

“The Bare Replacement”: Geneticists’ and Bioethicists Support of Eugenics, from after the Second World War to the Human Genome Project

A substituição nua: o apoio de geneticistas e biotecnólogos à eugenia da Segunda Guerra Mundial ao Projeto Genoma Humano

Christopher R. Donohue*

RESUMO

Usando uma combinação de arquivos e trabalhos secundários, este artigo argumenta que cientistas e bioeticistas, após a Segunda Guerra Mundial, defenderam uma ampla variedade de práticas eugênicas e apoiaram fortemente o desenvolvimento de uma eugenia fortalecida pelos avanços na medicina e na genética humana e populacional. Detalho uma extensa pesquisa nos documentos de Curt Stern e da American Eugenics Society (American Philosophical Society, na Filadélfia), os quais permitiram-me levantar escritos desconhecidos da eugenia e sua integração nas ciências após a Segunda Guerra Mundial, por figuras importantes como Curt Stern e Theodosius Dobzhansky. Além disso, detenho-me na participação de Richard Lewontin em uma conferência em Princeton patrocinada pela American Eugenics Society, em 1965. Este artigo também é o primeiro a descrever

ABSTRACT

Using a combination of archival and secondary sources, this article argues that scientists and bioethicists after the Second World War advocated a wide variety of eugenic practices and strongly supported the development of eugenics, strengthened by advances in medicine, human genetics, and population genetics. I detail extensive research in both the Curt Stern and the American Eugenics Society Papers (American Philosophical Society in Philadelphia), uncovering novel defenses of eugenics and its integration in sciences after the Second World War by key figures such as Curt Stern and Theodosius Dobzhansky. Moreover, I relate to Richard Lewontin’s participation in a Princeton conference sponsored by the American Eugenics Society in 1965. This article is also the first to not only describe geneticists’ de-

* National Human Genome Research Institute, National Institutes of Health, Bethesda, Maryland, USA. donohuecr@mail.nih.gov <<https://orcid.org/0000-0003-4286-5427>>

não apenas a defesa e o desenvolvimento das ideias eugênicas pelos geneticistas, mas também a detalhar a defesa dessa ideologia desumana e anticientífica pelos bioeticistas, até o início do Projeto Genoma Humano, no final da década de 1980. Palavras-chave: Eugenia; Genética; Projeto Genoma Humano; Segunda Guerra Mundial; Curt Stern; Theodosius Dobzhansky.

fense and development of eugenic ideas but also details bioethicists' defense of this inhumane and unscientific ideology until the dawn of the Human Genome Project in the late 1980s. Keywords: Eugenics; Genetics; Human Genome Project; Second World War; Curt Stern; Theodosius Dobzhansky.

INTRODUCTION

There has been a growing acknowledgment across the sciences and the humanities of the pervasiveness of defenses of eugenics and eugenic practices throughout the twentieth century and into the present, extending well beyond the closing years of the Second World War and well after the horrors of the Holocaust became widely known¹. Mark Adams, a generation ago, provided a comprehensive comparative overview of the global eugenics movement (Adams, 1990), while Diane Paul continues to emphasize the profound lessons of eugenics for the development of genetics and genomics (Paul; Spencer, 1995). Furthermore, scholars such as Nathaniel Comfort have brilliantly narrated the close connections between eugenics and contemporary biomedicine's emphasis on cure, improvement, and progress. They also point out the prevalence of eugenic rhetoric in the treatment of rare genetic conditions (Comfort, 2012; Comfort, 2018a; 2018b), while Alexandra Minna Stern (afterwards Alex Stern), has not only underscored the ubiquity and inescapability of eugenics rhetoric and practices in the American experience (Stern, 2016), but has also traced the complex historical and conceptual continuities, and just as importantly, the *discontinuities* between eugenics and the practice of genetic counseling in America (Stern, 2012). Stern has also highlighted the continuing practice of involuntary sterilization, its close connections with scientific racism and notions of hierarchy, and the necessity of redress for survivors of sterilization practices in the United States (Stern et al., 2017).

To date, however, discussions of geneticists and others' defenses of eugenics and barbaric eugenics practices, such as involuntary sterilization and marriage restriction, as well as the open advocacy of using genetic counseling, prenatal screening, and diagnosis for eugenic purposes, remain episodic. This is particularly true at the level of a *long-durée* ideology articulated by a wide va-

riety of scientists after the Second World War. Most scholars have not systematically extended their inquiries to the transformations of eugenics practices and rhetoric, and they have only recently begun to realize the extent to which not only geneticists but also bioethicists continued to advocate for even involuntary methods of sterilization through various means until well after the Second World War. While the advocacy of broad eugenics programs does appear in scientific journals and other forms of print media, such as Curt Stern’s contribution in the journal *Science* (Stern, 1949), the advancement of a robust eugenic program as imperative to the present health and future prosperity of humanity is even more strongly present in talks and lectures that were not edited for publication and are only available in archives. From my work in the Curt Stern papers, as well as some underutilized archival and secondary sources, in particular, I am the first to extensively document his post-war advocacy of both eugenic ideas and both negative and positive eugenic measures², particularly from unpublished sources, emphasizing that Diane Paul’s work fails to extend Stern’s interest in the development of scientific eugenics into the 1960s, as Paul’s citation to Curt Stern’s genetics textbook is from the late 1940s³.

This is a significant advancement, as neither Alex Stern nor Nathaniel Comfort exhaustively discuss Curt Stern as a eugenicist. While Dobzhansky’s advocacy of eugenics in the work of Frederick Osborn does attract brief notice in Comfort’s work, the latter’s focus differs significantly from mine as Dobzhansky is mostly portrayed more positively as a counterpoint to H. J. Muller’s pessimism over radiation, genetic deterioration, and variation as “reactionary”. I argue that both men are similar in their advocacy of eugenic programs and principles (Comfort, 2012, p. 151). Likewise, Olby’s work on Crick downplays his embrace of eugenics (Olby, 2009).

Perhaps equally significant is the presence of Richard C. Lewontin, who is often seen today as opposing eugenic ideas, but as illustrated below, he was an active participant in at least one conference of the American Eugenics Society at Princeton University in 1965. This is a unique and significant archival discovery, given that Lewontin is universally portrayed as the “anti-racist” and a revolutionary opponent of E.O Wilson’s sociobiology (Newman et al., 2021). It is worth noting that one can be both against a biological and genetic account of race, but also open to engaging in conversations with eugenicists and entertaining their ideas. The writings of Theodosius Dobzhansky, among Lewontin’s mentors and his PhD advisor, provide a more certain step towards open advocacy of eugenic ideas and sterilization practices.

Lewontin’s mere presence at the American Eugenics Society Princeton

conference significantly complicates the history of biology and genetics literature, especially challenging the assumption that, with the advent of the so-called “evolutionary synthesis” – the complex and contradictory effort to unite an understanding of small-scale changes at the level of the gene or genome with broad shifts in the “fitness” and evolution of populations⁴ – eugenics, as a biologically reductionist account of race, was disproven and on the decline⁵. It also challenges the idea that eugenics, after the Second World War, was unable to integrate with the developments in theoretical and population genetics.

However, my thorough examination of materials at the American Philosophical Society in Philadelphia, Pennsylvania, particularly the Curt Stern Papers, the papers of the American Eugenics Society, and the institutional holdings of the American Society of Human Genetics (ASHG), perhaps the world’s foremost human genetic society, along with various secondary conference materials and other sources, has led me, in many respects, to opposite conclusions. In fact, I argue that the development of modern genetics after the Second World War did little to diminish the enthusiasm for eugenics and practices such as involuntary sterilization. Such scientific developments, I argue, actually strengthened, contrary to a significant scholarly consensus, the hold and ubiquity of eugenics in the minds of geneticists and like-minded scholars, since for these scientists, because of the stupendous advances in genetics and molecular biology, eugenics was finally on a firm and “scientific” footing.

That being said, defining eugenic rhetoric and practices in the United States after the Second World War is a complex task. To adapt and paraphrase Marius Turda’s argument, eugenics did not have a “fixed definition” in the post-war period. Instead, eugenics “[...] assumed their values within their usage in specific historical circumstances” (Turda, 2013). In many instances, state-sponsored involuntary sterilizations through public-health authorities and institutions, especially at the state level, persisted, often with similar rhetoric of racialization as seen in eugenic campaigns before the First World War and in the inter-war period (Kaniecki et al., 2023), although this varied by state (Schoen, 2011). This dynamic becomes even more complex as genetic concerns were often absent from state-sponsored, involuntary eugenic campaigns of state officials.

In the postwar period, the geneticists in question apparently wrote without apparent awareness of the actions of state health officials. Their focus was on the problem of the individual and on presenting eugenics as a reasoned, “scientific” choice, with eugenics on the verge of becoming an actual “science” of population management and control. In this capacity, these geneticists were

often aligned with bioethicists such as Paul Ramsey and Joseph Fletcher. Indeed, the lines between geneticists such as Muller and Crick and bioethicists like Fletcher were often quite blurred, as with Julian Huxley eugenics played a central role of a new ethics. For bioethicists, in particular, eugenics and the control of population and reproduction were “sanity” in the infamous phrase of Joseph Fletcher.

Notably, Fletcher’s work on “ending reproductive roulette” (Fletcher, 1988) was republished at the same time as some of the very first efforts to map and sequence the human genome were underway. While the National Institutes of Health’s official role in the governance of the Human Genome Project did not officially begin in the United States until 1990, this multinational effort to turn the human genetic code into computer-analyzable information characterized significant aspects of molecular biology, genetics, and the burgeoning science of (bio)informatics from the mid-1980s onward. Importantly, the Human Genome Project is often regarded as a crucial nexus between modernity and “postmodernity.” Consequently, it may come as a surprise to many perhaps that robust defenses of eugenics were sustained during this era and even into the present (Richardson; Stevens, 2015; Green; Donohue 2018).

The stance of ethicists, including philosophers like Ramsey and Fletcher, in their support of various kinds of eugenic practices, including marriage restriction and sterilization, may appear surprising, as has been addressed as well by Alex Stern, Nathaniel Comfort and others. This is especially the case since many ethicists and philosophers in the years that followed, strongly opposed eugenics and enhancement, particularly in this new effort called the Human Genome Project (Tauber; Sarkar, 1992). In the first instance, bioethicists consistently and at times vehemently advocated for eugenic programs, such as Agar’s concept of “liberal eugenics” (Agar, 1998). In the second instance, bioethicists (and geneticists) took advantage of two ambiguities. Firstly, the UNESCO statement on race from July 1950 carried with it the widespread understanding that Nazi eugenics was “race science” embodying the “Hitlerism” that the “Aryan-Nordic-German race was the only one endowed with a multitude of excellent qualities and with no bad ones” (Dunn; Dobzhansky, 1947, p. 10). However, subsequent eugenicists argued that eugenics would be built on a foundation that was dependent not upon vulgar racial ideas but on novel understandings of genetics derived from the evolutionary synthesis, the fusion of Mendelism and Fisher’s mathematical and statistical genetics.

In the second instance, bioethicists capitalized on an ambiguity in how the legacies of the Nuremberg Trials were interpreted, as not explicitly outlaw-

ing “scientific eugenics”, or even euthanasia in some instances, but as outlawing unlawful or immoral human subjects’ (or participant) research (Spicker et al. 1988). Bioethics, as a discipline, consequently has been slow to address eugenics as a subject of concern (Jecker, 1997). Hans Jonas, one of the esteemed founders of bioethics in the United States, while ultimately rejecting “genetic control” due to its perils, is somewhat less clear and definitive on this topic, posing the question: “Who will be the image-makers, by what standards, and on the basis of what knowledge?” (Jonas, 2014, p. 21).

Nevertheless, for as much as was new concerning these post-war defenses of eugenics, there remained considerable continuities with older frameworks. These included social Darwinist defenses of eugenics, particularly over the concern that modern civilization had replaced “natural selection” with that of “social selection” – on this see (Donohue, 2020; Paul, 2003) –, and of the dire threat posed by “mutations”, “gene erosion”, and “mutational load” (the presence and accumulation of deleterious mutations in a population over time) (Muller, 1950) to the future evolution of human kind. Such discussions had profound echoes with the generational-long obsession with “degeneration”, “criminality”, and “atavism.” On this see (Pick, 1993; Pick, 2007). As important to post-war defenses of eugenics was an obsession with both “quantity” and “quality”, mirroring older interwar frameworks (see Schneider, 1990).

Most importantly, as evidenced by the conference sponsored by the National Institutes of Health in 1971, eugenics not only retained its focus on quantity and quality in the post-war years but also maintained a paranoid fixation on the reproduction of those individuals with intellectual and developmental disabilities. Sadly, many of the statements made by participants at one of the world’s leading research centers in child health and development would not be out of place in interwar Europe or the United States during the “peak” of the global eugenics movement.

This noted, the development of these amoral and unethical schemes should be considered in the context that prominent geneticists also rejected eugenics as unethical and unscientific, none more so perhaps than Isadore Michael (I. M.) Lerner. Much of Lerner’s work in genetics emphasized that populations were generally in a state of balance and general optimal “fitness”, displaying none of Dobzhansky’s false pessimism. Lerner underscored that any broader program aimed at removing individual “carriers”, or those individuals who carry and “can pass on” a genomic variant (or allele) “to its offspring”, without displaying any symptoms of the condition (Carrier, 2022) – would undoubtedly lead to disaster, as “[...] all of us are carriers of, on average

several detrimental mutations.” Thus, he continued “[...] eugenics based on heterozygous screening on a scale large enough to be of significance *would not lead to improvement but rather to termination of mankind on earth*” (Lerner, 1968, p. 179) (Italics Donohue). Moreover, eugenicists, Lerner noted, were very keen on proposing a program for the development and fixation of values and behaviors in a population, but it was unclear what those behaviors should be, if any. He explained that, “Statemen and diplomats are rewarded for the most outrageous lies; pilots and generals are decorated for wholesale destruction and murder.” (Lerner, 1968, p. 271).

However, few heeded Lerner’s objections. I argue that as the evolutionary synthesis and modern human and population genetics underscored that variation was “normal” and widespread, geneticists and other scientists and bio-ethicists became concerned with the nature of that variation and its “eugenic” implications. Equally important, due to the “scientific” nature of eugenics and the imagined threat of overpopulation, for many scientists in the post-war period, eugenics, often including involuntary sterilization and “therapeutic abortion”, was seen as the moral choice over starvation and misery⁶. Moreover, as defenses of eugenics and eugenic practices grew more strident and extreme due to the widespread belief that eugenics was finally on “scientific” footing, this led to the widespread conviction that the barrier to eugenics was neither scientific nor moral, but social. Francis Crick and others argued that society simply wasn’t prepared for a large-scale eugenic program.

TOWARDS THE REPLACEMENT OF “NATURAL” WITH “ARTIFICIAL” SELECTION: GENETICISTS AND THE SUPPORT OF EUGENICS

Theodosius Dobzhansky, one of the revered geneticists of the 20th century⁷, summarized many of the eugenic anxieties of post-war scientists and their willingness to defend the most unethical practices in his 1962 work *Mankind Evolving* when he wrote: “The only solution open is replacement of natural with artificial selection. Persons known to carry serious hereditary defects ought to be educated to realize the significance of this fact if they are likely to be persuaded to refrain from reproducing their kind. Or, if they are not mentally competent to reach a decision, their segregation or sterilization is justified. We need not accept a Brave New World to introduce this much of eugenics.” (Dobzhansky, 1962, p. 333). Like many others discussed in this article, Dobzhansky was deeply concerned with the replacement of natural selection,

the ubiquity of “mutation”, and the possibility that carriers of “serious hereditary defects” might exercise their reproductive autonomy and have children as they wished. Additionally, he was well aware of the horrors of the Nazi regime. He framed his defense of involuntary sterilization and segregation as an ethical practice because it was very much not *that* “Brave New World” of eugenics; it was ‘limited’ in scope. In the preface to Frederick Osborn’s⁸ *The Future of Human Heredity*, Dobzhansky noted that “And yet eugenics has a sound core” where the “real problem” was “where the evolutionary process is taking man, and where man himself wishes to go” (Osborn, 1968, vi).

Dobzhansky also argued that though past eugenics efforts were crude and ineffective, geneticists’ modern understanding of population genetics highlighted that for a eugenic program to be scientific and effective, it “must be more dexterous, for instead of making everybody alike [...] it will have to engineer a gene pool of the human population that would maximize the frequency of the fit and minimize that of the unfit.” (Dobzhansky, 1962, p. 127). In this perspective, he emphasized the desirability of variation and heterozygosity, lauded as part of his deconstruction of race. Nonetheless, this is nothing but, the social Darwinist⁹ concept of “survival of the fittest” merged with the post-war novelties of population genetics.

THE AMERICAN EUGENICS SOCIETY PRINCETON CONFERENCES AND THE POSTWAR NORMALIZATION OF EUGENIC IDEAS

Much like Dobzhansky’s desire to develop not quite a “Brave New World”, but with certain limitations, during the 1960s, the American Eugenics Society (AES), with Osborn playing a significant role, sponsored a number of conferences at Princeton University seeking to merge the “new eugenics”, population genetics, demography, and the analysis of “primitive” and “modern” human communities. This data was often combined with ethnological and comparative ethological studies. The focus of these gatherings varied. In 1967, the AES convened several renowned human and population geneticists, such as James (Jim) F. Crow, to discuss “assortative mating”, while a 1965 conference brought together experts in genetics and social structure in both human and animal communities. Some of the most prominent scientists gathered at the 1965 meeting were the geneticists J. P. Scott and Richard Lewontin¹⁰. Scott, much like Sheldon Reed, discussed later in this article, was one of the leading researchers of animal (especially canine) genetics and social behavior. He also

conducted comparative studies on social systems and their connection to genetics (Scott; Fuller, 1974). Scott was also fascinated by the genetic and social factors contributing to aggression and other violent behaviors.

In a prepared paper, Scott observed that “[...] the eugenics movement can profitably proceed in two directions” one of these directions was to understand the “interaction between heredity and social behavior” focusing on understanding the “differences in social organization” which have led to variations in “basic biological behavior” and the “genetic constitution of [...] populations” (American Eugenics Society, APS, 1965, p. 14). The other role of eugenics was in “making people aware of the theoretical genetic consequences of social change and thus affecting the direction of such change”, According to Scott, this was particularly important in the context of regimes of artificial insemination, where “[...] sperm from a single donor could be used to fertilize hundreds of women.” Given that the “[...] average person [...]” posses “a mutational load of two or three lethal genes”, (similar to Mueller’s eugenic concerns), this could result in “[...] widespread diffusion of these genes throughout the population” with an “[...] increasable probability that the carriers would mate and produce homozygous individuals in future generations.” Eugenics, he argued, would also have beneficial consequences for the “alleviation of genetic defects [...]” (American Eugenics Society, APS, 1965, p. 15). In a broader sense, Scott believed that genetics and social life were intimately intertwined, and that a careful examination of animal studies, particularly in canines, could allow for many insights into human behavior and the future course of eugenics, see (Scott, 1994).

In the transcribed discussion with Richard Lewontin during the AES meeting responding to a question about human evolution reaching some sort of “asymptote”, Scott underscored that it would be possible to effect or change “the variation” of the population because the dog has existed under all manner of civilization (like human beings). The dog “[...] is a useful model in this respect” because, like human beings, their evolution can be changed in a “desirable direction” (American Eugenics Society, APS, 1965, pp. 44-45). Scott then observed that human genetic and phenotypic variability “[...] if you get two highly aggressive individuals marrying each other the results are going to be quite different in the organization of their relationship from two very calm and placid individuals.”

Amid Scott’s discussion of directed evolution and eugenics, Lewontin enthusiastically responded that, “[...] the dog is an unparalleled example to look at.” He continued, “Supposing you take the genetics of the question and suppos-

ing one takes a population of feral dogs [...] and study the social structure in such a population and then in-breed from them, would this reproduce not only the old breeds, or some new breeds [where] you might be able to see how much genetic variation there is in the population of feral dogs in behavioral traits as to what extent the social structure of such a feral population is dependent upon genetic variability?" (American Eugenics Society, APS, 1965 pp. 45-46).

Both Lewontin's presence and significant participation as an interlocutor at the AES meeting, along with his line of questioning regarding the close relationship between genetics and social structure, the extent to which social structure in dogs (and by implication, human beings) was genetic or social, and how one could ascertain this by manipulating social structure in an experimental environment, were remarkable, considering his polemic against sociobiology and the work of E. O. Wilson just a few years later. If anything, Lewontin and Scott's engagement and remarks at the Princeton meeting shows not only the close connections between the post-war eugenics movement and 'mainstream science,' but also the willingness of a significant number of scientists to engage in discussions with proponents of eugenic views.

CURT STERN, C.M GOETHE AND "THE BARE REPLACEMENT"

The geneticist Curt Stern, who worked with T. H. Morgan and others on *Drosophila*, a type of fruit fly, became well-regarded later in his career as a human and behavior geneticist in Berkeley, California. He was not only a past president of the ASHG, but also his name graced an ASHG senior career award until this year. In his article "Genes and People", he wrote the following: "What has happened since the appearance of modern man [...]. Has the rise been continued [...] has it leveled off completely? Could the genetic endowment even have decreased? What may be the trends for the next hundred years or the next thousand?" And much like Dobzhansky, Stern continued, "Past errors of proponents of eugenic measures and the crimes committed under the pretense of eugenics should not stand in the way of new approaches" (Stern, 1967, p. 519).

Curt Stern himself had long-standing interests in the possibility and effectiveness of a eugenic program. In a 1949 *Science* article, Stern acknowledged, "Eugenic thinking has always emphasized the well-being of mankind, even though much eugenic counseling was based on inadequate knowledge and has been harmful." However, he continued, "Although eugenic problems are not as urgent as the pessimists believed, their ultimate importance can hardly be overestimated" (Stern, 1949, p. 208). Stern's arguments some years

later for a wide-scale eugenic program were further detailed in his widely read textbook *Principles of Human Genetics*, which went through several editions. In the textbook, Stern argued, “Too much reliance on medical and surgical progress lead to an ever-increasing number of persons whose normal functioning is made possible only by the performance of major operations, by the permeant use of [...] functional aides [...] or by repeated blood transfusions” (Stern, 1973, p. 795). Stern predicted that due to the relaxation of selective pressures brought about by the advent of civilization, “At some stage, it seems, preventative eugenic measures will become truly urgent” for “The tasks of human genetics”, he observed, “concern the future as well present generations”.

Both genetics and eugenics would have to consider both the “individual and society” and while much of “eugenic thinking in the past was based on inadequate knowledge and prejudice” and “has been harmful”. Nevertheless, he underscored “wise planning will be possible in the future”, where “genetic and eugenic counseling will become the foundation of man’s direction of his own biological evolution” (Stern, 1973, p. 795). For both Stern and Dobzhansky, as well as for Francis Crick, Paul Ramsey, and Joseph Fletcher, the development of modern genetics did not prevent eugenics or tarnish its reputation but rather transformed it into a scientific, actionable, practicable, and ethical endeavor.

Such was the character of Stern’s conviction that, while president of the ASHG in 1957, at the behest of the eugenicist and banker C.M. Goethe (Platt, 2005), he established a fund to support the careers of “perhaps 20” who, while “struggling for higher degrees”, still recognized their “own responsibility as carriers of desirable genes” and aimed to “try to father at least 3 children, the bare replacement.” Goethe’s rhetoric of “good genes” and “the bare replacement” in his letter to Stern not only resonated with concerns over selection, degeneration, and the future of humanity’s evolution, but also reflected the rhetoric of “replacement ideology”, where white supremacist supporters of eugenics were concerned with the number of white, cisgendered men and their social and institutional success (Stern, APS, 1957). In other words, discussions of quality and quantity were not limited to genes” and “population” but were inherently intertwined with a racial ideology and mobilization strategy (Donohue, 2020; Gonzalez, 2022; Minakov, 2023). Notably, one of the bursary recipients was Thomas Roderick, who is credited with coining the term “genomics” (Ganguly, 2020) thereby establishing a tangible connection between eugenic legacies and the Human Genome Project (Stern, APS, 1957).

Likewise, to my knowledge, in an unpublished 1962 lecture discovered in the Curt Stern papers at the APS titled “Population Problems: Quantity and

Quality”, Stern expressed concerns about both overpopulation (quantity) and the presence of “deleterious constitutions” (quality). Stern thought the problem of “quantity” to be “urgent” and the matter of quality to be “less urgent, but important nonetheless.” He saw eugenics as having “two problems”, the “existence of admittedly deleterious genetic constitutions” and “upgrading of populations in regard to normal variation”. For Stern, as for Dobzhansky and Scott, the evolutionary synthesis was used to argue for both positive and negative eugenics in a world where “normal variation” needed to be upgraded. In order to accomplish this, Stern underscored that, for example, carriers of hemophilia should be subject to a “reducing incidence by reduced reproduction”, (he does not specify the precise means). He also proposed the solution of “prohibiting marriage” for other carriers of hereditary conditions (such as beta-thalassemia, a form of anemia) (Stern, APS, 1962, pp. 1-2).

NOBEL LAUREATES, EUGENICS, AND THE “MAJOR AIMS OF MANKIND”

Nor was the defense of the most vulgar forms of eugenics restricted to small circles of human geneticists at various universities or at conferences sponsored by Osborn’s American Eugenics Society. It was the ubiquitous talk of the day. In 1962, the Ciba Foundation, now known as the international medical charity Novartis Foundation, brought together twenty-seven “distinguished contributors”, including such luminaries and avowed supporters of eugenics, such as Julian Huxley¹¹, Joshua Lederberg, Hermann Muller, J. B. S. Haldane, and Francis Crick. All except Huxley and Haldane were winners of the Nobel Prize. These distinguished contributors did not gather to discuss the threat of nuclear Armageddon, nor the revolutionary advances in physics, mathematics, medicine, or astronomy, but rather “man and his future”.

This rather innocuous-sounding title hid a harsh reality, as these scientists gathered to defend some of the most cruel and violent forms of eugenics in response to anxieties over “gene erosion” and “mutational load.” Both inter-related ideas presupposed that the number of mutational and deleterious genes were increasing in the general population (see Carlson, 1987; Paul, 1987; Carlson, 2001) and were based on unfounded fears over the “population explosion” in the Global South. And here there was little attempt at euphemism.

At the beginning of the volume and the conference, Julian Huxley, who, along with Dobzhansky, was one of the primary proponents of the “evolutionary synthesis”, expressed his support for the eugenic ideas of Hermann Muller. According to Huxley, “Eugenics will eventually have to have recourse to meth-

ods like multiple artificial insemination by preferred donors of high genetic quality.” Such a policy, Huxley argued, with little acknowledgement of its ethical barbarism “will not be easy to execute”. Nevertheless, Huxley would “confidently look forward to a time when eugenic improvement will become one of major aims of mankind” (Wolstenholme, 1963, p. 17).

The Nobel Prize-winning geneticist Hermann Muller, building on Huxley’s narrative, made the following suggestions, developing a method of eugenics called “germinal choice” (Wolstenholme, 1963, p. 258) using artificial insemination through donors (or AID). Muller explained that it was “[...] a short step in motivation from the couple who wish to turn their genetic defect to their credit by having, instead, an especially promising child, to the couple who, even though they are by no means subnormal are idealistic enough to *prefer* (italics his) to give their child as favorable a genetic prospect as can be obtained for it.” (Wolstenholme, 1963, p. 259). All this was necessary as modern civilization “has instituted a negative feedback from cultural progress to genetic progress”. Mirroring Dobzhansky’s worry, unlike selection in nature, selection in the context of civilization, Muller explained, “[...] prevent(ed) the genetic isolation of small groups” “[...] sav(ed) increasing numbers of the genetically defective” while leading the “better endowed” “to engage more sedulously than others in reproductive restraint”, mirroring the old point by Vacher de la Lapouge and others that industrial civilization led to an imbalance between the reproduction of the “unfit” over the “fit” (Wolstenholme, 1963, p. 261).

Likewise, the celebrated geneticist J. B. S. Haldane, in the same volume, began his defense of eugenics by noting that “[...] insofar as medical science enables people with congenital abnormalities who would have formerly died young to reproduce themselves, it is dysgenic [...]”. However, Haldane offered that with a new program of eugenics. Once these individuals realized that it would be “wrong to have children, there is good reason why they should marry, using contraceptives, or after one or both have been sterilized” (Wolstenholme, 1963, p. 350). He thus advocated not only compulsory sterilization for individuals who have “congenital abnormalities” but suggested that they should marry each other, presumably to arrest the spread of “dysgenic” “abnormalities.”

Francis Crick, one of the intellectual architects of the Human Genome Project, opened his discussion of eugenics in this volume by musing about whether it was possible for “[...] a government to put something in our food so that nobody could have children” and then “[...] possibly [...] they could provide another chemical that would reverse the effect of the first, and only

people licensed to bear children would be given the second chemical. This isn't so wild that we need not discuss it" (Wolstenholme, 1963, p. 275). Crick further argued for "licensing" for children, noting that "[...] I do not see why people should have the right to have children." Crick continued, "If one did have a licensing scheme, the first child might be admitted on rather easy terms" though "If the parents were genetically unfavorable, they might be allowed to have only one child, or possibly two under certain special circumstances" (Wolstenholme, 1963, p. 275). He concluded his discussion of eugenics by stridently arguing that "[...] we are likely to achieve a considerable improvement [...] by using a very primitive knowledge of genetics; that is, by simply taking people with the qualities we like, and letting them have more children." The "difficulty" was not with eugenics but what was "*socially* possible, in the present social context, and in the social context of the next twenty or thirty years [...]" (Wolstenholme, 1963, p. 295).

In 1965, following a similar vein, the "Nobel Conference Lectures" were held at Gustavus Adolphus College and republished in a volume the following year. This was a unique gathering of Nobel laureates and other vaunted scientists, hosting lectures by no fewer than three Nobel Prize Winners. For Polykarp Kusch, Professor of Physics at Columbia University, "the knowledge of science and the power of closely related technology have offered to man great opportunities for enriching life, for giving increased meaning to life." Kusch breezily mentioned the stupendous advances in the physical sciences, such as the discovery of X-rays and the work of the Curies. He nevertheless immediately characterizes a more dire picture where the very genetic future of man is at stake. Positively glossing the work of William Shockley, another Nobel Prize-winning physicist, for his co-invention of the transistor, who is now equally known for his segregationist, racist, and eugenicist views¹², Kusch underscored that Shockley was as concerned as him and the other attendees with the "human condition and its future". This concern resolved itself, for Shockley, as for the other speakers, into the fundamental choice, "Population Control or Eugenics" (Roslansky, 1966, p. 5).

As Shockley outlined in that talk, there was, among other dire issues, a curious situation in the United States where so-called "medical and economic exponential explosions that have produced our abundant American society assure to all the privilege of reproducing their kind, even though in many cases they may have genetic defects which would result in an inability to survive to the stage of reproduction in a more primitive environment". A direct consequence of this was, according to Shockley, "possible genetic deterioration of

the human race”. Shockley then warned that if “[...] no steps to discourage such genetic defects as diabetes... genetic deterioration will continue” (Roslansky, 1966, p. 98).

As such, “[...] the biochemist and the geneticist may develop additional means... for patching up genetically defective offspring so that they may be successful citizens in a progressively more artificial environment” (Roslansky, 1966, p. 98). Preventing these trends for “the dignity of man” required the development of a eugenic program, which, rather than eliminating the “unfit”, was concerned with “selecting the most fit” (Roslansky, 1966, p. 98) and was a “necessary step in the struggle for existence”, with Shockley arguing for Ernst Mayr’s proposal “of changing laws to favor large families of superior people” (Roslansky, 1966, p. 102). Shockley further underscored his nightmare that the “technological explosion”, which created “our great abundant society” in the United States, would remove “the last vestiges of survival of the fittest and lead to a reversal of evolution” (Roslansky, 1966, p. 103). Outlining among other factors “nuclear war, the population explosion and genetic deterioration”, Shockley resolved that through a program of eugenics, “man’s destiny will be shaped by the acts of man” (Roslansky, 1966, p. 104).

PAUL RAMSEY, POSTWAR BIOETHICISTS AND THE “ETHICS OF BIOLOGICAL SELECTION AND CONTROL”

Likewise, in the same volume, one of the foremost bioethicists of his era, Paul Ramsey¹³, began his discussion of the morality of eugenics by dismissing the relevance of the Nazi horrors to the possibility of scientific eugenics on two scores. First, echoing other writers at the time, he argued that scientists were “being driven to varying degrees of gloom regarding the future of mankind because of the inexorable degradation of the human gene pool.” Note that Ramsey took the “inexorable degradation of the gene pool” as a fact, rather than as a paranoid superstition. Secondly, molecular biology and genetics have “increased in range and precision” (Roslansky, 1966, p. 110).

On the former point, Ramsey echoed the anxieties of many other geneticists when he concluded, falsely, that “some future generation will begin to experience 20% genetic deaths.” Ramsey noted that, “The quality of human beings to be born could be maintained at its present level if and only if 20 percent become genetically extinct”, while arguing for the morality of some form of strict and widespread eugenics as, for him, future generations would find out

“too late if we do not adopt deliberate control of the *numbers* (italics his) to be born and if we simply wait for the overcrowding of the planet and starvation to correct overpopulation, so with respect to the *quality* (italics his) [...] it will be too late (and indeed it will be inhumane) if we do not adopt measures to counteract the genetic deterioration of which modern civilization and humanitarianism foster and if we simply wait [...] [to] pull out the plug our hospitals now place in the way of extinction of genetic defects” (Roslansky, 1966, p. 111). Ramsey continued his argument, stating that “[...] by doing away with natural selection that used to keep us reasonably fit, by holding at bay the lethality of lethal genes and weakening the disfavor formerly placed upon bearers of unsociable traits, mankind is allowing an insidious genetic deterioration that will leave us unfitter (*sic*) than when we began” (Roslansky, 1966, p. 116).

Not to be relegated to outlining a eugenic program in one publication, in his *Fabricated man: the ethics of genetic control*, published in 1970, and the first work on genetic ethics, Ramsey further details not only the biological necessity but also the morality of eugenics, echoing many of the ideas of both Crick and Muller. Ramsey did not believe in the morality of involuntary sterilization, describing it as biologically and genetically needless. Nevertheless, he argued that “[...] if carriers could be identified, and even if each heterozygous carrier has only half as many children as he otherwise would have, we would reduce the abnormal-gene frequency by fifty percent” (Ramsey, 1970, p. 57). Ramsey underscored, that if eugenics were more widely practiced, this identification and eugenic action would “greatly reduce the incidence of defect” as well as “prevent untold human misery” (Ramsey, 1970, p. 57).

For Ramsey, the question for bioethicists was not only the biological or genetic necessity of eugenics, but also the need to articulate the conditions under which eugenics was the only moral option. “To make eugenics more effective”, Ramsey continued, “will require the development and widespread adoption of an ‘ethics of genetic duty.’” This was because, many parents, Ramsey argued, “will accept grave risk of having defective children rather than remain childless.” This was nothing but “genetic imprudence” and as such “[...] imprudence is gravely immoral” (Ramsey, 1970, p. 57).

For Ramsey, as for Muller, who deeply influenced him, as well as Crick, individuals did have a right to have “[...] their infirmities cared for, they do not have the right knowingly to pass on to posterity such a load of infirmities [...] of genetic [...] origin as to cause an increase in the burden already carried by the population” (Ramsey, 1970, p. 58). Ramsey continued “[...] Christian teachings have always held that procreation is an act by which men and wom-

en are to perform their duty to future generations of men.” If that couple, according to Ramsey, “[...] cannot be the progenitors of healthy individuals [...] or if they are the carriers of serious defect, then such a couple’s “right to have children” becomes their duty not to do so, or to have fewer children.” Moreover, the “science of genetics” was to inform couples of the “fact situation”, where, according to him, there would be for a number of couples “the systematic practice of lifelong *un*-parenthood (italics his)” or “of less parentage” (Ramsey, 1970, p. 59). In this new world of necessary and Christian eugenics, this new “movement”, parents with “deleterious mutations” would, because of their “genetic duty to future generations”, forgo children (Ramsey, 1970, p. 30).

Other bioethicists went much further. Ramsey’s contemporary, Joseph Fletcher, a prominent founder of so-called “situation ethics”, which contended that ethics should be evaluated not according to any specific principle, such as virtue in natural law, nor a categorical imperative of universally accepted validity, but solely the consequences of said action, was unrestricted in his defense of eugenics, forcible sterilization, “therapeutic abortion”, and even newborn euthanasia (Fletcher, 1966)¹⁴.

Fletcher began his 1974 book (but continually reprinted until 2011) *The Ethics of Genetic Control: Ending Reproductive Roulette*, by mirroring the arguments of many of the Ciba Foundation and Nobel conference members, as well as Stern and Dobzhansky, the latter being a particularly strong influence. The revolution in modern medicine had raised the “quantity” of the population, but not its “quality” (Fletcher, 1988).

Fletcher then said: “Having babies is not the greatest thing in the world.” For some individuals, according to him, children were undesirable, and the presence of “genetic deformity and disease” needed “the ethics of biological selection and control.” Fletcher, much like Crick, therefore ridiculed the “right to reproduce” (Fletcher, 1988, p. 5) as “our bias is for fewer babies and better ones, whether they are made naturally or in the new artificial modes.” Unlike in past eras, mirroring the thinking of the French microbiologist (and supporter of eugenic population policy René Dubos)¹⁵, Fletcher underscored that human beings, for the first time in history, were “[...] now in a position to change not only the social and environmental conditions, but even man himself, his very stuff” (Fletcher, 1988, p. 5). For Fletcher, the ability (and like Ramsey), the ethical imperative of bringing forth a program of eugenics – to decrease the *quantity* and to increase *quality* (italics mine) – was to justify some of the most barbarous forms of eugenics.

Eugenics, moreover, for Fletcher, “[...] expresses the true spirit of medi-

cine as well as situation ethics.” He continued that for those born with genetic or chromosomal conditions, “Terrible and uncorrected fetuses will have to be aborted or, after birth, let go; for those that *are* (italics his) preserved and are able to live to reproductive maturity sterilization can prevent the spread of bad genes and obviate the dysgenic side effect” (Fletcher, 1988, pp. 29-30)¹⁶. Fletcher observed that such a regime of positive and negative eugenics would be achieved through a variety of mechanisms where “contraception and sterilization only control quantity, *quality* control (italics his) is achieved by a combination of the new fetal medicine with selective abortion” (Fletcher, 1988, p. 48). He underscored, much like Crick, that there is a “moral lag between medical science and popular attitudes” as there was, he continued, unfortunately “no law requiring genetically unfortunate people to give up ‘normal’ sexual reproduction” even when many families are “cursed” with “bad gene carriers” (Fletcher, 1988, p. 49).

Moreover, due to the existence of hundreds of “lethal” genetic mutations and abnormalities, for Fletcher, eugenics was nothing but the extension of a natural process into the social and ethical world. Fletcher concluded, “Spontaneous abortions and many miscarriages are a blessing”. “Nature”, he continued, “takes the same way medicine does; it closes the book on failures” (Fletcher, 1988, p. 51).

Rounding out his strident defenses of eugenics, sterilization, and “therapeutic abortion” was his summation of the book’s thesis at the beginning of the work. Here, Fletcher wrote that “[...] fetal control will help enormously”, where genetic engineering and other forms of eugenics not only reduce the quantity but also improve the quality of individuals.

This was a central tenet of the “new biology”, a revolution beginning with the discovery of the helical structure of DNA and moving forward where molecular biology can allow for the discovery of “mutations”, “abnormalities” and “diseases” efficiently, at relatively low cost, and across the entirety of our genome. On the close connections between modern-day eugenics and genomics (see, among others Rembis, 2009; Roberts, 2011; Rembis, 2018, Fletcher underscored that “The accusation that the new biology is trying to create a “master race” is fair enough if it means that a people with fewer defects and more control over the crippling aspects of “nature” are better able to master life’s ups and downs. Most of us would want to belong to the master race in that sense. Mastery in the sense of good health and inheritance is sanity” (Fletcher, 1988, p. 13). Fletcher bemoaned the “foot draggers” and others “for putting a stop to research and development along these lines [...]” (Fletcher, 1988, p. 13). As

“the biomedical sciences [...] empower us to improve the quality of our babies, and as part of our quality control, we shall have to control their numbers” (Fletcher, 1988, p. 16).

CONCLUSION: “SOCIETY SHOULD NEVER ENCOURAGE THE REPRODUCTION OF PERSONS WITH GROSS DEFECTS”

Nor was the National Institutes of Health exempt from the promotion of eugenics, as well as dehumanizing and ableist ideas, particularly in the context of intellectual and developmental disabilities. Gerald D. LaVeck, then Director of the National Institutes of Health's National Institute of Child Health and Human Development, sponsored in 1971 conference and publication on *Human Sexuality and the Mentally Retarded*, published in 1973. In one chapter, by S[heldon] C. Reed and V. Elving Anderson¹⁷, the authors asked, “What effect would increased reproduction of retardates have on the gene pool?” They answered, “[...] it is reasonable to assume that any change in the reproductive rate of the retarded will be echoed by a change in the frequency of the genes related to mental retardation [...]” This led them to conclude that “In principle, society should never encourage the reproduction of persons with gross defects.” Any reproduction, if allowed, should be “encouraged” “[...] for specific individuals as exceptions to the general rule.” When “both members are retarded”, the offspring are “[...] at highest risk of producing a retarded child.” In these instances, both authors counsel, “[...] therapeutic abortions may be justified” (De la Cruz; LaVeck, 1973, p. 123).

Edmund Murphy, a medical geneticist and close collaborator with Victor McKusick, later in the same volume responded that both authors' suggestion was concerning insofar as it would involve “arbitrary cut-off points.” Murphy then suggested that since many people would defend “[...] the general right to reproduce [...] we might take the less drastic step of allowing mentally retarded persons to reproduce unfettered and to place their offspring in foster care at birth.” Such a solution was amenable to Murphy as he was less (or so he thought) of a biological or genetic determinist than either Reed and Anderson, and thus more open to ameliorative environmental influences. Murphy believed that “[...] even a few hours of mental stimulation a day would be sufficient to compensate for the child's environmental deficit.” Placing the children of intellectually and developmentally disabled individuals in foster home would also have

the added benefit of assisting researchers with untangling the “genetic and cultural components in retardation.” (De la Cruz; LaVeck, 1973, p. 136).

As the above illustrates, and as the work of Nathaniel Comfort, Diane Paul, Marius Turda, Alex Stern, and many others has demonstrated, and this account brings forward and deepens, there was no “retreat” of eugenics ideologies and defenses of its practices after the Second World War, much in the same way as there was no retreat of scientific racism in the post-war period. Physicists, geneticists, and bioethicists were all concerned with “quantity” and “quality” and were all convinced that eugenics, having learned from the excesses of the past, would finally be on a firm, “scientific”, and ethical foundation.

Genetics and the “new biology”, it was thought, would allow for the efficient selection and encouragement of “positive” traits and the elimination of “negative” ones. There was no need, according to Crick and others, to wait, for genetics was sophisticated enough to “select” those traits which were desirable now. It could already do so with the knowledge it had. Furthermore, because of the ubiquity of “deleterious constitutions”, “mutations”, and “bad genes”, humanity, the above geneticists and ethicists argued, an immediate eugenics program, whether through sterilization, selective termination, or segregation, was the only route to prevent misery and death through overpopulation.

Thus, these defenses of these vicious, inhumane, unethical, and pseudo-scientific practices were not only dependent on “science” but also on moral and ethical pronouncements from many of the most “formidable” scientific and ethical minds of the 20th century. This article not only describes how eugenics was thought to be “moral” and “scientific”, but also how eugenics was defended in ways that were perfectly consistent with “older” versions of eugenic ideologies. While there was a new emphasis on the ethics of personal responsibility and individual choice, essential continuities remained.

As importantly, the beforementioned points to the ubiquity of defenses of eugenics, not only among geneticists but among scientists from other disciplines as well as ethicists. Work in personal papers and conference proceedings was essential, as in many cases, discussions of eugenics in the post-war period were held in informal or closed forums. Thus, the question for these scientists and thinkers was neither the justice nor ethicality of eugenics, but merely how to carry it out, what forms it should take, and what populations it should most concern itself with. And perhaps equally surprising is the extent to which eugenic measures, sometimes quite general (such as Crick’s horrific suggestions), were explicitly endorsed by scientists and ethicists such as Dobzhansky or Scott, as well as Curt Stern. They openly advocated for specif-

ic methods, including euthanasia, therapeutic abortion, and involuntary sterilization. While others, such as Lewontin, seemed content to treat discussions of eugenics and the opinions of eugenics advocates as just another exchange of sometimes rather interesting ideas. Ironically, it was due to the perceived morality, necessity, and scientific foundation of eugenics that some scientists and ethicists felt justified in pursuing the harshest, most unethical, and brutal eugenic methods, both positive and negative.

In conclusion, Fletcher arguably continued to advocate for eugenic sterilization and euthanasia until his death in 1991, while Crick remained an essential rhetorical and iconographic force behind the completion of the Human Genome Project until his death in the early 2000s. Many of the participants mentioned in this discussion of eugenics and its defenders lived well into the 2000s, and some have only recently passed away. Such facts make it impossible and irresponsible to argue that genomics as a science is somehow insulated from eugenics or that eugenics is a relic of the past. Many institutions, such as the NIH and Princeton University, have promoted eugenic ideas and practices in the past. The NIH is only beginning to acknowledge its role in this history. The case of Thomas Roderick, who benefited from the ASHG’s eugenic fund and played a central role in the genomic enterprise, along with the assured nature of scientists’ defenses of eugenics, demands, above all things, a much franker assessment of the history of human genetics that does not dismiss its eugenic legacies. Such a history also calls for humility in the face of certain scientific “progress.”

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NOTES

¹ An account of the continuities of the defenses of eugenics and the persistence of these ideas in no way diminishes the magnitude of the euthanasia and eugenics programs pursued by Nazi Germany, nor does it lessen the harm done by the prewar eugenic movement in the United States. On both see Turda (2010, pp. 62-79) and Kuhl (2002).

² Alex Stern has discussed the geneticist Curt Stern (no relation), particularly in his advocacy of using a different term than the vulgar “mongolism” to describe trisomy 21. The complex legacy of Curt Stern’s contributions to genetics, which includes advocating for the slightly less offensive term “Down’s syndrome”, his role as one of the most important founders of behavior genetics, and his significant presence in scientific research into the Y chromosome, remains to be detailed and is outside the scope of this paper.

³ Specifically, the first edition of Stern’s *Principles of Human Genetics*, published in 1949.

⁴ On the evolutionary synthesis, the standard work is still Smocovitis (1992).

⁵ David Depew and John Jackson discuss many of the same figures as this article, viewing Theodosius Dobzhansky as one of the architects of the evolutionary synthesis and as a laudatory figure for disproving race. Regardless of his views on race, Dobzhansky vehemently supported eugenics and involuntary sterilization, as evident in his laudatory preface to Frederick Osborn’s post-war defense of eugenics, among other writings. Nathaniel Comfort also points this out in his book *The Science of Human Perfection* (see as well Jackson; Depew, 2017).

⁶ For the wider context of these debates see Bashford (2014).

⁷ On the significance of Dobzhansky to the development of modern genetics and 20th century science see Adams (2014).

⁸ Osborn was a past president of the American Eugenics Society in 1946, and, along with American luminaries like John D. Rockefeller, he developed or directed several efforts aimed at addressing “overpopulation”, and promoting eugenics in the years following World War II.

⁹The literature on social Darwinism is vast and growing. Throughout the twentieth century, social Darwinists, including many social scientists like Edward A. Ross believed that though the selective processes at work in society differed from those in nature, there was still a kind of selection occurring. Ross in his *Foundations of Sociology* observed: “Nature eliminates the unfit; society the misfit” (Ross 1905, p. 342). Standard works include those by Crook and Claeys (2000) and Crook (2007).

¹⁰A revered population geneticist and keen and acerbic critic of sociobiology and the work of fellow Harvard naturalist and evolutionary biologist E. O. Wilson, see among others Shen and Feldman (2022).

¹¹Huxley’s support of eugenics was extensive and well-documented. See his own article in *Nature* (Huxley, 1962, pp. 227-228); Weindling (2012, pp. 480-499). For Huxley’s role in the synthesis see Mayr (1993, pp. 31-34), and Provine (1998).

¹²Shockley’s segregationist views were widely discussed during his lifetime, where he was the subject of several incidents of student activism, much like E. O. Wilson some years later during the sociobiology debates. On Shockley’s racism see Thorp (2022, p. 683).

¹³Ramsey, Werpehowski and Crocco (1994). Ramsey remains widely viewed as one of the most important Christian ethicists of the latter 20th century and one of the founders of bioethics, especially in the context of genetic ethics. Ramsey’s defenders typically underscore that he was against involuntary sterilization and abortion. But his approval of stigma and his stridently ableist and authoritarian language point to the necessity of having a wider view of how eugenics was defended in the post-war period.

¹⁴A considerable part of Fletcher’s support of eugenics, euthanasia, and forced sterilization comes directly from his philosophical anthropology as a kind of “reactionary modernism.” For Fletcher, there was no such thing as “human rights.” A human being was only such if it met several “positive human criteria” such as “minimal intelligence”, “self-awareness”, “the capacity to relate to others”, “communication”, where, as Fletcher notes, “This criterion comes into question in patients who cannot hear, speak, feel or see others.” If individuals did not meet these arbitrary and deeply ableist criteria, they can be “set aside.” in Fletcher (1972). On “reactionary modernism”, see the landmark Herf (1984). Not incidentally, this is not the only instance of the Hasting’s Center, one of the premiere global bioethics think tanks, giving a platform to defenses of eugenics. See for example the work of Hastings ethicist Mark Lappe (1976, pp. 421-430). See also Fletcher (1973, pp. 670-75).

¹⁵Dubos postulated, “Who can doubt that human eugenics will eventually overcome the resistance of social traditions and ethical scruples and will make it possible to plan parenthood not only in time and quantity, but also in quality? A day will come when children can be made almost to order, with perfect fitness for life in the Arctic or on the equator, in the foundry or in the presidential chair.” Dubos (1987).

¹⁶For a very similar argument concerning the supposed ethical and social desirability of euthanasia for “severely disabled infants”, refer to the work of Peter Singer. See Kuhse and Singer (1985).

¹⁷ Sheldon Reed and V. Elving Anderson were both prominent human geneticists interested in the study of behavior. Reed, after his death in 2003, was lauded for his contributions to “genetic counseling” and his support “...for behavior genetics.” Indeed, it was Reed who coined the term “genetic counseling” in 1947 as an alternative to the then prevalent term “eugenic counseling”, with 1955 seeing the publication of the foundational work *Counseling in Medical Genetics*. Scholars have typically underscored Reed’s work as a move away from eugenics and the “genetic hygiene” of Nazi Germany, but this is difficult to resolve given his writings in the 1960s and 1970s. In addition to the chapter discussed above, like many geneticists and biologists’ writings in the years after the Second World War, Reed argued that advances in population genetics, demography, and sociology necessitated a “new eugenics”, which could overcome the excesses of the past. Thus, Reed, in his article for the *Eugenics Review*, concluded that “The need for eugenic concern is greater to-day than ever before because of the population ‘explosion,’ and the automation ‘explosion.’ It is not realistic to encourage the more intelligent to increase their birth rate greatly because of the menace of overpopulation. It is imperative that the less intelligent be discouraged from reproducing as much as at present because machines are rapidly taking over the jobs previously held by the least able of our fellow men” (p. 74). This vague and menacing language around “discouraging reproduction” mirrored similar formulations by Curt Stern, Dobzhansky and others. See Reed (1965, p. 72); Possehl (2017).

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