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# Skulls and blossoms: Collecting and the meaning of scientific objects as resources from the 18th to the 20th century

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Collections, botanical gardens, and museums are key places for natural history. As multi-coded spaces of knowledge, they fulfil many different functions. Their focus and their meanings have changed over time. Having originated from convent gardens and curiosity cabinets, they first became prominent in the 16th and 17th centuries within a variety of politically infused circumstances—courts, scholarly culture, patronage, trade, and colonialism.<sup>1</sup> The gradual separation between natural and cultural objects, which became visible by the late 18th century, transformed the landscape of collections. By the 19th century, many of them had become public museums that welcomed both professional scientists and an increasingly widening spectrum of the general public. Objects and specimens from different parts of the world were assembled in collections and museums, facilitating comparison, synopsis, and the dissemination of knowledge. Each collection has its own unique history. However, collections should also be analysed in terms of configurations that were essential to all of them—the interrelation between the collector, the object, and the viewers.

Over the past 20 years, historical interest in physical spaces dedicated to the accumulation of scientific objects—specimens, visual images created to capture and analyse nature, research instruments, and living creatures, such as wild and exotic animals and plants—has grown rapidly. Collections, botanical gardens, natural history cabinets, and museums have attracted new attention, now associated with the making of knowledge rather than with more traditional stories about academic luminaries making important acquisitions for the benefit of science.<sup>2</sup> Paula Findlen has provided an important stimulus to such work by arguing that natural history and collections situated at the princely courts of Renaissance Italy were essential for understanding the world that dramatically expanded in the 16th century as a result of voyages of discovery and the printing press. Collections not only provided a means of controlling the influx of new objects and information, they helped to ease the tension between the authority of ancient texts and the new experiences opening up for Europe.<sup>3</sup> With a focus on materiality and cultural dimensions, collections become interesting not only because they can be used to illustrate a scientific argument, but also because they provide a means for scholars to reconstruct the very process of knowledge production. Collections are no longer seen as immutable entities, but rather as things and their meanings in flux. These historiographical changes include a wide range of perspectives, such as the political, social, cultural, and administrative as well as that of economic

<sup>1</sup>Brockway, 2002; Cook, 2007; Cunningham, 1996; Spary, 2000.

<sup>2</sup>Alberti, 2005, 2017; Asma, 2001; Beretta, 2005; Kohler, 2006; Kohlstedt, 1995, 2005; Ogilvie, 2006; Outram, 1996; te Heesen, 2013.

<sup>3</sup>Findlen, 1994, 1996.

negotiations. Examining the making of collections opens new doors not only for understanding the wide array of practices involved, but also, more particularly, the processes of communication that link collectors, collections, and the different types of viewers they address.

The contributors to our volume analyse a variety of purposes for which different actors used specimens and the ways in which these objects acquired new cultural and scientific significance within society. They examine a broad range of natural history collections—from craniological specimens amassed by naturalists in the Caucasus to the European bison hunted and preserved by the Russian administration. In terms of geography, this volume covers two distinct areas. Some of our contributors focus on lesser known museums and botanical gardens in France and Belgium, while others deal with collections amassed in parts of Eastern Europe and the Caucasus that belonged to the Russian Empire in the 18th and 19th centuries—a large region that is still poorly represented in Anglophone history of science. In addition to including an instructive juxtaposition of cases from Europe's “core” and “periphery,” most of the papers in this volume examine collections in countries that were caught up in rapid political transformations, such as the French Revolution, the making of a modern nation state, the emancipation of the peasantry, and the transition to mass democratic society.

Quite appropriately, our contributors pay considerable attention to the political dimensions of collection-making processes. Between 1770 and 1914, the processes of nation-building became involved in all cultural and scientific endeavours. Impressive collections and museums were instrumental in enhancing the prestige of a nation and demonstrating its commitment to progress. At the same time, scientific specimens on display could be presented as reflecting all sorts of animate and inanimate riches that a nation possessed. Political considerations should not be dismissed as mere background to the establishment of a collection. If we consider science and politics as two inter-twined spheres of human activity, they can be viewed as resources for one another, as “conditions that govern the possibility” (“Ermöglichungsbedingungen”) of acquiring and establishing scientific knowledge.<sup>4</sup> Both spheres are governed by structures and principles of their own, which become entangled as each uses the structures and principles of the other for its own purposes. The question of which side benefits most from such interactions is perhaps less important than the acknowledgement that the interaction of the spheres has a synergistic effect. This volume examines cases that transcend national boundaries and compares them with other cases that are specific to nations and work only in the framework of the nation-state. Thus, a collection could have meaning as a national treasure even though its origin and ways of acquisition bridged national boundaries.

Let us now consider the articles and their discussions of the interaction between the scientific and the political in the collections' histories. Maddalena Napolitani focuses on two mineral collections in Paris established by the royalist chemist Balthazar-Georges Sage in the politically transformative period dating from the last decade of Ancien Régime to the early 19th century. One belonged to the newly founded École Royale des Mines of Paris and the other was his personal collection. Both were central to his career as an academician at the Académie Royale des Sciences from 1770 onwards and later as chair of docimological mineralogy during the first decade of the École Royale des Mines (1783–1794) in the Hôtel de la Monnaie. The mineral collection of the École Royale des Mines typified those of noblemen in ancien régime France, yet by 1784 it had already acquired an additional layer of meaning as a “national monument.” For this reason, it could be easily modified to fit the new political system after the revolution. Through-out this entire period, Sage's collections and exhibitions at the Mint covered the mineral geography of the whole of France and served as a register of the real wealth of the French Monarchy and later the Republic.

Anastasia Fedotova, Tomasz Samojlik, and Piotr Daszkiewicz analyse the complex ways in which European naturalists were able to realise their dreams of obtaining a European bison, the largest of all European land mammals. A legendary beast, by the 19th century it survived only in the Białowieża Primeval Forest, which, with the third partition of the Polish-Lithuanian Commonwealth in 1795, became a part of the Russian empire. Alexander I's 1802 decree prohibiting hunting of the bison gave the Russian tsar the power to decide who would be granted permission to obtain this exclusive trophy. In the course of half a century, the hunting of the bison as a form of noble recreation

<sup>4</sup>Ash, 2002, 2016, p. 544.

gave way to hunting it for scientific research. Thus, the animal increasingly became an object of science rather than noble entertainment, which in turn gave the emperor significance as a protector of science and forests and simultaneously increased respect for collectors and their exhibitions.

Denis Diagre discusses the political meanings of the newly founded Forestry Museum in Brussels and its related Geographic Arboretum in Tervuren, which formed a part of the State Botanic Garden at the turn of the 20th century. The Arboretum was quite unusual in its design and scale, as it was meant to represent plant communities typical for different geographical zones. Diagre investigates debates about whether the main function of the Arboretum should be “pure,” “applied,” or “popular” science. Catholic ministers of agriculture in Belgium pressed for making the State Botanic Garden in Brussels more “useful” to national industry and agriculture as part of a larger political initiative to promote a “less elitist kind of museum,” in line with propaganda supporting the protection of the countryside against socialism and liberalism. These Catholic politicians championed the creation of the Forestry Museum as fears of deforestation and a timber shortage wracked many European countries at the end of the 19th century. In contrast, the leftist Charles Bommer (1866–1938) exploited the opportunity by creatively reworking proposals for the Forestry Museum in order to benefit both academic research and science popularisation.

Olga Elina shows how Russian botanists' passion for new and exotic plants not only fostered diplomacy between Britain and Russia in the second half of the 18th century, but also engaged aristocratic protagonists in Russia, where private patronage functioned in a similar way as in Great Britain. As a science of state interest and of personal importance for monarchs, botany also became significant for the landed aristocracy. Private botanical gardens served a similar purpose to those of the state: they and especially their greenhouses were used as a platform for the exchange and circulation of rare plants. This paper examines two contemporaneous collections which underscore the activities of patrons as collectors within both a broad international network and aristocratic and scientific circles in the Russian Empire.

The paper by Erki Tammiksaar and Ken Kalling highlights the political dimension of research in physical anthropo-pology carried out by the famous naturalist Karl Ernst von Baer. In the mid-19th century, most Russian ethnographers preferred their discipline to focus on the Russian population of the empire and therefore did not support Baer's emphasis on ethnic minorities in his anthropological research and collections. Baer's research embedded a significant political dimension: the study of the development of early ethnicities inhabiting the Russian Empire, the link between prehistoric populations and modern inhabitants, and an emphasis on the mixture between different types of humans, especially in Europe.

What does it mean when a “pure” scientific museum is confronted with modern notions of accessibility to the general public? Nadezhda Slepkova and Tatyana Yusupova take up this question in their study of the Zoological Museum of the St. Petersburg Academy of Sciences in the second half of the 19th century, when it was under increasing pressure to open its doors to more diverse social groups in the context of the abolition of serfdom, the liberalisation of public life, and a general reform of education in Russia. When the question of public access arose and the museum's custodians were faced with a demand from the minister of education to broaden it, they took advantage of the unique opportunity to request more financial resources and posts. In a next step, the Museum opened special exhibitions (in 1881 and 1887) on the famous Russian expeditions in Central Asia led by the explorer Nikolai Przhevalskii and, later, in 1895, it was given a huge new building of its own. The separation of areas for display, research, and storage was essential for reaching a wider audience, a change which was typical for most natural history museums in late 19th-century Europe.<sup>5</sup>

In addition to their political meanings, collections functioned as a vehicle of knowledge claims that reflected the epistemic predilections and academic ambitions of their curators.<sup>6</sup> There was a close relation between the collections themselves and the assertions made by their collectors. Just as with the laboratory, the iconic locale where scientific authority was achieved, scientific collections were crucial for establishing the authority of those who own or organise them, boosting not just their academic status, but also the credibility of their claims. Moreover, access to collections was essential for verifying scientific hypotheses, while the lack of access could undermine elaborate arguments

<sup>5</sup>Sheets-Pyenson, 1988; Yanni, 2000.

<sup>6</sup>Orosz, 1990; Winsor, 1991.

against them. Many of our contributors emphasise the role of scientific collections in enhancing the academic reputation and power of those who owned or maintained them. Some of our authors go even further than this and examine the ways in which curators used their collections to advance their own concepts and ideas in their respective fields of fundamental research.

Maddalena Napolitani takes a closer look at the life of Balthazar-Georges Sage, a royalist academician, who survived the Terror (1793–1794) in France as a prisoner. With the fall of the Jacobine dictatorship, he was able to reestablish himself and give public lectures in mineralogy and chemistry. His collection, which became part of the École Royale des Mines, was a very useful means of persuading the new regime that his whole life had been dedicated to the service of the nation.

The collection of human skulls that Karl Ernst von Baer amassed while serving as the first director of the Zoological Museum at the University of Königsberg and, later, as academician at the St. Petersburg Academy of Sciences was instrumental not only in his development as a physical anthropologist but also in transforming anthropology itself into a discipline based on quantitative methods.

In her paper on two important botanical collections in 18th-century Russia, Olga Elina highlights different strategies employed by their aristocratic owners, Prokophy Demidov and Count Alexei Razumovsky. While Demidov used his collections as a star of the Moscow “Vanity Fair” to manifest his passion in public, Razumovsky, who was also an educated nobleman, entrusted scientific activities to professional botanists in seclusion. For both, botany played a key role in their activities as patrons of science.

Both Olga Elina and Anastasia Fedotova, in co-authorship with Tomasz Samoilik and Piotr Daszkiewicz, emphasise the function of natural history collections and specimens as gifts exchanged between academic and non-academic partners, an activity that was deeply embedded in social and political relations. Such gifts bound together givers and recipients and were deliberately intended to facilitate other transactions. Hunters, bureaucrats, travellers, experts, merchants, and collectors were important actors in these “spaces-in-between” in the transformation of a living plant, inorganic matter, or a wild animal into a scientific specimen.<sup>7</sup> Such exchanges are, of course, reminiscent of Marcel Mauss’ seminal essay in which he stressed the role of gifts in creating personal bonds and social cohesion through the obligations of reciprocal exchanges.<sup>8</sup> Although our contributors do not explicitly adopt anthropological perspectives in their papers on early modern and modern scientific collections and specimen exchange in this volume, it is clear that their research could potentially be expanded to include an analysis of communities that are created through such scientific endeavours as well as the mutual obligations from which a community’s bonds are created, which are disguised by the seemingly free and unreciprocated nature of gift-giving.

The shift of attention from ideas to practices in the history of science in the last decades has alerted scholars to the importance of the spatial and material dimensions involved in the production of knowledge, fostering a growing corpus of literature on natural history cabinets, museums, and botanical gardens. This means that spatial dimensions—understanding space as a physical, socially generated, and symbolic entity—should be taken into consideration simultaneously with each other. In this volume, we bring attention to the places where collections were displayed and the institutions with which they were affiliated. As many of our papers show, rich and reputed collections can outgrow their original material and institutional environment and become the impetus for the establishment of a new, larger one. For example, Maddalena Napolitani discusses the mineralogical collection that helped the École Royale des Mines establish itself as a new educational institution in France. She argues that the collection was a “key element of the identity-building of the new institution,” and would continue to be when it was later enlarged and redefined as a museum during the French Revolution. As Ken Kalling and Erki Tammiksaar persuasively demonstrate, the lack of his own collections made Karl Ernst von Baer feel acutely vulnerable about his academic standing because he was forced to ask permission to access the collections of his colleagues at the St. Petersburg Academy of Sciences. After amassing an impressive collection of his own, he was able to overcome his subordinate status. Similarly,

<sup>7</sup>Klemun, 2012; Raj, 2016.

<sup>8</sup>Mauss, 1924.

when he began his academic career in Dorpat and later in Königsberg, his collections belonged to the university and the Zoological Museum. Later, the transformation of his zoological collection at the St. Petersburg Academy of Sciences into a public museum helped the Academy obtain more space and procure a new building (1895) that was separate from the administrative offices of the Academy.

The papers in this volume also raise the importance of a collection's materiality. Historians of science have paid scant attention to the technicalities of transforming a living animal, a plant, or a mineral into a specimen or the physical requirements necessary for preserving specimens in museums.<sup>9</sup> Several papers in this volume show that the conflicting expectations of the general public and the scientists working at museums not only affected the choice of exhibits displayed or the strategies used to interpret a museum exhibition, but also had far-reaching consequences for the physical environments in which they were housed. While the public expected the Zoological Museum in St. Petersburg to be well heated and illuminated, its curators evidently preferred a darker and cooler milieu for the sake of the specimens and their preservation. In addition, transforming the dead body of an animal killed in a hunt into an exhibit destined for a leading European museum was by no means a trivial matter. It required an experienced taxidermist to abandon his daily comforts in a nation's capital and to move to an unfamiliar region for a few months, to live in the woods and to deal with social groups with which he would not have otherwise been in contact.

The relationship between collections and specimens is an important issue. The paper by Fedotova, Samojlik, and Daszkiewicz offers a particularly interesting example: from the 16th century on, the European bison was hunted exclusively by rulers. At the beginning of the 19th century, however, hunting it in the Białowieża Primeval Forest was banned because of the species' near extinction. Yet academic institutions—and museums in particular—constituted an important exception to this regulation, as the Russian emperors still permitted the hunting of these animals for the benefit of science. The last bison in the Białowieża Primeval Forest was killed in 1919, yet the species survived in captivity. Through evocative displays and publications, museums made the animal familiar to European audiences, while at the same time retaining its exotic, primeval connotations. The increasing popularity of this bovine contributed to its successful reintroduction into the wild in the 20th century.

Many papers in this volume relate to a growing separation, a widening conceptual gap, between nature and culture from the 18th to the 20th century. Historians of science have emphasised the constitutive role of this divide for the 19th-century scientific episteme; the papers in this volume confirm this understanding.<sup>10</sup> However, they also demonstrate a persistent entanglement of the two, raising the futility of efforts to sever the connections between these two conceptual realms. Aesthetic charges also played a key role. Maddalena Napolitani's startling presentation of the mineral collections that Balthazar-Georges Sage amassed in late 18th-century Paris reminds us not only of their scientific value, but also of their artistic beauty that was much appreciated by contemporaries. Aesthetic pleasure (and perhaps gastronomic delights) undoubtedly played an important role in prompting Russian aristocrats to cultivate lush botanical gardens on their estates, styling them in accordance with the prevailing fashion or personal inclinations, as we learn from Olga Elina's paper. An impressive collection of human skulls amassed by Karl Ernst von Baer highlights the ambiguous status of anthropology within 19th-century fields of science, as it claimed to describe and explain human cultural diversity by concepts and methods developed in the natural sciences. Not surprisingly, Baer's energetic pursuit of interesting specimens occasionally violated his contemporaries' sense of propriety; Ken Kalling and Erki Tammiksaar very tactfully, yet at the same time with a great sense of humour, relate to us some of the academician's adventures in his quest for human skulls. Leading European museums competed among themselves for a chance to exhibit a European bison from the Białowieża forest, both because of its status as a rare species and its function as evidence for the evolution of bovine anatomy. These meanings were important for scientists, but the wider public was probably more interested in the bison's rich cultural symbolism—its association with primeval forces of nature, the wilderness, and the dawn of European history. Yet scientists also benefitted from these popular connotations, as Anastasia Fedotova, Tomasz Samojlik, and Piotr Daszkiewicz assure us in their paper.

<sup>9</sup>Among research in this field, we should name Alberti, 2008; Patchett & Foster, 2008; Poliquin, 2008.

<sup>10</sup>Hirst & Woolley, 1985; Inglis, Bone, & Wilkie, 2005; Novgorodova, 2018; Rader & Cain, 2014.

The case of the European bison highlights another aspect discussed by some of the papers in our volume, namely the meaning of collections in academic research versus their meaning in the popular imagination and the interplay between the two. As Fedotova, Samojlik, and Daszkiewicz demonstrate, the European bison had historical meaning for both scientists and lay audiences, but science and popular culture differed in how they viewed its history. Academic research aspired to grant the bison a place within evolutionary history, while popular culture sought the vestiges of Europe's vanishing past. On occasion, scientists were known to appropriate the meanings of animals produced by popular culture for their own ends—as a means of transferring the symbolic power of a wild beast to their scientific needs. More often, however, curators of museum collections sought to stabilise the meaning of exhibits. Some historians might see their attempts to do so as an integral part of the science popularisation movement in the 19th and early 20th centuries. However, more recent research on 19th-century science popularisation has amply demonstrated its function as a means of creating an identity for institutionalised forms of professional scientific research and of drawing a boundary between professional and “lay” participants.<sup>11</sup> Indeed, by communicating the “achievements” of the sciences in a simplified form that emphasised established, undisputed truths, scientists confirmed their own privileged status in the production of knowledge, which was thus sharply demarcated from its dissemination. Denis Diagre as well as Nadezhda Slepkova and Tatyana Yusupova highlight precisely such an entangled unfolding of these two processes—the drive to turn museums and botanical gardens into vehicles of science popularisation and the compulsion of professional scientists to close these institutions, or at least parts of them, to unqualified visitors in order to create institutional spaces of their own.

These important points raised in the contributions to this volume are by no means exhaustive. We hope that the papers will enhance the understanding of the ways in which natural objects were transformed into specimens, assembled as collections, and defined by a broad variety of cultural, political, economic, and social contexts in early modern and modern Europe. Last but not least, we should not overlook the growing value of 18th- and 19th-century collections and specimens for contemporary research in the life sciences, thanks to new methods and instruments for studying them. Many European natural history collections that originated from aristocratic and princely curiosity cabinets have survived wars and revolutions, floods and fires, and relocations and reforms. The study of their complicated pasts promises to shed new light on lost historical and type specimens, on the biodiversity of extinct habitats, on formerly unrecognised new species, and on lost genetic intraspecific diversity.

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<sup>11</sup>Alberti, 2001; Bensaude-Vincent, 2001.

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