Südasien-Chronik - South Asia Chronicle 8/2018, S. 139-162 © Südasien-Seminar
der Humboldt-Universität zu Berlin ISBN: 978-3-86004-337-0

Making Human Differences in Berlin and Maharashtra: Considerations on the Production of Physical Anthropological Knowledge by Irawati Karvé

THIAGO PINTO BARBOSA
THIAGO.PINTO.BARBOSA@ZMO.DE

KEYWORDS: IRAWATI KARVÉ; PHYSICAL ANTHROPOLOGY; RACE; CASTE; ANTHROPOMETRY; CIRCULATION OF KNOWLEDGE

1. Introduction

Ever since its formation as a scientific discipline, anthropology has striven to understand the diversity of the human being. In the context of the growing sense of globality and an awareness of human variation(s) that marked the colonial/modern period, the discipline has achieved a widespread academic institutionalisation. While notions related to concepts such as "culture" or "ethnicity" have been preferred by many anthropologists to understand different humans, other categories of difference have also been evoked by anthropological knowledge in the search for a universal classification.

It is in this overarching context that the concept of "race" also emerged as a scientific category in knowledge production that strived to explain and classify human differences across varied scientific disciplines. Ever since, knowledge about "race" has been further transformed and circulated in and between various sites of scientific practice through an increasingly globalising network. Especially in the first half of the twentieth century, there was a profusion of claims about "race" and "human races" made within scientific knowledge production (cf. Reardon 2004; Dikötter 1998).

In the German scientific world, the idea of "Rasse" was central not only in the discipline of *Anthropologie* but also in other disciplines dealing with human variations. From a European perspective, the centrality of "race" as a category to classify and manage human difference probably reached its historical apex when racial theories backed Nazi Germany's eugenicist politics and genocidal acts. Although the post-Second World War period marked a general rejection of the idea of 'human races' and their hierarchisation within science, "race" itself has persisted, not only as a social category, but also as an object of scientific investigation in different fields of research, and in different parts of the planet.[1] Different scientists researching human diversity have played a central role in establishing the fluidity of "race", translating or adapting this concept to relevant debates in their various settings of work or putting it in relation to other categories of difference, thus often contributing to racialisation of these categories (Haraway 1997; Reardon 2004; Lipphardt 2009; Schramm et al. 2012; Tallbear 2003).

The Indian anthropologist Irawati Karvé (1905-70) is an emblematic example in this regard. Karvé started her scientific career as a researcher in Berlin at the well-known Kaiser-Wilhelm-Institut für Anthropologie, menschliche Erblehre und Eugenik (Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics, thereafter KWI-A), where she conducted her PhD research on the topic of racial differences in human skulls under the supervision of the 'racial mixture' expert Eugen Fischer (Karvé 1931). Back in India in 1930, and working as a professor and researcher at the Deccan College in Pune, Maharashtra, until the end of her life in 1970, Karvé is especially known today for her work in the fields of cultural and social anthropology. Lesser known, however, is how she made a major contribution to the establishment of physical anthropology and population genetics in India. With several publications on very relevant national debates—from independence and partition to Aryan migration theory—, Karvé put forward claims that dealt with difference and sameness of varied social groups in South Asia, often translating racial anthropological knowledge and applying it to other categories of difference such as caste, tribe and religion.

In this article I offer some key considerations from my incipient analysis of Karvé's physical anthropological knowledge production practice. More than presenting my first findings in an attempt to reconstruct Karvé's research situatedness and her contribution to translating "race", in the following I will primarily address some questions that I have encountered in my ongoing research. Thereby, I intend to contribute to a better understanding of trans-national entanglements in the making of scientific knowledge on categories of difference. As my analysis will demonstrate, shedding light on the case of Karvé brings up new insights for the discussion on the intersection of "race", "caste" and "tribe", beyond the usual historiographic focus on India's colonial period

(e.g. Bates 1995; Bayly 1995; Dirks 2001). By following Karvé through this trajectory that moves through historical periods from Interwar Germany to postcolonial India, I hope not only to contribute with an important piece to the puzzle of the continuing transformation of physical anthropological knowledge on a global level, but also to investigate the role of a scientist's shifting positionalities in such a process. Thereby, a contribution of my work is to add to the body of literature on the impact of the German tradition of racial anthropology (e.g. Massin 1996; Campt 2004; Schmuhl 2008), by reflecting on its international influences before and also post-1945. Moreover, by following the objects used in Karvé's practice, my analysis also offers a new insight to the role of materiality and their layers of historicity that are entangled in the making of categories of difference.

In the next section, I first engage in a discussion with the critical science and technology studies (STS) literature, exploring the key conceptual and methodological insights it might offer for unveiling this case of physical anthropological knowledge production and circulation in this particular historical (1927-70) and spatial (Germany – India) context. I then apply such insights to my analysis, first zooming into Karvé's work in Berlin and then to her research in Maharashtra, with special attention to how she has articulated, translated and transformed the notion of "race" throughout her scientific career across different contexts of social and political situatedness. As I follow Karvé through different research sites, geographies and social positionalities, and attentive to her relation to research objects, my paper examines how physical anthropological knowledge on human variation has transformed across time and space. As I will argue, Karvé's physical anthropological knowledge production in India is driven by—and contributes to—political and scientific debates on the country's social formation. In particular, Karvé's research of the "racial" in "tribes" and "castes" aims to explain historical patterns of migration, commenting on the Aryan migration theory, and to contribute to forming a picture of Maharashtra's biological, social and cultural fabric. Analysing the knowledge produced by her is key not only to understand how these debates have taken shape then but also to understand the nature of contemporary discussions at the intersection of genetics, physical and biological anthropology, taking place in Maharashtra specifically and in India in general.

2. Studying the circulation of knowledge from a Science and Technology Studies perspective

When studying the production and circulation of knowledge, the body of literature in the field of science and technology studies can be extremely insightful. Although with somewhat different perspectives, different authors[2]

largely agree that the study of science can benefit from an ethnographic look at knowledge production practices and their materiality, in consideration of the different actors (human and non-human) involved in such practices. Focusing on local practices, but definitely not overlooking how the actors articulate discourses, this gaze can also capture how the specific historical, political and social situatedness of the different actors involved plays a role in the transformation of knowledge.

This 'anthropological conviction' of the locality of the production of scientific knowledge (Anderson 2002: 651) does not imply that the different spatial and historical situations related to knowledge creation are unconnected. Particularly Latour (1987, 2008), Anderson (2002) and Law (2007) suggest the understanding of science as a network so one can apprehend the production of knowledge at the same time in its locality and translocality. For Latour (1987), the resources are concentrated in a few places (the nodes), which have connections with one another through links and a mesh, forming a net that extends to various places. The practice of scientists, with their objects of research, is immersed in and at the same time composes such linkages through which knowledge travels. This view on science makes explicit that even the longer, global networks are local at all points (Latour 1987; Anderson 2002). The nodes of this network are especially dense in the case of what Latour (1984: 232) calls 'the centres of calculation', meaning the scientific centres that concentrate resources, research materials, technologies and personnel. Moreover, different STS scholars working from a historical perspective have pointed out to the importance of capturing the temporality and historicity of different elements involved in the process of knowledge production. Thereby, apprehending how these elements travel through time and are captured in a knowledge making practice is equally important to understand the transformation of knowledge (Schramm et al. 2012; M'charek 2014; Braun 2014; Breckenridge 2014[3]).

Furthermore, Latour's *Science in action* (1984) gives us numerous insights into unveiling the practical and rhetorical strategies that scientists pursue when they strive to produce a scientific fact. As the author explains, scientific texts usually mobilise different allies in order to powerfully put forward a claim: these allies can be, for example, references to other authors, other texts, different visual technologies such as graphs and tables, or references to the use of instruments or inscription devices. When a scientist claims that a fact is a result of a calculation or inscription made by a technology, for example, s/he is thereby mobilising this technology as an ally and implying that the claim is not a result of her/his personal argument but rather a visible objective fact that is lying in front of the reader's eyes. The scientist would be simply commenting on what the readers themselves directly see, namely the representations of the inscribed

things and/or the assembled referenced arguments (ibid.). As Latour summarises:

> What is behind the claims? Texts. And behind the texts? More texts, becoming more and more technical because they bring in more and more papers. Behind these articles? Graphs, inscriptions, labels, tables, maps, arrayed in tiers. Behind these inscriptions? Instruments, whatever their shape, age and cost that end up scribbling, registering and jotting down various traces. Behind the instruments? Mouthpieces of all sorts and manners commenting on the graphs and 'simply' saying what they mean. Behind them? Arrays of instruments. Behind those? Trials of strength to evaluate the resistance of the ties that link the representatives to what they speak for. It is not only words that are now lined up to confront the dissenter, not only graphs to support the words and references to support the whole assembly of allies, not only instruments to generate endless number of newer and clearer inscriptions, but, behind the instruments, new objects are lined up which are defined by their resistance to trials. (Latour 1984: 79)

Accordingly, a scientific claim is as robust as how many allies or actants it can call into life and mobilise. A strong scientific claim is usually tied to a lot of black boxes, i.e. very consolidated facts that are very hard to be untied by someone who might disagree with them (Latour 1984: 80).

Thus, this understanding of science makes visible the important role of two elements that are key in the production and circulation of knowledge: the role of technology and the act of translation. As for the first, besides Latour many different authors writing under the framework of material semiotics and actor-network-theory (e.g. Haraway 1984; Law 2007; Braun 2014; Schramm et al. 2012b) suggest that keeping our gaze attentive to the relationality between technology and scientists is extremely helpful in understanding how knowledge travels and changes through time and space. More than often, the making of knowledge is mediated by the scientist’s technology, whose materiality might have a differentiated contingency that navigates from other spatial and historical contexts, dating back from the context in which that technology was designed. In the case of instruments used by scientists to generate and represent data, these 'inscription devices', as Latour (1984: 68) calls them, produce visual displays that will let the data 'speak for itself', thereby filling the rhetoric of scientific texts. But not only are they used by scientists, they also shape the scientist’s practice, often transporting the temporal and spatial context of their design to the scientist’s knowledge production.

This point is greatly exemplified by Lundy Braun’s (2014) study of the respiratory capacity measurement device spirometer: created in mid-19th century England,[4] this device was designed in a way to apply a "race correction" in its quantitative measurements of each patient, as it was then believed that

there was a correlation between "race" and "vital capacity". Through this correction, the normal respiratory capacity of patients of the race "black" was expected to be less than the average expected for patients of other races. Made with a portable and adaptable design, the spirometer with its attached function of "race correction" would have a longstanding international circulation. In fact, the instrument is still used in medical practices today, although racial theories might have been rejected to a large extent. In this way, a biological understanding of "race" as a marker of human difference got rooted in the very materiality of the spirometer, which, through its "race correction" function has ever since produced racialised results with deep political and social consequences.[5] Thus, as John Law (2007: 9) reminds us, material durability is a key aspect in the forming of networks of knowledge production and knowledge transmission, for 'social arrangements delegated into non-bodily physical form tend to hold their shape better than those that simply depend on face-to-face interaction'. In this sense, apprehending the constancy of such materiality used by scientists as well as the context of its creation is also key to a historical understanding of knowledge transformation.

As for the act of translation, the term is used to understand scientists' practice not only in its linguistic sense ('relating versions in one language to versions in another one') but also in a geometric sense: 'moving from one place to another' (Latour 1984: 117). As Star and Griesemer explain, in dialogue with Latour (1984): 'in order to create scientific authority', scientists enlist allies from different locations or fields and reference to their work or concerns to 'fit their own programmatic goals' (Star & Griesemer 1989: 389). In other words, scientists often frame or adapt their own knowledge claims to debates *en vogue*, calling up alliances by referencing to arguments, concepts and methods taken up by other scientists. Moreover, through representations and inscriptions they also operate several translations to render their object of study understandable, visible and relatable. This is especially so in the case of natural, biological and life sciences, since these are fields in which standardisation and translation efforts have come up with certain concepts to be applied universally (Star & Griesemer 1989), such as the notions of species or race. Working as 'boundary objects' (ibid.), these universal concepts have the power to facilitate communication across different scientific communities.

In fact, "race" has been under the radar of many social scientists and humanities scholars researching science and technology, not only for its striking social and political consequences, but also due to the emblematic—now fairly unveiled—constructedness of this concept, as Donna Haraway (1997) reminds us. As the philosopher of science points out, "race", as an object of knowledge, was 'crafted [by several] institutions, research projects, measuring instruments, publication practices, and circuits of money and people' (Haraway 1997: 217).

Whereas Haraway focuses on the US-American case to think on how "race" has transmuted and permuted into "population" and "genome" across the last century's life sciences, in Schramm, Skinner and Rottenburg's (2012a) volume, different authors strive to apprehend how ideas concerning "race" and "genetics" have travelled on different paths to different times and locations around the globe. Using the term 'travelling ideas' as a shorthand for the 'processes of transmission, translation and transformation', Schramm and co-authors contend that

> [i]deas (and practices) about race, ethnicity, racism and identity […] travel across time, between locations, between institutional settings, between spheres of expertise, and between experts and the lay public. In transit, these ideas do not remain the same, but are rather reinterpreted and remade. (Schramm et al. 2012b: 6)

Furthermore, Schramm et al. (ibid.) echo Law (2007) and Braun (2014) when they recognise that 'ideas cannot travel on their own but need to be inscribed into objects that can be moved from one context to another without completely changing character.'[6] Thus, as vehicles in which ideas travel, 'objects hold meaning, are attributed with meaning and shape processes of sense-making' (Schramm et al. 2012b: 7).

Having in mind the theoretical and methodological insights offered by the authors discussed above, in the following two sections I will offer a short examination of Karvé's physical anthropological knowledge, first with a focus on its situatedness in Berlin (1928-30) and then in Maharashtra (circa 1940-60). Thereby, I strive to remain attentive to her relationality to colleagues, research objects and technologies. For this investigation, my methods included: an analysis of some of Karvé's publications; conversations and interviews with experts on her work, former colleagues, former students and family members in New Delhi, Pune, Phaltan, Berlin and New York City; research in different archives (archive of the Max Planck Society in Berlin, archive of the Humboldt University Berlin, library of the Deccan College in Pune, Irawati Karvé Museum of Anthropology at Pune University, etc.); an analysis of written materials by actors relevant to her work (Eugen Fischer's memoirs and publications, Rudolf Martin's textbooks); as well as secondary sources. Taken together, these bits of information will be glued in order to form a less blurred picture of Karvé's knowledge production practices and the thereby entangled routes of all relevant actors involved—including material objects.

3. "Race" and difference at the Kaiser Wilhelm Institute for Anthropology in Berlin

Anthropology, especially on the lines of what would later be differentiated as physical and biological anthropology, played a key role in the making of "race". Entangled with European colonialism and the institutionalisation of modern sciences, anthropology emerged as a scientific discipline in the late nineteenth century, pushed by the colonial need to understand and administrate human diversity (Widmer & Lipphardt 2016). Physical anthropologists saw in the concept of "race" a boundary object that, due to its universalising framework to classify and order human variation, could enable the scientific dialogue in intersection with other (more established) life sciences. Often relying on colonial routes to undertake fieldwork and collect data, artefacts, human remains or other material objects to be brought to centres of calculations in the metropoles, physical anthropologists and their scientific objects would then form a global network of scientific practice (Widmer & Lipphardt 2016; Grosse 2000; Stoecker et al. 2013). Representing the central nodes of this network, the centres of calculation were where scientists inscribed and processed data from the objects collected from all over the world.

In the twentieth century, one of the main centres of calculations on "race" was the Kaiser Wilhelm Institute of Anthropology, Human Heredity and Eugenics (1927-44) in Berlin, Germany.[7] Besides concentrating funds by state subsidies, research foundations and private investors[8], the KWI-A concentrated a large amount of resources of different kinds: technological, human and archival resources. As for the technological aspect, the Institute assembled a large set of newly developed measurement devices, which allowed researchers to generate numeric data from the study of both bodies and remains of humans. As the methodologies of craniometry and, more generally, anthropometry were central in nineteenth and early twentieth century anthropology, different anthropologists (among other scientists) contributed to the development of instrumental technologies and standardisation of methods to study the proportions of human skulls and bodies (cf. Morris 2013). Many of these devices were designed by anthropology Professor Rudolf Martin[9], who would let many of his designs be tested by his friend and KWI-A director, anthropologist Eugen Fischer (Morris 2013; Hugentobler-Schwager 1990; Hoßfeld 2016). Two instruments developed by Martin were much used in the work at the KWI-A and also by Irawati Karvé: the cubic craniophor (used for the inscription of measurements of human skulls)[10] and the anthropometer (used for the measurement of different body parts), both still available for purchase today and used in physical anthropological and archaeological laboratories, for instance at Delhi and Pune Universities. Especially the anthropometer became a key-instrument for many physical anthropologists and medical researchers in their travels around the

globe, also owing to its plasticity and adaptability envisioned by Martin's thoughtful design.[11]

The concentration on human remains was a key condition to the calculations that informed the scientific production of knowledge about "race" at the KWI-A: the attic of the Institute's building stored a skull and skeleton collection of around 5,000 individual pieces.[12] The collection, known as the "S-Sammlung", was started by anthropologist Felix von Luschan, who worked at what is today the Ethnological Museum of Berlin at the end of the nineteenth century. Thereafter it was moved to the Friedrich Wilhelm University (renamed Humboldt University of Berlin in 1949) before being loaned to the KWI-A in 1928. The collection contained skulls and other human remains from former German colonies in Africa and Southeast Asia (of which at least 30 Namibian skulls were obtained during German colonial rule), as well as from numerous other locations across the world (Bergmann et al. 1989; Stoecker 2012; Stoecker et al. 2013; Barbosa et al. 2016, Barbosa et al. 2018).

Figures 1 & 2- Left: Two researchers at the KWI-A measuring skulls. Right: The KWI-A building in the late 1920s (Ihnestrasse 22 in Berlin-Dahlem). Source: Archive of the Max Planck Society, Berlin-Dahlem.

The diverse and international origins of these human remains allowed the also international team of scientists at the KWI-A to research on "racial differences" across groups of people and to produce generalising claims on the concept of "race". This knowledge would also take on different routes and travel and be transformed along the trajectories of the many German and international

researchers who were trained in Berlin. The KWI-A comprised the work of dozens of German and 34 international race researchers: three of them came from India, one being P.C. Biswas, who undertook his PhD research on finger-prints and later became the first director of the Anthropology Department at Delhi University, another was Irawati Karvé.

Karvé travelled to Germany in 1928 to undertake her PhD. After finishing her M.A. studies with G. S. Ghurye in Bombay[13], the decision to go study in Germany was encouraged by her husband Dinakar Karvé[14], who had also studied in Germany.[15] During her research stay at the KWI-A between 1928 and 1930, she developed her PhD research under the supervision of Eugen Fischer on the topic of skull asymmetries and racial difference.

Karvé's PhD thesis was titled *The normal asymmetry of the human skull*. Based on craniometric measurements made with use of the cubic craniophor, Karvé examined the frequency and correlations of asymmetries of 149 skulls from the KWI-A collection and also from the University of Berlin, of which 50 skulls were from the Collection Czekanowsky (obtained in Ruanda) and 50 from the Collection Thurnwald (from present-day Papua-New-Guinea and Solomon Islands). All in all, the skulls selected by Karvé corresponded, according to her, to three different racial groups: '[White] Europeans, Melanesians and [Black Africans]'[16] (Karvé 1931: 16). With the cubic craniophor, she produced drawings of all the skulls, from different angles, and then generate different measurements. With these data, she calculated craniometric indexes, which were deductively connected to categorisations informed by racial theories. From those index values, Karvé undertook a statistical analysis of correlation, comparing the different variables according to the three sampled groups of skulls.

Yet, interestingly, Karvé summarises her research results by claiming that '[…] there exist no frequency differences between [the three analysed groups], not even racial differences'[17]. In this sense, Karvé's research at the KWI-A is a very remarkable—and indeed unique—example of a deviant conclusion compared to the established scientific research praxis at the institute: she was probably the only researcher there who claimed to not have found evidence of the existence of "racial differences" (Barbosa et al. 2016).[18]

Regardless the fact that Karvé had just moved back to India by the time of the publication of her doctoral thesis[19], one might still ask why her knowledge claim, i.e. that there are no racial differences in skull asymmetries, was not taken up by other scientists at the Institute in Berlin. In fact, the research further developed in the subsequent years at the KWI-A would go in the opposite course of what Karvé concluded, namely in the direction of solidifying theories of "racial difference". Navigating on the assumption of superiority of the "white race", some KWI-A researchers would even directly support the formulation and

implementation of racist and eugenicist policies of Germany's National Socialist government.[20]

If we take into account the ongoing discussions on craniometry by the time of her publication in 1931, Karvé's PhD results might have been read as an indicator of the limitations of craniometric research. Following the delegitimisation of the science of phrenology by the turn of the twentieth century, craniometry, perhaps due to some gaps in confirming racial theories, had been slowly discredited as a methodology (Barbosa et al. 2016; Spencer 1997). In fact, in post-WW2 autobiographical accounts, Karvé's supervisor Eugen Fischer downplays the quantity of craniometric research done at the KWI-A (Fischer 1946). Allegedly due to a common (mis)conception among natural scientists that all that anthropologists would want to do was measuring skulls (whereas in fact 'already back then anthropology could do and did much more'), Fischer claims to have decided not to undertake or supervise craniometric research at the KWI-A, which, as he acknowledges, was not followed 'literally', as he might have supervised up to ten research projects with such methodology (Fischer 1946: 117).[21]

Nonetheless, read from today's perspective, Karvé's *The normal asymmetry of the human skull* in fact stands out as the only work produced at the KWI-A with a statement which outspokenly contradicts racial theories of that time. On a more speculative note, this could be interpreted within Karvé's positionality as a non-European race researcher in a predominantly European research staff. In a footnote in a chapter of a book on caste-like formations in other societies, Karvé states about herself:

> The author remembers vividly how Germans and Englishmen refused to see any comparison between the institutions of the primitive people and their own institutions. Every time the author, then a student or a much younger teacher suggested such a comparison it was brushed aside. After this experience one learnt to keep one's thoughts to oneself. (Karvé 1968: 179)

Understanding the role of Karvé's positionality and how it shifted from Germany to India might help us read her knowledge claims articulated in her physical anthropological work in Maharashtra, which, as I will show in the next section, did not mean a rejection of the idea of "race" but its translation.

4. Translating "race" from Germany to India: Karvé's physical anthropological work in Maharashtra (1940s-50s)

In 1939, several years after returning to India, Karvé joined the Deccan College, in Pune, as the first Reader in Sociology, where she worked there until the end of her life in 1970. As the head of the department, professor, researcher and author of a large number of books and papers (over 100), Karvé became one of

the best-known Indian anthropologists of her time.[22] Through her broad research on the particularities and differences of varied social groups in India, especially in Maharashtra, Karvé aimed to offer anthropological answers to crucial issues at debate then, from the question of the historical origins of the different social groups in her home state to the problem of social and national cohesion. She offered several M.A. courses, with titles such as "The biological basis of human society" and "Indian sociology", and advised 25 PhD students in the field of physical anthropology—later in her career referred to by her as 'genetic studies' (ibid.: 363, 383, 390). In fact, one of the long-standing legacies of Karvé's work was the approach she developed for undertaking genetic studies based on endogamous "caste-clusters" and "tribes" as the analysed population units. Indeed, this theoretical and methodological formulation of the category of "caste-cluster" as an object of genetic analysis is much followed by researchers even today.[23] In this sense, Karvé contributed largely for the intersection of the fields of anthropology, in a broader sense, and genetics.

In general, a considerable portion of Karvé's work remained close to the tradition of physical anthropology learnt at the KWI-A[24], as one can see in several of her works on Indian society, Indian (sub)castes and ethnic groups (e.g. Karvé 1947, 1954, 1963). While Karvé might have 'evidently imbibed some eugenicist inclinations from [her PhD adviser] Fischer' (Sundar 2008: 380)[25], especially in the years close to Indian independence she could be seen as a 'strident Hindu [nationalist]'[26] (ibid.: 363) and considered Muslims and Christians in India as distinctive "racial groups", possibly seeing them as 'unassimilated forces' in Indian society (see Sundar 2008: 391f.).[27] In the face of the partition of India, she comments that the Muslims in India presented a situation of "racial conflict" (Karvé 1947: 20).[28] For Sundar (2008: 391), Karvé's 'feelings' towards these religious groups is perhaps explainable through her positionality as a Brahmin scholar in Maharashtra,

> a region [which] constructed its history predominantly as one of resistance against a Muslim empire; which had witnessed concerted challenges by Christian missionaries; and which was the bastion of a "Hindu reform" movement that saw itself as countering inroads made by other religions. (Sundar 2008: 392)

Major social and political events in South Asia, especially in the 1930s, 1940s and 1950s, are strongly reflected in Karvé's work. Renewed anxieties concerning the cohesion of the (from 1947 onwards independent) Indian state with its pronounced social and cultural diversity were underlying intellectual and political debates, as well as debates on the formation of a Marathi speaking state, which were very much pushed forward by a circle of intellectuals from Pune in which the Karvé family was also inserted (Mukharji 2014). As Karvé's children and

grandchildren recounted in interviews, her house in Pune was frequented by many visitors and was a vivid stage of long political discussions.

Furthermore, on the rise in that time were some debates about the ancestry of different social groups in India, especially concerning the alleged European or so-called Aryan origin of high caste groups, a theory that has been fuelling heated national debates until today. Moreover, fast-paced modernisation, urbanisation and a sense of civilisational decay worried both traditionalists and cultural diversity enthusiasts. Last but not the least, eugenicist ideas were since the 1930s on the increase in India, in a strong connection not only with a neo-Malthusian discourse of the 'population problem' in the subcontinent, but also with a growing concern of the national elites with the future and progress of the soon-to-be-independent Nation (cf. Hodges 2012; Savary 2016).

In order to better grasp how Karvé worked on the object of "race", I will concentrate my analysis on her scientific claims in her work from 1940 until 1950, which was heavily based on anthropometric methods. Here I will focus on her first main book co-authored with statistician Dandekar, entitled *Anthropometric measurements of the Maharashtra*. Published in 1951, the book was based on an 11-year-long research conducted by her in several fieldtrips in what came to be the state of Maharashtra, in west-central India.[29] Karvé and Dandekar (1951) justified the efforts of collecting anthropometric data in light of the "racial mixture" due to migration flows in India. The authors (ibid.: 2) justified the use of anthropometry by calling up rhetorical allies in Europe, when they state that 'this method was followed by European anthropologists for the investigations of races in Europe.' Although the authors offer a long discussion of the concept of "caste", they do not offer any clarification on the notion of "race"—this category is taken for granted.

In fact, with a very few exceptions, "race" always appears in the adjective form "racial" in Karvé and Dandekar's (1951) book. The 19 different social groups analysed in the book are referred to by the categories of "castes", "sub-castes" and "tribes".[30] Mainly with use of Martin's anthropometer[31] that she brought with her from Berlin[32], Karvé aimed to undertake precise and extensive measurements[33] with samples from all analysed groups, describing each of them not only by the means of these data (and with indications of features like skin tone and eye colour, nose shape, hair, etc.) but also shortly in terms of their geography, culture, and social organisation. For some, especially lower caste groups or tribes, Karvé and Dandekar (1951: 36) highlight some traits as being 'very fond for liquor' and inclination to expend great amounts of money for parties. In this way, such cultural traits are semantically and directly connected by Karvé with anthropometrically produced features, becoming thus racialised.

The anthropometric data is statistically analysed and presented at length in Karvé and Dandekar's (1951) book. The authors compare the means of each group, with the aid of numerous tables and graphs, which virtually fill half of the book's length. These tabular and graphical inscriptions work as a strong rhetorical element, as the reader is made to believe that 'the racial' of these studied groups is there, enacted and proven by all the represented numbers. Special attention is given to nose[34][35] and head measurements[36], whereby their geographic mean distribution was interpreted by the authors as signs of migratory movements.

In the book's conclusion, the authors highlight the anthropometric differences between what they called 'primitive people' and higher caste groups. The fact that some high caste individuals had, in the authors' words, 'primitive features' was a sign of 'racial mixture going on with the other Hindus', claimed Karvé and Dandekar (1951: 129). Relating their findings to the on-going Aryan migration debate in India, the authors, in a rather contradictory sentence, highlight that some of the (higher caste) groups they studied 'definitely [belong] to great Europoid division of humanity', despite the fact that '*none* of [their] characteristics can be compared to other Europid stocks' (ibid.: 131, emphasis added). According to them, further research both in the Indian south and north-west was needed in order 'to find resemblances which can solve the question of *racial affinities*' (ibid., emphasis added).

In short, with help of the anthropometer, its measurements and their statistical tabular representations, Karvé's scientific work in the 1940s, 1950s and even 1960s[37] produced a large set of anthropometric, racial variables which were used to make sense of the "messiness" of human and cultural diversity, explaining them through migration patterns and "racial mixture". Although the category of "race" is barely mentioned in the substantive form, "the racial" is very much used in the portrayal of the studied groups. Thereby, her scientific claims operate following a manoeuvre of translation, where "race" becomes "the racial", and the studied groups are not "races" but "(sub)castes" and "tribes" with "racial traits"[38]. The making of 'the racial' in her studies functions as a link between physical features and social and cultural traits, thus racialising other categories of difference that she worked with in her research in India.

Moreover, the use of internationally standardised anthropometric methods and the reinforcement of the category "racial" can also be understood as Karvé's strategy in making her research in India relatable vis-à-vis the physical anthropological research in other contexts, in Germany and elsewhere. Furthermore, working with this boundary object of "race/racial", Karvé successfully managed to make her claims be present in different scientific fields, such as physical, biological, social and cultural anthropologies, as in population

genetics and other life sciences. In fact, a marker of her career is how her claims have been taken—and further transformed—by different scientific disciplines (cf. Sundar 2008).

5. Final considerations

As Latour (1984) reminds us, in order to build a scientific fact, scientists need to 'to *enrol* others so that they believe it, buy it and disseminate it across time and space', since, he continues,

> [i]f people are not interested, or if they do something entirely different with the claim, the spread of a fact or of a machine in time and space does not take place. A few people toy with an idea for a few days, but it soon disappears, to be replaced by another. […] Established facts are quickly turned into artefacts, and puzzled people ask, 'How could we have believed such an absurdity?' […] Dissenters who interrupt the spread of any fact or artefact proliferate. (Latour 1984: 121)

Today, we might ask ourselves—how could anthropologists and other scientists have believed in the absurdity of a hierarchical system of classifying humans in different races? Yet, beyond fact and fiction, "race" might still ghost around in different scientific fields and influence scientific practices (see e.g. M'charek 2013). The concept has been translated to or merely substituted by other categories, often transported to other research contexts where life scientists struggle to categorise and make sense of human variation. Through the different claims put forward by Karvé throughout her career, from Germany to India, we can see the use and translation of this category "race", being adapted to forms that would suit her studies of social groups in India. And here lies the power of Karvé's claim-making in her physical anthropological work done in Maharashtra: translating racialised knowledge to her Indian research situations and relating it to relevant political debates on migration and national and regional cohesion, Karvé produced a knowledge that became referential to colleagues and later generations of physical and biological anthropologists. In this sense, her work became, in Latour's terms, an *obligatory passage point* (1984: 132) for others researching similar issues. Supporting her methodological approach were the references that she made to scientists using similar methods in Europe.

In contrast, Karvé's findings articulated in her doctoral thesis in Germany (Karvé 1931) failed to be taken on by other scientists. While she localised her argument to a very specific methodological discussion—on the limits of applying one craniometric method to examine racial difference—Karvé did not engage with other arguments in her claim, nor did she connect her claims to on-going political and scientific discussions.

In a nutshell, the knowledge production case I analyse here reveals the importance of other two aspects involved in the construction of scientific claims: the role of technology and the role of a scientist's positionality or situatedness. As for the first, especially the anthropometer, a measurement device developed by Rudolf Martin in the late nineteenth century, plays a crucial role in Karvé's work in India as late as the 1960s. This contingency of anthropometric research is not only to be justified by the discursive durability of the racial theories behind this methodology, but also by the material durability of the instrument itself, which in fact was carefully designed to be portable, durable and adaptable. Having the racial thinking of late nineteenth century materialised in its very design and capability, the anthropometer has ever since, either as an effect or goal, produced racialising measurements.

Moreover, the contrast between Karvé's claims in her studies, on the one hand, in Berlin and, in Pune, India, on the other, is also revealing. Whereas her craniometric research done at the KWI-A argued that there were no racial differences in those skulls measured in Berlin, her anthropometric research "on the Maharashtra" contributed to making and enacting "the racial" in different social groups in India—so-called castes, sub-castes, tribes, and religious communities. This contrast might point out to the relevance of her personal positionality vis-à-vis the context of her scientific praxis, once as a non-white non-European researcher in Berlin who questioned her European professors and later as an established upper-caste, upper-class professor in Pune.

Categories of difference in South Asia such as "caste" or "tribe" have gone through continued transformations, to some extent being racialised—already under influence of British administration policies of social classification and control or large anthropometric studies by British administrators-researchers (cf. Dirks 2001, Bates 1995), but also by national intellectuals. More recently and following Karvé's legacy, these differences have been subscribed to the molecular level, being studied—and thereby re-constructed or re-affirmed—in the booming field of population genetics in India today. In this sense, Karvé's scientific practice points out to the fact that the articulation of racialised and/or geneticised understandings of human difference to other existing, transforming categories have continued to happen through the work of physical anthropologists in post-colonial India. Thereby, examining the practice and trajectories of such researchers, their networks and the circulation of the technologies and methodologies used by them, are key to understand this process in its global complexity and historical persistence.

Endnotes

[1] While the evident case of apartheid South Africa, for instance, has gained considerable attention in the literature (e.g. Dubow 1995; Schramm 2016), Dikötter (2008: 472) points out that racist and eugenicist knowledge has been further produced and applied in different places around the globe, especially in those sites that are more 'peripheral' in relation to well-known centres of scientific research, e.g. China.

[2] In this section, I will especially consider the theoretical and methodological articulations put forward by Karin Knorr-Cetina (1983), Bruno Latour (1987, 1988, 2008), Donna Haraway (1984, 1997), Warwick Anderson (2002), John Law (1991, 2007), Katharina Schramm (2015, 2016, 2017), Schramm et al. (2012b) and Projit Bihari Mukharji (2016).

[3] See Breckenridge (2014) for a very insightful example of a study of knowledge production that takes into account a scientist at work and their situatedness–in this case Francis Galton (1822-1911) and his development of statistical methods during his anthropometric fieldwork in German South-West-Africa (today Namibia). Breckenridge analyses the circles in which Galton found himself and his personal views and interactions during his fieldwork, which very much conflated with his racist perspective that led to him founding the science of eugenics.

[4] Braun (2014) highlights the specificities of the historical scenario of Victorian England, marked, on the one hand, by anxieties concerning the rapid ongoing industrialisation, pollution and fear for the health of workers, and, on the other, by a growing interest for precision measurement technologies and for statistics.

[5] One example highlighted by Braun (2014) regards the case of black workers in the late 1990s in Baltimore (USA) who, in the case of asbestos-related lung illnesses, had more difficulties than their white co-workers to prove the correlation between working conditions and respiratory deficiencies. The employer contended in the lawsuit that African Americans, compared to whites, had biologically decreased pulmonary capacities, and thus these black workers would have to demonstrate higher levels of disability to be eligible for benefits. As the author puts it, 'race correction reinforces—and buries—the idea of "naturally occurring" differences in lung function in ways that are difficult to unmask' (Braun 2014: xix).

[6] As examples of objects the authors mention: 'written text, a pictorial representation, a technological artefact, a model or a procedure for doing things.' (Schramm et al. 2012b: 7).

[7] The institute had a purpose that was closely linked to politics as it sought to raise the social welfare of the state through scientifically guided "race" population policy. This link would become very evident during the National Socialist regime, when KWI-A researchers supported, in different levels from research to political consultancy, the formulation of eugenicist population policies (see Barbosa et al. 2016).

[8] The Rockefeller Foundation is an example of private investors that funded the KWI-A (Barbosa et al. 2016).

[9] On the theoretical level, Martin can be aligned to what in the 1930s would be the mainstream racial thinking in German physical anthropology: he believed in a genetic, racial inheritance of physical, spiritual and moral capabilities. For example, he defines "race" as a central concept in anthropology, and suggests a hierarchical classification of human races. Yet, Martin's recognition was especially in the field of anthropological methodologies and devices. He was a strong advocate of the standardisation of measurement methods in anthropology, having published a book which would become a canonical methodological manual in the field, the over-one-thousand pages long 'Textbook of anthropology in systematic presentation' (Martin 1914). A version of this book can be found in the Karvé collection of the Deccan College library in Pune.

[10] Martin designed the cubic craniophor in a way that the skull can be fixated on different horizontal levels, and then with help of additional instruments also developed by Martin, one could make relief and contour drawings.

[11] The anthropometer could not only be easily demounted in four different parts, but it could also be easily mounted to a series of add-on measurement tools specific to the measurement of different body parts. In different publications, Martin wrote very detailed, step-by-step prescriptions on the adaptability and assemblage of the anthropometer and its add-ons. Martin's design took into account the weight, durability,

humidity-resistance and flexible mountability of the instruments that composed the anthropometer, so that they could be easily packed in a suitcase and taken along to research travels in 'tropical climate zones' (see e.g. Martin 1929).

[12] The collection of various 'anthropological research materials'—mostly human bone remains—was widespread during the late nineteenth and early twentieth century. Numerous institutes and museums in Germany and across Europe housed such collections, which were often used for anthropometric research (Barbosa et al. 2016, Barbosa et al. 2018).

[13] Karvé obtained a master's degree under the supervision of Prof. Ghurye at Bombay University in 1928, with a thesis in which she made a study of her own caste, titled *The Chitpavan Brahmans: an ethnic study* (Sundar 2008).

[14] Dinakar Karvé was the son of a prominent Maharashtrian Brahmin intellectual and social reformer Dhondo Keshav Karvé (Sundar 2008).

[15] According to different interviewees, the decision to go to Germany over Britain was also due to a strong anti-colonial political view.

[16] For the latter, Karvé would use the category in German '*Neger*' [sic].

[17] Translation mine, from the original in German: '[…] feststellen, […] daß Häufigkeitsunterschiede zwischen Europäern, Negern und Melanesiern, wohl überhaupt Rassenunterschiede, nicht bestehen.' (Karvé 1931: 38).

[18] See also see Von Verschuer (1964) for a panorama of research projects developed at the KWI-A.

[19] Karvé's thesis was published in Leipzig in 1931.

[20] To name one of many examples, Eugen Fischer's student and "racial mixture" expert Wolfgang Abel was responsible for the recommendation of forced sterilisation of 'mixed race' children in Rhineland, Germany, which was implemented on 385 children and youth by the Nazi government in 1937 (Schmuhl 2008; Campt 2004).

[21] Such a statement by Fischer, however, might also have been biased by the typical tone of his post-WW2 accounts, which highlights the scientific and objective aura of the research done in the institute founded by him. Similarly, the fact that Karvé's research was mentioned in a commemorative report on the activities of the KWI-A published in 1964 by former KWI-A's eugenics section director (and then 'human genetics' professor) Von Verschuer, might also indicate how her research was emphasised in such post-WW2 narratives of German KWI-A researchers as indicative of diversity in research results at the KWI-A (cf. von Verschuer 1964).

[22] As Sundar (2008) argues, Karvé's work was crucial for the establishment of anthropology as an academic discipline in India.

[23] Different interviewees at Pune University and Deccan College highlight this as Karvé's longest standing legacy, much present in today's biological anthropology done in Pune. For further-going discussions on the intersection of caste and genetic studies, see for instance Egorova (2009, 2010).

[24] According to Sundar (2008), Karvé remained an 'old-fashioned anthropologist', combining physical anthropology, cultural anthropology, linguistics and archaeology in her research, mostly on castes and ethnic groups in India, and 'as late as 1968 [Karve & Malhotra 1968] she retained a belief in the importance of mapping social groups like subcastes on the basis of anthropometric and what was then called "genetic" data (blood group, colour vision, hand-clasping, and hypertrichosis)" (Sundar 2008: 380).

[25] Sundar also comments that, in general, Indian anthropology, especially during but also after Karvé's time, had a 'fairly strong eugenicist slant' (2008: 380).

[26] Sundar (2008: 393) contends that, in Karvé's later writings, 'the need to maintain India as a multi-cultural, multi-religious society becomes paramount'.

[27] According to Sundar (2008: 391), 'in this, Karvé was not very different from […] most other Indian sociologists to the present, who have followed a path of benign neglect towards minorities—when not actively excluding them from definitions of "Indian culture".'

[28] On this regard, see also Sundar (2008: 392).

[29] Karvé's study's selection of groups in what would still be officially acknowledged in 1960 as the state of Maharashtra might also reflect, according to Mukharji (2014), her position as a Chitpavan Brahmin in Pune, thus probably caught up by the Samyukta Maharashtra movement, a movement for the creation of a Marathi-speaking state, led by Chitpavan Brahmins in Pune.

[30] The groups were: Bari, Andh, Agari, Bhandari, Bhavsar, Bhilla (Mavachi, Tadvi and others), Brahmins, Carak Brahmins, Konkan Brahmins, Burud, Chambhar, Dhanagar, Dhivar, Fulmali, Gond, Govari, Gujar, Gurav, Halbi, Halba Kostis, Khatri, Kohali, Kolam, Koli, Koli-Malhar, Korku, Kunbis Mana Kunbi, Khaire Kunbi, Marathas, Dhanoje, Mahars, Mang, Nhavi, Parit, Pathare Ksatriya, Powar, Prabhu, Pathare Prabhu, Sali, Simpi, Sonar, Sonkolis, Teli, Thakur, Tvasta Kasar, Vaisya Vani, Somavamsi Vadaval, Vanjari, Warli (Karvé & Dandekar 1951: 19-43).

[31] Besides the anthropometer, Martin's eye-colour scale and Luschan's skin-colour scale were also used (See Karvé & Dandekar 1951: 46).

[32] According to a former anthropology professor in an interview in Pune, most anthropometers used by anthropology students would be bought from a manufacturer that started doing them in India; yet, Karvé's anthropometer was different, being brought by her from Germany. Nowadays, anthropometers bought for the Pune University are imported from a manufacturer in Switzerland.

[33] The collected data consisted of 18 different measurements for each measured individual and the subsequent calculation of 12 different indices (see Karvé &Dandekar 1951: 45-7).

[34] Some nose forms are described by the authors as 'fine' (usually when describing high caste groups), others as 'broad', in an implicit hierarchy, as the exemplified in the following quote: 'The Marathas have the *finest noses* – a group of Brahmins, almost indistinguishable from the Marathas, is that of Madhyandin Brahmins. They possess slightly shorter faces than the Marathas. […] The Tirole and the Charaks have slightly broader noses, which may be due to their occupation of northern Maharashtra and *a slight mixture with the large primate population in the region*. […] The other castes comprising of lower artisans and hereditary village servants*, by the broadness of their noses and slightly smaller circumference of the head, occupy a position midway between the Marathas and the primitives.*' (Karvé & Dandekar 1951: 131, emphasis added) Similar hierarchically classifying language is also at play when comparing head sizes.

[35] See Srivatsan (2005) for a historical examination on the role of nose measurements in the history of physical anthropology of castes and tribes in South Asia.

[36] Karvé and Dandekar (1951: 85-9) classify the analysed groups by, in their words, 'small-headed', 'long-headed', 'big-headed', etc., the latter being often associated by the authors with higher status groups.

[37] See e.g. Karvé and Malhotra (1968).

[38] The avoidance of the term "race" in favour of 'population' might also be understood in the process of the critique of the notion of "race" in the context of the post-World War II. See Haraway (1997) for a detailed description of the US-American case. In her later career, Karvé would follow this trend and referred to the studied groups as 'populations'.

Bibliography

Anderson, Warwick. 2002. Postcolonial technoscience. *Social Studies of Science*, 32 (5/6), pp. 643-58.

Barbosa, Thiago Pinto, Owen Brown, Julia Kirchner & Julia Scheurer. 2018. Remembering the anthropological making of race in today's university: an analysis from a students' memorial project in Berlin. *Etnofoor*, 30 (2), *forthcoming.*

Barbosa, Thiago Pinto, Owen Brown, Julia Kirchner, Lili Mundle & Julia Scheurer. 2016. *Manufacturing race: contemporary memories of a building's colonial past,*
http://www.manufacturingrace.org [retrieved: 18.05.2018].

Bayly, Susan. 1995. Caste and 'race' in the colonial ethnography of India. In: Peter Robb, ed. *The concept of race in South Asia.* Oxford: Oxford University Press, pp. 165-218.

Bates, Crispin. 1995. Race, caste, and tribe in Central India: the early origins of Indian anthropometry. In: Peter Robb, ed. *The concept of race in South Asia.* Oxford: Oxford University Press, pp. 219-59.

Braun, Lundy. 2014. *Breathing race into the Machine: the surprising career of the spirometer from plantation to genetics.* Minneapolis: University of Minnesota Press.

Breckenridge, Keith. 2014. *Biometric state: the global politics of identification and surveillance in South Africa, 1850 to the present*. Cambridge: Cambridge University Press.

Campt, Tina. 2004. *Other Germans: black Germans and the politics of race, gender, and memory in the Third Reich*. Michigan: University of Michigan.

Dikötter, Frank. 2008. Race culture: recent perspectives on the history of eugenics. *The American Historical Review*, 103 (2), pp. 467-78.

Dirks, Nicholas B. 2001. *Castes of mind: colonialism and the making of modern India*. Princeton: Princeton University Press.

Dubow, Saul. 1995. *Scientific racism in modern South Africa*. Cambridge: Cambridge University Press.

Egorova, Yulia. 2010. Castes of genes? Representing human genetic diversity in India. *Genomics, society and policy*, 6 (3), pp. 32-49.

_____. 2009. De/geneticizing caste: population genetic research in South Asia. *Science as Culture*, 18 (4), pp. 417-34.

Fischer, Eugen. 1946. [Untitled]. Archive of the Max Planck Society, Berlin, III Abtl., Rep. 94, N. 45.

Grosse, Paul. 2000. *Kolonialismus, Eugenik und bürgerliche Gesellschaft in Deutschland 1850-1918*. Frankfurt: Campus Verlag.

Haraway, Donna. 1997. Modest_Witness@Second_Millennium. FemaleMan©_Meets_OncoMouseª: feminism and technoscience. New York: Routledge.

_____. 1984. Teddy bear patriarchy: taxidermy in the Garden of Eden, NYC, 1908-1936. *Social Text*, 11, pp. 20-64.

Hodges, Sarah. 2012. South Asia´s eugenic past. In: Alison Bashford & Philippa Levine, eds. *The Oxford handbook of the history of eugenics*. Oxford: Oxford University Press, pp. 228-42.

Hoßfeld, Uwe. 2016. *Geschichte der Biologischen Anthropologie in Deutschland: Von den Anfängen bis in die Nachkriegszeit*. Stuttgart: Franz Steiner Verlag.

Hugentobler-Schwager, Hildegard. 1990. 'Der Anthropologe Rudolf Martin (1864–1925)', Inaugural-Dissertation zur Erlangung der Doktorwürde der Medizinischen Fakultät der Universität Zürich. Zürich: Juris Druck & Verlag Zürich.

Karvé, Irawati. 1963. *The racial factor in Indian social life.* History Summer School on Indian social history – 7 June 1963.

_____. 1954. Anthropometric measurements in Karnatak and Orissa and a comparison of these two regions with Maharashtra. *Journal of the Anthropological Society of Bombay*, 8 (1), pp. 45-75.

_____. 1953. *Kinship organization in India.* Bombay: Asia Publishing House.

_____. 1947. *Racial conflict.* New Delhi: Indian Council of World Affairs.

_____. 1931. *Normale Asymmetrie des menschlichen Schädels. Inaugural-Dissertation*. Leipzig: Schwarzenberg & Schumann.

Karvé, Irawati & K.C. Malhotra. 1968. A biological comparison of eight endogamous groups of the same rank. *Current Anthropology*, 9-1, pp. 109-24.

Karvé, Irawati & V.M. Dandekar. 1951. *Anthropometric measurements of Maharashtra*. Poona: Deccan College.

Knorr-Cetina, Karin. 1983. The ethnographic study of scientific work: towards a constructivist interpretation of science. In: Karin Knorr-Cetina & Michael Mulkay, eds. *Science observed: perspectives on the social study of science*. London: Sage Publications, pp. 115-40.

Latour, Bruno. 2008. A textbook case revisited – knowledge as a mode of existence. In: Edward J. Hackett et al., eds. *The handbook of science and technology studies.* 3rd edn. Cambridge: the MIT Press, pp. 83-110.

_____. 1988. *The pasteurization of France.* Cambridge: Harvard University Press.

_____. 1987. *Science in action: how to follow scientists and engineers through society*. Milton Keynes: Open Univ. Press.

Law, John. 2007. Actor network theory and material semiotics, version of 25 April 2007, http://www.heterogeneities.net/publications/Law2007ANTandMaterialSemiotics.pdf [retrieved 01.12.2016].

_____. 1991. Introduction: monsters, machines and sociotechnical relations. In: John Law, ed. *A sociology of monsters: essays on power, technology, and domination.* New York: Routledge, pp. 1-23.

Lipphardt, Veronika. 2009. Der Körper als Substrakt des Unterscheidens: Vom Rassenkonzept zur Humandiversität. In: Ernst Seidl, ed. *Körper-Wissen, Erkenntnis zwischen Eros und Ekel*. Zur gleichnamigen Ausstellung des Museums der Universität Tübingen MUT im Museum Schloss Hohentübingen vom 30. Oktober 2009 bis 31. Januar 2010. Tübingen: Museum der Universität, pp. 104–11.

Martin, Rudolf. 1929. *Anthropometrie: Anleitung zu selbständigen anthropologischen Erhebungen*. Zweite Vermehrte Auflage. Berlin: Springer-Verlag.

_____. 1914. *Lehrbuch der Anthropologie in systematischer Darstellung*. Jena: Gustav Fischer Verlag.

Massin, Benoit. 1996. From Virchow to Fischer: physical anthropology and "modern race theories" in Wilhelmine Germany. In: George W. Stocking, ed. *Volksgeist as method and ethic: essays on Boasian ethnography and the German anthropological tradition*. Madison: University of Wisconsin Press (*History of Anthropology* 8), pp. 79–154.

M'charek, Amade. 2014. Race, time and folded objects: the HeLa error. *Theory, Culture & Society*, 31 (6), pp. 29-56.

_____. 2013. Beyond fact or fiction: on the materiality of race in practice. *Cultural Anthropology*, 28 (3), pp. 420-42.

Morris-Reich, Amos. 2013. Anthropology, standardization and measurement: Rudolf Martin and anthropometric photography. *British Journal for the History of Science*, 46 (3), pp. 487–516.

Mukharji, Projit Bihari. 2016. *Doctoring traditions. Ayurveda, small technologies, and braided sciences*. Chicago: The University of Chicago Press.

_____. 2014. From serosocial to sanguinary identities: caste, transnational race science and the shifting metonymies of blood group B, India c. 1918–1960. *The Indian Economic & Social History Review*, 51 (2), pp. 143-76.

Reardon, Jenny. 2004. *Race to the finish: identity and governance in an age of genomics*. Princeton: Princeton University Press.

Savary, Luzia. 2016. *Race, evolution and public spheres: the vernacularization of science in colonial India, 1860-1930.* PhD Dissertation, ETH Zurich, Zurich,

https://www.research-collection.ethz.ch/handle/20.500.11850/126169 [retrieved 20.04.2018].

Schmuhl, Hans-Walter. 2008. *Crossing boundaries: the Kaiser Wilhelm Institute for Anthropology, Human Heredity, and Eugenics, 1927-1945.* Berlin: Springer.

Schramm, Katharina. 2017. Es könnte anders sein: Von postkolonialen Momenten und hoffnungsvollen Interventionen. In: Susanne Bauer, Torsten Heinemann & Thomas Lemke. *Science and technology studies: Ein Überblick über klassische Positionen und aktuelle Perspektiven*. Frankfurt am Main: Suhrkamp.

_____. 2016. Casts, bones and DNA: interrogating the relationship between science and postcolonial indigeneity in contemporary South Africa. *Anthropology Southern Africa*, 39 (2), pp. 131-44.

_____. 2015. Wie Phönix aus der Asche: Klassifikation, Erinnerungspolitik und Populationsgenetik in Südafrika. *Sociologus*, 65 (2), pp. 201-23.

Schramm, Katharina, David Skinner & Richard Rottenburg, eds. 2012. *Identity politics and the new genetics: re/creating categories of difference and belonging*. 1st edn. New York: Berghahn Books.

_____. 2012. Introduction: ideas in motion: making sense of identity politics and the new genetics. In: Katharina Schramm, David Skinner & Richard Rottenburg, eds. 2012. *Identity politics and the new genetics: re/creating categories of difference and belonging*. 1st edn. New York: Berghahn Books, pp. 1-29.

Spencer, Frank. 1997. Anthropometry. In: Frank Spencer, ed. *History of physical anthropology*, vol. 2. New York: Garland Publishing, pp. 80-7.

Srivatsan, R. 2005. Native noses and nationalist zoos: debates in colonial and early nationalist anthropology of castes and tribes. *Economic and political weekly*, 40 (19), pp. 1986-98.

Stoecker, Holger. 2013. Knochen im Depot: Namibische Schädel in anthropologischen Sammlungen aus der Kolonialzeit. In: Jürgen Zimmerer, ed. *Kein Platz an der Sonne: Erinnerungsorte der deutschen Kolonialgeschichte*. Frankfurt am Main: Campus.

Stoecker, Holger, Thomas Schnalke & Andreas Winkelmann, eds. 2013. *Sammeln, Erforschen, Zurückgeben? Menschliche Gebeine aus der Kolonialzeit in akademischen und musealen Sammlungen*. Berlin: Links.

Sundar, Nandini. 2008. In the cause of anthropology: the life and work of Irawati Karvé. In: Patricia Uberoi, Satish Deshpande & Nandini Sundar, eds. *Anthropology in the East: founders of Indian sociology and anthropology*. Calcutta: Seagull Books, pp. 360-416.

Tallbear, Kimberly. 2003. DNA, blood, and racializing the tribe. *Wicazo Sa Review*, 18 (1), pp. 81-107.

Widmer, Alexandra & Veronika Lipphardt, eds. 2016. *Health and difference: rendering human variation in colonial engagements*. New York: Berghahn.