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After Lewontin: Dr. Pangloss and His Imagined Community

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ABSTRACT
Two influential papers of Richard Lewontin "The Apportionment of Human Diversity" (1971) and "The Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme" (1979) co-authored with Stephen Jay Gould have a profound effect on post-Darwinian evolutionary biology discourse. In his 1971 paper, he is credited for causing a major paradigm shift in scientific thought on race by demonstrating that there was more variation within human populations than between them. He also shares Gould's joy in triggering another one by laying out the case of the adaptation in their 1979 paper. Lewontin's contributions to the discussions on the relationship between race and genetics, as well as his adaptationist approach, had a tremendous political impact, which is consistent with his ideals as a "good scientist" since his definition of science entails producing politically useful knowledge. This paper assesses the two papers comprehensively , in terms of their scientific reliability and relevance to current political discussions. It also aims to discuss the concepts introduced by Lewontin such as "good science" and "politically responsible scientist". It can be recommended that these ideas should be reconsidered and that their value as a legacy needs to be discussed again.
Keywords: Adaptationism, Apportionment, Lewontin

Introduction

The "Spandrels of San Marco and the Panglossian Paradigm: A Critique of the Adaptationist Programme" (1979) by evolutionary biologist Richard Lewontin and paleontologist Stephen Jay Gould has undoubtedly become one of the most contentious publications in the anthropological literature. Although Lewontin later revealed that the paper was mostly written by Gould alone, he does not deny that he had contributed to the paper to some extent (Wilson, 2015). Gould also claims to have been equally involved in the process of borrowing the term from architectural terminology (Gould, 1997). Meanwhile, the paper has continued to be attributed to both authors in various publications (Olson, 2019; Mastrogiorgio, 2022) to this day.

The scope of the iconic publication in which they sarcastically criticize an irrational Adaptationism they consider to be a pervasive trend in the evolutionary biology community has gone beyond the authors' home fields of genetics and evolutionary biology and reached the literature of fields such as medicine, psychology, and sociology. This is also true for Lewontin's stand-alone publication, "The Apportionment of Human Diversity" (1972), which is the second most popular publication of his career after the Spandrel article. These fields indeed have provided a significant contribution to the turgid citation statistics (Carlson and Harris, 2022).

The attention paid to both papers was due to their timing, language, and context, i.e., their contributions to contemporary scientific and political debates at the time of publication, rather than their groundbreaking findings. Lewontin and Gould successfully catch the zeitgeist of the post-World War II period when studies on animal social behavior and its assumed continuity with human behavior rapidly gained attention. The origins of the controversies on the matter could be traced back to Darwin's natural selection theory and the following Victorian nature-nurture debates to which Francis Galton, cousin of Darwin also contributed. Thus, the extent they reached has been relatively novel. Post-war discussions were centered around the studies on innate and learned behaviors, and these studies were mainly conducted by the pioneers of ethology such as Lorenz and colleagues. Later, the approach of this emerging scientific field caused a polarization between the environmentalist doctrines of American psychologists versus the European genetic determinism, then represented by etiology (Barlow, 1991).

Stemming from Herbert Spencer's "survival of the fittest" and evolving into Lorenz's theoretical scheme which defines development as "a process of intercalating instincts and learning", the biological determinist view consistently reflected the proclaim that natural selection was the primary determinant of important characteristics of human behavior. The early twentieth-century eugenicists claimed that the origins of "deviant" behaviors such as alcoholism or criminality were genetically based, and another camp represented by Arthur Jensen and his colleagues in the 1970s suggested that racial differences and intelligence also had a genetic basis (Allen, 1984). Gould and Lewontin shared a common political stance

against the biological determinist view (Allen, 1984), which Gould also had traced its' origins in the history of Western thought back to the Ancient Greek era in his later-to-be-published book "The Mismeasure of Man" (1981).

Biological determinism suggested a model in consistency with the Darwinian adaptationist view. It was possible to categorize people based on phenotypes such as skin, hair, and eye color, the patterns of variation of which were genetically determined and evolved through natural selection. There was more variation between human populations than within populations in terms of these phenotypes, suggesting that this could be a useful tool for categorizing human populations. Eventually, similar patterns of variation in human traits such as intelligence, scholastic achievement, and criminal behavior could be demonstrated.

The climax of the publications of the biological determinist camp was undoubtedly Edward Wilson's famous book, bearing the date 1975, *Sociobiology: The New Synthesis*. He attempted to combine the approaches of biology, psychology, and other relevant sciences and create a grand narrative on the "biological basis of all social behavior" (Barlow, 1991; Levallois, 2018). Having reignited the debate, Wilson received a strong response. Later, his critics came together under the dome of the Sociobiology Study Group to take further actions against the works of biological determinists, particularly Wilson. The most active segment of the group consisted of Richard Lewontin, Richard Levins, and Stephen Jay Gould; all three were at Harvard University, which was Wilson's home institution at the time (Barlow, 1991).

According to Feldman (2022), although Lewontin did not place his work in this framework, he made several publications with his colleagues, especially Gould, to indirectly refute the biological determinist assumptions. In this regard, his 1972 paper proposed that the variation underlying the phenotypes thought to distinguish races was greater within populations than between populations. As a response to the biological determinists' assumption that these variation patterns were genetically determined, he brought the methodological problems in human genetics' studies using hereditary statistics into question. Simultaneously, in the well-known Spandrel paper, he and Gould directly discussed the adaptations view itself to demonstrate that such models did not arise by natural selection.

In this paper, I tried to take an unpopular stance and discuss Lewontin's mentioned works, specifically the Spandrel and apportionment papers, as well as the scientific zeitgeist that led to the emergence of these works. It can be suggested that the influence of the political atmosphere on the scientific studies produced at a given time, and its effect on the reliability of scientific knowledge is a rather underappreciated phenomenon that needs further discussion.

1972 Paper: The Apportionment of Human Diversity

Lewontin wrote his *opus magnum,* "The Apportionment of Human Diversity" at a time Arthur Jensen made controversial publications on genetics and races, and many geneticists were called upon to respond (Novembre, 2022). Jensen's 1969 paper "*How Can We*

Increase IQ and School Achievement", were showed that IQ score was highly hereditary, varied between races, and could not be increased later in life as he observed on the scale of his program was the leading one (Jensen, 1969). The following year, 1970, Lewontin published a critical response (Lewontin, 1970), followed by other publications in 1974 (Lewontin, 1974) and 1975 (Lewontin, 1975). (Lewontin and Feldman, 1975). Although it was clear that the famous 1972 article was written in the context of the discussion triggered by Jensen's publication (Novembre, 2022), Lewontin made no reference to Jensen in it. The article was written almost *in vacuo*, insulated from current political debates. Thus, one of the most important publications of Lewontin's career was not a critical response to Jensen, an opinion piece, or a scientific comment. *Prima facie* it emerged as an independent scientific study that proved the theoretical and practical inaccuracy of suggesting a genetic basis for race.

Lewontin sequenced the gene loci encoding 17 proteins, mostly erythrocyte antigens, from various populations, which he first classified as Caucasians, Black Africans, Mongoloids, South Asian Aborigines, Amerinds, Oceanians, and Australian Aborigines, and then further classified into 168 subgroups. Then he compared the relative degree of variation found in these loci. In conclusion, he demonstrated that 85% of the genetic variation in these loci was seen within the populations, while 15% was seen between populations. According to him, genetic differences among human populations cannot be used to rationalize racial identity. Thus, he declared that there was no need to discuss races, as it was now biologically proven that there was no such thing as race.

The paper was followed by both supporting and opposing publications. Supporting ones repeated his work by using different kinds of data such as microsatellite and single nucleotide polymorphisms yielding concordant results. Yet their implications from their works slightly differed. Among them were Nei and Roychoudhury, who agreed that the biological concept of race should be abandoned but insisted that statistically significant differences between smaller population groups could justify the continued scientific division of humans by gene type (Carlson & Harris, 2022). However, according to Cavalli-Sforza (1997), the accumulation of publications in favor of the "more-variance-within-than-between hypothesis" was sufficient to claim the invalidation of race and it could finally be trumpeted that "*the burden of the proof is now on the supporters of a biological basis for human racial classificatio*n (Cavalli-Sforza, 1997)".

The criticisms, on the other side, covered the scientific accuracy and reliability of the paper in addition to its polemical style. Single-locus analyses, according to Spielman and Smouse (1976, cited by Novembre, 2022), would be insufficient to measure human genetic diversity, and they recommended multivariate analyses instead. Mitton argued that multiple loci studies were eligible to demonstrate a greater partitioning of variance among populations (1977, cited by 2022)

Neel summarized this dispute by stating that it was the questions differed on both sides. Lewontin, Nei, and others asked, *"What proportion of all the genetic variation within some large group can be attributed to differences among subgroups and individuals, on average, overall known loci?",* while the question Spielman and others asked was *"Are the levels of allelic frequency variation found between human populations sufficient to generate a useful taxonomy?"* (Novembre, 2022).

According to Novembre (2022), Lewontin's focus was not on whether one could do classification, but on what a racial classification conveyed about genotype. He was interested in the taxonomic value of the current race groupings in the sense of their predictive nature of meaningful differentiation at a typical genetic locus, and, fifty years after the publication, his key empirical claim that there was more variance within human populations than between continued to hold.

In the first two decades of its life, the paper, now regarded as one of the milestones in anthropology's long journey away from racism, did not go beyond the population genetics literature. It also had no impact on the scientific consensus within the field that race was not a taxonomically significant category. Only 15 percent of the article's total citations were made between 1972 and 2002. 85 percent, by an ironic coincidence, were from 2002 to the present (Carlson and Harris, 2022). According to Ruvolo and Seielstad (2001, cited in Carlson and Harris,2022), the article's lackluster interest in this early period was due to the scientific community's belief that race was a scientific nonissue or that discussions about race and genetics were too politically charged. They mentioned that Lewontin's findings were surprising to the readers and that although the term "race" began to be abandoned in anthropology, it was still a concept that continued to be respected by many scientists and laymen. According to Carlson and Harris (2022), the provocative conclusions of Lewontin's article earned it iconic status because they appealed specifically to scholars in the social and human sciences. In the late 90s and early 2000s, the paper became hugely popular, and in newspaper articles and even introductory and educational texts prepared during the Human Genome Project period, the phrase *"there is more variation within populations than between populations"* was quoted out of context, without even mentioning Lewontin's name. It was no longer regarded as a reference to a scientist's work, but rather as a scientific consensus, and it gradually became anonymous and circulated as such (Carlson and Harris, 2022). Its' relationship with Lewontin became so obscure that William Edwards (2003), author of one of the most famous criticisms of the article, initially thought that the common taxonomical practices in evolutionary biology were starting to disappear completely, hence he first titled his article "Death of Phylogeny", intending to criticize this trend in the field. Later, following the traces of this variation analysis, he explored Lewontin's 1972 article and decided that this criticism should have only had one aim and changed the title to "Lewontin's Fallacy". One of the reasons that prompted Edward to write this article was a sentence he encountered in a paper published in Nature in 2001 that reads, "*Two random individuals from any group are almost as different as any two random individuals in the entire world".* The enthusiasm

of its political connotations following the focus of the discussion being shifted, let alone being taken out of context, greatly distorted Lewontin's conclusion. It is indeed the rhetorical and contextual differences of Lewontin's work that separated its path from similar ones. Lewontin stood firm on his position on race and the biological determinist views concerning it. As a consequence, he gained the growing support of social sciences. Being in the public eye assisted him in his cause as well. Meanwhile, the works of his colleagues like Nei and Roychoudhory were overlooked, and their rather-scientific-than-political suggestions were accused of *"reflexively falling into the comfortable habit of White supremacy in science"* (Carlson and Harris, 2022).

Therefore, it is critical to emphasize the impact of scientific communities' vulgar contributions to such debates, as well as the impact of publicity on a scientist and his works. The tendency of academia to reduce scientific disputes down to two ends and hyperbolically demonize one out of them plays a major part in the progress of these debates. This tendency causes an aggressive polarization, creates nothing but two extreme sides, and leaves no ground for a reasonable discussion. This hostile environment fosters the concept that the most virtuous thing a scientist can do is deliver a scientific "silver bullet" to end all of these harmful debates. Lewontin's 1972 paper was his bullet, or, according to Feldman (2022), it was *"one foray in his battle against biological determinism"*. The militaristic jargon in the analogy gives an insight into the persistence of academic belligerence.

1979 Paper: San Marco's Spandrels

Stephen Jay Gould and Richard Lewontin's article *"San Marco's Spandrels and the Pangloss Paradigm: A Critique of the Adaptationist Programme"* begins with an interesting definition of an architectural term. The authors begin by describing the "spandrels" or "pendentives" in San Marco Basilica, a famous cathedral in Venice. These structures are triangular spaces formed where the domes intersect with the arches beneath them, and they enhance the cathedral's aesthetics with valuable works of art on them. To the authors, it is possible for visitors who are not interested in architectural history and lack technical knowledge about the subject to think that these above-arched spaces were placed in the cathedral to display the artwork they saw there. The triangular spaces spontaneously appeared on their four sides while the domes were placed on the arches. Famous artworks were made to fill these gaps afterward, and this aesthetic emerged as a result. It is therefore ridiculously optimistic to believe that the spaces were placed solely to act as canvases for painters. Similarly, evolutionary biologists in the 20th century attempted to assign a function to each anatomical or physiological feature of organisms to produce a meaningful adaptation story about them. The authors then mention a ludicrously optimistic character in the French novelist Voltaire's novel Candide, Dr. Pangloss, written to ridicule the optimistic philosophy of the famous mathematician and philosopher Gottfried Leibniz. Dr. Pangloss is an exaggerated caricature of Leibniz, suggesting that even the greatest disasters happen to serve a good cause and that the world we live in is the best of all possible worlds. The adaptationist approach,

according to Gould and Lewontin, is the evolutionary biological equivalent of acting like Dr. Pangloss or performing a Panglossism in some way. Biologists narrate evolutionary mechanisms using imagination and goodwill despite insufficient data or an empirical model.

The adaptationist approach also refers to the norms of capitalist society by emphasizing the combative aspect of the individuals of the 20th century who are best adapted, have the highest chance of reproduction, and invest in the right place, just as the evolutionist view reflects the dynamic political character of the 19th century that resulted in bourgeois revolutions. Therefore, it is an approach that must be divorced from its ideological burdens. In this context, their position on Darwinian adaptationism reflects a broader political stance suggesting that 19th-century capitalism had a significant impact on natural and social science theses at the time. These dynamics are articulated by psychologist Erich Fromm: *"In order to prove that capitalism corresponded to natural needs of man, one had to show that man was by nature competitive and full of mutual hostility. While economists "proved" this in terms of the insatiable desire for economic gain, and the Darwinists in terms of the biological law of the survival of the fittest, Freud came to the same result by the assumption that man is driven by a limitless desire for the sexual conquest of all women."*

So, in their paper, Gould and Lewontin repeated this popular generalization of Darwinian evolution theory in the form of a scientific article to initiate a discussion in the post-Darwinian evolutionary biology community of their time. The latent problem with Darwin's theoretical approach seems to be its failure in complying with the Marxist standards applied to biology. Lewontin explains his Marxist filter by stating that: *"As working scientists in the field of evolutionary genetics and ecology, we have been attempting with some success to guide our research by a conscious application of Marxist philosophy…"* and goes on by *"There is nothing in Marx, Lenin or Mao that is or that can be in contradiction with the particular physical facts or processes of a particular set of phenomena in the objective world." (Barlow, 1991)."* The paper demands an epistemological break from Darwinian evolution theory the way it happened with Freudian and Malthusian theories in other disciplines in their respective history. The underlying theoretical and practical differences between natural and social sciences do not appear to matter, and despite being praised by Gould as a "kindly liberal," Darwin's political stance does not save his scientific theory or his bourgeois birds in Galápagos. Another aspect of the paper is, to Feldman (2022), it's being one of the *"crucial components of his* (Lewontin's) *campaign against biological determinism and the racism with which it was associated"*. The Spandrel paper is a rather discursive study in evolutionary biology (Nielsen, 2009), and Gould and Lewontin react to sociobiology (Pigliucci and Kaplan, 2000), which they see as another representative of the biological determinist views they oppose. Pigluicci and Kaplan (2000) argue that *"The attack on adaptationism expressed in Spandrels, and which Lewontin and Gould each pursued in many other works, would probably have been far less aggressive if the adaptive significance of the variation in the color of snail shells were the only thing at stake."*

The paper has received harsher criticisms, possibly because its extra-scientific nature was easier to educate. Thomson (1994) states that *"Principally Gould's creation, it is, as he says in this volume of essays devoted to it, a distinctly personal "opinion piece" and as such falls outside the rules (whatever they are, and they are probably unnecessarily restrictive) of the "paper." Intended as a challenge to orthodoxy, it was deliberately crafted as a tour de force, leaving the interesting question whether its central message would - have been so compelling if its exposition had been less polemical."* and goes on to say: *"As scientific prose, its dramatic energy and imagery render it a model to some readers and a case of puffery to others."*

Another aspect of the discussions has been the challenge against the adaptationist approach itself. According to Dennett (1995), the role of the adaptationist view plays in evolutionary biology is so important that displacing it would immediately result in Darwinism's downfall, let alone the collapse of modern biochemistry and all the life sciences and medicine. According to Smith (1995), questioning what function an unknown structure was chosen to perform a specific function is fundamental to evolutionary biology. *"Confronted with feathers, or eyes, or ribosomes, we cannot ask what they are for. It would be no more plausible to suppose that they are accidental and non-selected byproducts of something else than it would be to suppose that the gyroscope in the V2 rocket was connected as it was because some German fitter made a mistake,"* he adds.

Criticisms seem to have sensed the extra scientific motivations of the paper and responded to it well, but they somehow don't elaborate on it. An out-of-context call to reject a useful paradigm for almost entirely political reasons, on the other hand, is not common in evolutionary biology. Lamarck represented a previous epistemological break. He was rejected, however, because he was incorrect, not because his evolutionary theory would not have satisfied Mao. Instead, the debate didn't last long as the sociobiology discussions seem to come to an end. The spandrel paper began to lose its political charge and the terms it introduced became popular in evolutionary biology literature over time. Gould himself brought the usefulness of the term "spandrel" to the table in a paper he later wrote (Gould, 1997). According to Müller (2013), the concept of spandrel became more useful for studies in this field as evolutionary and developmental biology emerged as separate fields during the 1980s. And, like others introduced by Gould, the concept was eventually accepted by the literature.

Thus, the Spandrel debate got resolved on its own as it became eventually clear that Wilson's sociobiological approach wouldn't make way for a Fourth Reich. The paper got slowly depoliticized and the color variation in snail shells became the main concern again, letting the practices shown in the hectic period of the debate go by the wayside.

A Look at Lewontinian Science

Richard Lewontin became an original scientist by opening up the philosophical dimensions of scientific knowledge production and the political repercussions of biology's data and implications. He prioritized dealing with evolutionary biology and genetics in their

broader contexts, making room in his laboratory for biology historians and philosophers (Braide, 1999). His entire life was dedicated to combating the use of biology to justify and perpetuate racial, class, and gender inequalities. Lewontin fought this struggle with his many identities, including those of a scientist, activist, or an authority figure influencing public opinion, and even preferred not to separate these identities, which were already intertwined, in order to increase the power of his discourse and actions. In the period 1970-80 which covers the year 1972 when the apportionment article exploded, he made many media appearances, including television interviews, which led to an increased interest in his work. Between 1982 and 1994, he was already a well-known author, having published four major books (Carlson and Harris, 2022).

He perceived his social role as a scientist differently from other colleagues. In an interview, he described how his wife, Mary Jane Lewontin, questioned the significance of his scientific work: *"I was talking with a colleague about some work I was doing on ants and ant behavior, and a woman came up from Stanford to talk to me about it. When my colleague left, Mary Jane said to me, "Why do you want to do that? Why does anybody want to study the behavior of ants? What's it got to do with anything that we care about?" And we started to talk about that issue, which is: "What is the motivation for academic life, in general?"*

Scientists are people who have a respected and privileged place in society, to him, and their academic work should not only serve to satisfy their intellectual curiosity. They must do meaningful work that would have political relevance. However, renouncing science in favor of purely political motivations is not the right thing to do. Science is a pursuit that would give people who want to take political action legitimacy. As a result of this legitimacy, scientists gain the right and authority to interpret social issues. Therefore, every scientist must continue to do scientific studies if they want to become an authority and remain so before the people.

Thus, the scientists in Lewontin's ideal are people conducting meaningful scientific studies under the guidance of their political attitudes. And since their scientific studies give them a respectable authority, they eventually find a settlement for political discussions in the public arena. They are the self-citing *Deus ex-machines* of social issues.

According to Novembre (2022), this is an example of "misbehaving science", which is a term introduced by sociologist of science Aaron Panofsky. In this mode of science, "*controversy is 'persistent', 'ungovernable' and 'political' and 'scientists are confounded to draw the boundaries between politics and science'. And 'if science is like a machine for resolving controversies, in misbehaving science that machine is broken'"* he cites.

Panofsky's emphasis on the inability of misbehaving science to resolve controversies is highly significant. Segestrale (1986), concordantly, defines the dynamics between Lewontin and Wilson as a symbiosis, with both parties interested in the same thing, which is keeping the controversy going. And this shows that a scientific debate may not always be a true representation of what the conflict is about.

Indeed, Lewontin and his colleagues, both supporters, and opponents, were more concerned with how they carried out a controversy than with its resolution. Segestrale (1986) suggests that both Lewontin and Wilson were *"engaged in long-term agendas based on fundamentally different metascientific convictions strongly "coupled" to their moral self-images as scientists"*. However, I choose to examine Lewontin's relationship with his self-image as he is the one whose scientific contributions are accepted as a legacy for all scientists.

Scientific studies are classified as "good science" or "bad science," according to Lewontin. Good science has no problems and is simple to explain, whereas bad science requires more explanation. According to him, the primary cause of bad science is scientists' political bias. Also, he believes in having a two-stage mission as a scientist: the first is to show scientists who hold false political beliefs the scientific mistakes they made, and the second is to prove that the cause of these mistakes is their false belief (Segestrale, 1986). Having professed to be a Marxist himself (Barlow, 1991), he believes that "his science would be immune from the influence of ideology because of his ideological awareness" (Segestrale, 1986). Lewontin can be distinguished from the others who perform bad science not whether they produce science under the influence of their political views, but whether the political views per se are correct. Hence, according to this formulation, Lewontin is a good scientist employing his correct political convictions.

Good science produced with the right political view bears the power to nullify a political debate, as it would always yield "explainable" and "correct" results. A good or "politically correct" scientist would be able to produce definite and indisputable resolutions to social conflicts and demonstrate with p0.05 reliability that they were on the right side of history. And this is not their talent and grace, but rather their debt to society as a scientist.

Politically correct scientists should perform positive science, produce data to give the world the right answers, and even change the paradigm if necessary. If genetic studies have become a confirmation mechanism for negative political views, they must reject genetics. If natural selection has come to be useful for this purpose, they should have come to terms with the adaptive view itself. They should be ready and motivated to prove, if necessary that even Darwin was wrong, that we did not consume oxygen, or that DNA consisted of three strands, instead of two. Studies in which the data alone seems insufficient should have a sarcastic tone, and borrow the style and caricatures of Voltaire, who also conducted his philosophical discussion with Leibniz with the assistance of his sarcasm. The authors then should create ridiculous biologists who produce bad science and win the imaginary debate against them on paper.

However, this substitution of scientific studies for political action is an attitude that feeds the intellectual sloth on the one hand and damages the influence of scientific knowledge on policymaking in the long run, on the other. Most importantly, it undermines the intellectual consensus on what scientific and philosophical truth is, as well as what it means to reach the

truth through scientific methods. If what is politically correct is always true, then what is politically correct should never change. Even in a purely Marxist-Leninist political ground, "good science that tells us the truth" could easily change, as in the case of Stalin's belligerent disagreement with Mendelian genetics (Witkowski, 2008). Mendel's "factors" responsible for the plastids synthesized by the white blooming flowers remained constant; it was Stalin's political interpretation of Mendelian genetics that proved to be incorrect. Meantime, the beans were unaware of the politically charged scientific discussions covering their flower color.

A similar change in discourse appears to be occurring in the notorious race and genetics debate. Reich (2018), one of the evolutionary biologists who disagree with Lewontin's interpretations of his 1972 paper, elaborates his position by stating that: "*The approach of staying mum, of implying to the public and colleagues that substantial differences in traits across populations are unlikely to exist, is a strategy that we scientists can no longer afford, and that is positively harmful. If as scientists we willfully abstain from laying out a rational framework for discussing human differences, we will leave a vacuum that will be filled by pseudoscience, an outcome that is far worse than anything we could achieve by talking openly*."

It is not yet clear how such disagreements would resonate in the groves of academe. It can be suggested to reconsider the Lewontinian practices leading the good scientists to perform the same, never-ending *reductio ad Hitlerum,* making them respond in the most hyperbolical way they could, using the same old broken machine -as Panofsky put it.

Conclusion

Richard Lewontin has had a great influence on a whole generation of scientists as well as laypeople. He is still recognized for his *sui generis* contributions to critical scientific and political discussions with keystone publications such as The Apportionment of Human Diversity (1972) and Spandrels of San Marco (1979).

However, in the world after Lewontin, and in the 50th year of the apportionment paper, we should reconsider the idea of Promethean scientists fighting against politically and thus scientifically unacceptable movements. Scientists should not be assigned an intellectual debt such as resolving political or social conflicts using their scientific efforts. They also should not be judged by the hypothetical and almost imaginary outcomes of their findings. These hostile attitudes are what intimidate scientists and leave a vacuum to be filled by pseudoscience instead, and now that vacuum is becoming much more visible than ever.

Thus, now seems to be the best time to reconsider the validity of Lewontinian scientific practices for the future of anthropology.

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