Physical anthropology and the description of the 'savage' in the Brazilian Anthropological Exhibition of 1882

Antropologia física e a descrição do 'selvagem' na Exposição Antropológica Brasileira de 1882

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Abstract

This paper discusses attempts to popularize scientific knowledge about anthropology through exhibitions of natives in the United States and Brazil from the nineteenth century to the beginnings of the twentieth century. In the First Brazilian Anthropological Exposition (Rio de Janeiro, 1882), a group of Botocudos was characterized in a manner that can be related to the reification of the myth of the savage, an important part of the European culture that played a significant role in the construction of anthropological knowledge in the nineteenth century. From the analyses of such exhibitions, we derive implications for science popularization and education, concerning the ideological undertones of scientific knowledge.

Keywords: anthropological exhibitions; scientific racism; physical anthropology; indigenous people; science popularization.

Resumo

Analisa tentativas de popularizar o conhecimento científico em antropologia por meio da exibição de nativos nos Estados Unidos e no Brasil, no século XX e no começo do XX. Focaliza a Primeira Exposição Antropológica Brasileira (Rio de Janeiro, 1882), em que foi apresentado um grupo de Botocudos, de modo relacionável à reificação do mito do selvagem, importante componente da cultura europeia e mais especificamente da construção do conhecimento antropológico no Oitocentos. As conclusões concernem à popularização da ciência e, por extensão, à educação em ciência, em especial quanto aos valores ideológicos subjacentes ao conhecimento científico.

Palavras-chave: exposições antropológicas; racismo científico; antropologia física; populações indígenas; popularização da ciência.

The scientific animalization of 'the other': the characterization of 'non-Europeans' as semi-animals by nineteenth century physical anthropology

During the second half of the nineteenth century, 'non-Caucasian' populations were usually described as inferior human varieties from an evolutionary point of view (Sánchez Arteaga, 2006a, 2007a). According to polygenism, a powerful bio-anthropological school that postulated the existence of a number of contemporary different human species, it had been clearly established by the most rigorous taxonomic studies that many of the 'non-Caucasian' populations were evolutionarily closer to the great apes than to the 'white man'. For example, the great German biologist Karl Vogt (1878), who, by the way, believed that contemporary slave plantations in the United States could be used as formidable experimental laboratories "demonstrating the best conditions to create a modified race" (p.578-579)[1], concisely explained this point of view in his famous *Lessons on man*, one of the first books dealing with human evolution from a strictly biological perspective:

> The difference between two well characterized species of monkeys is never bigger, and is frequently smaller, than those that can be appreciated between two human races. This comparison leads us, inevitably, to the conclusion that it is necessary to consider human races as real species, or, on the other side, to admit that what we consider as different monkey species are just simple varieties of the same species (p.579).

According to many of the best physical anthropologists of the period, numerous ethnic groups seemed to be unavoidably condemned by biological laws to perish in an interracial fight for survival against the 'civilized human races' (Haller, Jr., 1995). According to the polygenists, many of their anatomical features resembled animal characteristics better than those corresponding to 'civilized man'[2]. Stigmatized by science as atavistic, semi 'ape-men', the so called 'inferior races' seemed to be compelled by nature to live in a clearly inferior evolutionary stage with respect to the Europeans.

The atavism theory – which was based on the assumption that some anatomical traits represented an evolutionary throwback to primitive biological stages – seemed to be confirmed with each new study on the comparative anatomy of the human races. This evolutionary setback could be allegedly observed in innumerable traits of the non-Europeans' anatomy, from the feet up to the face, where, considering features such as prognatism, hair type, or the flattening of the nose, among others, one could describe many "inferior races falling into the general laws of animality" (Ariza, 1874, p.183). An enormous ensemble of anatomical traits in non-European populations was described as 'brutal' or 'animal-like' by some of the best physical anthropologists of the time. According to Rafael Ariza, former president of the Spanish Anthropological Society, "their arm length, leg emaciation, the flattening of their soles, the constant semiflexion of the savage's knees, etc., make them appear closer to the monkey than to man in the evolutionary scale" (p.184).

As a result, a scientific animalization of *the other*, represented by non-European populations for the Eurocentric physical anthropology of the period, reached its maximum degree of scientific rationalization, its theoretical climax, in the last part of the nineteenth century. Taking this into account, it may not seem so surprising that during the last half of the nineteenth century human beings were so commonly exhibited in zoological

institutions as well as in anthropological congresses and world exhibitions in a manner that showed many similarities with animal displays, and were even integrated with them.

According to the contemporary Spanish anthropologist and pre-historian Juan Vilanova (1888), the habit of displaying human native exhibitions at anthropological congresses or world fairs began when the so-called civilized nations understood the pedagogic value of showing to the public

> the contrast existing between light and darkness, between the already developed civilizations and the rudimentary or developing ones, between humanity in its infancy, ignorant, uncertain, forgetful, submissive to Nature, oppressed by itself, taking a step forward only to fall back the next day … and adult stages of humanity, ennobled by science, fecundated by liberty, sanctified by work, and walking with firm steps along the unlimited paths of progress (p.397).

In this paper, we discuss one paradigmatic example of this kind of scientific exhibition, which took place in Brazil during the last half of the nineteenth century: the First Brazilian Anthropological Exposition (*Primeira Exposição Antropológica Brasileira*), which was held in Rio de Janeiro in 1882, by the Brazilian National Museum. But first we will take a brief look at a very famous case, that of Ota Benga, in the US.

Native exhibitions and the 'savage' popularization of physical anthropology in the second half of the nineteenth century[3]

In 1904, the American missionary Doctor Samuel Philips Verner signed a contract with the St. Louis World Fair Company to travel to West Africa and then bring back a group of pygmies to the United States. They thought these indigenous people would create a sensational effect if they could be shown to the public in the huge exhibition that the city of St. Louis was preparing for that year. Once in Africa, Verner negotiated the export of nine men with a local slave trader and brought them successfully to the United States. Among these men was Ota Benga, a Batwa native who, before being captured as a slave, had already survived the terrible slaughter of his people at the hands of the *Force Publique* – the African army of Belgian King Leopold II.

After a few months travelling and being exposed to the public in a number of exhibitions held in different parts of the United States, Ota Benga was installed in a cage at the Bronx Zoo in New York City, a place that had been suggested by the director of the American Museum of Natural History, Hermon Bumpus, as an appropriate location for the African native (Figure 1). There, Ota Benga was exhibited in the Monkey House, alongside with an orangutan as his only 'housemate'.[4] Ota Benga had been allowed by the Zoo's authorities to hang his hammock on the cage. In return, he was ordered to perform archery exhibitions for the visiting public every day. Besides Hermon Bumpus, both the director of the Bronx Zoo and some other prominent contemporary naturalists, such as the American conservationist Madison Grant[5], expressed their satisfaction regarding Ota Benga's exhibition, and considered it as one of the most instructive entertainments devoted to the public's scientific education offered by that zoological institution. On the first day of his exhibition, September 8, 1906, a plaque in front of Ota Benga's cage offered the Zoo

visitor the following explanation about that valuable 'specimen': "The African Pigmy, 'Ota Benga'. Age, 23 years. Height, 4 feet 11 inches. Weight, 103 pounds. Brought from the Kasai River, Congo Free State, South Central Africa, by Dr. Samuel P. Verner. Exhibited each afternoon during September" (Man and monkey..., Sept. 10, 1906, p.1).

Today, we may find Ota Benga's story completely illogical and under no circumstances could we try to find a scientific justification for this kind of popularization of physical anthropology. However, throughout the second half of the nineteenth century and the beginning of the twentieth century, physical anthropology provided a theoretical framework that could serve to legitimize such human exhibitions (Haller, Jr., 1995; Sánchez Arteaga, 2006b, 2007a, 2007b). In fact, this approach to the popularization of scientific knowledge was quite common throughout that period in the field of physical anthropology (e.g. Lindfors, 1999; Bancel et al., 2002; Abbatista, 2005).

As a matter of fact, the tradition of exhibiting non-Western peoples in Europe goes back centuries (Rothfels, 2002, p.86). From Roman exhibits of Asian and African slaves, the practice of showing exotic natives when coming back to Europe had become an almost ordinary habit for all kinds of conquerors and/or explorers throughout history, from Columbus' and Vespucci's Indians to Cook's Tahitians and Robert Fitzroy's (the *Beagle*'s captain) Fueguians. But for the first time in history, at the turn of the the twentieth

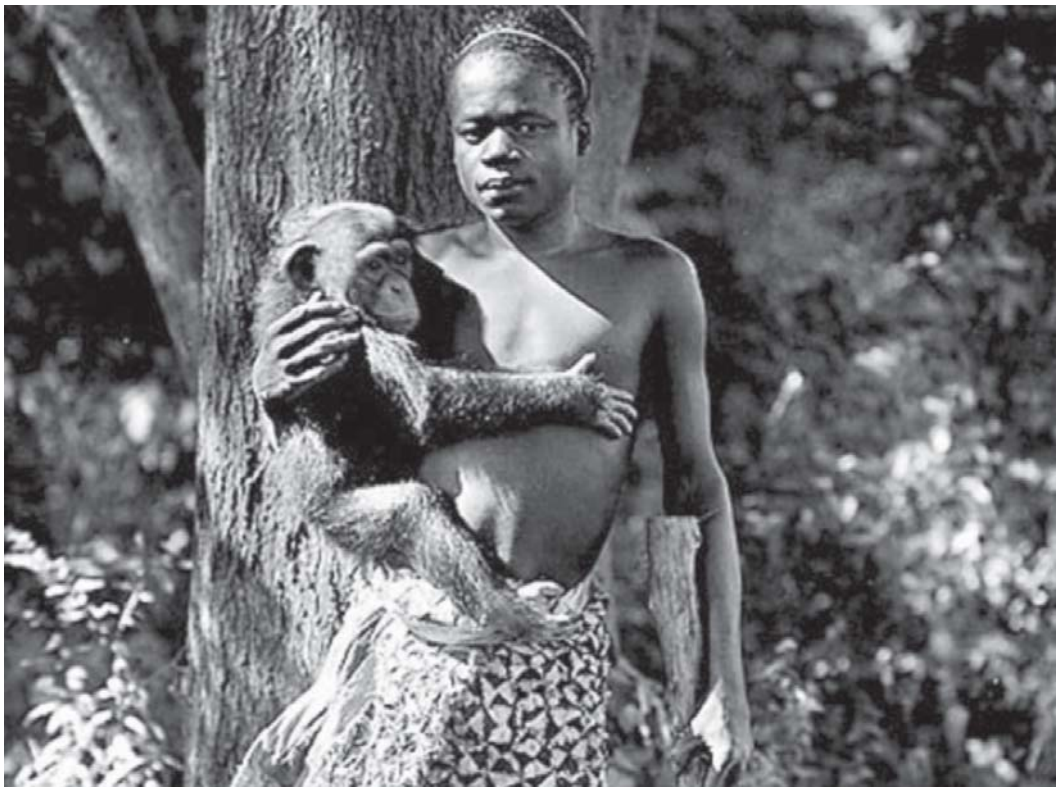

Figure 1: A portrait of Ota Benga in 1906, purportedly at the Bronx Zoo (An African pigmy, *Zoological Society Bulletin*, Oct. 1906, published by the New York Zoological Society)

century, 'people shows' – as they were known – began to be considered primarily as exhibitions of high scientific value: "For scientists of all kinds – not simply physical anthropologists and physicians, but ethnologists, linguists, musicologists, and all manner of specialists … the exhibits provided repeated opportunities to investigate little known peoples both without the expense and danger of travelling around the globe" (p.93). In this period, people shows even became a prosperous business for travelling entrepreneurs, such as the famous German businessman Carl Hagenbeck, whose exhibitions of native people from all over the world – primarily displayed in zoological gardens, with the support of numerous zoological and anthropological societies – had developed, in a few decades, "from a small 'Lapland' exhibit presented in the back court of the Hagenbeck property in Hamburg to huge productions touring all the major cities of Europe and patronized by hundreds of thousands of visitors" (p.86).

It is easy to understand, considering both of these factors – scientific interest and large business profits – that 'anthropological exhibitions' proliferated in all 'civilized nations', from the United States and Great Britain (Burton, 1983) to France (Bancel et al., 2002), Italy (Abbatista, 2005), Switzerland (Minder, 2003) and Germany (Rothfels, 2002). In some cases, such as in the French or British World Fairs, these people shows acquired really huge dimensions, trying to represent and display the global power of the great European Empires over the peoples of the whole world: "Following the example of the 1867 Exposition Universelle in Paris, which included *tableaux vivants* of North African subject peoples, British world's fairs … [such as] the Colonial and Indian exhibition of 1886 accommodated almost a hundred exotic representatives of the peoples of India, Burma, Senegal, Canada, Cyprus, South Africa, Malaya and Hong Kong" (Ritvo, 1997, p.125).

Nevertheless, recent historiography has focused primarily on European or North American examples of these 'scientific' and 'educational' exhibitions. In the following pages, we will describe a paradigmatic South American example, namely the First Brazilian Anthropological Exposition, which was held in Rio de Janeiro in 1882, by the Brazilian National Museum (Andermann, 2004).

The Brazilian Anthropological Exhibition of 1882

On July 29 1882, in the presence of the entire Brazilian Court (Andermann, s.d.), the National Museum of Rio de Janeiro opened a major exhibition, called *Primeira Exposição Antropológica Brasileira*, which displayed a huge number of objects and information about the aboriginal inhabitants of Brazil, addressing linguistic, historical, archeological, and ethnographic features of different indigenous groups (Nascimento, 1991; Monteiro, 1996; 2001, p.172-181). The main attraction offered by the exhibition, though, consisted in a group of Botocudos, a Brazilian native group, who were brought from the states of Goiás and Espírito Santo (Langer, Rankel, 2004) in order to be shown to the public for educational purposes, "in a simulated everyday-life environment" (Andermann, 2003, p.300). The National Museum also published a catalogue of the exhibition, the Brazilian anthropological exposition magazine, or *Revista da Exposição Antropológica Brasileira* (Figure 2), which contained, among other items, several scientific studies specifically devoted to the

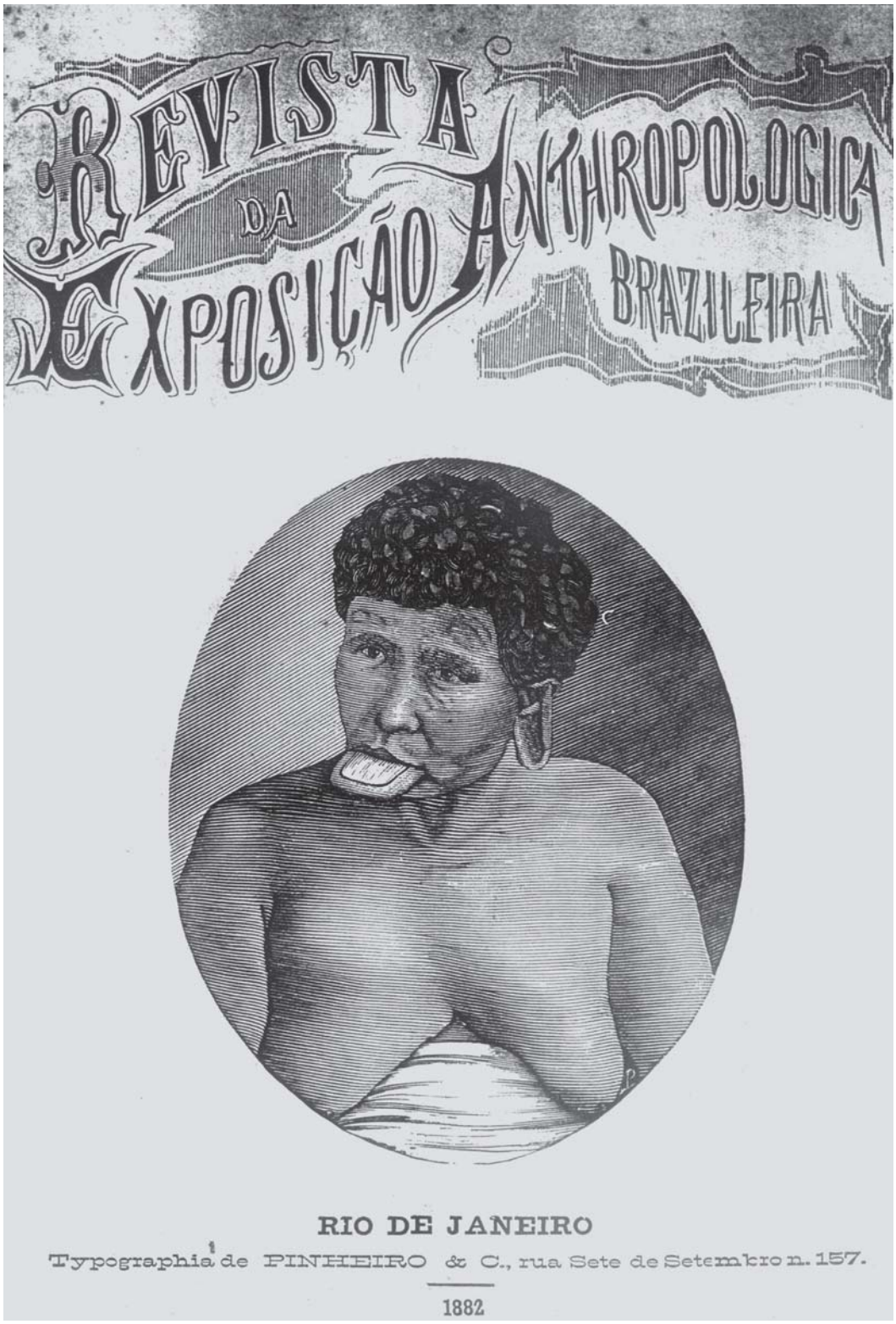

Figure 2: Over the last third of the nineteenth century, different anthropological exhibitions were held in many countries, where natives were exposed to the public as a main attraction. The image above shows the cover of the *Revista da Exposição Antropológica Brazileira* (Brazilian Anthropological Exposition Magazine). This exhibition was organized by the National Museum of Rio de Janeiro. A group of Botocudos were described within the exhibition as living fossils, current representatives of primitive stages in human evolution

anthropological description of that indigenous group from a biological point of view (Moraes Filho, 1882). As John Monteiro (2001, p.173) points out, the anthropological aspects of the exhibition were considered the most interesting from a scientific perspective: "The *Revista,* compiled by Mello Moraes Filho, presented a really diversified 'menu', offering to the reader historical, ethnographic, linguistic, and finally – the main dish, from the Museum's point of view – anthropological considerations, which in that period related both to the physical and moral characteristics of the human races."

Many of these anthropological works were written by some of the best experts in the country. The analyses of such scientific descriptions of the Botocudo natives can offer us some hints about the ideological commitment of Brazilian physical anthropology to the then contemporary racial hierarchies.

In the exhibition's catalogue, the Botocudo were systematically described as living fossils, as current representatives of primitive stages in human evolution, closer – in evolutionary terms – to the great apes than to the 'white man'. In this regard, it is significant that it was precisely a sample of Botocudo – and not people from any other tribe belonging to the Tupi-Guarani ethno-linguistic group – that was taken to Rio in order to be exhibited. Historically – at least since von Martius' classification of the Brazilian indigenous people (1845) – a clear and mythological demarcation had been established between the Tupi – who were thought of as perfect noble savages, participants in the genesis of the Brazilian Nation, to which they contributed with their blood and their language – and the Tapuia, considered to be barbarous, stupid, and grotesque savages at the lowest grade of civilization:

> For the Imperial intellectuals … the Tapuia Indians, frequently characterized as enemies instead of as allies, represented the treacherous savage of the *sertões* (as the Brazilian hinterlands are known), always menacing and interrupting the progress of civilization. They were situated at the opposite pole of the Tupi – the noble warrior who signed a peace and blood brotherhood with the colonizer (Monteiro, 2001, p.174).

If we consider that demarcation, it is not surprising that an indigenous people that did not belong to the Tupi-Guarani ethno-linguistic group, who, moreover, used wooden disks in their lips and ears, contributing to their exotic appearance, was chosen by the exhibition organizers as living representatives of the most primitive and brutalized hominids. In this regard, Ladislau de Souza Melo Neto (1882a, p.113-114) – as the National Museum's director, the main scientist responsible for the exhibition – expressed his authoritative opinion that

> When we carefully study the gradual descent of humanity, and we take into account all the superior evolutionary qualities acquired by the Indo-Germanic races – the highest expression of human improvement –, we find a bigger difference between the most educated and beautiful types of this race, and the most bestial and imperfect human groups, than, on the other hand, the distance between the latter and gorillas and chimpanzees.[6]

According to Ladislau Neto, there was a close evolutionary link between the contemporary indigenous races inhabiting Brazil and those pre-human hominids that had supposedly lived in the prehistoric Americas. More specifically, the then recent discovery of 'The skull of Lagoa Santa' in Brazil – an extremely old calotte from prehistoric ages –

was seen as putative proof, when compared with equivalent Quaternarian human remains from Europe, that indigenous tribes evolved independently in the New World, as an autochthonous hominid species, called *Homo americanus*. Sharing this same point of view, João Lacerda – deputy director of the National Museum –, argued that the Botocudos' cranial morphology was almost identical to that observed in the prehistoric skull of Lagoa Santa. Nevertheless, even though he considered the Botocudo people as one of the most 'brutalized' indigenous breeds in Brazil, Lacerda (1882a) asserted that they occupied a slightly higher position in the evolutionary scale of brain development compared with their ancestors from Lagoa Santa.

But this was not the only article characterizing the ethnic group of the Botocudo as current representatives of the primitive *Homo americanus*, thus explicitly describing them as another human species, separate from the 'white man'. Other works in the exhibition catalogue were focused on the unlikelihood of hybridization between those indigenous people and white Europeans, given the enormous biological distance separating those racial groups, as we will see below.

In another of the studies included in the catalogue, Ladislau Neto explained that the modern Botocudo Indians were the evolutionary product of a biological degenerative process. This same idea of a biological degeneration of the natives had been previously stated by many naturalists who had established contact with different Brazilian tribes, such as von Martius, Agassiz and Auguste de Saint-Hilaire, among others. In the second half of the nineteenth century, degenerative racial processes were diagnosed not only among the Indians, but also among the mixed offspring of blacks, Indians and whites that constituted most of the Brazilian population. Consequently, a generalized 'fear of degeneration' was found among the intellectual classes of the country (Santos 2002; Schwarcz, 1994, 1993).

With respect to the Botocudo, Ladislau Neto stated – differently from Lacerda – that the degenerative processes of their race had led them in present times to a lower biological and cultural level than that reached by their better developed ancestors, who, according to Ladislau Neto (Melo Neto, 1882b), evolved in the American continent perhaps during the Tertiary period: "For more than three centuries, all the lofty moral and physical characteristics of the American people – very probably, a collateral branch of the oldest sources of humanity – have turned off, one by one." As we see, Ladislau Neto even stated that science could not deny the possibility that the Botocudo were one of the oldest human groups in evolutionary terms. He supported his biological assertions on an argument taken from philology, stating the philological possibility that Sanskrit – the oldest known language, according to the linguistics of the time – had evolved from an older American source:

> If, according to some linguists, Quechua is a corruption of some military language closely related to Sanskrit – and this opinion is based on some glottic (sic) affinities between them –, why should it not be stated that, contrary to this assumption, Sanskrit could have evolved as a profound alteration of the ancient sources of the primitive language spoken by the men of the Andes (p.77-78).

In any event, according to Ladislau Neto, a clear degenerative evolutionary hierarchy could certainly be established from the ancient imperial civilizations of *Homo americanus* to the savages that still occupied the huge Brazilian jungles. This hierarchy – or natural scale ('scala naturae') – of American hominids would spread from the most sophisticated natives – such as the Incas, Mayas or Aztecs – to the most brutalized (such as the Botocudos themselves). Actually, in his own words, "all the gradations of a scale of progressive achievement, from the brave troglodyte to the worshipping Quechua, the industrious Aztec and the Maya" could be found (Melo Neto, 1882c, p.III).

Another of Lacerda's studies included in the exhibition's catalogue consisted of a thorough discussion of the dental anatomy of the Botocudo, which was compared to the Europeans' dental anatomy from an evolutionary point of view. The main conclusion was that a comparative analysis of the dental anatomy in those human groups reinforced the idea that they had evolved as different species from the very beginning. According to the deputy director of the National Museum, the conformation of the incisor teeth in the Botocudo was a specific feature of this American hominid. For Lacerda (1882b, p.92), his study corroborated "the ethnic unity of the peoples who inhabited the vast regions of the New World in prehistoric times and those native groups nowadays living in the same areas." But he also argued that the Indian dental anatomy clearly indicated their biological inferiority with respect to the 'white man', and their closer evolutionary proximity to the species of great apes:

> We believe that the overall shape of the teeth in the indigenous races of America can be considered as a biological feature of ethnic inferiority. When you see the entire anthropological collection … in the National Museum, at first glance some kind of animality printed on the teeth of these Native American skulls becomes apparent (p.91).

Lacerda also believed that, in the specific case of the Botocudo, their already brutal physical appearance was further reinforced by the special ornaments they used to deform their lips. This ethnic tradition would have caused "the Botocudo' physiognomy to present the most repulsive aspect" (Lacerda, 1882c, p.2). Moreover, he argues that "from a moral and intellectual point of view, Botocudo are the perfect example of a human race brought down to its deepest degree of inferiority. Some of them are still fond of the horrible practice of cannibalism, and only with great difficulty can they become adapted to a civilized environment" (p.2).

According to Lacerda, the mixture between the aboriginal native and the European had led to a humanitarian catastrophe in modern Brazil. Among the mestizo population of the Brazilian cities, one could frequently observe, according to him, numerous atavic reversions to almost simian evolutionary stages. These were ideas obviously related to the fear of degeneration of the Brazilian people that afflicted intellectuals of that time.

Ladislau Neto noted, in turn, that these atavic reversions of the 'hybrids' were manifested especially during their puberty, even in those who were almost white. But he also remarked that fortunately, in most cases, "this morbid condition was ephemeral" (Melo Neto, 1882d, p.5). Those evolutionary reversions observed during the puberty of the mestizos were accompanied by a whole range of biological changes in the oral mucosa, eyelids, lips,

nipples, and genitals, all of which acquired a very intense pigmentation. Moreover, he argues,

> there is also a conspicuous growth of the mouth and the nose, while at the same time, the chin retracts; then that disgusting odor appears in their axillary transpiration, called *cantinga*, their hair becomes curlier … and their facial angle suffers a decline. All these changes are accompanied by a sharp increase in their indolence, an excessive apathy, and a deeper state of alienation, or rather intellectual inactivity, similar to the stupid ineptitude of the *negro*. There is also a kind of libidinous instinct preceding all of these degenerative symptoms, as well as an outbreak of burgeoning animal sensuality, which can only be eradicated with the efficient dam of the strongest moral education standards (p.4-5).

Moreover, under a particular code of sexual selection, which was completely different from that of the 'white man', the indigenous Botocudos had come to acquire a repulsive morphology to European eyes. According to Neto, this differential eroticism of the indigenous races had adaptive causes and, perhaps, no greater ethological contrast between two human groups could be found than that concerning the Europeans' refined sexuality and the sexual behavior of those 'semi-beasts', who, "because of an evolutionary degeneration of their deplorable race, became little more than animals" (Melo Neto, 1882e, p.60-61). Among the amatory rituals of this indigenous people, an entire deployment of manifestations of brutality reflected, in Melo Neto's view, their 'pithecoid' primitivism with respect to the 'white man'. Among these manifestations of an aberrant code of sexual selection, he specifically pointed to the use of the *tembetá*, a wooden tablet with which the Botocudos adorn their lips and ears, to the point of deforming them completely, and which, according to Neto, prevented the Indians from knowledge of the European kiss, a "sweet expression of pure love" (p.60). In his view,

> This ignorance of kissing must have been also helped by the way in which sexual unions are conducted among many of these native people. Whether or not this kind of sexual union could be a concomitant cause – along with the use of labial ornaments – for the absence of kissing; whether or not we consider that ignorance, rather, as an immediate effect of the adornment itself, I am led to believe that among peoples relegated to such a wild state, so far from the height reached by the civilized nations, their sexual union would always happen *ad instar animalium* (p.60).

Concluding remarks: the current significance of examining the history of scientific exhibitions

At the dawn of the twentieth century and in many countries, a significant portion of the leading experts on physical anthropology was contributing to the scientific characterization of 'non-Caucasian' populations as a sort of missing link, lost creatures on the evolutionary border between human and animal. For many of the best physical anthropologists of the period, a good portion of the ethnic groups living on our planet could not properly be called humans, based on rigorous scientific analysis. They were merely, as in the case of the Botocudo, "creatures who only had the form and the physical nature of man; individuals whose almost absolute deprivation of a modulative language

capable of expressing their thoughts and whose crude gestures and ape-like customs revealed much of the character of those animals with which they live in complete promiscuity" (Melo Neto, 1882c, p.III).

Consequently, the public exhibition of members of those populations did not constitute a problem for many of those scientists, even when natives were shown in zoos alongside with animals, as in the case of Ota Benga, who was taken to the Bronx Zoo in 1906 at the suggestion of the director of the American Museum of Natural History himself. During the last half of the nineteenth century and the first three decades of the twentieth, this kind of 'popularization' of scientific knowledge constituted an ordinary educational practice in the field of physical anthropology, as shown by many of the colonial exhibitions held in Europe up to the 1930s. This kind of dissemination of scientific knowledge was considered a valuable instructive activity for many of the best physical anthropologists of the period.

What can we derive from an analysis of these exhibitions with regard to current efforts to produce, popularize, and teach scientific knowledge? It is our view that studying these exhibitions, which are a largely forgotten part of our scientific legacy, can play a key role in science education and popularization, since it highlights how ideological commitments substantially influence our efforts to produce and diffuse knowledge, not just in the past, but certainly also today. We believe that the consideration of this kind of historical episode – full of ideological, cultural, ethical, and philosophical features – can play an important role in science education, since it can help us address the human, personal, ethical, cultural, and political side of the construction of scientific knowledge, and also promote a richer understanding of the complex relationships between science and the overarching intellectual and social environment. From the perspective of what has been called 'contextual approaches to science teaching' (e.g., Matthews, 1994), we choose to advocate in the final section of this paper a role for the study of these exhibitions as a way of improving science education, so that it duly takes into account the socio-cultural, historical, and philosophical dimensions of science, and thus contribute to a more critical citizenship education. Science is not weakened, but rather strengthened when these dimensions are included within its study and diffusion, since our students and audience are offered a clearer view of the scientific endeavor as a human activity.

Symptomatically, since the beginnings of the twentieth century, several science educators have been stressing the necessity of teaching students not only about the contents of science, but also about the nature of science. Nevertheless, for most of that century, when one talked about instruction concerning the nature of science, the emphasis was put mainly on teaching about the scientific method (Abd-El-Khalick, Lederman, 2000), even though it has been argued that the very idea that there is a single scientific method is in itself a myth (for both philosophers, such as Feyerabend, 1993, and science education researchers, such as Bauer, 1994, and Gil-Pérez et al., 2001). Since the 1960s, however, there has been a significant change in the landscape of teaching about the nature of science, since the need to focus on the history and philosophy of science themselves has been increasingly highlighted, going beyond instruction regarding 'the scientific method' (Abd-El-Khalick, Lederman, 2000). More timidly, we also see in that landscape a plea for teaching about sociological and cultural aspects of science (e.g., Smolicz, Nunan, 1975; Cobern,

Aikenhead, 1998; El-Hani, Mortimer, 2007). In the face of the current crisis of science teaching, related, among other issues, to the perception of a low level of scientific literacy among people from several different countries, more and more attention has been given to contextual approaches to science teaching. Symptomatically, several educational reform documents have emphasized understanding the nature of science as a central component of scientific literacy (e.g., NCC, 1988; AAAS, 1993; for reviews, see Mathews, 1994; McComas, Olson, 2000). Indeed, we think that a contextual approach to science teaching is a key element for making science education not only more effective, but also – and even most importantly – more conducive to the development of critical thinkers.

In this paper, we have discussed attempts to popularize scientific knowledge about anthropology through exhibitions of natives in United States and Brazil from the nineteenth century to the beginnings of the twentieth century, focusing in particular on the First Brazilian Anthropological Exposition. The discussion about these exhibitions in a typical high school science classroom, for instance, can lead, in our view, to a treatment of science as a human practice in a way that makes it closer to personal, ethical, cultural, and political concerns. This may, in turn, contribute to students' understanding of how the production of scientific knowledge takes place in a social milieu, in the sense that it is both the product of a social group, the scientific community, and is influenced by the larger social networks in which it is embedded, above all, by the social institutions that finance it. Moreover, we consider that this can be done without taking contextual science education away from epistemic issues, such as the relationship between theory and experiment or the theory-ladenness of observation, while focusing also on sociocultural factors.

To address such efforts to popularize scientific knowledge, which no science teacher is likely to relate to an innocent visit to a zoo, also contributes to improving teacher education by promoting a richer and more authentic understanding of science and its place in the intellectual and social milieu. In particular, it would stress the need to consider the ideological undertones of scientific knowledge while teaching and learning about science, not only in the past, when those exhibitions were held, but also in present times.

After all, the analysis of these exhibitions as attempts to popularize scientific knowledge about physical anthropology clearly shows the ideological undertones of the construction of scientific knowledge. When racist ideologies were accompanied by a sort of scientific rendering of the old European myth of the savage living on the outskirts of the white man's civilization in a rather brutal state, the result was a treatment of natives as semi-animals (Bartra, 1996), as well as a biomedical discourse about races that was quite popular in the nineteenth century and for several decades into the twentieth (Sánchez Arteaga, 2006b). But is this just a feature of the past, of a science which was not sufficiently mature yet? We do not think an affirmative answer to this question can be properly supported, since it is still the case – and how could it be different? – that scientific knowledge is the product of human beings organized in a highly specific social group, but inevitably in contact with governments and corporations (from where most funds for scientific research originate), and with the larger society as a whole. But it is not also the case, in our view, that science is only an ideological apparatus of the capitalist society, or something similar. It is rather the case that science is a complex endeavor, involving a great number of

determinants that are internal to the scientific community, but also determinants that are external to it, so that any completely internalist or externalist account is not sufficient to understanding it. Moreover, we think that it is possible to find particularly illuminating ways of understanding science in points of contact and interaction between the scientific community and other social institutions, such as governments, corporations, or society at large, as in the case of the scientific exhibitions discussed here.

We cannot see, thus, how science as practiced today might be free of any ideological undertones. They are inevitable for the simple fact that the construction of scientific knowledge is undeniably a social human endeavor. Therefore, to consider past approaches to the production and popularization of scientific knowledge, such as those discussed here, is not a task to be made merely for archaeological purposes. It is something to be taken into account in current scientific practice, as well as in science education. What are the ideological undertones of the scientific knowledge of our times? To consider the past events discussed here can open the way for both science teachers and scientists to pose this difficult, but inevitable question. And, certainly, one can see the hints of ideological commitments in our current discourse about science. Just consider, for instance, the social discourse about genes that pervades our societies today, with its deterministic approach to the understanding of genes and their relationships to phenotypic traits, with several political, economic and social implications. Or consider the ideas about optimizing the human species through genetic engineering, cloning, gene therapy, and so on. What would be the optimal human? Is it not plausible that the old views about the superiority of some races or genres are being translated into these new ideals of improving ourselves? It is possible that, by addressing our anthropological discourse of the past, a teacher and his or her students can raise such questions, and, thus, move to a more critical attitude towards current scientific knowledge and its relationship with technological approaches to our individual and social lives.

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NOTES

[1] All quotations from works and documents in languages other than English have been freely translated.

[2] A paradigmatic example of this kind of analysis, so common during the last part of the nineteenth century, is provided in Hovelacque, 1880.

[3] The authors wish to thank anthropologist Wangui Kimari for her comments and bibliographic information concerning Ota Benga.

[4] A civic response to these exhibitions was soon organized by an Afro-American clergyman, James H. Gordon, who eventually managed to get Ota Benga out of the zoo. After that manumission, Ota Benga had no place to live in the United States, and, thus, was compelled to inhabit a number of different

locations, among them, a nursing home, an orphanage, and, finally, a tobacco plantation in Virginia, where he committed suicide in 1916, at the age of 32.

[5] One of the fathers of American Conservationism, who was, in addition, the author of one of the leading works of early twentieth century scientific racism, *The bases of racial European history*, a book that, in its latest editions, was published with a foreword by the great American biologist Henry Fairfield Osborn (cf. Grant, 1921).

[6] The passages from the papers included in the 'Brazilian anthropological exposition magazine' were translated from Portuguese to English by J. Sánchez-Arteaga.

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