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Conhecimento biomédico no México durante a Guerra Fria e seu impacto nas representações visuais de Homo sapiens e hierarquias raciais

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Abstract

This paper provides an overview of the state of Mexican genetics and biomedical knowledge during the second half of the twentieth century, as well as its impact on the visual representation of human groups and racial hierarchies, based on social studies of scientific imaging and visualization (SIV) and theoretical concepts and methods. It also addresses the genealogy and shifts of the concept of race and racialization of Mexican bodies, concluding with the novel visual culture that resulted from genetic knowledge merged with the racist phenomenon in the second half of the twentieth century in Mexico.

Keywords: race; transnational; representation; Mexico.

Resumo

Este artigo traça um panorama do estado da genética e do conhecimento biomédico no México durante a segunda metade do século XX, assim como seu impacto na representação visual de grupos humanos e hierarquias raciais, baseado em estudos sociais da imagem e visualização científica e de seus métodos e conceitos teóricos. Também aborda a genealogia e as mudanças nos conceitos de raça e racismo nos corpos mexicanos, que resultaram na nova cultura visual fruto do conhecimento genético, interligando-se ao fenômeno do racismo na segunda metade do século XX no México.

Palavras-chave: raça, transnacional; representação; México.



The large number of local studies of science in recent years demonstrates the contributions non-Western nations to modern science, provoking very interesting changes in the historiography of science. For at least two decades, one of the most important questions in the field of Science and Technology Studies (STS) has been whether this multitude of local studies can be integrated into a more global history of science; in other words, exploration of connected transnational narratives that direct research towards a bilateral treatment of the greater global context (with local circumstances that have now been established) significantly determine the direction and results of scientific practices. As James Secord pointed out in 2004, unlike diffusionist histories, transnational histories question how knowledge circulates, how that knowledge ceases to be owned by an individual or group and becomes part of the general understanding of other communities, and how the history of science should be written to illuminate global trends and local resistance.

This transnational approach began to emerge at the end of the Cold War in other areas of history such as diplomacy and international relations to question nationalist narratives. The transnational history of science is nested within this framework, and focuses on studying the circulation of scientific knowledge and the search for global histories, without focusing on particular nation-states. But because the circulation of knowledge is only an approximation of the various ways in which transnational histories can be achieved, this sort of historical research offers numerous possibilities like circulation understood strictly as communication (ideas, knowledge and practices) as well as in its material form as scientific objects (material culture), people, networks of collaboration etc. What this article discusses is part of a research project that attempts to account for the transformation of racial scientific theories and notions after Second World War and their impact on the visualization of racialized bodies in science and culture in Mexico. This is a way to shed light on how the knowledge produced in developing countries is part of international knowledge as it circulates inside and outside national borders, through collaborative networks or through the circulation of ideas or material objects.

Because the discourse on racial hierarchy has generally been supported by illustrations since the eighteenth century (Guédron, 2014) which have changed according to shifts in the scientific conceptions of race and human evolution, it is relevant to investigate local visual responses to theories on human diversity by Mexican scientists and educators during the Cold War period. This moment represents a drastic change in practices within the life sciences, because of new technologies such as massive DNA sequencing which developed and gained strong support, as well as advances in computer technology. It was also a time when biology was propelled by large-scale projects and certain transnational investigations, usually financed by national governments or associations corresponding to what is known as “big science”. How (if at all) did these new techniques and practices after Second World War and the state of Mexican genetics and biomedical knowledge impact the visual representation of human groups and racial hierarchies in this country?

This post-war time is also interesting for many reasons. In transnational terms, the world witnessed enormous changes in scientific activity, especially in the humanities

and life sciences. Additionally, this period “covers a major global transition away from an uneven but fairly broad scientific consensus endorsing race as a concept with which theorize – and evaluate – human diversity towards a growing consensus that rejected race as a fundamentally undemocratic way to evaluate and judge human diversity” (Wade, 2017, p.53) without genetic support. Locally (and paradoxically) in Mexico, this era represents the beginning of efforts to delimit the existence of the Mexican mestizo due to the apparent possibility of characterizing this group genetically. How did these ideas and efforts move (if at all) towards the realms of pictorial representation of human diversity? Is it possible to say that post-war human genetics generated a novel visual culture of human taxonomy? These are just a few questions I will attempt to answer.

On the western conception of race, the racialization of Mexican bodies, and the relation to scientific imagery

There is a clear link between the study of scientific imagery and the invention of race (Guédron, 2014). If we understand the racist phenomenon as a historical construction linked to the meaning that populations confer on the physical and cultural diversity of human groups, which heavily relies in a visual apparatus to validate and naturalize itself, we can appreciate how the discourse of racial hierarchies and their manifestations of exclusion, xenophobia, war, extermination etc., have been supported by pictorial representation. In this sense, it is interesting to address the epistemic practices of the production, interpretation, and use of scientific images supporting racial hierarchies and exploring their trajectories from their production and reading through their diffusion, deployment, and adoption in different social worlds to their incorporation into the lives and identities of individuals, groups, and institutions.

Two broad contexts are relevant to understand the establishment and singularities of the science of race, its strong linkage to biomedicine and genomics in Mexico, and its resulting impact in pictorial representations of *Homo sapiens* and racial hierarchies. First is the genesis and subsequent changes in the notion of race in Europe and the United States, and the second is the invention of the colonial category of the mestizo and its use in political and social spheres since the Mexican post-revolution; the latter is important to understanding its transformation into a typological category, used as a guide in numerous genomic investigations.

Genesis and changing notions of race

Scientific ideas about race are a few hundred years old; some argue they can be traced back to the sixteenth century (Fredrickson, 2002), while other scholars suggest racial theories emerged and were disseminated in the scientific arena in the eighteenth century (Bancel, David, Thomas, 2014). The briefest summary of the intricate origin of scientific racial theories might indicate that the fully racial (and racist) ideology of the nineteenth century emerged from the ethnocentric ideas of the seventeenth and eighteenth centuries (Jackson, Weidman, 2004). Whatever the case, there is a broad consensus that the concept

of race originated with the establishment of modern science, and its theories were developed primarily in North America and Europe. However, “they can be understood in a global context, considering their impact on and shaping by imperialism, colonialism, slave trade, genocide and world war” (Jackson, Weidman, 2004, p.XIII). According to Bancel, David, Thomas (2014), the epistemological moment that triggered the emergence of the contemporary concept of race occurred somewhere between 1730 and 1790, when it was invented and rationalized. This does not mean that the concept of race did not exist previously, but it was during the second half of the eighteenth century that racial taxonomies became formalized, resulting from naturalist models that allowed for differentiation between human groups according to somatic characteristics. Importantly, as Jackson and Weidman (2004) point out, what is and has been considered a racial group has varied greatly in time and space. For example, sixty years ago Jews were considered to be a race, a notion that very few would now support.

The Enlightenment, understood as the culmination of a process of intellectual and social transformations, was the setting for European theories about human difference (Malik, 1996). The eighteenth century witnessed the transformation of the slave trade into the very foundation of the global economy, while racial classifications simultaneously congealed into pseudo-biological types (Malik, 1996). However, Enlightenment-era assumptions about the diversity of humans were monogenist, assuming a single origin for human kind (Adam and Eve) and therefore the existence of only one species. As a result, the notion that racial types originated separately emerged strongly at the beginning of the nineteenth century, and it was also thought that biology, specifically race, caused cultural differences and thus served to naturalize and normalize social inequalities (Jackson, Weidman, 2004).

Enlightenment philosophers were nevertheless largely hostile to the idea of racial categorization, and their descriptions were more empirical descriptions than moral condemnations. A recurrent Enlightenment motif was acceptance of the superiority of European civilization, coupled with a belief in a common human nature and the plasticity of human varieties (Malik, 1996). According to Kenan Malik (1996, p.123): “It was the transformation of Enlightenment attitudes through the course of the nineteenth century that helped mutate the eighteenth-century discussion of human variety into the nineteenth century obsession with racial difference.”

The making of the idea of race

Together with the different proposals of racial taxonomies, mainly by anthropologists, a visual machinery was developed to represent the different races and associated racialized bodies. At this time there was no consensus on the number of existing races, which varied from three to several dozen. This changed with Johann Friedrich Blumenbach’s five-fold taxonomy, and his terminology – in particular the expression “Caucasian” – which became firmly established in both popular and scientific thinking about race and remains to this day. After his meticulous comparative examinations of numerous human skulls, Blumenbach concluded that light-skinned people from Europe, western Asia, and northern Africa not only belonged to the same race but also represented a superior one, based on the

supposed greater symmetry of their skulls. In this way, his racial hierarchy included the Caucasian, Mongolian, American Indian, Malay, and Ethiopian types, with the latter four considered degenerate races of the ideal type, and therefore naturally inferior (Figure 1).

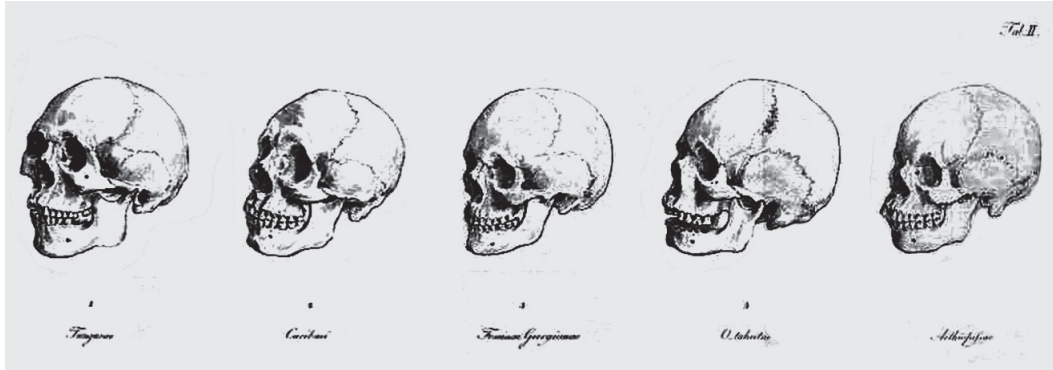


Figure 1: Blumembach's five-fold taxonomy (Blumembach, 2011)

Very importantly, new technological innovations during this period including anthropometric techniques and photographs made it possible to refine the representation of racialized bodies, which allowed the broad circulation and dissemination of both race theories and the modes of display that supported them (including wandering ethnic shows, world fairs, and colonial or imperial exhibitions) within transnational and local contexts. As Edwards (2009) shows, the portrait-type photography which was very popular in nineteenth-century England served different purposes, from making specimens visible for anthropometric studies to satisfying popular curiosity about the exotic by showing peoples from distant places (always with racial and cultural stereotypes). Here is important to recall that at that time “the ‘popular’ and the ‘scientific’ were not separate strands but entangled and mutually reinforced” (p.167) (Figure 2).



Figure 2: Example of portrait-type portrayal: Sakalava woman in Madagascar (Schomburg Center for Research in Black Culture, The New York Public Library)

Meanwhile, the nineteenth century was when many nation-states fully appeared. This “emergence” was coupled with longings and displays of superiority reflected in different areas of the social, cultural, economic and political spheres. In addition, modernization efforts often resorted to colonialism and imperialism, which appealed to notions that some cultures and of course certain individuals are superior to others. The concept of race was consequently the result of the social inequality that occurs normally in colonies and empires. However, these extraordinarily persistent differences eventually became naturalized, and it was conveniently thought that the hierarchy of human groups responded not to social actors but rather to natural laws. Nineteenth-century thinking began to consider these differences as innate and permanent, and subject to imperial exploitation and colonialism (Malik, 1996).

As a result, in the late eighteenth and early nineteenth centuries the scientific debate focused on whether human biological difference was only racial variation or represented an entirely different species. The “species” theory, polygenism, held that different races had different origins and were akin to distinct species. This meant human “races” had different lineages, and suggested a hierarchy that positioned Africans between man and the lower primates. Polygenism was the antithesis of monogenism, which espoused a single origin theory of humanity.

One fascinating example of the discussion between monogenists (such as Blumenbach, Prichard, Horn, Agassiz, Darwin, and Huxley, among others) and polygenists (including Poole, Glidden, Puchet, and Voght) and of interest in the visual reconstruction of human diversity is a descent diagram sent to Darwin from Edward Blyth in a letter dated February 19, 1867 (Figure 3).

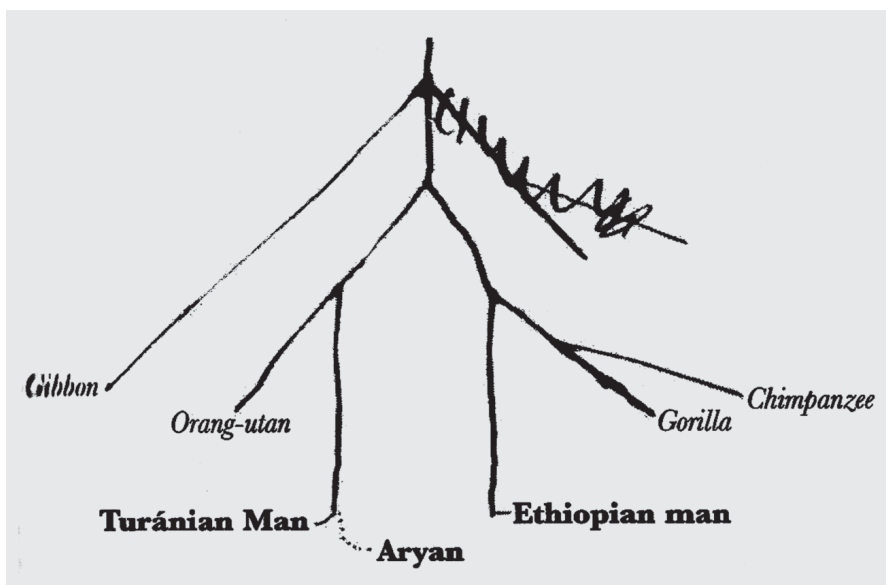


Figure 3: Diagram showing the possible origin of humans from different primate species, in Blythe's letter to Darwin, dated February 19, 1867 (Darwin Archive, DAR 160: 209, 209)

This diagram is Blyth's polygenist hypothesis on human origin and diversity from different families of primates (for example, Malaysians from orangutans and blacks from gorillas). Blyth (1867) tells Darwin,

The marked resemblance in facial expression of the Orang-utan to the human Malay of its native region, as that of the Gorilla to the Negro, is most striking, & what does this mean? Unless a divergence of the anthropoid type prior to the specialization of the human peculiarities, which however would imply a parallel series of at least two primary lines of human descent which seems hardly probable; & moreover we must bear in mind the singular facial resemblance of the *Lagothrix Humboldtii* (a *platyrrhine* form) to the negro, wherein the resemblance can hardly be other than accidental. The accompanying diagram will illustrate what I suggest (rather than *maintain*).

In response, Darwin wrote to Blyth on February 23, 1867:

I am thinking of writing a short essay on Man & have consequently been much struck with your remarks on the Orang. Do you know C. Vogt's nearly similar remarks on the origin of Man from distinct Ape-families, founded on Gratiolet's observations on the brain? I think you cannot object to my cautiously alluding to your observation on the similarity of the Orang & Malay &c: I think the similarity must be accidental... (Darwin, 1867).

It was perhaps Samuel George Morton's efforts to provide empirical evidence to affirm the thesis of inequality and the separate origins of human races that strongly drove the polygenist thesis of races (Gould, 1996). "Polygenists believed that each human race had originated in its own center of creation and that each therefore belonged in its own separate, natural homeland" (Jackson, Weidman, 2004, p.30). Thus, polygenism became (not overnight but very gradually and unevenly) a central ideological component for defenders of racial inequality and slavery.¹ Nonetheless, this does not mean that most naturalists had converted to polygenism, although the notion had major proponents in France, England and the United States such as Charles White, William F. Edwards, Paul Broca, Josiah Nott, George Gliddon and, of course, Samuel Morton.

Here it is interesting to point out some historical curiosities and ironies. While the slave trade saw its boom at the end of eighteenth century, the abolitionist movements also began to emerge, causing the slave trade to be slowly and gradually abolished in the newly-created colonies and nation-states during the nineteenth century. However, also in the age of abolition "scientific obsession with racial differences took hold," and the era of racial typology began (Jackson, Weidman, 2004, p.34) (Figure 4).

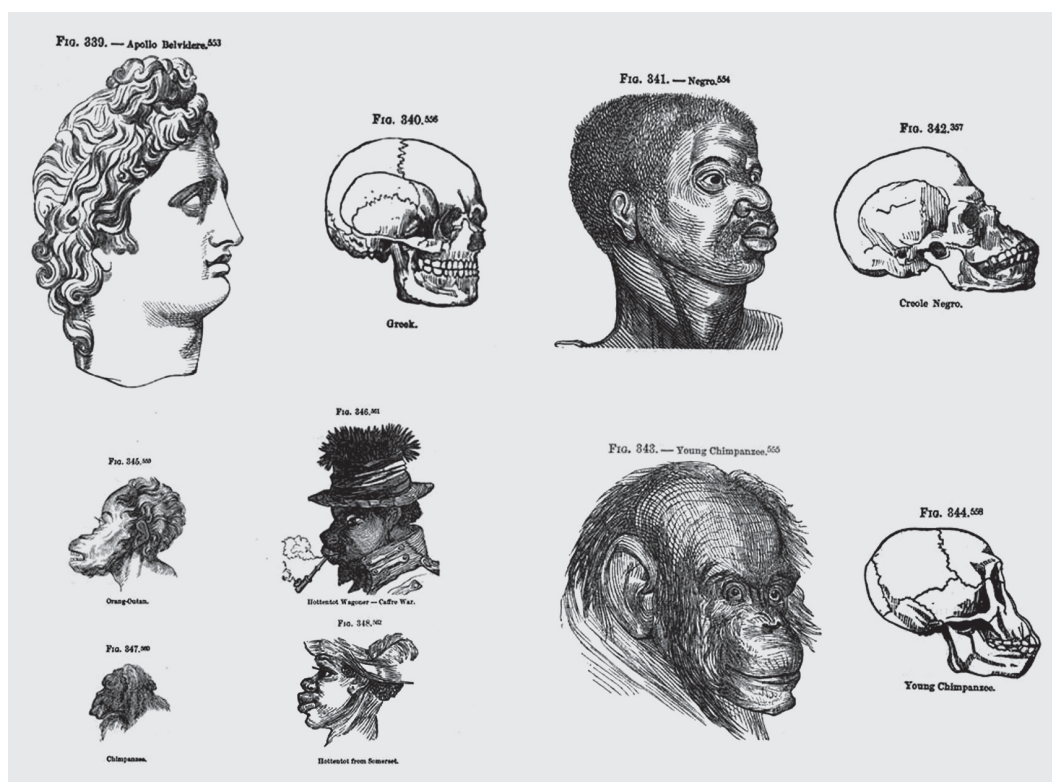


Figure 4: "Types of mankind or ethnological researches, based upon the ancient monuments, paintings, sculptures, and crania of races, and upon their natural, geographical, philological, and biblical history" (Nott, Gliddon, 1854) (J.C. Nott and Geo. R. Gliddon/Google Books).

Keeping in mind that questions related to racial theories adapted differently to different national and/or imperial contexts (Bancel, David, Thomas, 2014), it is interesting to consider Mexico's local framework. In Mexico, the process of racialization began early in the eighteenth century as means of conferring legitimacy on the hierarchization of society. It is not yet clear whether the study of the "physical, intellectual and moral" bearing of the indigenous peoples of New Spain had the same spirit as the one carried out in the United States which was meant to establish a scientific basis for the study of non-European peoples (for example, Samuel Morton's study of his huge cranium collection). However, "since the sixteenth century, Spaniards had transferred their own social schema to their colonies. The subordination of state to church and the ideology of *limpieza de sangre* [blood purity] where the absence of Jewish or Muslim blood defined an honorable Old Christian, were factors in Spain's hierarchically organized society" (Katzew, 2004, p.39). By the mid-eighteenth century, there was a perfectly differentiated caste system in New Spain, and its visual apparatus was already institutionalized. What can be seen in these images of mestizos and other racial groups is the way in which developing visual technologies in late eighteenth and early nineteenth century (technologies that facilitate contemporary theories of racial science) work to define and illustrate for Novohispanics what race, mestizo, and specifically "the other" meant (Figure 5).



Figure 5: Casta painting showing a *Mestizo* resulting from the union of a male Spaniard with an indigenous woman (Cabrera, 1763)

This caste system created by the Spaniards, based on the pre-racist theory called the “ideology of blood purity,” was configured by the different crosses which were possible in the Americas between the three great racial trunks: indigenous, European, and African (Figure 6).



Figure 6: Depiction of the casta system in Mexico (Ignacio María Barreda, “Las castas Mexicanas”, 1776)

The scheme imposed by the conquerors was hierarchical, and configured by the criteria of feudal roots from Europe to increasingly decrease the rights of descendants. Some of the Mexican castes included: *Creole* (Spanish born in New Spain); *Mestizo* (mixed indigenous and European); *Castizo* (mixed *mestizo* and European); *Zambo* (mixed African and indigenous); and *Mulato* (African and European).

In contrast to both baroque conceptions and illustrations of the races in the beautiful *casta* paintings of the colonial period, Mexican Independence (1810-1821) brought with it a simplified view of these classifications; for example, a statistic from 1889 reduced the number of races to four (mestizos, Indians, "Europeans," and blacks). The practice of relating races with food, such as Europeans with wheat, Americans with corn, and Asians with rice, was also common at the end of nineteenth century, as seen in an example from mentioned by the positivist Francisco Bulnes (Figure 7).

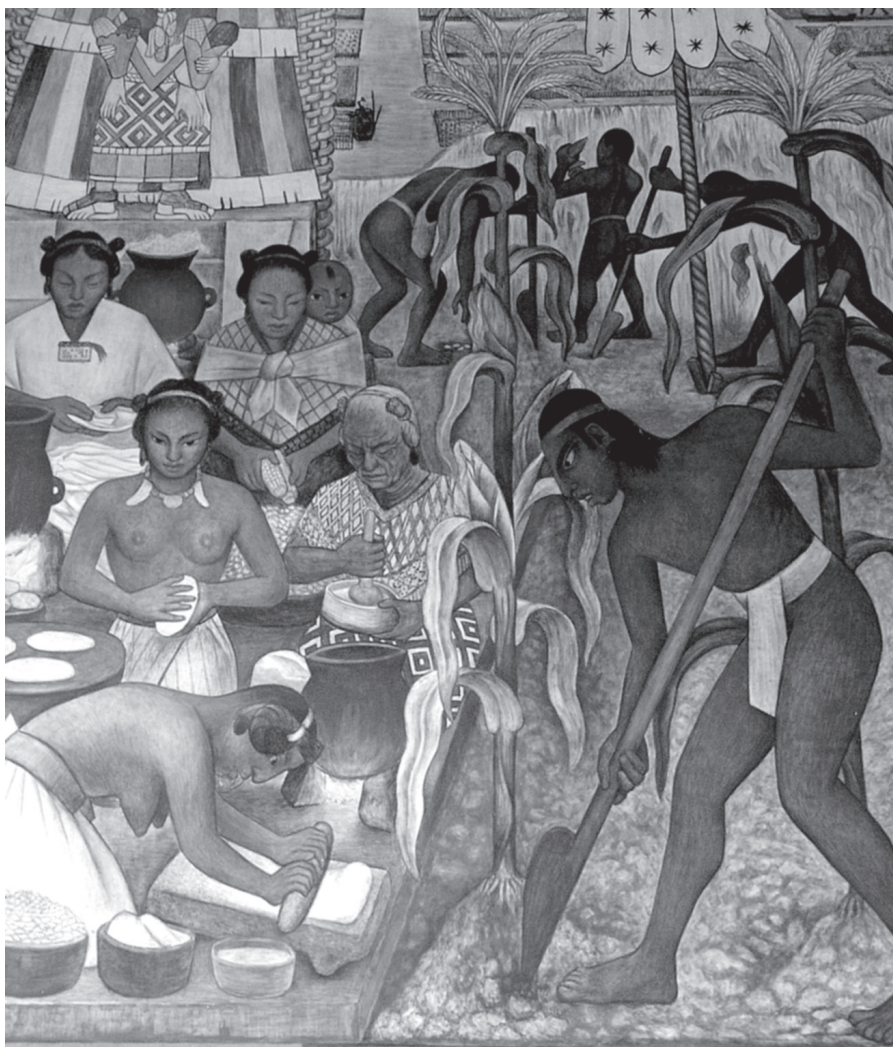


Figure 7: Maize people (Fragment of mural by Diego Rivera in the Palacio Nacional, Mexico City, 1929)

But at the same time in nineteenth-century Mexico, efforts began to racially homogenize the country, since the ruling elites decided that the indigenous world had to be transformed so it could be integrated into the newly developed project of nation. This complicated enterprise was achieved by establishing what the “Mexican” type had to be. Some people defended the idea of whitening and homogenization, but liberals like Ignacio Ramírez (1889, p.191) underscored the importance of recognizing Mexico as a heterogeneous nation composed of a multitude of indigenous peoples as fundamental for achieving the ideals of independence. This recognition of racial diversity made it clear that the “Mexican” type had to be the brown mestizo, which “implied incorporating the mestizo body of the rest of the nation into the indigenous population through biological crosses and educational acculturation” (López-Beltrán, García, 2013).

The Mexican scenario

As Juárez-Barrera and Bueno-Hernández (2017) state, by the end of the 1870s some ideas from biology and anthropology fully entered the discussion about the indigenous people of Mexico, allowing us to fully appreciate the dynamics of scientific practices both globally and locally by noting the role of transnational exchange networks and the circulation of scientific knowledge, people, artifacts and practices.

In Mexico, attempts to formalize physical anthropology in the late nineteenth century were pushed forward by the French through the Scientific, Literary and Artistic Commission of Mexico. At that time, scholars from varied disciplines who were mainly interested in anatomical, hereditary, hygiene, pathological, and physiological studies of Mexican populations began to establish the foundations of what would eventually become the field of physical anthropology (Vera Cortéz, 2017). The problems that began to be addressed in this foundational moment in Mexican anthropology can be grouped into three categories: discussions on the nature of the Mexican Indian, the ancestry of American populations and their origin, and criminal anthropology. Although these themes were rooted in interests shared with global physical anthropology, the “Indian problem” is interestingly local, because the concern for “the Other” that Europeans had since the dawn of imperialism and colonization was based on distant beings that did not represent a problem in their homelands. However, for Mexican anthropologists the Indian problem was right there in the territory, “there was no need to go overseas to celebrate that meeting” (Vera Cortéz, 2017, p.12), which is one of the main reasons Mexican anthropologists were obsessed with the search for the physical type of the Mexican Indian.

As for whether human differences implied a shared origin of human beings, in late-nineteenth-century Mexico

the theories of Lamarck and Darwin, the mono and polygenist theses as well as the theory about racial degeneration and its counterpart, the mestizo vigor, were discussed in intellectual circles. From these debates, some characters of the Mexican intelligentsia adapted those ideas to a progressive vision of miscegenation, converting them in central elements of the discourse that they elaborated about the new nation (Vera Cortéz, 2017, p.4).

In short, the predominant idea for saving the disadvantage represented by a heterogeneous, disintegrated, and dispersed Mexican population was to promote racial mixing and grant greater importance to the mestizo as a symbol of national identity. During the twentieth century, Mexicans came to be almost entirely identified as mestizos (Bartra, 2005).

The fact that the mestizo hoisted the identity of the Mexican contrasted with the hardening of scientific racism which was strongly promoted by Herbert Spencer, from its beginnings but especially during the first decades of the twentieth century. In this way, part of evolutionary thought was transformed into a significant ideology which maintained that evolution was a struggle between races, with Nordics or Indo-Germans superior above all (Figure 8).



Figure 8: Illustration by Gustav Müller (Haeckel, 1868). Its intention was to show the affinity between the “lowest humans” and “highest apes.” From top to bottom, the heads represent the Indo-German, Chinese, Fuegian, Australian Negro, African Negro, Tasmanian, gorilla, chimpanzee, orang, gibbon, proboscis monkey, and mandrill

These transnational trends were met with strong local resistance. The Mexican intelligentsia began to fight these derogatory visions of miscegenation and of the nature of mestizos employing “the same western scientific theories (geographic, medical, and anthropological) to construct more benign interpretations of the quality of the original non-European races (especially indigenous ones), and positive versions of the effects of *mestizaje*” (Stepan, 1991; Nieto Olarte, 2007; López-Beltrán, quoted in López-Beltrán, García, 2013).

Once the Mexican population was established as a mixture of races and became a fundamental part of the Mexican social and politic identity in twentieth century, the enterprise of understanding and determining the characteristics and processes that occur when races mix (for example, in skin and eye color, skull shape, hair and blood type etc.) became imperative. The big question for the brown Mexican mestizo was about uniformity, since the main category of social analysis was racial identity rather than cultural.

After the amazing changes in the life sciences in general and biology in particular (particularly in terms of technology, raw materials, alliances, and concerns after Second World War), racial mixing began to be understood as a complex biocultural process that could first be addressed through biomedicine, and later through genomic science. One of subsequent turning points was that racial segregation became absolute and worryingly evident, and the problem of race turned political and polemical, not only for the moral values associated with the concept but because of related prejudice. Science then started making efforts to demolish racism by showing that races do not exist among humans.

In 1950, the United Nations Educational, Scientific and Cultural Organization (Unesco) published a Statement on Race, declaring that

Scientists have reached general agreement in recognizing that mankind is one: that all men belong to the same species, homo sapiens. From the biological standpoint, the species homo sapiens is made up of a number of populations, each one of which differs from the others in the frequency of one or more genes. Such genes, responsible for the hereditary differences between men, are always few when compared to the whole genetic constitution of man and to the vast number of genes common to all human beings regardless of the population to which they belong. This means that the likenesses among men are far greater than their differences. (Unesco, 1950, p.1).

With regard to biomedical and genetic knowledge in Mexico during the second half of the twentieth century, these disciplines (as in every other part of the globe) showed that “although humans are sometimes divided into races, the morphological variation between them is not indicative of major differences in DNA... Furthermore, the DNA of two humans chosen at random generally varies less than other types of hominids such as chimpanzees and orangutans” (Bauman, Bohannon, 2017, p.92)

Paradoxically, this post-war time represents the beginning of efforts to delimit the existence of the Mexican mestizo due to the apparent ability to characterize it genetically; in other words, the possibility of finding molecular and genetic criteria for identifying the supposed essential physical and hereditary characteristics of this group. According to Barahona, the first research in Mexico into genetic variants of the different mestizo and Amerindian subpopulations used techniques developed in European countries: creating collections of data and molecules, using molecular markers and reactions, and applying serological, immunological and electrophoresis techniques (Barahona, 2009). In Mexico, geneticists like Rubén Lisker and Alfonso León de Garay investigated human populations to reveal the markers of *mestizaje* in terms of the frequency of blood groups, molecular

variants, (hemoglobins) and the G6PD enzyme (Glucose-6-phosphate dehydrogenase of erythrocytes) (Barahona, 2009).

At the dawn of the twenty-first century, as great hopes were placed on the new technologies for massive DNA sequencing that made the Human Genome Project possible, the Mexican National Institute of Genomic Medicine (Instituto Nacional de Medicina Genómica, INMEGEN) was created in 2004. In its own words,

INMEGEN is a national and international leader in genomic research and its main objective is to contribute to the health care of Mexicans through the development of scientific research projects with cutting-edge technology, training of excellent human resources and generation of genomic applications innovative to improve health care, adhering to universal ethical principles and respect for human rights (INMEGEN, 2004).

The creation of INMEGEN responded (if very late) to the optimism of the Cold War related to the possibilities of new technologies in genetics and biomedicine. Although the period known as the Cold War spans the late 1940s to 1989, when the Berlin Wall fell, INMEGEN can be described as part of the context of the post-war period that laid the foundations for the development of contemporary science, with its particular concerns and ways of dealing with them. One such concern was understanding the genetic constitution of the mestizo in order to combat its particular vulnerabilities (such as obesity and diabetes) from its very molecular constitution.

López-Beltrán and Vergara Silva (2013) showed that astonishingly for historians and philosophers of science, Mexican researchers in genomics have made the mestizo their main object of study for scientific as well as ideological reasons. By trying to establish patterns of *mestizaje* and percentage of ancestry, the debate about the biological bases of human races is alive and kicking in Mexico, and in the minds of many people around the world. In his book *Race and reality: what everyone should know about our biological diversity*, Guy P. Harrison (2010, p.5) wrote:

One day in the 1980s, I sat in the front row in my first undergraduate anthropology class, eager to learn more about this bizarre and fascinating species I was born into. But I got more than I expected that day as I heard for the first time that biological races are not real. After hearing several perfectly sensible reasons why vast biological categories don't work very well, I started to feel betrayed by my society. 'Why am I just hearing this now? ... Why didn't somebody tell me this in elementary school? ... I never should have made it through twelve years of schooling before entering a university, without ever hearing the important news that most anthropologists reject the concept of biological races.'

How has the visual economy responded to the retreat of scientific racism in Mexico? Did the Mexican mestizo move to the center of basic education in order to shape Mexican identity during the second half of the twentieth century? Did educators of that time pay attention to the Unesco recommendations?

The resulting Mexican popular visual culture

Janet Browne (2009) has shown the importance of looking at both textual and non-textual non-scientific realms to understand how a scientific concept, theory, or idea meets society. In this sense, studying what is shown in educational materials such as textbooks is a powerful vehicle for obtaining information about educational practices and policies, as well as the dominant values and ideology from the periods in which they were developed (including the validation or invalidation of important scientific contributions). Furthermore, the influence of textbooks in shaping the perception of students (of themselves as well as the world around them) should not be underestimated. Various studies have shown that textbooks contribute to the creation and solidification of scientific, historical, national, and individual identity, as well as civic values (Heyneman, Farrell, Sepúlveda, 1994; Hurd, 2002; Flores, Barahona, 2003; Lewis, 2008). In Mexico they occupy a fundamental position in basic education, since they are free and universal. For example, 2.7 million copies of the natural sciences textbook for sixth-year students are published each year.

Free universal textbooks in Mexico were born of the post-revolutionary Mexican state; one of its imperatives was to constitute the nation's identity and consolidate national unity, which above all meant cultural homogeneity. At that time, there was the idea that a national state had to have a common national culture within the conception of a homeland and a nation. The 1921 creation of the Secretariat of Public Education led to the Universal and Free Textbook project, which meant that all Mexican children who attended elementary school would utilize the same texts regardless of socioeconomic status or ethnicity, whether they lived in the country or in the city.

It was finally in 1959 that the National Commission of Free Textbooks (CONALITEG) was established to standardize education in Mexico and, in doing so, prevent dropouts, absences, and illiteracy (which in 1953 was 42%), as well as end discussions on the nature (compulsory or not), contents, and ideology of textbooks. On September 1, 1959, President López Mateos declared in his first government report that "in a country of so many disinherited, free primary education involves the granting of textbooks: we have resolved that the Government donate them to the children of Mexico." The first free universal textbooks first appeared in 1960. From then on, the Mexican state would oversee decision-making policies on what children should know, as well as the values and criteria involved (Torrens, Barahona, 2017).

With these criteria stated, and keeping in mind that in the twentieth century nearly all Mexicans identified as mestizos (Bartra, 2005), it is curious that the cover of the sixth-grade textbook "Nature and sciences" from 1955 shows a Caucasian male factory worker, very far from the "mestizo archetype" (Figure 9). However, in this particular book, the concept of race was not present.

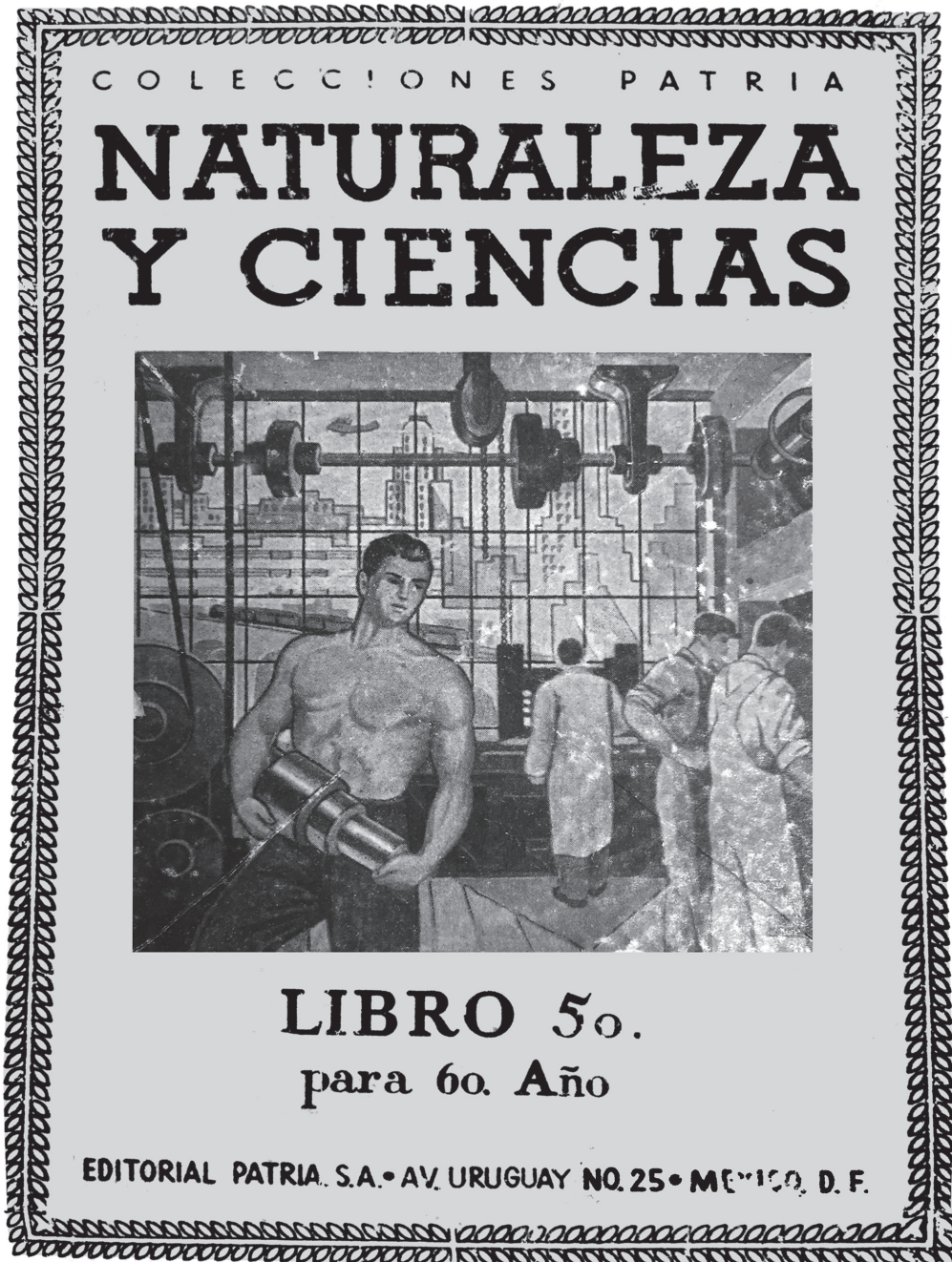


Figure 9: Cover of the textbook *Naturaleza y ciencias* (Nature and sciences) (Jáuregui, 1955)

In textbooks for secondary education (junior high school) from prestigious Spanish-language publishing houses such as Porrúa and Eclalsa, the theme of race during the 1960s and the 1970s was addressed at the end, right after the chapter dedicated to biological evolution. Having shown the ancestry of humans and their placement within the single species *Homo sapiens*, through Alfred Romer's iconic tree in his 1949 *Time, series and trends in animal evolution* (Romer, 1949) (Figure 10) (which presents a Caucasian man as the epitome of the evolutionary process), the text then begins to discuss the concept of race and different human groups.

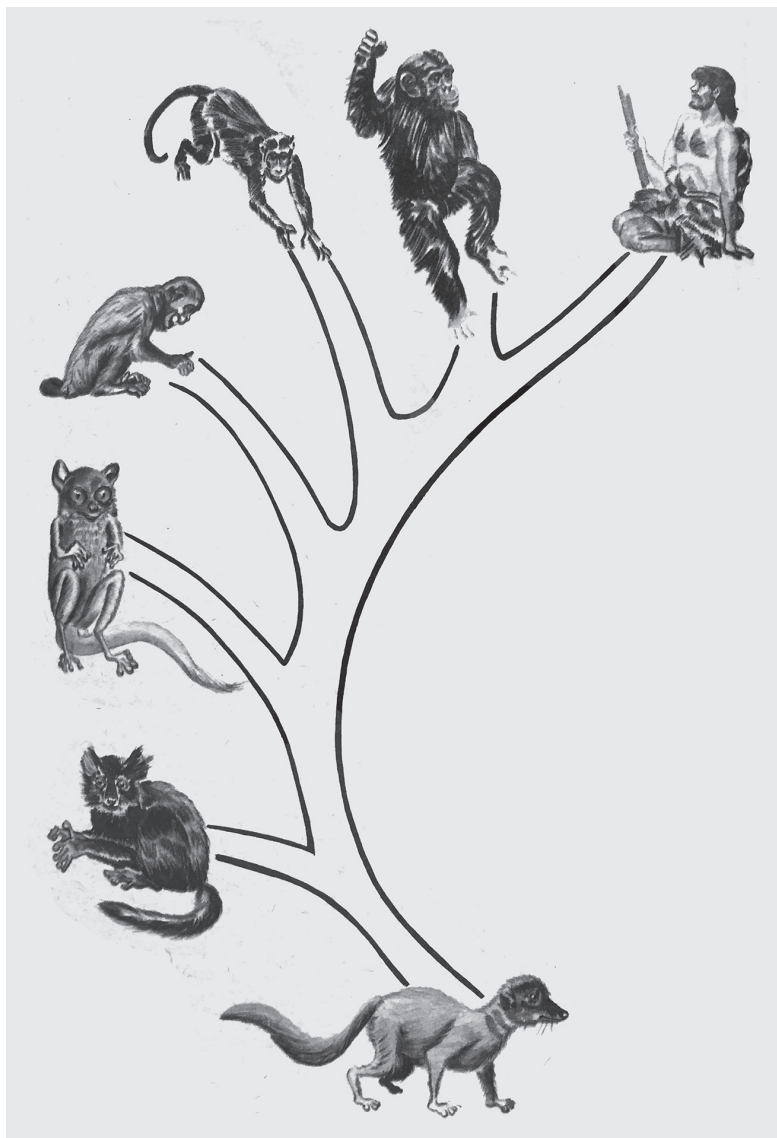


Figure 10: A simplified genealogical tree of primates (Romer, quoted in Contemporary Biology, 1962)

The text states the following:

The prevailing opinion today accepts that all human beings belong to a single species. It is also evident that within it there are groups with different characteristics, among which one of the most apparent is the color of the skin. These groups are called races. The prevailing opinion of anthropologists is that there are three basic human groups: Caucasoid, Mongoloid and Negroid, although some consider it convenient to increase to four (Australoids) for Aborigines of Australia (Contemporary Biology, 1962, p.413).

Caucasoids generally called 'white' have clear skin. The body hair is well developed and the blond or black hair is straight or curly. The Mongoloids are characterized by yellowish or reddish skin. The hair is sparse and the head is black, straight and rough [Figure 11]. The negroids have very dark skin, which can be in some like the color of the ebony, although dark brown in others. The nose is broad and flattened; the thick lips and the lower jaw prominent (Contemporary Biology, 1962, p. 415) [Figure 12].



Figure 11: Mongoloid race, according to Romer (Contemporary Biology, 1962, p.366)



Figure 12: Head of the "Hottentot Venus"
(Copy of the sculpture in the Natural History Museum of Paris)

The books then move to the distribution of the main human groups worldwide (Figure 13).



Figure 13: The distribution of the main human groups worldwide,
according to Mathew (Contemporary Biology, 1962, p.366)

Also important among Mexico's educational materials are texts known locally as "monographs." These uniquely Mexican pedagogical resources consist of thin sheets of paper measuring 31cm by 23cm, with colorful visual images in one side and related text on the other. These monographs are produced at very low cost and distributed widely, targeting children aged 6 to 15 (a group which comprises approximately 24,500,000 children). These educational materials are very important in Mexico, since most of these children are poor and many do not have access to books or computers; in many cases, monographs are the main or only means to conducting research on various topics.

Many of the images used during the Cold War (and even today) related to the topic of human evolution, human ancestry, and human variation in Mexican educational materials are reminiscent of the late eighteenth century, when scientific race theories were indistinguishable from the visual apparatus used to represent human varieties. The figures below are a few examples of how Caucasians or white men appear to be the pinnacle of the evolutionary process (Figures 14, 15, 16, and 17).



Figure 14: Representation of human evolution in Mexican monographs from the 1970s, which are still in use (El Homo..., n.d.)

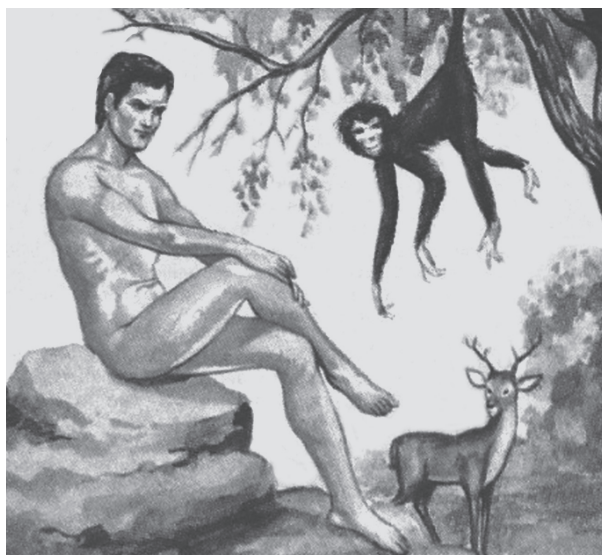


Figure 15: Representations of human evolution in Mexican monographs from the 1970s, which are still in use (El hombre, n.d.)

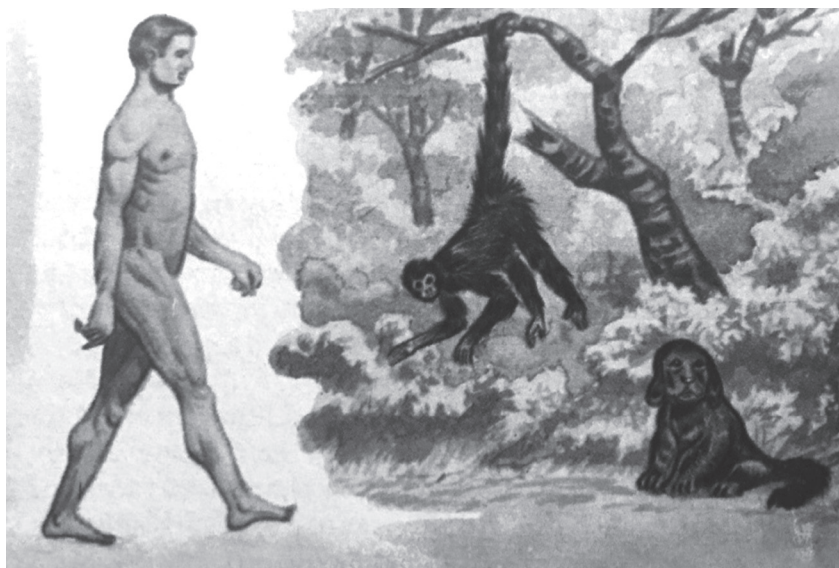


Figure 16: Representations of human evolution in Mexican monographs from the 1970s, which are still in use (El cuerpo..., n.d.)

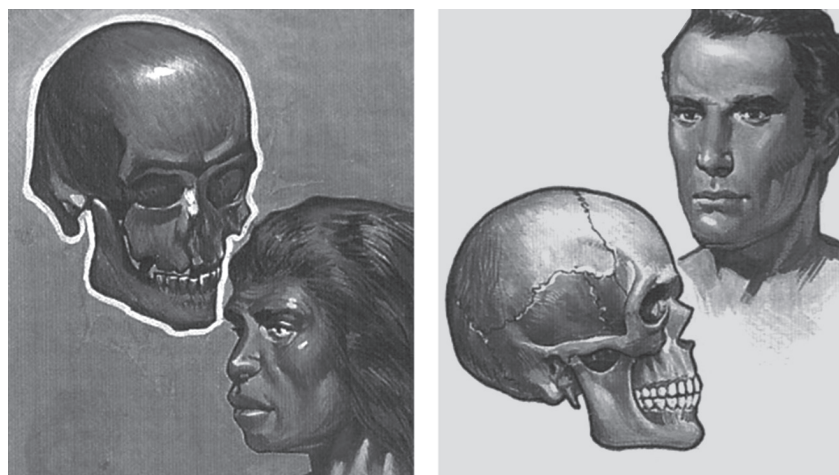


Figure 17: Representations of human evolution in Mexican monographs from the 1970s, which are still in use (Hombre de..., n.d.)

Final considerations

Discussions in the early nineteenth century about the differences and similarities between human beings and the rest of biological diversity laid the foundations for the relationship between biology and anthropology.

In the latter half of the eighteenth and early nineteenth century, numerous experiments and investigations were conducted to resolve the problem of the generation, bodily function, and diversity of beings. With the publication and subsequent acceptance of Darwinian theory, the life sciences began to look for more materialistic explanations

of these phenomena. Disciplines concerned with classifying biological diversity began to seek methods to base it on kinship relations between species rather than degrees of similarities or differences. This change in the classification of natural diversity had its parallel in anthropology, which looked for techniques to identify human diversity and establish differences between populations as natural classes. Since approximately the beginning of the nineteenth century, ideas about race shifted from a main role for the environment in molding of human differences to considering these differences as permanent and innate. Therefore, although racial scientific theories were impregnated with this search for materialistic explanations, ideas about race and the term itself were strongly tied to value judgments. Paradoxically, although the concept of races arose at the time when modern science was established, with its admiration for evidence and facts and not values, racial scientific theories always carried a moral charge which would seem to violate what is considered good science (Jackson, Weidman, 2004). As heir to the significant naturalistic concern for classification and establishing hierarchies, racial theories allowed the classification of human beings in an ascending hierarchy, which was convenient for the European colonial system. Once the notion of race was seen as the cause of cultural differences, it acquired immense political and social power, and efforts to dismantle this power only began to appear after Second World War. In other words, the beginning of the twentieth century witnessed both the institutionalization of racism and the beginning of its retreat in science, thanks to genetics and criticism of eugenics by certain scholars. Eventually, the use of the term “race” as a biological category ceased, and only remained in anthropology as a methodological tool. Currently there is a major discussion about the use of the term, and authors such as Templeton (2013) and Gannett (2014) suggest that referring to human diversity with the category of “race” includes social, historical, and political considerations that should be considered and weighed.

Importantly, many scientific images from the past are still being used to teach Mexican children, perpetuating racial stereotypes and consequently denying these children their identity. Monographs and perhaps even textbooks are charged with ideological content that appears to have not been revised in many years.

The hierarchical connotation of differences which is present in the representation of human diversity has resulted in the abandonment of the term race in favor of different concepts like ethnicity or populations to describe human variation. Although there is no real ontological commitment to the concept of race, at least in certain scientific circles the term is still used widely to address undeniable visible differences. In other words, it is still a pragmatic concept.

However, the powerful visual machinery related to discourses of racial superiority in the second half of the twentieth century became engraved in the collective imagination of many. Even today, an effective system of discrimination and socio-racial prejudice is still very much in place in Mexico, partially based on the numerous scientific images which are still being used to teach Mexican children; these images deny their identity and are charged with ideological and even racist content which is severely outdated.

It should also be noted that almost all reconstructions of the human past in Mexican educational materials tend to stereotype gender roles and to depict women far less often

than men, and always in the family domain, which implicitly defines their roles through their relationships with men. What does this say about female identity?

In 1991, Anderson pioneered a view of nation-states as imagined communities “because the members of even the smallest nation will never know most of their fellow members, meet them or even hear of them, yet in the mind of each lives the image of their communion” (p.6). This view presents imagination as a social and discursive process, emphasizing the fact that those in power often do the imagining for the rest of the citizens, offering them certain identity options and leaving other options “unimaginable.” With this in mind, the identities available for Mexican children have a tremendous power to affect not only their learning outcomes, but their views of themselves.

Today there is a widespread assumption that Mexico is living different times, and great emphasis on building not a single nation but a plural one. One example is the 1992 recognition of an addendum to Article 4 of the Constitution, describing the plural character of the nation. Other examples include the signing of Convention 169 of the International Labor Organization, and other measures in different states, such as producing textbooks in indigenous languages. So in a twenty-first-century nation that is moving toward plurality and a relationship of equity between its different cultural groups, how do educational materials contribute, along with the visual culture they produce? This question is undoubtedly very important in order to achieve equal circumstances in different environments (labor, educational, social and cultural) and for access to scientific knowledge, which is fundamental for any democracy, among other reasons.

NOTE

¹ Between 1662 and 1867, the Atlantic slave trade brought more than nine million Africans to the Americas (Jackson, Weidman, 2004).

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