

# Crania, bodies, and measurements: formation of anthropometric instruments at the Museu Nacional in the late nineteenth/early twentieth century

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This paper analyzes the formation of the collection of scientific instruments of the Museu Nacional's Biological Anthropology Sector (previously known as the Physical Anthropology Division), Universidade Federal do Rio de Janeiro, Brazil. It focuses on the instruments used for anthropometric measurements and their relations with the physical anthropology research produced in the past. Relating this collection with other of the institution's biological anthropology collections, as well as the past activities of Museu Nacional researchers within their sociopolitical and academic contexts, provides us a privileged view of scientific methods and theories in use in the final decades of the nineteenth century and beginning of the twentieth.

Keywords: history of anthropology; anthropometry; Museu Nacional (Rio de Janeiro); biological anthropology; scientific instruments.

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## Introduction

The Museu Nacional's Biological Anthropology Sector, formerly known as the Division of Physical Anthropology, traces its origins to the latter half of the nineteenth century.<sup>1</sup> Throughout its history, it has been home to intense work in research, teaching, and the compiling of collections; at times, it has been closely involved in debates on broad-reaching sociopolitical issues in Brazil (Castro-Faria 1952, 1999; Santos 1998, 2002; Seyferth 1985).

Today, the Biological Anthropology Sector is perhaps Brazil's oldest institutional setting devoted to biological anthropology research, with a collection of human skeletal remains (mostly from archeological research), documents, and scientific instruments that are invaluable to understanding the discipline's trajectory in Brazil starting back in the nineteenth century. Furthermore, the collections still play a vital role in the production of new knowledge in biological anthropology, especially our understanding of the dynamics of settlement and the lifestyles of peoples who in pre-historical times occupied what is Brazil's territory today (Mendonça de Souza et al. 1994; Neves et al. 1999; Rodrigues-Carvalho, 2004).

Since its earliest days, the trajectory of physical/biological anthropology has been tightly linked with the development of a plethora of instruments for measuring the human body, used in what is known as anthropometry. These technical developments took place within a context of major intellectual and political debates about the relations between the morpho-anatomical dimension of the human species and the moral, intellectual, and social realms of human existence. Against the backdrop of colonial European expansionism, this topic took the spotlight especially in the final decades of the nineteenth and first decades of the twentieth centuries in Brazil and many other places around the world (Gould, 1991; Monteiro, 1996; Santos 1996, 2002; Schwarcz, 1993; Stocking, 1968, 1988).

In the present research note, we look at physical/biological anthropology at the Museu Nacional primarily as regards the relations between science, anthropology, and history.<sup>2</sup> Our approach views the Biological Anthropology Sector as it comprises objects, people and their ideas, archeological finds, and, above all, a most interesting category of objects for scholars of science: instruments of measurement, of work, and of what may even be called 'mediation' (Latour and Woolgar, 1997). As we will see, the Sector's collection of scientific instruments provides a window through which we can glimpse aspects of interrelations between researchers, skeletons, bodies, and measurements—all vital links in the history of physical/biological anthropology.

## In times past

If we are to understand the process by which the Biological Anthropology Sector's collection of scientific instruments came to be, we must go back to the period that Castro-Faria (1952, 1999) has referred to as the "construction" of the field of physical anthropology in Brazil. From about 1860 to 1910, the development of physical anthropology was heavily influenced by European theoretical directions and methodological approaches, particularly those originating in France and, specifically, in the Société d'Anthropologie de Paris. The emphasis was then on craniology and, later, on Alphonse Bertillon's so-called metric anthropology, also known as 'Bertillonage' or the Bertillon method. Both found a place at the Museu Nacional's

physical anthropology laboratories in the late nineteenth and early twentieth centuries through names like João Batista de Lacerda and Edgard Roquette-Pinto, among others.<sup>3</sup>

In broad terms, anthropology in the latter half of the nineteenth century can be divided into two main streams. On the one hand, there were those busy studying the anatomy of human ‘races’, primarily researchers with ties to medical schools; on the other, jurists interested in deeper examination of the cultural specificities of so-called uncivilized peoples, a category that encompassed blacks and natives. According to myths about the origin of anthropology, these two groups competed in the founding of physical anthropology and of social/cultural anthropology, respectively (Schwarcz 1993; Stocking, 1968, 1988). Although in current syllabi on the history of anthropological theories, this fragmentation of the field supposedly accounts for the rift still existing between the two branches of anthropology, the separation has not always been clear-cut.

Based on the evolutionist model and largely underpinned by typological approaches, physical anthropology research during the late nineteenth and early twentieth centuries endeavored above all to understand the natural history of the human species and how it has diversified over time. Within this context, the ‘racial’ and similar approaches were predominant (Castro-Faria, 1952, 1999; Santos, 1996, 1998, 2002; Schwarcz 1993).

The latter half of the nineteenth century saw the apogee of craniology and phrenology as scientific practices that included among their goals linking ethnic and gender differences to intelligence, specific skills, physical and mental health, and even personality (Gould, 1991; Spencer, 1997). Phrenology was devoted to the in-depth study of the cranial characteristics and cerebral circumvolutions of individuals. The field became known for its analysis of the brains of people considered ‘geniuses’, ‘gifted’, and ‘deviant’ (i.e., prostitutes, murderers, homosexuals, etc.). The development of phrenology occasioned the creation of a range of instruments that later would be honed on a large scale by physicians and by physical anthropologists (Spencer, 1997).

As an heir to phrenology, craniology was based on techniques devised by Camper, Gall, Broca, Quatrefages, Topinard, and others, and was devoted to measuring crania in terms of volume and circumference and from a variety of angles. Craniometry was then seen as a discipline whose prime focus amounted to what we would call “anthropometry” in a broad sense. It sought to define patterns that would distinguish and inter-relate different human ‘races’. Further, it assumed that such characteristics as cranial capacity, brain weight, and shape of the cerebral circumvolutions, among other features, could provide information on the moral and intellectual aspects of an individual and, on a broader plane, on the chances of improving human societies. A central discussion was whether so-called primitive races—including therein the indigenous peoples and blacks that Europeans encountered in their global expansionism—could ever climb the ladder to reach the stage of civilization (Gould, 1991; Monteiro, 1996; Santos, 1996, 2002; Schwarcz, 1993).

In craniometry—the branch of craniology concerned with mensuration—the push to define measurements and indexes that grew ever more diversified and complex reflected a desire to lend scientific objectivity to a broad gamut of social phenomena. To the extent that they were invented for specific ends, craniometric measurement instruments were the spokesmen for this technique in a world of dynamic interaction between the realms of science and of political-

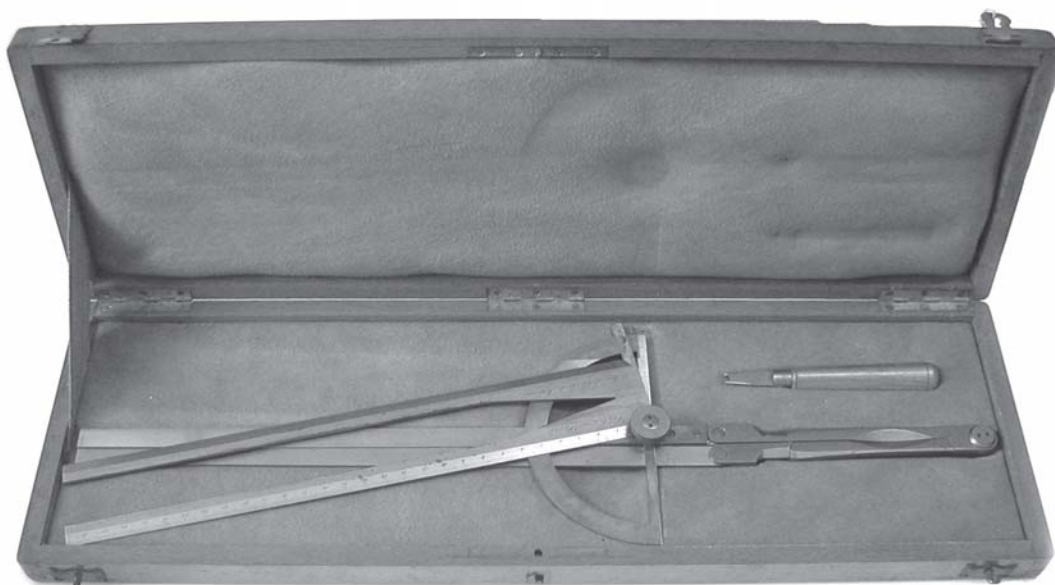


Figure 1. Quatrefages' goniometer (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/ UFRJ)

social debates. Behind the questions driving scientific research lay a thirst—particularly on the part of European society—to learn about equality and inequality between human beings in a time of colonial expansion.

Reflecting the close ties between science on the periphery and science produced in European centers, the first Brazilian anthropologists applied manuals and techniques imported from Europe to local material and cases. This dominance can be observed in a document from 1858 that lays out the guidelines for anthropological studies in Brazil (“Instructions for the Scientific Commission charged with exploring the interior of some of the lesser-known provinces of Brazil,” in Port.):

“Since the most important point in ethnology, for the study of physical man, is knowledge of type, sufficient notions can only be acquired through extremely faithful drawings of the whole, especially of the head. (...) It is also necessary to collect crania from all natural races in the country, and to make molds of some live heads, in order to, in the light of certain moral data, ascertain overall the more positive points of the Gall system: if there is truth to this doctrine, craniology should detect notable changes between the various protuberances of the cranium of a wild Indian and the cranium of a civilized Indian or mestizo, depending upon the dominant race. (...) The bearing and gestures of man are indispensable, because one and the other reveal social habits and individual temperament. The position of the head, arms, and legs, at rest, during movement, or at work, is very significant to the observer, because by this position, these movements, and the way the head rests on the neck, one knows the individual, as one does by the way he moves his arms, hangs his hands, and by the way and placement of the feet when he walks: the bearing of an idle person is quite unlike that of a worker” (cited in Castro-Faria, 1999: 18-9).

The first regular research and teaching activities in physical anthropology at the Museu Nacional were carried out by João Batista de Lacerda, a physician and anthropologist who

maintained ties to the institution from 1872 to 1915. Lacerda first served as under-director of “Anthropology, general and applied zoology, comparative anatomy, and animal paleontology” (Castro-Faria, 1952, 1999). During these early days of his career, Lacerda enjoyed the backing of the director of the Museu Nacional, Ladislau Neto, who was working to develop the museum’s osteological collection and asking provinces around Brazil for material from indigenous groups (Lopes, 1997).<sup>4</sup>

While anthropology in Brazil was taking its first steps, Europe witnessed the creation of the Société d’Anthropologie de Paris, in 1859. The society comprised mostly physicians who were researching the comparative morphology of human races, with Paul Broca as one of its best-known representatives. In 1875 Broca wrote the “Craniological and craniometric instructions of the Paris Society of Anthropology” (in French), based on his broad experience in cranial analyses. These instructions defined both basic procedures in craniological practice as well as standards governing the use of measurement equipment. These guidelines enjoyed such a broad reach that they solidified the influence of French physical anthropology—and of craniometry in particular—virtually around the world (Castro-Faria, 1973).

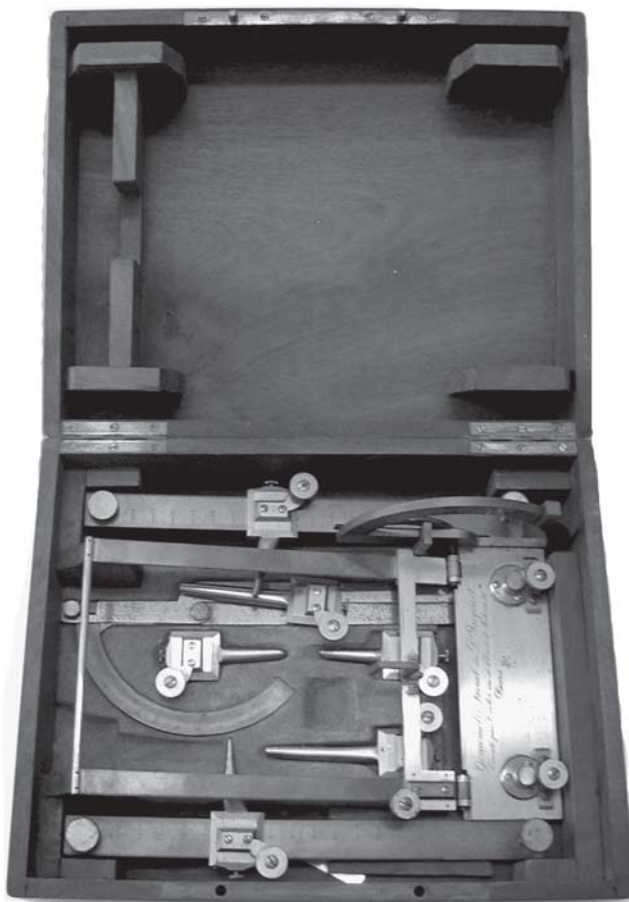


Figure 2. Jacquet’s facial goniometer (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/ UFRJ)



Figure 3. Indication of the origin of instruments from Casa Mathieu (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/ UFRJ)

Broca was responsible for the theoretical and methodological conception of many measurements that became key to craniometric studies; he also devised a number of measurement instruments that were then produced by Casa Mathieu, in Paris, according to his guidelines. As Castro-Faria underscores (1973): “The invention of each apparatus was followed by an explanatory monograph, with a detailed description of its structure and operation. To demonstrate its usefulness, he provided and compared hundreds of data, and soon the anthropological literature was enriched by new morphological research” (Castro-Faria, 1973:10).

Broca’s influence on studies conducted at the Museu Nacional is revealed not only in the adoption of French methodological protocols but also in the import of measurement equipment made in Paris. The rectangular goniometer, occipital goniometer, median goniometer, stereograph, facial goniometer, and coordinate compass are just a few of the instruments in the Biological Anthropology Sector’s collection (see figs.).

Studies conducted by Lacerda and collaborators in the 1870s contain data gathered using these instruments. In 1876, a series of papers on the “indigenous races of Brazil” was released by the Museu Nacional Archives (Lacerda 1876, 1905; Lacerda & Peixoto 1876). Within a

social, political, and intellectual context that understood so-called primitive races as physically, morally, and intellectually inferior (and destined to disappear), Lacerda relied on the morphological analysis of skeletons of indigenous origin and especially of crania, from the collection of the Museu Nacional, to construct his arguments (Monteiro, 1996; Santos, 2002). Evincing Brazilian anthropologists’ close ties to French physical anthropology, Lacerda published a paper on the “history of human fossils” in Brazil, in the *Mémoires de la Société d’Anthropologie de Paris* (Lacerda, 1875).

In 1882, Rio de Janeiro hosted the international Anthropological Exposition, a widely publicized event in the scientific world and among the general public as well. Archeological, ethnological, and physical anthropology specimens (primarily crania) relevant to the main anthropological issues of the day were part of the displays. Representatives of some indigenous ethnic groups were also brought to the museum to be studied by anthropologists from the institution. This was a time of debate over the abolition of slavery in Brazil and over the potential use of indigenous labor power. At the exposition, Lacerda



Figure 4. Broca’s stereograph (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/ UFRJ)

conducted physiological tests on some indigenous people, using an apparatus called a dynamometer to ascertain the muscular strength of their hands; this equipment is now part of the museum's Biological Anthropology Sector's collection. Based on his observations, he concluded:

“As a heavy laborer, the Indian is inarguably inferior to the Negro; the former displays greater agility than the latter but his body resistance and muscular strength are sharply lower. We used the dynamometer to measure the muscular strength of adult individuals belonging to the Bororó, Botocudo, and Cherente tribes, and the instrument detected a strength beneath that generally observed among white or Negro individuals” (Lacerda, 1905: 101).

During the first decades of the twentieth century, human skeletons (especially crania) from different archeological sites in Brazil continued to be added to the museum's physical anthropology collection. This period was characterized by the gathering of an extensive craniological collection, mainly of South American indigenous groups. In 1911, a collection of plaster-of-Paris molds of human crania was purchased from Casa Tramond in France.

Following the apogee of craniology, physical anthropology research at the Museu Nacional shifted its focus from crania and skeletons to investigations into Brazil's ‘anthropological types’. Conducted primarily in the 1920s, these studies were undertaken by Edgard Roquette-Pinto and were based on detailed anthropometric analyses of young people from around the country serving at military barracks in Rio de Janeiro. The crux of the discussion had to do with the effects of “racial mixing” and whether mestizos display “degeneration.” Released during the 1<sup>st</sup> Brazilian Congress on Eugenics, in 1929 (Roquette-Pinto, 1929), the results of this research had major repercussions, especially because this physician and anthropologist

had emphasized that the problem of Brazil's “backwardness” was not racial in nature—i.e., caused by a mixing of the races—but rather the product of problems ultimately linked to poor health and education (Santos, 2002). As Roquette-Pinto stressed, “there is a general habit of considering mestizos who are merely sick or dysgenic as degenerate. It is not the mixing; sickness is the reason why many of them seem feeble” (1929:136).

From a technical viewpoint, Roquette-Pinto's studies of ‘anthropological types’ relied on the Bertillon method, that is, a set of procedures for characterizing and measuring the human body devised by Alphonse Bertillon, another founding member of the Société d'Antropologie de Paris. Originally conceived for use in identifying criminal elements, and especially repeat offenders, the technique consisted of taking a large set of anthropometric measurements, characterizing specific morphological features

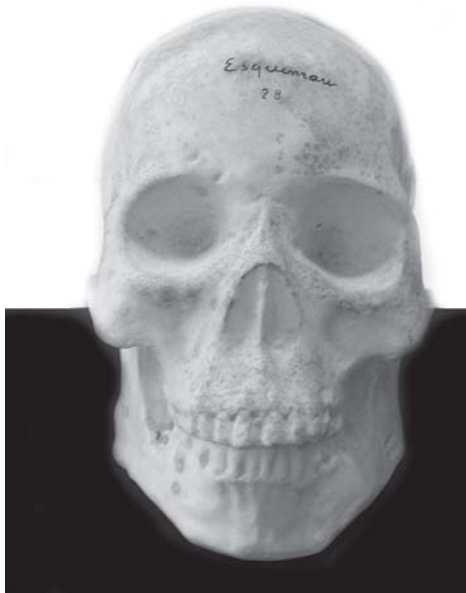


Figure 5. Mold of human cranium from Casa Tramond (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/UFRJ)

(related to eyes and hair), and taking photographs in standard positions. Bertillon developed a portable case that became known as a Bertillon kit, widely used not only at the museum but also by the Rio de Janeiro police in the first decades of the twentieth century (Carrara, 1990).

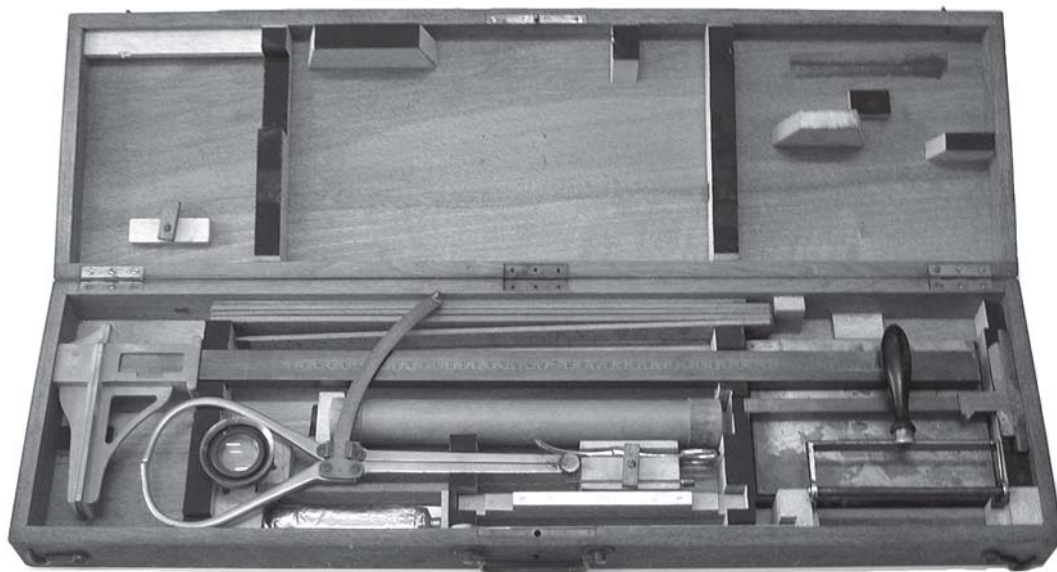


Figure 6. Kit containing Bertillon instruments (Collection of scientific instruments, Biological Anthropology Sector, Museu Nacional/ UFRJ)

### **With the passage of time**

Product of a trajectory covering nearly one and a half centuries, the Biological Anthropology Sector now houses diversified collections acquired during different periods of its history. It holds thousands of pieces, including human bone remains of archeological origin, instruments and equipment for physical anthropology measurements, and photographic material, among others. One of the most valuable of its kind in the country, the collection is an important source of information on the history of anthropology in Brazil and, in particular, on physical/biological anthropology.

In this look at the Sector's collection, in which we have highlighted the work of researchers from days gone by—especially the 'mediation' role played by scientific instruments—we have seen that the daily routine of practices, techniques, relations, and interpretations were permeated by the era's sociopolitical context. As we have endeavored to explore in these pages, crania, bodies, and instruments become "good for thinking about" the process of putting together collections and about the very "act of collecting."

As the techniques and research interests of the museum's physical anthropologists changed over time, a kind of 'dissociation' occurred between collections and instruments. In recent decades, new approaches have been used in investigating osteological collections, with a growing emphasis on anatomopathological analyses (see, for example, Mendonça de Souza et



al. 1994; Neves et al. 1999; Rodrigues-Carvalho, 2004), theoretically at a remove from the typological-racialized focuses that dominated physical anthropology until the 1950s (Santos, 1996). In research at the Biological Anthropology Sector, anthropometric studies gradually moved off center stage. In response to this change, a good part of the older instruments fell into disuse. Later purchases of new instruments, still in the past century, also contributed to this process by which elements of work became items in a collection.

Drawing relations between pieces in a collection, instruments, and characters goes beyond understanding the technical skills involved in handling them. From a special prism, we catch sight of the more fundamental elements in the production of scientific knowledge. To study the materials and topics of interest to them, physical anthropologists needed instruments to help undercover the information they held, while the instruments in turn had to be conceived upon concrete bases—and both processes demanded a scientific culture that would absorb them.

While this may at first seem a bit redundant, if the skeletons at the Museu Nacional always had the status of “collection,” the instruments underwent a very unique process of transfiguration before becoming part of a “collection.” Reflecting a specific logic of accumulation, the instruments went from being technical objects that were part of the daily work routine, lying atop lab tables and always being handled, to being pieces in a collection—in other words, artifacts. The action of time on these instruments – visible in the darkening of metals, dullness of the wood, and signs of rust – helped forge a symbolic transformation that redounded in the creation of new identities. Formerly possessing a utilitarian identity—“objects of daily use”—they have now become “sacred objects.” This metamorphosis was governed by elements of temporality as well as by the increasingly heavy aura of “exoticism” surrounding the objects, as they were removed from circulation, shut away in closets and hidden from daily view, and became more and more unfamiliar in terms of their purpose and function. Thanks to this shift, objects that once were not “pieces of a collection” became endowed with an ever more museological character (Pomian, 1984).

As modern anthropology has indeed taught us, identities and identity transformations are eminently relational. It is possible that the fact these measurement tools are “old” and no longer in use does not make them any more special than other instruments that are part of similar collections at museums with a tradition of research in physical anthropology. Nevertheless, what sets the Museu Nacional’s anthropometric instruments apart is the fact that their transfiguration into “sacralized” objects occurred in a very specific setting. The anthropometric instruments discussed in this paper possess a *mana* (Mauss, 1974) that issues not just from the physical, historical, and intellectual space they have inhabited for over a century—including the rooms where they were originally used—but also from the researchers who handled them. In other words, they are uniquely imbued with a singular, highly meaningful history and scientific culture.

### Final considerations

This article calls attention to a type of collection that can serve as a basis for future historiographic studies on problems and techniques involving old ways of practicing physical

anthropology. Neither crania nor instruments should be viewed as remnants of an archaic science, but rather as witnesses to an age when physicians and anthropologists addressed questions that had implications far beyond the boundaries of research laboratories, in a context of heated debate over the formation of a people and its potential direction. At one time, producing interpretive models of Brazil from the perspective of physical anthropology entailed the mediation of complex, creative instruments for measuring parts of the human body (Monteiro, 1996; Santos, 2002).

The proposal to use the remains of material culture—such as scientific instruments—to reach the people, ideas, and even society from which they were derived has not been explored much in the history of the sciences (Hoyme, 1953; van Helden and Hankins 1994). In these pages, we have emphasized the processes of acquiring, amassing, and transforming a working collection into a historical collection. We believe that an analysis that combines research on methods of use, on the gaps that came to be filled by instruments during the evolution of scientific disciplines, on the rituals involving their usage, and on the mapping of their social context can contribute to our understanding of the scientific cultures of the past.

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#### NOTES

<sup>1</sup> The research field now called biological anthropology was generally referred to as physical anthropology until around the 1950s. Santos (1996) addresses the theoretical and methodological transition that occurred during this period, which had to do with the rising influence of genetics and neo-Darwinism in studies on the origins and biological variability of the human species, central themes in bio-anthropological thought yesterday and today.

<sup>2</sup> This study began in 1995 as part of activities proposed under the “Integrated project for curatorship of collections belonging to the Biological Anthropology Sector of the Museu Nacional, Universidade Federal do Rio de Janeiro,” coordinated by Ricardo Ventura Santos (see Santos 1996, 1998, 2002; Santos and Mello e Silva, 2006).

<sup>3</sup> In his thoroughgoing work on the history of physical anthropology in Brazil, Castro-Faria (1952) provides valuable information on the other intellectuals with ties to the Museu Nacional’s physical anthropology work between the late nineteenth century and the 1940s.

<sup>4</sup> Lacerda’s career was quite wide-ranging, with work in areas beyond anthropology per se, like the study of physiology and infectious diseases (see Benchimol, 1999; Castro-Faria 1952, 1999).

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