Universities, opportunity structures

Eugenic Opportunity Structures: Teaching Genetic Engineering at US Land-Grant Universities Since 1911

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Stephen S. Jones*

The eugenics movement was founded on the theory that the human race could be improved through selective breeding. It grew out of a perception ‘that inferiors threatened to outbreed good men’ (Pickens, 1968: 55). Because the eugenics movement began to flourish in Europe, North and South America, and other parts of the world almost simultaneously between World Wars I and II, Barrett & Kurzman (2004) argue that it needs to be studied as a transnational social movement. They contend that the movement did not rise before World War I because it lacked the adequate political opportunity structure, and that it declined after World War II because it faced a hostile global culture.

Allen (2001) and Duster (1990) have each noted similarities between the eugenics movement of the first half of the 20th century and some of the

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claims made by geneticists at the end of the 20th century. After describing how eugenics seems to pop-up in scientific and popular media at different periods of history, Duster (1990: 2) states that 'the appeal of such [eugenics] accounts somehow remains just beneath the surface.' The political opportunity structure is a useful concept for explaining this 'just beneath the surface' phenomenon because it accounts for how social movements do not arise out of nothingness or disappear after they have succeeded or become discredited.

One eugenics opportunity structure that Barrett & Kurzman (2004) did not examine, but which we think should be highlighted, is the university. Nearly 400 colleges and universities in the USA were teaching eugenics courses by 1928 (Selden, 1999: 49). And for at least two reasons, the Land-Grant Universities (LGU) deserve special consideration. The first is that the LGU system institutionalized the science curriculum in the USA (Rudolph, 1978). A series of federal laws passed between 1862 and 1914 established the LGU system. Although these laws had the explicit goal of applying science to boost manufacturing and to facilitate the industrialization of agriculture, they also created the world's largest scientific research apparatus during the first half of the 20th century (Friedland, 1991). The second reason, which is connected to the first, is that the LGUs are often referred to as 'the people's university' because of their responsibility for making scientific knowledge accessible to the public (McDowell, 2001). Many social scientists have criticized the role that this scientific apparatus has played in undermining the viability of small farms, in fostering the economic concentration of large agribusinesses, and in promoting a resource-intensive and environmentally destructive agricultural system (Danbom, 1979; Friedland, 1991; Scott, 1998; National Research Council, 2002). What has received less attention is the role that the LGU system played in perpetuating eugenics. Evidence that eugenics has been prominent in the LGU curriculum would serve as an indicator of a eugenics opportunity structure.

Eugenics was launched in Britain by Charles Darwin's cousin Francis Galton when he wondered if plant and animal varieties could be improved with Mendelian practices: 'Could not the race of men be similarly improved?' (Kevles, 1985: 3). Despite its conceptual genesis in Britain, it became institutionalized in the US through the efforts of Charles Davenport at the Cold Spring Harbor Biological Laboratory, where he collected genetic information to use to write bulletins, books, and magazine articles (Kevles, 1985). What may have been even more important in converting the concept of eugenics into a social movement was the synergistic relationship eugenics had with the industrial agricultural sciences in the USA.

It was during the first two decades of the 20th century, through the profound influence of the American Breeders' Association (ABA), that eugenics became popularized (Kimmelman, 1983). The ABA 'introduced eugenic ideas to agricultural breeders who might not yet have come in

contact with them, thus forging a link between eugenic interests and the geneticists affiliated with agricultural research institutions' (Kimmelman, 1983: 192). Many of those ABA members were prominent men in the US Department of Agriculture and on the Country Life Committee (the presidential commission charged with promoting industrialization of agriculture). More importantly, many eugenicists were part of the LGU system, which consisted of an elaborate research, teaching, and outreach program for promoting the agricultural sciences.

The dominant narrative that portrays eugenics as nearly synonymous with Nazi Germany tends to distract attention from how central the US was in popularizing eugenics (Stern, 2005). The Nazis are notorious for their 'bestial' application of eugenics policies (Weiss, 1987: 3). But it is important to note that 31 of the states in the USA had sterilization policies before Germany developed one. Nazi Germany's 1933 sterilization policy translated and amplified the policies that state legislatures had passed in the USA (Barrett & Kurzman, 2004: 509–10). Nazi Germany sterilized 400,000 people, compared with 60,000 by the USA (Allen, 2001). Although the USA did not sterilize as many people as the Germans and produced nothing comparable to the enormity of the death camps, it did generate and implement eugenics policies before and after the Nazis.

The persistence of eugenics in the USA after the end of the Nazi regime led us to question the role of the LGUs. Barrett & Kurzman (2004: 498) contend that 'eugenics could scarcely speak its own name after the mid-1940s.' And yet, genetic engineering persisted in the USA, with sterilization and confinement policies and practices continuing into the 1990s. Perhaps even more striking, after the end of World War II, 19 LGUs offered courses with the word 'eugenics' in the course title. The German universities were forced to rebuild from a state of 'moral ruin' after having been corrupted by eugenics and other racist doctrines (Deutsch, 1959: ix). Examining the persistence of eugenics at LGUs may lead to a better understanding of opportunity structures that maintain the 'just below the surface' appeal of eugenics.

Land-Grant Universities as Opportunity Structures

The concept of opportunity structure assumes that collective action does not happen by chance, but rather is facilitated by the harnessing of social rules and resources. Ideas need to be perpetuated, legitimated, and converted into policies and practices if they are to become common and if a movement is to take shape. When Barrett & Kurzman (2004) refer to eugenics as a global social movement, they might have considered how universities, as international organizations, facilitated that development. Universities often recruit faculty and students internationally, and those faculty and students tend to publish in the same journals and attend the same conferences. Many scientists who attended the first International Congress of Eugenics in 1912, and other eugenics conferences, were

employed at universities. Universities became the sites for eugenics research and scholarly publications, as national governments and philanthropists, including Mary Harriman, John D. Rockefeller, and George Eastman, provided scholarships and research funding in the 1910s and 1920s (Kevles, 1985). And, by being connected with a university, eugenicists were able to generate scientific legitimacy for their inhumane policies and practices. Since a popular conception of scientific objectivity is that it transcends national boundaries, all of these characteristics certainly make the university an important global opportunity structure.

The LGUs have been so instrumental in the eugenics movement because of their location at the nexus of a set of social trends during the first half of the 20th century, including Progressivism, eugenics, and agricultural industrialization. Allen (2001: 61) contends that 'Eugenics fit[s] perfectly with Progressive ideology', because both sought to apply scientific expertise to solving social problems. Furthermore, both emerged at a time of urbanization and industrialization, during the late 19th and early 20th centuries, when immigration from southern and Eastern Europe, rural-to-urban migration, labor unrest, rising crime rates, a rising divorce rate, and a declining birthrate for whites of northern European heritage led many to worry about the wellbeing of the nation (Rosen, 2004: 10).

Efforts to industrialize agriculture were built upon this perfect fit between eugenics and Progressivism. By harnessing scientific discoveries in plant and animal breeding, policymakers hoped to address at least some of the social problems of the early 20th century by increasing agricultural production to feed the industrializing urban centers. With a nascent version of genetic engineering serving as a solution to these social problems, the ABA, which was formed in 1903 by US Department of Agriculture, university, and industry scientists to promote better breeding, became the agricultural context from which eugenics emerged and prospered (Kimmelman, 1983).

As the world's largest scientific organization, the LGU system provided eugenics with a cover of sophistication. And the LGU's mandate to extend knowledge to the public made it an important structure for creating public legitimacy.

Armed with Mendelian genetics, agricultural scientists were charged with generating better breeds of crops and livestock for American agriculture (Paul & Kimmelman, 1988). And these agricultural scientists quickly pointed to social implications of genetic heredity. The plant breeder Luther Burbank articulated society's interest in converting the lessons of genetics into social engineering: 'What shall we say of two people of defined impairment who are allowed to marry and rear children? It is a crime against every individual in the state. And if these physically degenerate are also morally degenerate, the crime becomes all the more appalling' (Burbank, 1907: 59). A 1926 newspaper article describing a talk by a professor from the University of Vermont (an LGU) connected livestock and human reproduction with the claim that the 'feeble minded' are the results of

breeding 'by parents who were not as carefully selected as dairymen breed cattle.'

Harvey (2005: 5) claims that for an idea to become common, 'a conceptual apparatus has to be advanced that appeals to our intuitions and instincts, to our values and our desires, as well as to the possibilities inherent in the social world we inhabit.' And Weiss (1987: 4) and Allen (2001: 61) claim that eugenics is seductive because there is just enough logic in it to give it popular appeal. Certainly, using scientific knowledge to industrialize agriculture helped to make the logic of eugenics seductive and intuitively appealing, since it was not a great leap for the agricultural scientist to apply lessons from animal and plant breeding to social engineering. And, for those familiar with farming, eugenics appealed to the traditional agricultural practice of artificial selection. For farmers, agribusinessmen, and scientists, then, agriculture provided the common sense that eugenicists could confirm with science.

Many LGU agricultural scientists and extension agents participated in state and county agricultural fairs all across the country. Exhibitions were held in buildings with cattle, hogs, and people on display to show the results of proper breeding techniques. Posters showed a man sowing seeds in a field with the caption, 'Only Healthy Seeds Must Be Sown! Check the Seeds of Heredity, Disease, and Unfitness by Eugenics.' At the Texas State Fair in 1925, a couple received a trophy for being the 'best eugenic couple'. One placard at the fair asked, 'How long are we Americans to be so careful for the pedigree of our pigs and chickens and cattle – and then leave the ancestry of our children to chance or to "blind" sentiment?' (Kevles, 1985: 63).

It is this public outreach to promote agricultural improvement that makes the LGU system such a centrally relevant eugenics opportunity structure. After all, LGUs were mandated by federal legislation to distribute scientific discoveries to the public. The 1862 Morrill Act established an LGU in each of the United States, the 1887 Hatch Act added experiment stations for scientific research, and the 1914 Smith-Lever Act established the Cooperative Extension program to spread the knowledge generated by LGU scientists. Cooperative Extension agents were responsible for teaching farmers and rural people about the latest technologies and ideas through farm demonstrations, children's programs, such as 4-H, and state and county fairs. Kevles (1985: 60) claims the 'eugenicists reckoned that, before a eugenics revolution could occur, the public would have to be taught to be "eugenic minded".' And an LGU professor who learned about eugenics at the ABA or International Conference of Eugenics meetings would find a ready-made system for teaching the public to be eugenics minded.

Emphasizing a similar time line for the demise of eugenics to that of Barrett & Kurzman (2004), Pickens (1968) claims that two major developments and one minor one led to the demise of eugenics. The first was the expansion of scientific and social scientific understandings of natural selection in the 1920s beyond genetic inheritance to include the natural

and social environment. The second was the stock market crash and Great Depression of the 1930s, which undermined the belief in inevitable progress and revealed that the genetically superior and inferior alike may be devastated during an economic collapse. The third, minor, development was the rise of Nazism, which served to discredit the science. Given this demise of eugenics in the popular imagination, one might be surprised to find that prominent LGUs continued to offer classes in eugenics long after the end of World War II.

Data and Method

The primary data for this paper were gathered by contacting special collections departments at LGUs by US mail, email, or telephone to request information on listings of eugenics courses in their university's course catalogs. We adopted a conservative approach in the data collection. Many courses with implicit references to eugenics may have been taught in LGUs over the past century, but we only recorded course listings with eugenics in the course title. The main focus of our information gathering was on when the eugenics courses were first offered and when the courses were dropped (or at least when eugenics was dropped from the title). We contacted all 50 of the LGUs, and they all responded. Twelve said that they had no records of eugenics courses having been taught at their universities. We also contacted several private and public (non-LGU) universities for comparative purposes.

Our conservative method of asking only about courses with eugenics in course titles may have excluded some relevant courses. To explore what we may have excluded as the result of our method, we followed up with the 12 LGU archivists who reported that their universities did not have eugenics courses by asking if they had any courses with 'racial hygiene' or 'problems in heredity'. Four of the 12 said that they did find courses listed with these terms in the titles, but the remaining eight did not respond to our second request. Though these types of courses clearly emerged from the eugenics movement, we chose to focus only on the appearance of 'eugenics' in the course title because the issue that frames our research is the claim that eugenics became so stigmatized after 1945 that it fell into disuse. If 'eugenics' persisted in the course titles at some LGUs, the implication is that the negative connotations associated with the word may not have been as widespread as Barrett & Kurzman (2004) suggest. We do explore the subtle ways that eugenics persisted at some LGUs even after the stigmatized term disappeared from course titles and course descriptions. However, it is easier to make the argument for the subtle persistence of eugenics after demonstrating that in many cases the persistence was overt.

It is important to note that university courses are not offered merely at the discretion of a professor. Courses and their contents must be approved by the department and by a university faculty oversight committee. In other words, one cannot necessarily dismiss these courses as the whim of

uniquely racist professors. In the case of Rutgers University, which will be discussed in detail later, the eugenics course is connected to the career of one professor. The course was initiated by that professor and it ended with his retirement. However, even he would have needed departmental and university approval to create the course. It is possible that a professor may have invoked the claim of academic freedom to get a controversial course approved. But it is more plausible that professors who wanted to teach eugenics courses managed to find enough supportive colleagues to get their courses through the approval process. Although it may be inaccurate to claim that an entire university condoned the teaching of eugenics if a course on the subject was offered, professors could not have taught the courses without their university's approval.

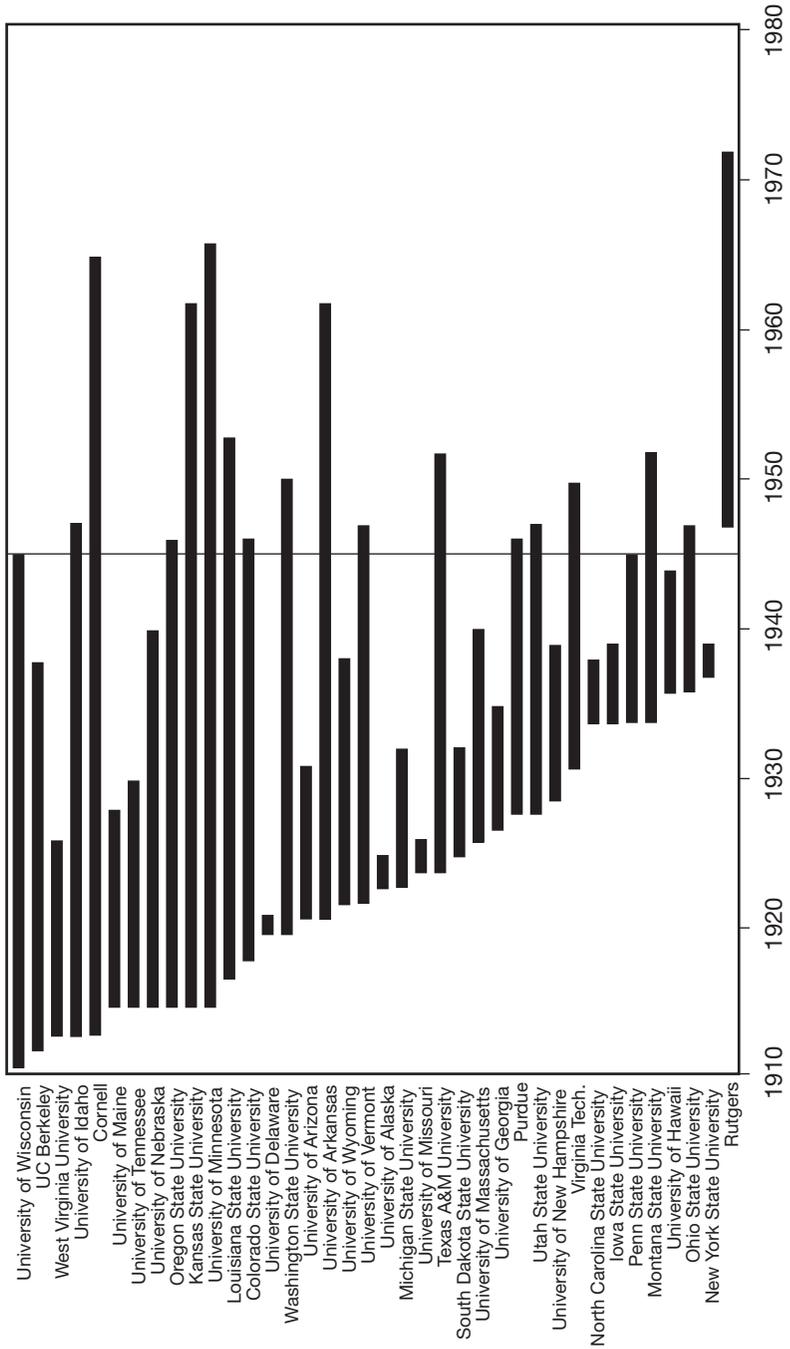
Eugenics Courses Taught at LGUs

Our data revealed that 38 LGUs offered courses with eugenics in the title at some point during the 20th century. Fourteen of them began teaching eugenics courses before the USA became involved in World War I, but most only began offering them in the 1920s. More importantly for this paper, 19 of them offered such courses after the end of World War II (Fig. 1). Eleven universities were even offering eugenics courses until 1950 and after: Washington State University (1950), Virginia Technical University (1950), Texas A&M University (1952), Montana State University (1952), Louisiana State University (1953), Kansas State University (1962), University of Arkansas (1962), Cornell University (1913–15, 1948–50, 1950–65), Pennsylvania State University (1932–57, 1957–64), University of Minnesota (1966), and Rutgers University (1947–72).

For comparative purposes, we also sought information about eugenics courses taught at non-LGUs. The University of Pittsburgh (1927–34), Kent State University (1929–34), Brown University (1922–39), Princeton University (1921–42), Oklahoma Baptist University (1925–45), and Brigham Young University (end date of 1941) tend to fit within the Barrett & Kurzman (2004) parameters that define the height of eugenics' popularity during the interwar period. Lincoln University was also typical for offering a course on eugenics from 1926 to 1936. But what makes Lincoln atypical is that it is an '1890 LGU', meaning that it was funded through the 1890 Morrill Act which established a series of LGUs to serve freed slaves. Perhaps it is an indication of just how common eugenics courses were in the 1920s and 1930s that it was even taught at an African American university. The University of Washington (1915–49), Delaware State University (end date of 1949), and Baylor University (end date of 1965) are exceptional for offering eugenics after 1945.

Our method of counting only cases where eugenics appeared in the title may also have limited the variety of examples of eugenics course taught at non-LGUs. For example, Lewis Terman was a well-known Stanford University professor who conducted pioneering work in creating intelligence quotient tests, which have been linked to eugenics efforts

FIGURE 1 Timeline of eugenics courses offered at LGUs. (Line indicates 1945, the end of World War II. Courses may not have been taught every year during the time span they were listed in the course catalogs.)



(Zenderland, 2001). Aware of this history, the Stanford archivist looked specifically for some of these known eugenics professors' course offerings. She reported, for example, that Terman taught a course titled 'Psychology of Endowment' from 1922–38, which focused on 'tests of general intelligence, special abilities, character and personality; psychology of genius; mental inheritance; race differences, etc.' She also found courses in the biology department with descriptions like this one: 'The importance of heredity in rational attempts to solve certain social problems arising out of immigration, population, social or industrial inadequacy, crime and delinquency, and race mixture'.

These examples of non-LGU eugenics course offerings after World War II indicate that the LGUs were not extraordinary. Almost two-fifths of LGUs continued to offer courses after 1945, but private universities such as Baylor and public universities such as Delaware State and the University of Washington also offered courses after 1945. Despite these similarities, we would argue that the LGUs were still exceptional because of their contribution to public legitimacy. The LGUs, which include scientific research, teaching, and extension, were created through federal mandate and funded through state and federal allotments. They have long had a profound policymaking influence and, as noted earlier, were instrumental in public-education efforts to promote agricultural industrialization through agricultural extension. Other universities may also have contributed to the eugenics opportunity structure, but that contribution would have been minor when compared with the LGUs.

Because the LGUs played such an important role in the nation's public science education, the persistence of eugenics at LGUs after 1945 is indicative of the slowness of the spread of the negative connotations associated with eugenics throughout the public education system. If eugenics was so tainted that it dare not speak its name, it is odd that eugenics courses would persist at 11 universities even after 1950. It is the slow departure of eugenics from course titles at some universities that led us to ask if perhaps the ideas were so entrenched at LGUs that those universities dropped 'eugenics' from course titles only begrudgingly while the subject matter was retained. We seek to address this question by examining the content of eugenics courses at LGUs.

Content and Persistence of Eugenics Courses at LGUs

A representative sample of the eugenics courses and descriptions at various LGUs gives an indication of the content:

- Michigan State University – 'Eugenics: ... inheritance of human mental and physical traits and the forces of human evolution. The class includes field trips to state institutions for the insane, feeble-minded and epileptic.' Taught from 1923 to 1932.
- Purdue University – 'Experimental Heredity 130/131: Animal Breeding and Eugenics.' Taught from 1928 to 1946.

- Rutgers University – ‘Heredity and Eugenics: The fundamentals of heredity applied to man; the interaction of heredity and environment in the expression of human traits; a program for human conservation based on the above knowledge.’ Taught from 1947 to 1972.
- University of Delaware – ‘Heredity and Eugenics 303: A study of the fundamentals of Mendelian heredity and human inheritance including a consideration of the factors underlying race-betterment and race-deterioration.’ Taught from 1920 to 1921.
- University of Hawaii – ‘Evolution and Eugenics 285: The doctrine of organic evolution, its historical development, supporting evidence, and applications; human genetics and evolution and their social importance.’ Taught from 1936 to 1944.
- University of Nebraska – ‘Eugenics and Genetics 144: Genetics and heredity in man, involving normal as well as abnormal physical and mental characteristics that appear in families for several generations.’ Taught from 1915 to 1940.
- University of Vermont – ‘Eugenics: A seminar course on practical applications of the principals [sic] of race betterment, including conservation of the family, and population problems such as migration, birth rates, and racial mixtures. Recommended for general cultural education and especially to those interested in any phase of social work, including teaching.’ Taught from 1922 to 1947.

The key theme that links these courses is biological determinism. Either implicitly or explicitly, the course descriptions incorporate a causal connection between genetics, heredity, breeding and social outcomes.

A common argument is that it is unfair to apply contemporary moral judgments to earlier historical eras. Moody-Adams (1997: 61) has debunked this ‘relativism of historical distance’ argument by explaining how those who make this claim must assume that cultures and historical eras are autonomous and impervious. And yet, there are good reasons to be careful not to be judgmental regarding eugenics, since the connotations of the term shifted over time and in different contexts (Zenderland, 2001).

Eugenics certainly did have positive connotations during its golden age between the two World Wars. During the 1920s, the Eugenics Record Office of the Carnegie Institution of Washington sent out questionnaires to colleges and universities to determine the number of eugenics courses being taught and the number of students attending those courses. On a completed questionnaire, a University of Idaho professor boasted that ‘Heredity & Eugenics and Social Hygiene are the two most popular courses in the University.’ On the line asking for the enrollment of the most recent course offering, which was 1920, he stated that 60 students had taken the course.

However, even during the period when eugenics carried positive connotations, opponents reminded eugenicists that their ideas were problematic. Well-known scientists, including Margaret Mead and Reginald Punnett, were outspoken in their criticisms. Franz Boas, at Columbia University,

asserted in a 1916 *Scientific Monthly* article that various social problems do not follow from genetics any more than 'in an agricultural community the occupation of farming descends from father to son.' And in *Marriage and the Sex Problem*, the Swiss ethicist and psychologist Friedrich Foerster stated that 'My desire is to protect against the brutal and superficial heredity terrorism with which certain modern eugenic enthusiasts advocate a regulation of human breeding borrowed from the stables and totally foreign to the human race.'

This quotation from Foerster is especially important because it was included in a 1920 letter from a University of Detroit professor in a response to the same Laughlin questionnaire that the University of Idaho professor responded to. This University of Detroit professor states that he is writing on behalf of the university president and for 'the Faculty of the University of Detroit' when he rejects the teaching of eugenics. The critical point here is that humanistic and critical-thinking professors were capable of rejecting eugenics for its brutality and lack of scientific merit even at a time when eugenics had positive connotations and was very popular.

The resistance by some to eugenics when it was popular makes the persistence of eugenics courses after 1945 all the more intriguing. Just as it is important to recognize that some universities and professors resisted eugenics at the height of its popularity, it is important to examine the reasons for the persistence of eugenics even after the concept took on negative connotations. Rutgers University certainly is an outlier not only because it was offering a eugenics course until 1972, but also because the course was initiated after 1945. And that course was connected to a single professor. However, by examining the cases of the University of Wisconsin, Purdue University, Washington State University, and Pennsylvania State University, we found that Rutgers was not unique.

The University of Wisconsin and Purdue University offer insights into how eugenics began to disappear after 1945. The University of Wisconsin course was linked to a prominent eugenicist, Michael Guyer, who had written a popular textbook on the subject in 1916. His course, 'Zoology 6: Heredity and Eugenics', was initiated when he arrived at Wisconsin in 1911, and it ended when he retired in 1945. After his retirement, the title of his course was shortened: 'Zoology 6: Heredity'. In the case of Purdue University, two professors were associated (teaching it individually and collaboratively) with the eugenics course, which was offered from 1928 to 1946. Although the reference to 'special attention on eugenics' was dropped after 1946, there was no other change to the course description.

Washington State University's eugenics course is intriguing not only because eugenics is not deleted from the course title after 1945, but because a second reference to eugenics is added. From 1920 to 1945, the word eugenics is not included in the extended course title:

- Zoology 61: Eugenics: 'A study of the heredity of traits and characters of man.' As listed in 1920.

- Zoology 61: Eugenics: 'A study of the heredity of traits and mental characters of man.' As listed in 1929.
- Zoology 61: Eugenics: 'A study of the heredity of traits and mental characters of man and their relation to *eugenic problems*.' As listed in 1946. (Emphasis added).

At a time when 'eugenics could scarcely speak its name', the professor teaching the course on the subject decided to list it twice in the course title. More than likely, this professor's department and the university's curriculum committee needed to approve this change in title.

The records of Washington State faculty discussions on terminating the eugenics course do not indicate that they did so because of negative connotations to the term. It had been taught for several years by the chair of the department, R.L. Webster (who was a member of the American Eugenics Society), but it was taught by an assistant professor, Ray Moree, in its final years. According to the Department of Zoology records, the course was discontinued because of a lack of student enrollment. According to a 17 January 1950 memo, the assistant professor teaching the course stated that 'Enrollment in Zool. 61, Human Heredity and Eugenics is not sufficiently high to justify its continuation; it is believed this course can be replaced by a new one which will meet the needs of a larger number of students.' Records indicated that he raised the issue because only six students had enrolled for the course to be taught in 1951, and only 12 had enrolled the year before. Neither the memo nor the minutes from the 24 January 1950 faculty meeting suggest that there was any discussion on ethical issues or the inappropriateness of the course material. The faculty voted to replace it with 'Genetics and Heredity', which suggests that the course content remained similar to its eugenics predecessor.

The history of the eugenics courses at Pennsylvania State University reflect the subtle ways that it entered the course listings, as well as the subtle ways that the underlying rationale behind eugenics remains in the course listings to this day. Eugenics first appeared in the Pennsylvania State course catalog in 1932–33 as Botany 32. Although a professor's name is not always listed with the Botany 32 course, the names of Professors Hill and Kelly are regularly listed. Therefore, it was not linked to a single professor. It was replaced in 1956–57 with Botany/Zoology 33, which did not have eugenics in the course title. That same course was listed as Biology 033 in 1981. It is still offered in 2005–06 with only minor revisions in the title.

- Botany 32: 'Evolution, Genetics, and Eugenics: ... facts and theories of heredity, variation and related phenomena; breeding practices; relationship of genetical knowledge to man.' Offered from 1932 to 1957.
- Botany/Zoology 33: 'Human Genetics: Human heredity and its individual and social implications.' Offered from 1957 to 1980.

- Biology 033: 'Human Genetics: Human heredity and its individual and social implications.' As listed in 1981.
- Biology 033: 'Genetics and Evolution of the Human Species: Human heredity and evolution, individual and social implications.' As listed in 2005–06.

We recognize the need to be careful not to make interpretations from these course titles that imply an intention on the part of faculty members to perpetuate eugenics. And yet the course-title revisions offer insights into the ways that eugenics may be persisting as a 'just below the surface' phenomenon. Eugenics was removed from the title, and the course syllabi have most likely been revised and updated regularly, but the persistence of the reference to the social implications of human genetics in the course description is important because it indicates at least a vestige of eugenic assumptions. However, a more thorough analysis of course syllabi would be necessary to confirm this.

A similar perpetuation of eugenic assumptions may also be evident in another course offered at Pennsylvania State University.

- Botany 22: 'Genetics: The facts and theories of variation and heredity in plants and animals. Relation of genetical knowledge to evolution and breeding practices.' As listed in 1920–21 course catalog.
- Botany 22: 'Genetics: The facts and theories of variation and heredity in plants and animals, *including man*. Relation of genetical knowledge to evolution and breeding practices' (emphasis added). As listed in 1921–22 catalog.
- Biology 022: 'Genetics: The facts and theories of variation and heredity in plants and animals, including man. Relation of genetical knowledge to evolution and breeding practices.' As listed in 2005–06 catalog.

The revision to Botany 22 'Genetics' in the 1921–22 course catalogue, which addresses topics of breeding practices in relation to genetic heredity in plants, animals, and people, certainly has implications for eugenics. The phrase 'including man', which was included in the description of the course listed as the prerequisite for the eugenics course, is still in the course offered at Pennsylvania State University today.

Pennsylvania State University is also exceptional because, like Rutgers, it began offering a new course in eugenics after World War II:

- Botany/Zoology 433: 'Genetics, Eugenics, and Evolution for Teachers: Facts of heredity, especially human heredity; bearing of genetics on improvement of lower organisms and man; relationships of genetics to evolution. Designed for teachers and prospective teachers.' Offered from 1957 to 1964.

It is safe to say that this course was not offered by one eccentric professor, because three professors (Wright, Grun, and Mitchell) have their names

listed on this course in 1957, and two (Wright and Grun) are listed as instructors in the last year that it was offered.

Conclusion

Barrett & Kurzman (2004) contend that opportunity structures must have been in place to enable eugenics to emerge as a transnational social movement between World Wars I and II. Referring to opportunity structures that would enable a transnational movement to emerge implies that rules and resources may have been present in one or more nations before the movement expanded beyond national boundaries. And we have sought to explain how those opportunity structures persisted even after eugenics faded as an international movement. We believe that our data regarding eugenics course offerings at LGUs reveal how the LGU system served as an opportunity structure. As it fostered the rise of the industrial agricultural sciences, the LGU system simultaneously helped to generate public legitimacy for the rise of eugenics between the two World Wars. And the LGU system's perpetuation of eugenics overtly and subtly after World War II may account for what Duster (1990: 2) calls the 'just beneath the surface' phenomenon.

During a time when 'eugenics could scarcely speak its own name', according to Barrett & Kurzman (2004: 498), 19 LGUs continued to offer eugenics courses. Eleven LGUs offered eugenics courses after 1950. Moreover, our analysis of LGU course offerings reveals that, even after 'eugenics' was dropped from course titles, some of the core ideas of the eugenics movement may have persisted, including the idea that social phenomena could be explained with genetic information. More research on the persistence of eugenic assumptions may provide support to Allen's (2001) and Duster's (1990) assertions that there are similarities between the eugenics movement of the first half of the 20th century and some of the claims made by geneticists at the end of the 20th century.

One could argue that the LGU eugenics course offerings were not dissimilar from private and public (non-LGU) universities. And that argument would not be inaccurate. But the history of eugenics at the LGU system takes on an added social significance because of the convergence of Progressivism, eugenics, and agricultural industrialization in the institution of the LGU scientific research, teaching, and extension complex. The LGUs' emphasis on agricultural research and outreach (including agricultural extension programs at state and county fairs) served to foster public legitimacy in ways that private and public (non-LGU) universities simply could not. Universities are presumed to be humanistic institutions governed by critical reason and populated by free-thinking scientists (Jaspers, 1959; Pelikan, 1992). Those who accept this presumption may be surprised to find that universities were promoting eugenics even after eugenics lost popularity. However, the LGUs' perpetuation of eugenics before, during, and after the interwar period indicates that universities have served as eugenic opportunity structures.

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