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Introduction to *Race and Biology*

Jean-Luc Bonniol, Élodie Edwards-Grossi and Simeng Wang

The notion of race, as commonly employed, is often and spontaneously associated with a biological foundation. To explain this connection with biology it is necessary to undertake an archaeological approach to the concept of race. Such an approach will identify different semantic strata, which, for both the scientific community and lay circles, have come to overlap.

The first stratum corresponds to the period before biology was recognized as a scientific discipline. There was a longstanding tendency to interpret human differences, whether physical or cultural, as the work of Nature, with categories of differentiation playing a key role in the description of ancestral ties between human lineages (Doron 2016). This *naturalization* of differences was tied to representations of heredity, and was based on recurrent metaphors, such as the purity of blood, for example, in late Mediaeval Spain, with the *limpieza de sangre* statutes (Kriegel 1983, Zuñiga, 1999, Savy 2007, Schaub 2015). This naturalization was largely founded upon inherited physical traits, as was the case during European colonization, which gave rise to prejudice based on skin color, especially in slave colonies (Vaughan 1989, Bonniol 1992).

A second stratum developed with the emergence of biology: racial categorization based on the idea of nature relied on the assertion of the tangible objective existence of distinct groups, that is to say collections of human beings differentiated by their physical traits, resulting from the separation of ancestral lines. Such racial thinking appeared in the 18th century, initially in scholarly circles, before entering the political lexicon in the course of the 19th century. It was articulated around deterministic concepts, with race being a major explanatory element for human behavior, both individual and collective. This semantic stratum remains widely present in current representations of race.

This deterministic biologizing was contested after World War II, notably in the four UNESCO Statements on Race between 1950 and 1967 (Guillaumin 1986, Maurel 2007, Stoczkowski 2007). These statements led to a separation between nature and culture, since racial identity can in no way account for acquired traits in human behavior.

Following the atrocities perpetrated in the name of racial purity during World War II, it became hazardous to evoke the notion of race: the biological sciences alone were deemed capable of exploring it.

That is why we have chosen in this issue, in collaboration with social and biological anthropologist Jean Benoist, to re-examine the third UNESCO Statement on Race, dedicated to 'race and biology', and delivered in a conference held in Moscow in 1964, which Jean Benoist attended. In the interview he was kind enough to grant us, he describes the situation in the mid-1960s, some twenty years only after the end of the Shoah and during decolonization. At that time, there was a consensus regarding the inadequacy of racial typology as a means of explaining human diversity. Nor could there be found any link between physical traits and social or cultural behavior. He also mentions an important idea that he himself was able to develop shortly after, with the relationship between race and biology reversed with respect to its standard determination: social factors are indeed what determines biology (Benoist 1966). He further points out that to geneticists, every human population is a society structured by relations between individuals. The choice of a sexual partner, necessary for genetic transmission, influences the social management of a crucial biological fact (reproduction) with a direct incidence on the genetic structure of the given population. This leads to a non-random distribution of genes, and thus to statistical 'raciation', as T. Todorov would state years later: "the value system acts as a genetic filter [...], and the population itself evolves towards the purpose society has set for it" (Todorov 1989). Thus, for example, it is through control of the reproductive encounters governing heredity in a society ruled by color-based prejudice that racial ideology can truly leave its stamp on the body (Bonniol 1992).

The assertion of a non-scientific basis for race did not come from the social sciences, since they studied the social impact of race: it fell to the biological sciences to undertake this revolution. A major break had begun to emerge in their field in the 1960s and especially the 1970s, leading to a radical questioning of the notion of race. One of the emblematic statements of this change of perspective is to be found in geneticist R. Lewontin's seminal article "The Apportionment of Human Diversity" (1972). His main argument is based on a 'continuum' wherein most human biological variation can be identified between individuals rather than 'races', thereby making the concept of race irrelevant and counter-productive. This devaluation of race among many biologists rapidly spread to the social sciences and political thinking, thereby opening an 'enchanted parenthesis', with many scholars feeling that race could be evacuated once and for all (Jacquard 1978), seemingly reinforcing antiracism, and the fashionable axiom: 'there is no such thing as race'. Thus, race was seen as no more than a social construct, based only tangentially on biological reality. This conceptualization subsists to this day in the social sciences (Reardon 2004). Race even came to be banned as a variable in most French social science publications, a sign that this devaluation was truly effective.

It can be observed, however, that biological race never fully disappeared from the scientific literature, as pointed out by a certain number of historians who have insisted upon the relevance of studying the historical continuum shaping relations between race and biology (Duster 1995, 2005 and 2006, Washington 2006, Wailoo 2006 and 2010, Hammonds & Herzig 2008, Hoberman 2012). Health professionals in their different theories had incorporated the relation between race and biology and medical practices to highlight the physical or mental differences deemed relevant in their practice,

whether in the context of Europe's colonial heritage or slavery in the United States.¹ Mobilized in healthcare categorizations and routine medical practices (Grossi 2018), through conversations and consultations between patients and caregivers (Wang 2009), the category of race, theorized as a biological entity, has long been juxtaposed with other uses of the term, as social construct, administrative category or cultural substrate (Marchetti 1994, Morning 2008). Such is the situation today in clinical trials in the United States (Epstein 2008, Montoya 2007, Montoya 2011), where population categories are still listed according to the rigid ethno racial pentagon: White, Black, Latino, Asian and Native American (Richomme 2007), five groups based on the well-established census categories (Schor 2009), thereby consolidating the admixture of administrative, medical and social uses of the notion. In fact, the diversity of use extends to a much broader field, touching on what, according to Bourdieu, can be called 'categories of practice' rooted in a cultural substrate governing identity-related practices. One such example is the Rachel Dolezal case, which made the headlines in the United States, home to the 'one-drop rule'² and racial separatism: Ms. Dolezal claimed to be 'Black', though she was 'White', according to her family. The scandal arose from this 'biological' fraud, since Dolezal did not match the phenotypic and genealogical criteria for being 'Black'. These criteria can be interpreted, however, in memorial terms: a 'Black' identity may be claimed if there exists a communal, shared fate (slave ancestors, in this instance), prerequisite for recognition by the group concerned (this became problematic for Barack Obama's assimilation as an 'African-American', which presumes solidarity based on a shared memory of the past trauma of slavery). Unlike 'transgender' identity (Wu 2003, Brubaker 2016), the social acceptance of 'transracial' identity becomes problematic when based on biological and cultural criteria.

It was again in the biological sciences that the concept of race as a social construct, as well its devaluation as a biological notion, were put into question, while it ultimately persisted in many social contexts. The first significant challenge to Lewontin's theory came from A. F. Edwards in his article "Human Genetic Diversity: Lewontin's fallacy" (2003). Regarding the study of human biological variability, the situation has been changing fundamentally since the early 2000s, with the rise of genomics. In 2000, the *Human Genome Project* concluded that human beings are 99.9% identical in their genetic makeup. But the findings were soon disputed, notably by scholars in the United States who saw DNA as providing irrefutable evidence that racial diversity is rooted in our bodies. DNA, thanks to its identificatory power, is a useful differential instrument for the remaining 0.1% difference, representing three million bases out of the three billion forming our genome. This suffices to express human diversity, in terms of both pathological risk and origin. And yet, DNA can be seen as a double-edged sword: on the one hand, it helps reveal the extraordinary genetic similarity between all human beings, while, on the other, it provides for making fine distinctions among the variants within human diversity. This has contributed in recycling certain obsolete theories on difference based on the idea of nature, in particular those establishing racial categories. In fact, some people view the old, traditional racial categories as corresponding, even if only very roughly, to the infinitesimal margin of biological variation between human beings, according to the argument often put forward in the United States, of 'proxy', or race, as an approximation of genetic heritage.

Thus, at least in some sectors, genomics opened the way to *re-naturalizing* the notion of race, with many consequences. For instance, there is the success of racialized pharmacogenomics, with the marketing of drugs intended for racially defined

populations, the first being BiDil, approved in 2005 by the United States Food and Drug Administration (Kahn 2012, Doron & Lallemand-Stempak 2014). The use of such drugs by caregivers reinforced belief in a genetic component of the racial variable for explaining differential diagnostic rates for cardiovascular disease, despite the lack of any proven correlation for this claim. Furthermore, combining genetic data and social identity is not limited to academic circles: the general public has appropriated genetic categories in various ways, especially with the popularization of genomics, consequent to the marketing of genetic ancestry tests in the United States since the early 2000s (Bolnick 2008, Bonniol 2006, 2014a and 2014b, Fullwiley 2007, Jordan 2008 and 2010, Lee 2013 and 2015, Lee *et al.* 2014 and 2018).

There are many social uses for these tests sold by American companies today, as they cater to a wide range of customers from all continents. Some white supremacists use their results to argue for a biological definition of race, dependent on the notion of purity (Donovan & Grossi 2017, Panofsky & Donovan 2018). On the other side of the political prism, antiracist militants make use of such tests for identitarian purposes, in various ways depending on their ideology, either to claim, for example, the diversity of their genetic heritage or, on the contrary, to assert an original racial identity. For many African-Americans, these tests offer an opportunity to retrace the memory of their ancestors who were subjected to the Middle Passage and thus confirm their African origin (Nelson 2016, Abel 2016). Moreover, genetic ancestry tests have attracted the attention of State governments on account of their capacity to classify individuals along biological and geographic lines (Abel 2018). Far from being homogeneous, the positioning of the various players (geneticists, pharmaceutical companies, physicians producing discourse on genetics, the State, non-specialists, militants) helps shape new, often diverse interpretations of biological race in the twenty-first century.

The work of Ricardo Ventura Santos and Marcos Chor Maio (2005), in this issue, on the relations between anthropology, race and identity-related dilemmas in the age of genomics applied to Brazil, addresses the contradictions that arise in these new interpretations of race. Their article is also representative of the state of population analysis techniques as regards origins in the early 2000s. It focuses on a series of genetic studies that marshaled the technology available at the time: *i.e.*, based solely on genes of mitochondrial DNA, non-recombinant since transmitted only by the mother, and the Y chromosome, whose genes, also non-recombinant, are transmitted only by the father. Thus, their article reveals the extent of interbreeding that seems to characterize the Brazilian population's biological history, apparently corroborating the vision expressed by the great Brazilian sociologist Gilberto Freyre in his well-known work *Casa-grande e senzala* (1933). This interbreeding was sexually differentiated and reflected the power relations prevailing in Brazil in slavery and post-slavery times, namely the sexual domination of white men over African and Native American women: the vast majority of markers on the Y chromosome transmitted by the father are of European origin, while those relating to mitochondrial DNA, transmitted by the mother, are mainly of African and Native American origin, including phenotypically White Brazilians. This 'molecular portrait of Brazil' also illustrates how genomics can reveal specificities in a society historically made up of different human elements. This depiction is, however, rejected at both extremes of the political spectrum: proponents of the Black movement see it as approving Brazil's proverbial 'racial democracy', now to be stigmatized since it appears as the acceptable aspect of a whitening policy that minimizes the contribution of African ancestry; while members of the Far Right cannot

tolerate seeing their ideal of ethnic separatism and racial purity challenged by genetic data.

Today, the different political uses of genomic identity echo the study of epigenetic mechanisms in the trans generational transmission of environmentally influenced traits, thereby shaping new ways of reappropriating the concept of race —some social, some biological— on the part of researchers examining these questions (Meloni 2017) as well as social players who are non-specialists in these matters. In recent years, many studies invoking epigenetic mechanisms have examined the epigenetic incidence of stress in African-American populations whose ancestors suffered the trauma of slavery. Some studies claim that this traumatic memory is transmitted by a trans generational mechanism which modifies the epigenome (which should be understood as the key variable in the expression of an individual's genes) of a large number of people whose ancestors may have undergone metabolic change linked to slavery, due mainly to dietary deficiencies. Despite the doubts expressed by many epigeneticists concerning the mechanism behind the trans generational transmission of trauma, which is not universally recognized by the scientific community, it is interesting to note that proponents of reparation for slavery (Grossi 2020), along with anthropologists and philosophers, increasingly cite this cause-and-effect reasoning as proof. Such reasoning predicates —on grounds other than the above-mentioned 'fabrication' of race on the basis of the social structuration of reproductive encounters— that race is 'inscribed in the body' through the epigenome.

Are such advances in genomics and epigenetics in relation to human diversity ushering in a return to the notion of 'biological race' in biology and medicine? Critical essays mention, in particular: an application of the 'new genetic medicine' to race (Fullwiley 2008), a movement towards 're-establishment' (Mukhopadhyay & Moses 2008), a 'resurgence' (Wailoo *et al.* 2012, Carson Bird *et al.* 2015), a 'return' (Morning 2014) and even a resurrection (Duster 2015) aiming to promote once again the concept of biological race in the late twentieth and early twenty-first centuries. The biological concept of race appears to have been 'buried alive' (Duster 2003), but without having been 'neutralized once and for all' (Morning 2011); ultimately, it has been 'reconditioned, transformed and remarketed' (Roberts 2011) by specialists in the natural and medical sciences. This recourse to the lexicon of a 'return' should orient us less towards the 'disappearance' of biological race than to its mutation and transformation, in pace with the historical evolution of biological and medical discourses, and their influence in the social sciences and beyond, in non-specialist circles.

Ann Morning's article (translated into French for this issue) is revealing in this respect. It points to the trend seen among certain American sociologists who have been influenced by geneticists —considered to have more legitimacy in addressing these issues— and who accept the biological foundation of race, accepting it as a given, despite the fact that they do not deny its social construction and that genetic clusters are always socially delimited beforehand. She concludes that a critical vision is indispensable in the face of any assertion of a genetic basis for race.

Today, the markers for the genetic singularisation of individuals are no longer limited to maternal and paternal lines: they include large-scale associations over the entire genome (GWAS, (genome-wide association studies), on the basis of sequencing nucleotides that form chains of DNA, SNPs (single-nucleotide polymorphism) (Jordan

2010), which may include markers that are among the most informative regarding differences in ancestry (AIMs, ancestry informative markers). Furthermore, research on ancient DNA has become decisive thanks to increasingly precise tracking of how the planet has been peopled over the ages, at least since the appearance of Modern Man in Africa and subsequent migrations to Eurasia, Oceania and the Americas. This is when differentiation occurred within isolates through adaptation to different environments, though there was also a continuous mixing of populations. Consequently, it comes as no surprise that one of the most eminent representatives of the study of ancient DNA, David Reich, author of the landmark book *Who We Are and How We Got Here: Ancient DNA and the New Science of the Human Past* (2018), should have contributed to the general discussion on race in a much commented-upon *New York Times* article “How Genetics is changing our Understanding of ‘Race’” (23 March 2018). Standing clearly in defense of race as a social construct and fully aware that genetic findings can be misappropriated in order to justify racism, he nonetheless pleads in favor of putting an end to a certain ‘orthodoxy’ in the social sciences regarding the issue of average genetic differences among populations, a position he considers tantamount to “sticking our heads in the sand” with the risk of leaving a vacuum that gets filled by pseudoscience (as attested by many publications in the United States that persist in alleging the importance of racial determinism in the field of human behavior and intelligence testing). Although his conclusions on the history of biological variability in humans are hard to challenge, it is unfortunate that his writing should be prey to a certain semantic vagueness, for example by placing terms referring to racial categorization alongside the results of statistical inferences on the history of the genome, which leads to not clearly distinguishing race and ancestry.

The molecular biologist Bertrand Jordan provides clarification of precisely this in his contribution to the present issue. Using genetically based reasoning, he prefers to renounce the term ‘race’, with its predominantly negative historical overtones, in favor of ‘ancestry group’. This has the advantage of precision, as it defines: a set of people who are genetically similar through their common origin, often in association with a region of the Earth where the group remained relatively isolated for several millennia. As such, it is not merely a politically correct substitute for the term ‘race’.

Finally, we turn our attention to one last debate: the intricacies of viewing race and biology from the standpoint of social inequality, sometimes ‘naturalized’ in popular discourse as potentially due to genetic differentiation between given populations. A brief article in this issue sheds light on the different interpretations of ethno-racial disparities in cases of morbidity and mortality due to COVID-19 on the basis of some thirty scientific articles, mostly in English, published since 2020. The countries discussed include the United States, Spain, Brazil, the United Kingdom and France, and the authors represent a host of scientific disciplines: medicine, public health, epidemiology, demography, sociology, economics, political science, psychology, and so on. The purpose of the succinct critical analysis by Simeng Wang is to examine whether scientific publications on the subject have taken race into account as a social construct and cultural variable or as biological fact. Some scholars resort primarily to biological and genetic explanations to account for disparities in morbidity and mortality due to COVID-19 in populations identified as ‘racially’ different, while others point to socioeconomic and sociodemographic factors (discrepancies in social conditions: access to healthcare, housing, employment, transport, savings, everyday stress, racist victimization, etc.) to which these ethno-racial groups are exposed.

Since we are currently facing the rise of biological definitions of identities, notably in relation to ancestry, how can we define the relations between race and biology?³ We have certainly witnessed the return of race as a biological notion since the 2000s. This return claims that we should rely not only on evidence and common sense, but also on a so-called “real” science, free from ideology, and based instead on new genetic knowledge. As it promotes the idea that it has a biological foundation, it also reinforces the ambient ethno-racial frame of reference, which is imbued with racialized imaginaries. Thus a new form of “racial realism” is emerging, and is indeed uppermost in academia, compared to the “social construct” notion—a notion whose uses remain contaminated by biological connotations. However, it must be recognized that the situation has changed over the last two decades mostly due to the activism of a certain number of minority groups, who advocate for justice in the area of public health, according to the paradigm of inclusion, linked to affirmative action and identity politics. But this is a double-edged sword, for this same logic is also found on the other side of the political spectrum, on the side of those obsessed with purity and racial superiority.

Faced with this racist revival, one can object that genetic knowledge is far from neutral, because it is permeated with blind spots and ambiguities, and that the production of genetic data is entirely enmeshed with processes of social construction, both in the description of the facts and their treatment. The production of genetic data conceals epistemological and political traps, in particular because of the tensions now in existence between the recognition of biological entities, which would be more or less separated, and the older discourses on the clinal and continuous character of human populations.

For sure, with the aid of genomics, the increasingly well-honed understanding of human diversity has helped adapt medical diagnosis and therapy to the individual’s genetic endowment. The progress this represents is unquestionable. But will it inevitably lead to racial semiotics, with, for example, the development of racialized medicine at the expense of personalized medicine? Is not human variability far too complex, in both its genetic and epigenetic dimensions, to be analyzed on the basis of timeworn racial categories, varying from one culture to the next, and bearing the legacy of a hierarchical vision and past—and sometimes present—oppression, even if race has been redefined by DNA?

The current and persistent use of race forces us to acknowledge a deliberate revival of its lexicon for designating individuals in public debate and even sometimes, in academia. For their part, the social sciences view it legitimately as a variable that should continue to be taken into account because of its social efficacy in the analysis of discrimination in particular, while avoiding all reference to biological underpinnings. Yet, would this mean that we do not wish to take into account the recent history of the notion with its biological definition and its socio-political uses, even if these new so-called “biosocialities” are supposed to be positive, fluid and non-deterministic (while still generating identities that are ambiguous)? Making it a simple social construct, however, runs the risk of forgetting the principle behind its use, namely the ‘naturalization of difference’, established on the basis of non-modifiable hereditary traits, since the categorization it establishes makes reference to genetically determined phenotypic signs, thus freighting the racial lexicon with a contagious biological burden and providing grounds for a daunting pitfall, which will crystallize and define

categories for years to come. In conclusion, we must relentlessly pursue our questioning of race as a biological entity.

BIBLIOGRAPHY

Abel, Sarah. 2016. "Crossing disciplinary lines: reconciling social and genomic perspectives on the histories and legacies of the transatlantic trade in enslaved Africans." *New Genetics and Society* 35 (2): 149-185.

Abel, Sarah. 2018. "What DNA can't tell: Problems with using genetic tests to determine the nationality of migrants." *Anthropology Today* 34 (6): 3-6.

Anderson, Warwick. 2006. *Colonial pathologies: American tropical medicine, race, and hygiene in the Philippines*. Durham: Duke University Press.

Benoist, Jean. 1966. "Du social au biologique. Étude de quelques interactions." *L'Homme* 6 (1): 5-26.

Bolnick, Deborah. 2008. "Individual ancestry inference and the reification of race as a biological phenomenon." in Koenig B.A., Lee S. and Richardson S.S. (eds.) *Revisiting race in a genomic age*. New Brunswick: Rutgers University Press, 70-85.

Bankole-Medina, Katherine. 1998. *Slavery and Medicine: Enslavement and Medical Practices in Antebellum Louisiana*. New York: Garland Publishing, Inc.

Bonniol, Jean-Luc. 1992. *La couleur comme maléfice. Une illustration créole de la généalogie des "Blancs" et des "Noirs"*. Paris: Albin Michel.

Bonniol, Jean-Luc. 2006. "La peau noire: va et vient d'un anthropologue entre le biologique et le social." *Ann Dermatol Venerol* 133: 853-858.

Bonniol, Jean-Luc. 2014. "Que faire de la 'race' ? Du diagnostic à la thérapie." *Ann Dermatol Venerol* 141: 553-559.

Bonniol, Jean-Luc and Pierre Darlu. 2014. "L'ADN au service d'une nouvelle quête des ancêtres?" *Civilisations* 63 (1 & 2): 201-219.

Brubaker, Rogers. 2016. *Trans Gender and Race in an Age of Unsettled Identities*. Princeton: Princeton University Press.

Frank, Reanne. 2015. "Back to the future? The emergence of a geneticized conceptualization of race in sociology." *The ANNALS of the American Academy of Political and Social Science* 661 (1): 51-64.

Collignon, René. 2006. "La psychiatrie coloniale française en Algérie et au Sénégal." *Revue Tiers Monde* 187: 527-546.

Cooper Owens, Deirdre. 2016. *Medical Bondage: Race, Gender, and the Origins of American Gynecology*. Athens, Géorgie: University of Georgia Press.

Donovan, Joan and Élodie Grossi. 2017. "Hate in the Blood: White Supremacists' Use of DNA Ancestry Tests." *The Activist Review*.

Dorr, Gregory Michael. 2008. *Segregations's Science: Eugenics and Society in Virginia*. Charlottesville: University of Virginia Press.

- Doron, Claude-Olivier and Jean-Paul Lallemand-Stempak. 2014. "Un nouveau paradigme de la race?" *La Vie des Idées*.
- Doron, Claude-Olivier. 2016. *L'Homme Altéré. Races et dégénérescence (XVII^e-XIX^e siècles)*. Ceyzérieu: Champ Vallon.
- Duster, Troy. 2003. "Buried Alive: The Concept of Race in Science." in Goodman A.H., Heath D. and Lindee M.S. (eds.) *Genetic Nature / Culture: Anthropology and Science Beyond the Two-Culture Divide*. Berkeley: University of California Press, 258-277.
- Duster, Troy. 2005. "Race and Reification in Science." *Science* 307 (18): 1050-1051.
- Duster, Troy. 2006. "The Molecular Reinscription of Race." *Patterns of Prejudice* 40 (4-5): 427-441.
- Duster, Troy. 2015. "A post-genomic surprise. The molecular reinscription of race in science, law and medicine." *The British Journal of Sociology* 66 (1): 1-27.
- Edwards, A.F. 2003. "Human Genetic Diversity: Lewontin's fallacy." *BioEssays* 25 (8): 798-801.
- Epstein, Steven. 2008. *Inclusion: The Politics of Difference in Medical Research*. Chicago: University of Chicago Press.
- Ernst, Waltraud. 2004. "Colonial Psychiatry, Magic and Religion. The Case of Mesmerism in British India." *History of Psychiatry* 15 (1): 57-71.
- Ernst, Waltraud. 2007. "Beyond east and west. From the history of colonial medicine to a social history of medicine (s) in south Asia." *Social History of Medicine* 20 (3): 505-524.
- Freyre Gilberto. [1933] 1952. *Casa Grande et Senzala. Maîtres et Esclaves* (trad. française), Gallimard, traduction de Roger Bastide, préface de Lucien Febvre. Paris: Gallimard.
- Fullwiley, Duana. 2007. "Race and genetics: attempts to define the relationship." *Biosocieties* 2: 221-37.
- Fullwiley, Duana. 2008. "The biological construction of race: Admixture technology and the new genetic medicine." *Social Studies of Science* 38 (5): 695-735.
- Gamble, Vanessa. 1997. "Under the shadow of Tuskegee: African Americans and health care." *American Journal of Public Health* 87 (11): 1773-1778.
- Grossi, Élodie. 2018. "Clinique politique et politiques de la clinique. Le cas des unités de soins psychiatriques 'ethno-raciales' de l'université de Californie à San Francisco." *Genèses* 111 (2): 92-113.
- Grossi, Élodie. 2019. "A Patient Labor: le travail des patients noirs et les pratiques de résistance dans les asiles psychiatriques du Sud, 1870-1910." *Revue française d'études américaines* 160 (3): 200-214.
- Grossi, Élodie. 2020. "New avenues in epigenetic research about race: online activism around reparations for slavery in the United States." *Social Science Information* 59 (1): 93-116.
- Guillaumin, Colette. 1986. "Je sais bien mais quand même, ou les avatars de la notion de race" in Frankel C. (ed.) *La science face au racisme*. Bruxelles: Éditions Complexe, 55-66.
- Hammonds, Evelyn and Rebecca Herzig (eds.). 2008. *The Nature of Difference: Sciences of Race in the United States from Jefferson to Genomics*. Cambridge: MIT Press.
- Heaton, Matthew. 2013. *Black Skin, White Coats: Nigerian Psychiatrists, Decolonization, and the Globalization of Psychiatry*. Athens, Ohio: Ohio University Press.

- Hoberman, John. 2012. *Black and Blue: The Origins and Consequences of Medical Racism*. Berkeley: The University of California Press.
- Hogarth, Rana. 2017. *Medicalizing Blackness: Making Racial Difference in the Atlantic World, 1780-1840*. Chapel Hill: University of North Carolina Press.
- Jacquard, Albert. 1978. *Éloge de la différence. La génétique et les hommes*. Paris: Éditions du Seuil.
- Jordan, Bertrand. 2008. *L'humanité au pluriel. La génétique et la question des races*. Paris: Éditions du Seuil.
- Jordan, Bertrand. 2010. "Chroniques génomiques. ADN, ascendance génétique et 'race' sociale: l'apport des SNIP." *Med Sci* 26: 215-218.
- Kahn, Jonathan. 2012. *Race in a Bottle: The Story of BiDiL and Racialized Medicine in a Post-Genomic Age*. New York: Columbia University Press.
- Keller, Richard. 2008. *Colonial Madness: Psychiatry in French North Africa*. Chicago: University of Chicago Press.
- Kenny, Stephen. 2011. "Sickness and Chains: the significance of enslaved patients in antebellum Southern infirmaries." *Medical Historian* 21: 63-91.
- Kevles, Daniel. 1998. *In the Name of Eugenics: Genetics and the Uses of Human Heredity*. Cambridge: Harvard University Press.
- Kriegel, Arthur. 1983. *La Race perdue. Science et racisme*. Paris: PUF, coll. "Questions".
- Larson, Edward. 1996. *Sex, Race, and Science: Eugenics in the Deep South*. Baltimore: John Hopkins University Press.
- Lee, Sandra, Sahra Gibbon, Barbara Prainsack, Stephen Hilgartner and Janelle Lamoreaux. 2018. "Excavating difference: race in genomic medicine." *Handbook of Genomics, Health and Society*, 221-27.
- Lee, Sandra, Janet K. Shim, Sara L. Ackerman, Katherine W. Darling, and Robert A. Hiatt. 2014. "Race and Ancestry in the Age of Inclusion: Technique and Meaning in Post-Genomic Science." *Journal of Health and Social Behavior* 55 (4): 504-518.
- Lee, Sandra. 2015. "The Biobank as Political Artifact: The Struggle over Race in Categorizing Genetic Difference." *Annals of The American Academy of Political and Social Science* 661 (1): 143-159.
- Lee, Sandra. 2013. "Race, Risk, and Recreation in Personal Genomics: The Limits of Play." *Medical Anthropology Quarterly* 27 (4): 550-566.
- Lewontin, Richard. 1972. "The apportionment of human diversity." *Evol Biol.* 6: 381-98.
- Marchetti, Gina. 1994. *Romance and the "Yellow Peril": Race, Sex, and Discursive Strategies in Hollywood Fiction*. Berkeley: University of California Press.
- Maurel, Chloé. 2007. "La question des races." *Gradhiva* 5: 114-131.
- Meloni, Maurizio. 2017. "Race in an epigenetic time: thinking biology in the plural." *British Journal of Sociology* 68 (3): 389-409.
- Montoya, Michael. 2011. *Making the Mexican Diabetic: Race, Science, and the Genetics of Inequality*. Berkeley: University of California Press.
- Montoya, Michael. 2007. "Bioethnic Conscription: Genes, Race and Mexicana/o Ethnicity in Diabetes Research." *Cultural Anthropology* 22 (1): 94-128.

- Morning, Ann. 2008. "Reconstructing Race in Science and Society: Biology Textbooks, 1952–2002." *American Journal of Sociology* 114 (1): 106-137.
- Morning, Ann. 2014. "And you thought we had moved beyond all that: Biological race returns to the social sciences." *Ethnic and Racial Studies* 37 (10): 1676-1685.
- Morning, Ann. 2011. *The Nature of Race: How Scientists Think and Teach about Human Difference*. Berkeley: University of California Press.
- Mouchenik, Yoram. 2001. "La psychiatrie coloniale en Nouvelle-Calédonie." *Journal de la Société des Océanistes* 2: 109-119.
- Mukhopadhyay, Carol and Yolanda Moses. 2008. "Reestablishing 'race' in anthropological discourse." *American Anthropologist* 99 (3): 517-533.
- Nelson, Alondra. 2016. *The Social life of DNA: Racial Reconciliation and Institutional Morality after Reparations, and Reconciliation after the Genome*. Boston: Beacon Press.
- Panofsky, Aaron and Joan Donovan. 2018. "Genetic Ancestry Testing Among White Nationalists." september. Accessed June 6 2019: <https://osf.io/preprints/socarxiv/7f9bc>.
- Ramey Berry, Daina. 2017. *The Price for Their Pound of Flesh*. Boston: Beacon Press.
- Reich, David. 2018. *Who We Are and How We Got Here: Ancient DNA and the New Science of the Human Past*. New York: Pantheon.
- Reich, David. 2018. "How Genetics is changing our Understanding of 'Race'." *The New York Times*, 23 mars.
- Reardon, Jenny. 2004. *Race to the Finish: Identity and Governance in an Age of Genomics*. Princeton: Princeton University Press.
- Richomme, Olivier. 2007. "La classification 'ethno-raciale' des statistiques démographiques aux États-Unis." *Annales de Démographie Historique* 113 (1): 177-202.
- Roberts, Dorothy. 2011. *Fatal Invention: How Science, Politics and Big Business Recreate Race in the 21st century*. New York/London: The New Press.
- Sadowsky, Jonathan. 1999. *Imperial Bedlam: Institutions of Madness in Colonial Southwest Nigeria*. Berkeley/Los Angeles/London: University of California Press.
- Savy, Pierre. 2007. "Transmission, identité, corruption. Réflexion sur trois cas d'hypodescendance." *L'Homme* 182 (3): 53-80.
- Santos, Ricardo Ventura and Marcos Chor Maio. 2005. "Anthropology, race, and the dilemmas of identity in the age of genomics." *História, Ciências, Saúde – Manguinhos* 12 (2): 1-22.
- Schaub, Jean-Frédéric. 2015. *Pour une histoire politique de la race*. Paris: Éditions du Seuil.
- Savitt, Todd L. 1978. *Medicine and Slavery The Diseases and Health Care of Blacks in Antebellum Virginia*. Urbana: University of Illinois Press.
- Stoczkowski, Wiktor. 2007. "Racisme, antiracisme et cosmologie lévi-straussienne. Un essai d'anthropologie réflexive." *L'Homme* 181 (2): 7-51.
- Swartz, Sally. 2010. "The Regulation of British Colonial Lunatic Asylums and the Origins of Colonial Psychiatry, 1860-1864." *History of Psychology* 13 (2): 160-177.
- Schor, Paul. 2009. *Compter et classer: histoire des recensements américains*. Paris: Éditions de l'EHESS.
- Todorov, Tzvetan. 1989. *Nous et les autres. La réflexion française sur la diversité humaine*. Paris: Éditions du Seuil.

- Vaughan, Alden T. 1989. "The Origins Debate: Slavery and Racism in Seventeenth-Century Virginia." *The Virginia Magazine of History and Biography* 97 (3): 311-354.
- Wailoo Keith, Alondra Nelson and Catherine Lee (eds.). 2012. *Genetics and the unsettled past: the Collision of DNA, Race, and History*. New Brunswick: Rutgers University Press.
- Wailoo, Keith. 2006. "Stigma, race, and disease in 20th century America." *The Lancet* 367 (9509): 531-533.
- Wailoo, Keith. 2010. *How Cancer Crossed the Color Line*. Oxford: Oxford University Press.
- Wang, Xiao-yan. 2009. 王晓艳. "人种间体质差异对针刺疗法的影响 (英文)." "Effects of physical differences between races on acupuncture treatment." *World Journal of Acupuncture-Moxibustion* 1: 49-54.
- Washington, Harriet. 2006. *Medical Apartheid: The Dark History of Medical Experimentation on Black Americans from Colonial Times to the Present*. New York: Anchor Books.
- Weindling, Paul. 2005. "L'eugénisme comme médecine sociale: l'époque de Weimar." *Revue d'Histoire de la Shoah* 183 (2): 135-142.
- Willoughby, Christopher. 2017. "'His Native, Hot Country': Racial Science and Environment in Antebellum American Medical Thought." *Journal of the History of Medicine and Allied Sciences* 72 (3): 328-351.
- Wu, Frank. H. 2002. *Yellow: Race in America beyond black and white*. New York: Basic Books.
- Xi, H., L. Pei, P. Cheng, W. Li. 2010. 席焕久, 裴林国, 程鹏, & 李文慧. 北京奥运会运动成绩的人种差异 "Racial Differences in Sports Results of the Beijing Olympics." *Sports science, 体育科学* 6: 81-84.
- Zuñiga, Jean-Paul. 1999. "La voix du sang. Du métis à l'idée de métissage en Amérique espagnole." *Annales HSS* 2: 425-452.

NOTES

1. A whole series of studies bear on race as an omnipresent biological entity in colonial medicine and healthcare for populations in French-speaking (Collignon 2006, Keller 2008) and English-speaking Africa (Swartz 2010, Sadowsky 1999, Heaton 2013), Asia (Ernst 2004, 2007, Anderson 2006), Oceania (Mouchenik 2001) and the Caribbean (Hogarth 2017), on the racial categories used in medicine in the United States in times of slavery and subsequently (Savitt 1978, Bankole-Medina 1998), in particular with the development of gynaecology in the United States and medical experimentation on Black people's bodies (Cooper Owens 2016), and on racialist medical theories in nineteenth- and twentieth-century medical schools and hospitals (Willoughby 2017, Kenny 2011, Ramey Berry 2017, Grossi 2019). Despite the association of this notion with certain notorious historical contexts —such as eugenic practices (Dorr 2008, Kevles 2008, Larson 1996) or racial experimentation in Tuskegee, Alabama (Gamble 1997) or pre-Nazi Germany (Weindling 2005)— biological race has remained an unseen category, routinely applied in healthcare practices in many societies. Yet, the conditions for its dissemination and reception from one society to another remain to be studied. For example, 'biological race' is a category currently employed in China for STAPS (Science and Techniques of Physical and Sport Activities) to compare athletic performance at the 2008 Olympic Games in Beijing (Xi *et al.* 2010).
2. The 'hypodescent rule' is based on the principle that a person with 'one drop of black blood is black'.

3. The following paragraphs were inspired by Claude-Olivier Doron's conclusion in his book: Claude-Olivier Doron, *L'homme altéré*, Champ Vallon, 2016.