

Working Paper 2

“Specimens Distributed”: The Circulation of Objects from Kew’s Economic Botany Collection

Caroline Cornish & Beth Wilkey

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Caroline Cornish & Beth Wilkey

1. Introduction

This is the second Working Paper of the Mobile Museum research project, an AHRC-funded collaborative project between Royal Holloway, University of London (RHUL), and the Royal Botanic Gardens, Kew (RBGK). The focus of the project is Kew’s Museum of Economic Botany and its successor, the Economic Botany Collection (EBC). During its lifetime, the Kew Museum received thousands of objects from all parts of the world, a considerable proportion of which were subsequently redistributed to other museums, botanic gardens and schools during the nineteenth and twentieth centuries. These redistributions provide the focus for this paper.

Working Paper 1 (WP1) analysed patterns in the accession of objects into the Economic Botany Collection, from its foundation in 1847 to the present day. Working Paper 2 considers the flow of objects outwards, drawing on the remarkably rich sources held at Kew and linking to sources elsewhere (see Bibliography). A number of themes emerge from our analysis. Firstly, there are the various modes in which objects circulated, including partage of those collections acquired on scientific expeditions; large-scale clearances undertaken at Kew on the closure of temporary exhibitions and of other museums, as was the case with the India Museum distribution of 1879–81; periodic disbursements of excess museum stocks following cycles of accumulation, as occurred in 1876; or as part of an ongoing commitment to British regional museums and schools. Secondly we focus on the role of negotiated exchanges in the circulation of objects. In this respect, there were precedent modes of botanical exchange practised at Kew which the museum emulated and adapted. From Kew’s earliest days as a royal garden, exchanges of live plants, seeds, and other forms of plant material had been central to Kew’s *modus operandi*, and, from 1793, these were recorded in the “Goods Inwards” and “Goods Outwards” books, now held in Kew’s archives. Botanists, too, were long accustomed to exchanging herbarium specimens, standardised units of knowledge which facilitated such transactions. Museum objects, however, particularly as understood at the Museum of Economic Botany, incorporated a broader range of object types—plant raw materials, processed materials, ethnographic objects and manufactures—thereby

complicating the processes of conferring value and of exchange. In this paper we use the notion of “equivalencing” to describe and define the means by which Kew navigated a heterogeneous forum to enable exchanges to take place, a process which could involve monetary exchange but more usually did not.¹

This leads into a further theme, the emerging market for biocultural objects in the second half of the nineteenth century. We introduced the term biocultural in WP1; a creation of the twentieth century, it has proved useful to us as a means of encompassing those collections which create knowledge about human uses of nature. Thus the term can be applied equally to collections of animal products as to art objects, to science and technology collections as to ethnographic. The market for biocultural objects which arose with the proliferation of museums in the nineteenth century, we refer to as a “biocultural economy”. This was not necessarily a commercial market (although commercial dealers were prevalent at this time), but one in which shared values of the relative values of objects emerged, and in which exchange was the prevalent mode of transaction. Thus exchanging between museums became a common transaction and required curators to hold a supply of duplicate objects, and this introduces another theme, the use of duplicates as a form of currency.² The very concept of the duplicate object is one which has its origins in the collecting of natural history specimens. During the nineteenth century, the principle was extended to other types of collection, most notably, ethnographic collections, notwithstanding the evident differences between such objects.³ Recent emphasis on the agency of objects in the development of museum collections ought not, however, to overshadow the roles played by human actors in the process. In this respect Chris Wingfield has warned of overlooking the “donors, loaners, dealers and swappers” who are so often occluded in museum databased records.⁴ With this in mind, a further recurrent theme in the paper is that of the social networks which enabled the movement of objects from remote settlements, over national

¹ Recent work on the emergence of a global market in natural history collections has highlighted the role of logistics and trust in exchanges between collectors: see Anne Coote, Alison Haynes, Jude Philp and Simon Ville, “When commerce, science, and leisure collaborated: the nineteenth-century global trade boom in natural history collections,” *Journal of Global History* (2017): 1–21, <https://doi.org/10.1017/S1740022817000171>; Tomomi Kinukawa, “Learned vs. Commercial?: The Commodification of Nature in Early Modern Natural History Specimen Exchanges in England, Germany, and the Netherlands,” *Historical Studies in the Natural Sciences*, Vol. 43 (2013): 589–618.

² Jane MacLaren Walsh, “Collections as Currency,” in *Anthropology, History, and American Indians: Essays in Honor of William Curtis Sturtevant*, ed. William L. Merrill and Ives Goddard, Smithsonian Contributions to Anthropology, Number 44 (Washington, D.C.: Smithsonian Institution Press, 2002), 201–209

³ Walsh, “Collections as Currency,” 205.

⁴ Chris Wingfield, “Donors, Loaners, Dealers and Swappers: The Relationship behind the English Collections at the Pitt Rivers Museum,” in Sarah Byrne, Anne Clarke, Rodney Harrison and Robin Torrence (eds.), *Unpacking the Collection: Networks of Material and Social Agency in the Museum* (New York City and London: Springer, 2011), 119–140.

borders, across oceans, and around “cosmopolitan circuits of exhibition and display,” and the consequent implications and outcomes of that mobility.⁵

Whilst focussing on the transfer of objects via the Kew Museum, this paper raises wider questions about the relationship between acquisition, distribution, and exchange. Kew’s Museum of Economic Botany, and its successor, the EBC, are positioned as apparatuses for the circulation of biocultural objects, and further, as nodes in a network of institutions engaged in similar practices. We also aim to offer insights into the motives, expectations and practices of actors at the Museum of Economic Botany and elsewhere in the work of distribution, and into the observable outcomes of distributive museum activity. Later working papers will explore various aspects of the use of these objects, including object pedagogy and school museums (Working Paper 3), international museum networks (Working Paper 4) and object trajectories (Working Paper 5).

In order to provide a research context for the paper, we first introduce key themes from recent literature concerning the mobility, acquisition and exchange of museum objects (section 2). There follows an account of the sources used to generate the distribution data analysed in the remainder of the paper (section 3). This dataset is currently based primarily on Kew sources, supplemented by materials gathered from elsewhere for the period 1847–1881, when there was no continuous Kew record. In this section, and with more detail in an appendix, we also describe the methods used to populate the integrated database currently under development. The main part of the paper presents an interim analysis of the dataset in its current form (section 4). This covers patterns in the number of distributions over the whole period 1847–1990, as well as more detailed analyses by source region, object type, and recipient type, following the same framework as that of the “entry” series in WP1. The institutions most frequently represented in the “exit” series are highlighted in order to provide a focus for subsequent research on institutional networks of exchange. There follows a detailed case study of one such institutional relationship, between Kew and the British Museum (section 5). Here we move beyond the walls of both institutions, according to the “relational museum” approach.⁶ In mapping the trajectories of fifteen textiles from Sarawak, sent to Kew in the 1850s by Sir James Brooke, we trace networks of knowledge production in the biocultural economy of the nineteenth century. Finally, in conclusion we offer a summary of key findings, and reflections on some wider conceptual issues relating to the circulation and exchange of collections (section 6).

⁵ Saloni Mathur, *India by Design: Colonial History and Cultural Display* (Berkeley, CA: University of California Press, 2007), 9.

⁶ Chris Gosden and Frances Larson, *Knowing Things: Exploring the Collections at the Pitt Rivers Museum 1884 -1945* (Oxford: Oxford University Press, 2007), 6–7; see also Pitt Rivers Museum website, “The Relational Museum,” accessed 16/11/2017 at: <https://www.prm.ox.ac.uk/RelationalMuseum.html>.

2. Object circulation in museum histories

“In short, the Garden should be perfectly adapted to the three branches of instruction, exhibition, and supply.”

John Lindley 1840⁷

As Lindley’s 1840 report on the future of Kew Gardens made clear, the distribution—or “supply”—of objects was part of the founding vision for a state-funded botanic complex at Kew. The practice of circulating and exchanging botanical objects, especially duplicates, was already well-established amongst natural history collectors in Britain, Europe and North America.⁸ More generally, the circulation of objects, people, methods and ideas is a key theme in the history of modern scientific knowledge.⁹ In the Kew Museum context, distributions of objects were not simply one-way transactions. Even where object exchanges did not take place, as in the case of distributions of specimens and artefacts to schools and regional museums, such transfers may have prompted or reactivated relationships between Kew and other institutions which benefitted Kew in the longer term. In other cases the distribution of objects was an integral component of a system of knowledge production which, through shared practices of acquisition, distribution and exchange, linked Kew with other institutions on a global scale, notably national museums and national botanic gardens. Those involved in such relationships were aiming to extend the geographic and taxonomic reach of their own collections, for the purposes of research, public display and education; to build networks for the exchange of knowledge in various forms; to achieve recognition and authorisation for scientific work from fellow scientists—to “enrol” and “mobilise” allies, in Latourian terms;¹⁰ and to extend the museum beyond its walls, a form of science communication, as in the case of Kew’s role in supplying scientifically labelled specimens to schools.

Most academic research on the history of museums has focussed on the acquisition of objects through practices and networks of collecting and on the role of objects in the building of collections. Much less attention has been paid to the re-circulation of objects from museum collections. This reflects the

⁷ John Lindley, Report to Treasury Committee on Management of Royal Gardens at Kew by Doctor Lindley, February 1838, (1840) Parliamentary Paper (PP) (292), 5.

⁸ Hans Sloane is a prominent earlier example; see James Delbourgo, *Collecting the World: The Life and Curiosity of Hans Sloane* (London: Penguin Random House, 2017) and Victoria Pickering, “Putting Nature in a Box: Hans Sloane’s ‘Vegetable Substances’ Collection,” (PhD thesis, Queen Mary, University of London, 2017).

⁹ See, for example, James A. Secord, “Knowledge in Transit,” *Isis* 95 (2004): 654–672; David N. Livingstone, *Putting Science in Its Place: Geographies of Scientific Knowledge* (Chicago: University of Chicago Press, 2004); Kapil Raj, *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650–1900* (Basingstoke: Palgrave Macmillan, 2007).

¹⁰ Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987), 223–228.

primary interest of museum professionals in interpreting their present collections, and the readier availability of accession records in comparison to those of deaccession. By addressing the subject of distributions specifically we hope not only to illustrate the mobility of objects and collections through museum networks, but also to raise wider questions about the role played by circulation in the history of collections. In this context, the exchange of duplicates, a well-established practice by the eighteenth century, appears to have been extended to other kinds of objects, including ethnographic artefacts, in the second half of the nineteenth century. This theme of duplicate exchange, which has been the subject of recent scholarship, has a particular resonance in the case of biocultural collections such as those at Kew.

For the Kew Museum a paradigm for object exchange already existed in the older botanical practice of exchanging herbarium sheets and plants. Consequently the benefits of exchange were well understood. Elsewhere comparable systems of exchange had to be developed. At the United States National Museum, as Jane Maclaren Walsh has shown, specimens were used as “currency” in order to establish its holding institution, the Smithsonian, as a national research centre. The Smithsonian’s International Exchange Service enabled it to take on a new role as self-appointed clearing house for publications and collections from universities and learned institutions throughout the United States and Europe (Figure 1). By exchanging surplus specimens for others which it lacked, and by using valued objects acquired through exchanges to purchase specific items from dealers, it was possible to build universal collections within the very finite spaces of the Smithsonian.¹¹ Specifically, by exchanging American specimens for those of other continents, as occurred with the Kew Museum, a process of “geographical calibrating” took place between the collections of widely dispersed museums. This proved a low-cost way of producing new knowledge and of securing scientific collaboration.

However, when the practice of exchange was extended to ethnological and archaeological collections, the process raised new questions. Many of the exchanged items could not “in any sense be described as duplicates, even by nineteenth-century standards.”¹² In the case of the Smithsonian, numerous unique specimens were traded away, leaving the Smithsonian collections less than representative. In her work on cultures of circulation in late nineteenth-century North America, Catherine Nichols illustrates the epistemological, spatial, temporal, and even administrative contingencies of so-called duplicates.¹³ The

¹¹ Jane MacLaren Walsh, “Collections as Currency,” 201.

¹² Walsh, “Collections as Currency,” 205.

¹³ Catherine A. Nichols, “A Century of Circulation: The Return of the Smithsonian Institution’s Duplicate Anthropological Specimens,” *Museum Anthropology* 37 (2014): 144–159; Catherine A.

circumstances which give rise to duplicates, she argues, can be traced to catalogue-based classification methods. Catalogue fields are inextricably linked to scientific and disciplinary epistemologies; they reflect, in museums like the US National Museum and the Museum of Economic Botany—museums founded on the methods and principles of natural history—the type of information relevant to the science performed there. By grouping specimens, and by extension, hand-made objects, according to similarity—a practice which was a direct effect of classification through the museum catalogue—duplicate specimens were brought into existence.¹⁴



Figure 1. "Smithsonian International Exchange Service at Work," c. 1903-1904 (Smithsonian Institution Archives, MAH-15674).

The notion of the ethnographic duplicate is further problematized by Nichols and Nancy J. Parezo in their study of the practice of ethnological exchanges by Smithsonian ethnology curator, Otis T Mason.¹⁵ Visiting museums at home and abroad, which, incidentally, included the Kew Museum, allowed Mason to assess a range of curatorial and exhibitionary approaches, but also to acquire a "visual inventory" of other museums' collections which might be sought in future exchanges. However, the process of building social networks was not

Nichols, "Exchanging anthropological duplicates at the Smithsonian Institution," *Museum Anthropology* 39 (2016): 130–46.

¹⁴ Nichols, "Exchanging anthropological duplicates," 131–134.

¹⁵ Catherine A. Nichols and Nancy J. Parezo, "Social and Material Connections: Otis T. Mason's European Grand Tour and Collections Exchanges," *History and Anthropology* 28 (2017): 58–83.

unproblematic and difficulties arose in the area of “exchange equivalencies.” In the US context, these were usually quantified in financial terms with curators observing market valuations to achieve peer recognition and good will.¹⁶ Market valuations, however, appeared harder to establish in situations of international exchange, as Mason found when trying to broker exchanges with the British Museum (BM), the situation further exacerbated by the “relative power imbalances” between the two institutions at that time.¹⁷ To ease the process, Mason often sent more objects than he received to the BM. Since he had no shortage of tradeable objects, he was less concerned with the commodity value of this material than with enhancing the Smithsonian’s position amongst museums internationally. Mason was less successful with the BM’s natural history department, where William Henry Flower reported that he had no spares to trade. These two contrasting responses from within the same institution, highlight the contingency of the definition of “duplicate” on factors such as collection size and content, modes of display and classification, and institutional contexts. Flower’s refusal to trade with Mason rested on his museum’s need for multiple examples of the same specimen for purposes of scientific research—comparative morphology and other destructive forms of testing. The Smithsonian, on the other hand, required duplicates for permanent and temporary exhibitions and to satisfy its own institutional policies regarding exchange.

Circulation in the form of object exchange was a well-established practice amongst natural history collectors by 1847 when the Museum of Economic Botany opened at Kew. In the field of botany, such exchanges typically took the forms of herbarium sheets between herbaria, and live plants, seeds, and the like between gardens. In its early years, however, the limited resources of the museum made it difficult for administrators to introduce a comparable system of exchange for museum objects. In Kew’s annual report for the period 1853 to 1859, William Hooker explained that to extend to the museum “the complicated system of exchange and distribution” as practised in the gardens and herbarium, would require additional space and staff. As we shall see, by this time some distributions to individual collectors and colonial museums had already taken place.¹⁸ Until more resources were made available, he suggested, the mission of the Kew Museum would of necessity be “to indicate how such Institutions may be founded and conducted, and not as the source whence they are to draw.”¹⁹

¹⁶ Nichols & Parezo, “Social and Material Connections,” 64.

¹⁷ Nichols & Parezo, “Social and Material Connections,” 66.

¹⁸ The first mention comes in the 1856 annual report: *Sir W J Hooker’s Report on Kew Gardens, &c.* (London, 1857), 5.

¹⁹ William Hooker, *Report on the Progress and Condition of the Royal Gardens of Kew, from 1853 to 1859* (London: HMSO, 1859), 9.

This situation was soon to change as the Kew Museum became a major source of material for museums and other institutions both nationally and internationally.

3. Object distributions at Kew: sources and methods

A key output of the Mobile Museum project will be an Access database of object exits from Kew, combining data drawn from archival sources at Kew with datasets of objects recorded as having being received at recipient museums. Selected data, including records of former Kew objects that can be identified as currently held in recipient museums, will be incorporated into an updated version of the Economic Botany Collection catalogue, and the full raw data for the project will be freely available for download. An introduction to the entry and management of distributions data within this database is provided in an appendix. Here we describe the sources and methods used to analyse the data presented in this paper.

Distributions from the Kew Museum were recorded systematically from late 1881 to 1990 in the “Specimens Distributed” registers, currently held in the EBC. This data, representing a continuous and comprehensive series covering most of the museum’s lifetime, has been transcribed and incorporated into the database. In addition, at the time of writing this working paper (November 2017), we have completed a systematic survey of Kew and non-Kew sources for the previous period (1847–late 1881), for which no continuous Kew record exists, and have thus extended the series backwards to the foundation of the Kew Museum in 1847. Although the current analysis is based on an interim dataset, to be augmented by additional data from other archives over the course of the project, we are confident that it incorporates the bulk of distributions from the Kew Museum during its lifetime.

Specimens Distributed books, 1881–1990

The specimens distributed books (hereafter referred to as exit books) record deaccessions from the Museum of Economic Botany from 1881 to 1990. They were introduced in November 1881, a particularly significant date as the museum had just completed a huge redistribution of all the botanical collections from the former India Museum, a process which had taken over a year. As a result the museum had a stock of objects in reserve, a dedicated space for sorting and packing, and a reinforced labour force consisting of Assistant Director William Thiselton-Dyer as overseer, curator John Reader Jackson, assistant curator John Masters Hillier, and museum “préparateur,” George Badderly, who had come from the India Office (see below). The introduction of the exit books, therefore, marks a new stage, not only in administrative practices in the museum, but also in how Kew’s own view of its museum had changed, from being an example to other botanic gardens and museums of “how

such institutions may be founded and conducted," to becoming "the source whence they are to draw."²⁰ The first book covers the period November 1881–1901 and the second 1901–1990. Entries are mostly handwritten, with some typed records in the later years. An example of a deaccession record can be seen at Figure 2.

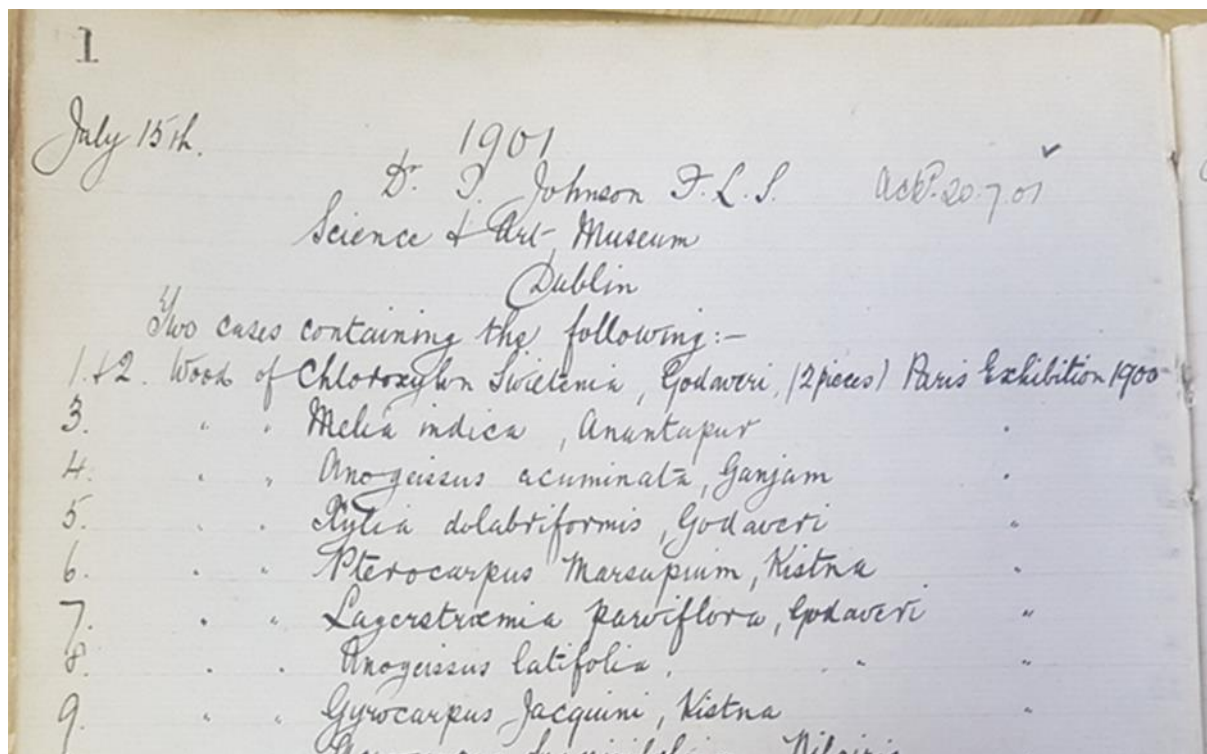


Figure 2. Extract from Specimens Distributed, Book 2, 1901 – 1990.

The books typically record a named individual, an associated institution (if applicable), recipient address, and a list of specimens sent. Other recorded details may include the manner in which the specimens were sent, acknowledgement of specimens received, the original collector of the object, and whether they featured in any prominent exhibitions.

Entry books, 1847–2017

Certain distributions were not recorded in the exit books, of which the most significant were a number of distributions of ethnographic material to the British Museum, Pitt Rivers Museum and Horniman Museum, which took place between 1958 and 1961. Instead, these distributions were recorded by means of annotations in the entry books. The use of such annotations to record distributions was an exceptional practice. The associated data has been included

²⁰ RBGK, Archives, K1 Kew Gardens Annual Reports 1844–70: W.J. Hooker, *Sir W. J. Hooker's Report on Kew Gardens, [31st December 1859]* (London: Royal Botanic Gardens, Kew, 1860), ff.73–74.

in the distribution series (for an example of such an annotation, see Figure 6 below).

Other sources for 1847–1881

For the period from the opening of the Museum of Economic Botany in September 1847 to October 1881, however, there had been no system for the continuous recording of objects leaving the museum. In the absence of a continuous record, we have consulted a variety of sources at Kew and at other institutions (notably the British Museum and Glasgow Museum) in order to reconstitute a continuous record of distributions for these years. As previously stated, this part of the dataset is an interim record as of November 2017, but we are confident that it represents the majority of deaccessions activity for the 1847–1881 period. Here we provide a brief summary of the key sources used to generate this part of the time series.

Kew annual reports were first submitted to the government in published form by William Hooker in 1855 and continued under Joseph until 1882; they currently form part of the library collection at Kew.²¹ Prior to this, manuscript reports were sent to Kew's commissioners and these can be found in Kew Archives.²² Citations of objects distributed from the Kew Museum occur in the years 1856, 1862, 1868, 1876–80, and 1882 (see Chart 1), however the level of reporting is usually summary and has not provided precise dates, quantities, or types of object in many cases. Furthermore, a number of distributions which we have identified from other sources, such as the donation of over three hundred objects to the Christy Collection of the British Museum in 1866, do not appear in the annual reports.

Kew Directors' Correspondence has provided a further source of quantitative data for the database and of contextual detail for our understanding of these transactions. This body of archival material, consisting of approximately 80,000 letters, news clippings, specimen lists, and notes, encompasses the scientific correspondence received by senior staff from 1841 to 1928, and Sir William Hooker's correspondence from before 1841, which he brought with him to Kew. Copies of outgoing correspondence are not normally included. Approximately

²¹ From 1887 onwards, initially under the aegis of Thiselton-Dyer, Kew's activities were recorded for more public consumption in the *Bulletin of Miscellaneous Information* (Royal Botanic Gardens, Kew). Published reports resumed in 1946 but did not appear on an annual basis until 1971 onwards.

²² RBGK, Archives, K1 Kew Gardens Annual Reports 1844–70. From 1841 to 1850, Kew's commissioning department was the Commissioners of Woods, Forests, Land Revenues, Works and Buildings. This body was replaced in 1851 by the office of the Commissioners of Works and Public Buildings and the Commissioners of Woods, Forests and Land Revenues, dividing between them the public and the commercial functions of the Crown lands. From this point until 1903 Kew reported to the Commissioners of Works and Public Buildings.

40% of this correspondence has now been digitised and is accessible through *JSTOR Global Plants*. Joseph Dalton Hooker's Personal Papers have also been digitised, by the Joseph Dalton Hooker Correspondence Project, and can be found online, digitally reunited with letters from a number of international archives.²³

Kew's **Miscellaneous Reports** have proved to be invaluable in piecing together details of distributions during the early years of the museum. These are bound volumes containing printed reports, correspondence and miscellaneous items which cover the period from 1850 to 1928. They relate chiefly to Kew's relations with botanic gardens, international exhibition commissioners, and other overseas organisations, with an emphasis on economic botany.

Recipient institution archives provide important evidence of Kew distributions for the period prior to late 1881, as well as for subsequent years when they may be matched with entries recorded in the exit books. For the purposes of this paper, data from the British Museum and Glasgow Museum for the pre-1882 period were incorporated into the series alongside data from Kew sources, significantly enhancing the distributions record. A search for "Kew" on the BM's Merlin database, for example, revealed a number of accessions from Kew in the 1860s and 1870s of which there was no trace in the published Kew records. Further investigation of archival sources at Kew, including Directors' Correspondence, provided contextual evidence. This enabled a more targeted search in the BM accession registers ("Presents Books") and archives, where, as at Kew, annual reports, minutes of meetings, and correspondence were highly informative. Navigating these archives, which consist of Central Archives and archives held in the collections and research departments (Africa, Oceania and the Americas [AOA]; Asia and the Near East [ANE]; and Britain, Europe and Prehistory [BPE]), was facilitated by BM archives and collections departments staff. A case study of the BM 1866 transfers is provided in section 5 below.

Methods

In the analysis of accessions data presented in Working Paper 1, the basic unit of analysis was the "accession event" rather than the individual object.²⁴ This was in large part due to variations in the way objects were described and enumerated, making comparisons over time difficult. By contrast, the recording of deaccessions at Kew was generally consistent, with individual objects itemised and numbered. Nonetheless, in the interests of consistency, we focus again in

²³ RBGK website, "Joseph Dalton Hooker Correspondence," accessed 14/11/2017 at <http://jdhooker.kew.org/p/jdh>.

²⁴ Caroline Cornish, Felix Driver & Mark Nesbitt, "The Economic Botany Collection at Kew: Analysis of Accessions Data," Mobile Museum Working Paper 1 (June 2017), 20, accessed from <https://www.rhul.ac.uk/mobile-museum>, 04/2/2017).

this paper on patterns relating to “deaccession events”, rather than on individual objects. This approach not only enables direct comparison with the accessions series (Chart 2); it also provides a consistent basis for integrating the pre- and post-late 1881 deaccessions series, and gives an measure of the pattern of inter-institutional exchanges.

1990 has been chosen as the final year for this analysis as that is the final year recorded in the Exit Books. In practice, by then the practice of distributing duplicate objects had almost ceased. Distributions from the 1980s were usually subsamples of raw materials such as resins and woods; this type of sample continues to be distributed but is now recorded on paper forms. Accurate counts for sample distribution since 1990 could be achieved but would require disproportionate effort. Cessation of object distribution since about 1990 may well be linked to the introduction of individual catalogue numbers, applied to specimens when they moved from the old museum buildings to the purpose-built research store in the Sir Joseph Banks Building in the mid-1980s. Current museum practice is often to maintain a distinction between objects received, and objects formally accessioned. It is usually considered in museums that objects received may in some cases be redistributed without the formalities attending deaccession of an accessioned (i.e. numbered) object. Numbering of Kew’s economic botany specimens may have raised awareness of Kew of this distinction, and thus an awareness that deaccessioning is not straightforward. Note that some objects continued to be deaccessioned though the 1990s, to Kew’s Education team, to the display at Kew’s Millennium Seedbank at Wakehurst Place, and perhaps to other institutions. We have not located any centralised record of these transfers.

It is useful here to note other work on museum databases focussing on collecting events rather than overall numbers of objects. In his study of the English collections at the Pitt Rivers Museum (PRM), for example, Chris Wingfield argues that a sole emphasis on object numbers is not an effective means of evaluating museum-donor relationships.²⁵ Analysing accessions using standard museum databases, he suggests, may overstate the significance of large donations, for various reasons: large donations can reflect the ease of collecting certain types of object at low cost; database records may treat the component parts of a single assemblage as separate donations; and they can simply reflect the amount of collections management and research time spent on them. As an alternative, Wingfield turns to the method adopted by Janet Owen in her work on the collections of John Lubbock, in which “collecting events” to determine the extent of Lubbock’s own agency in amassing his collections. Coding each collecting event in terms of field-collected, auction purchase, or gift, enabled

²⁵ Wingfield, “Donors, Loaners, Dealers and Swappers.”

Owen to take a more qualitative approach to the history of Lubbock's cycles of accumulation; thus she argues that purchases and field collecting represented an "active concern" to develop his collection whereas gifts, conversely, signalled "a more passive form of collecting." With this in mind, Wingfield advocates a re-examination and representation of the data held in traditional accession registers, which are designed to record the transactions leading to objects' transfer to museum ownership and which, therefore, reflect "the collection-as-process". Similarly Geoffrey Swinney argues for a consideration of the materiality of the register, for it is by heeding the processes by which registers are produced—processes which are embedded in the register's pages—that we are alerted to the losses that can be incurred when such registers are translated into digital form. Such losses encompass, not only data, but also those qualities relating to the materiality of the register: the visual, haptic and olfactory sensations which collectively enable us to access the tacit knowledge contained therein.²⁶ For the Mobile Museum transcription and database creation, we believe that the use of an events list will enable the accurate identification of accessioning and de-accessioning events and hence the preservation of that attribute normally associated with material registers.

4. The biocultural economy: analysis of distributions from the Kew Museum

From the mid-nineteenth century, the growth in the circulation of biocultural objects was enabled by a particular set of circumstances related to an increase in the number of botanic gardens and museums, technological improvements in the infrastructures of travel and communication, and the colonial designs of certain polities. The consequent increase in demand for such objects was a contributory factor to the emergence of what we call here a "biocultural economy" founded on shared understandings of value. The term is informed by Nichol's notion of the "economy of artifacts," a social network composed of people, institutions and objects, enabling the acquisition and distribution of ethnographic objects through collecting networks.²⁷ Distributions from the Kew Museum were in the main composed of plant-based objects of varying degrees of human intervention, but because of the heterogeneity of economic collections, Kew and other institutions were able to practise exchanges in an extended forum which incorporated ethnographic, technological, antiquities, applied art and archaeological collectors. In describing this exchange space as a biocultural

²⁶ Geoffrey Swinney, "What do we know about what we know? The museum 'register' as museum object" in Sandra Dudley et al (eds.), *The Thing about Museums: Objects and Experience, Representation and Contestation* (Abingdon: Routledge, 2011), 31-45.

²⁷ Nichols, 2016, 130.

economy, we also draw on Philp's concept of "the exchange industry," based on acts of trust between two parties who regarded themselves as trading equals.²⁸

4.1 Chronology

Chart 3 shows the time series of distribution events from the Kew Museum between 1847 and 1990, and on the basis of this we can identify four key phases. **Phase 1** is the period from the foundation of the museum in 1847 to 1875 when the museum was in its initial phase of development and arguably more concerned with growing its collections than redistributing them. Although low in frequency, some of these distributions were significant in terms of object numbers and types: these include the distributions to the BM's Christy Collection recorded in BM archives and examined in more detail in section 5 (more precise details of the 1866 distribution can be seen at Chart 20). There are a number of possible reasons as to why Joseph Hooker did not want to publicise the redistribution of over three hundred ethnographic objects to the BM in 1866, and why, consequently, no mention of this appears in the annual report for that year. We have already alluded to the fact that prior to 1876, museum distributions were not uniformly reported in the annual reports. Pre-1876 details of distributions only occur in the reports for 1856, 1862 and 1868 (Chart 1). This sporadic reporting was almost certainly related to pressures of time and availability of duplicates, but it seems also possible that Hooker may have believed that such news would deter donors, or that it reflected adversely on the management and mission of the Kew Museum, or indeed that he wanted to keep Kew's governing department, the Department of Works and Public Services, at arm's length.

Phase 2 (1876–1914) is one during which the circulation of objects as a museum practice was at its most intense at the Kew Museum and elsewhere. The dates are significant for a number of reasons: 1875 marked the arrival of William Thiselton-Dyer as Assistant Director to Joseph Hooker, in which position he had responsibility for the overall management of the museum. This post had been suppressed when Joseph acceded to the Kew directorship in 1865, so its reinstatement meant that Joseph now had the resource he needed to review the museum collections and displays. As part of a broader plan to buttress Kew's position as a scientific institution, the two men shared a desire to reshape the museum collections and displays according to the more physiological approach of the "new botany" from Germany.²⁹ In his 1876 annual report, Joseph

²⁸ Jude Philp, "Hedley takes a holiday: collections from Kanak people in the Australian Museum," in Sarah Byrne, Anne Clarke, Rodney Harrison & Robin Torrence (eds.), *Unpacking the Collection: Networks of Material and Social Agency in the Museum* (New York City and London: Springer, 2011), 271.

²⁹ F. O. Bower, *Sixty Years of Botany in Britain (1875–1935): Impressions of an Eyewitness* (London: Macmillan & Co. Ltd, 1938).

announced that the museum buildings were “in a most crowded condition” and unable to accommodate more exhibits. To provide accommodation for new objects, and also to more strictly define the scope of the collections, Thiselton-Dyer and the museum curator, John Reader Jackson, had begun a systematic revision of the entire collection. There was to be no duplication of specimens; objects would only be retained on grounds of “usefulness throughout the vegetable kingdom” or “structure”, reflecting a new emphasis on plant physiology. Separate collections “of merely technological interest” were to be broken up and re-distributed.³⁰ In a letter to Asa Gray, Thiselton-Dyer referred to this undertaking thus: “The management of an Economic Museum is no light matter as I have found during the last few years to my cost. It requires unremitting labour to prevent its degenerating into a mere assemblage of heterogeneous odds and ends.”³¹ Examples of objects dispersed under this new order included “three sectional models of boats” which had been acquired from the Vancouver Island Court at the 1862 Exhibition, and which were transferred to the South Kensington Museum in 1876;³² and large quantities of food products, and insect specimens, for the food and animal products collections respectively at the Bethnal Green Museum (Figure 3).³³ By 1878 Hooker was able to report that “the contents of No. 3 Museum have also been carefully revised, and an immense number of duplicate and useless specimens withdrawn. Great improvements have also been effected in the display of the larger objects, especially the fine specimens of the stems of palms and tree ferns”.³⁴

A second factor affecting distributions from Kew during this period was the increased incidence of international exhibitions. In 1878 Kew took receipt of a “very large collection of woods, gums, resins, fruits, fibres, &c.” from the Indian Forest Department.³⁵ When counted there were over a thousand specimens. They were a duplicate set of those exhibited at the Paris Exposition Universelle of 1878, and after Kew had selected for its own purposes, distributions to other

³⁰ J. D. Hooker, *Report on the Progress and Condition of the Royal Gardens at Kew during the Year 1876* (London, 1877), 27.

³¹ Letter from William-Thiselton to Asa Gray February 20, 1880 in “William Turner Thiselton-Dyer letters to Asa Gray,” contained in “Papers of Asa Gray,” Asa Gray Correspondence Project, accessed 02/10/2017 at <https://www.biodiversitylibrary.org/item/225498#page/12/mode/1up>.

³² Royal Botanic Gardens, Kew (RBGK), Archives, Miscellaneous Reports, MR/41 South Kensington Museum, Science and Art Department 1855–1912, f.278.

³³ RBGK, Archives, MR/41, ff. 305–312.

³⁴ J. D. Hooker, *Report on the Progress and Condition of the Royal Gardens at Kew during the Year 1877* (London, 1878), p. 44 cited in Caroline Cornish, “Nineteenth-Century Museums and the Shaping of Disciplines: Potentialities and Limitations at Kew’s Museum of Economic Botany,” *Museum History Journal* (2015): 17.

³⁵ RBGK, Economic Botany Collection (EBC), Museum Entry Book, 1861–79, EBN 64.1878.

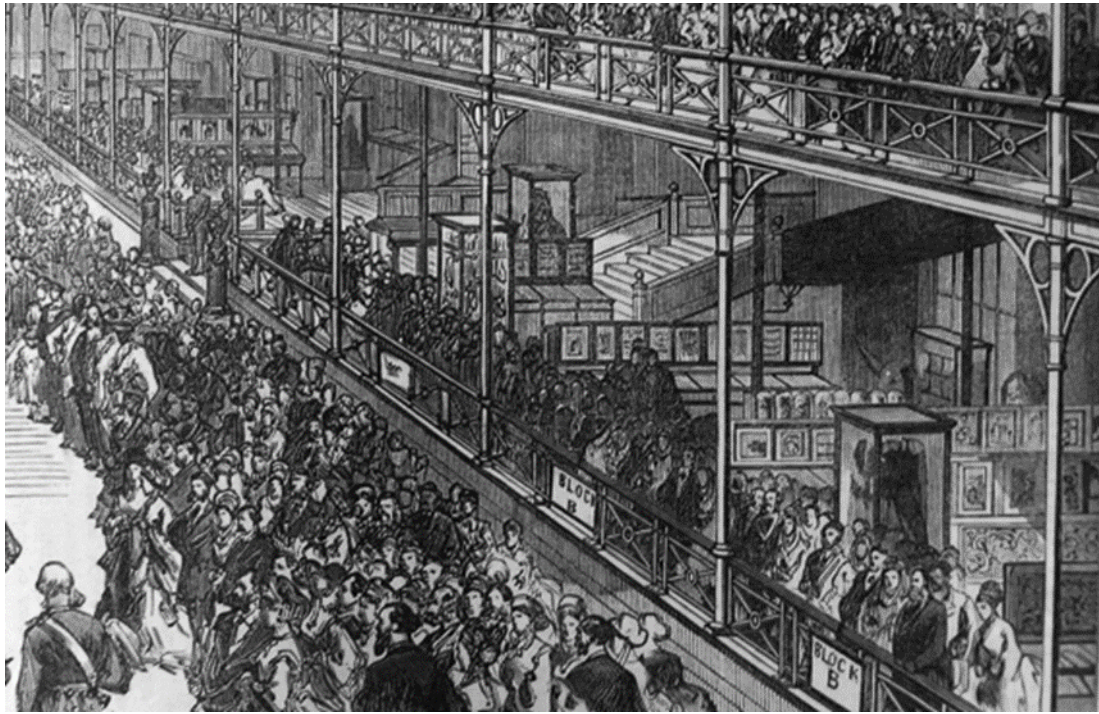


Figure 3. Detail of engraving of the opening of the Bethnal Green Museum, showing gallery with the Animal Products Collection (*Illustrated London News*, June 29, 1872; 620; Issue 1712).

collections began in 1879, including the Sydney Technological Museum,³⁶ the City Industrial Museum at Glasgow,³⁷ and the Botanical Museum at Harvard University.³⁸ This event marked the onset of the Kew Museum as a clearing house for plant-based collections, when, embedded in exhibitionary networks, it could identify from afar, and negotiate the acquisition of, large collections on the premise that, having first selected for its own museum, it would then redistribute to other institutions nationally and internationally.

The largest and best known of these exercises in redistribution followed in 1879, when the former museum of the East India Company—the India Museum—closed. Kew readily accepted the role of receiving, sorting and distributing the India Museum botanical collections, since prior to this it had had no official access to EIC networks.³⁹ As Desmond records in his history of the India Museum, barges laden with over 3,000 timber specimens weighing thirty-six tons were sent up the Thames to Kew.⁴⁰ Significantly, the India Office agreed to

³⁶ RBGK, Archives, MR/398, Sydney. Technological Museum, 1879-1890, f.1.

³⁷ RBGK, Library, "Pamphlets, Reports, &c", Vol. 5, *Report on the City Industrial Museum, Glasgow for the Year 1879*.

³⁸ J. D. Hooker, *Report on the Progress and Condition of the Royal Gardens at Kew during the Year 1880* (London, 1881).

³⁹ RBGK, Archives, India Museum 1875-92 [bound volume], f.21: letter to Thiselton-Dyer from George Birdwood, July 13, 1879.

⁴⁰ Ray Desmond, *The India Museum, 1801-1879* (London: HMSO, 1982), 185.

pay the total expenses of removal, and to award Kew £2,000 towards the building of an extension to Museum No. 1, in order to accommodate the new material. Furthermore, it granted a sum of £200 per annum for maintenance costs and for the services of mycologist Mordecai Cubitt Cooke—a former India Museum curator—at Kew for three days a week over a five year period, contributing £200 a year towards his salary.⁴¹ The process of sorting took one year to complete in temporary buildings erected for the purpose, with the first distributions—to Glasgow’s City Industrial Museum and South Kensington—in late 1879, and the rest extending across 1880. The main recipients, as named in the annual report for 1880, can be seen at Chart 4. This does not include, however, a number of private collectors such as Eliza Brightwen, and commercial associates like Thomas Routledge of Ford Paper Mills or Septimus Piesse of the perfumery, Piesse & Lubin. Together they give some idea of the breadth of Kew’s networks of exchange by this time, from philosophical botanists to captains of industry, and from regional British museums to international repositories. At the end of the process a reserve quantity remained, to be used “for the supply of future applicants,” and a building forming part of the donation—the “iron house”—also remained, ear-marked for the future packing and distribution of museum objects.

By the end of 1880, Kew had not only completed the task of redistributing the India Museum botanical collections, as promised to the India Office, but it had also put in place the sites and stocks for distributions to become a regular activity at its museum. In the annual report for 1880, Joseph Hooker outlined the advantages of large-scale distributions like this one. Apart from enriching its own collections, and offering a more “complete” representation of Indian useful plants, the redisplay of the objects at Kew allowed greater public access to the Indian collections, which had previously been displayed in cramped conditions at South Kensington and held in storage across London. The objects had accrued botanical and economic value by being identified and labelled at Kew, and furthermore, at the Kew Museum they could be viewed comparatively alongside species from around the world.⁴²

And it was not long before the iron house was once again operating at full capacity, as Kew became involved with the school museums movement. This subject will be more fully covered in Working Paper 3; suffice it to say here that, from 1877 onwards, the Kew Museum began to receive requests for specimens for school museums. Chart 5 illustrates the relative importance of schools in relation to other recipients during this period, and Chart 6 shows the total percentage of distribution events (35%) accounted for by schools over the

⁴¹ Hooker, *Report during the year 1880*, 56.

⁴² Hooker, *Report during the year 1880*, 59–60.

history of museum distributions at Kew. Further to the Elementary Education Act of 1870, schools were encouraged by their school boards to create school “museums,” cabinets containing both natural history specimens and “specimens of raw and manufactured products in stages to illustrate the various industries of our land.”⁴³ In 1877 Kew entered into an arrangement known as the “Botany Scheme” with the London School Board, by which duplicate museum specimens from Kew were sent to the Board to be distributed to schools across the capital.⁴⁴ The next decade saw, in addition, many individual schools writing to Kew requesting museum objects. In 1894 there was a huge surge in demand, with requests solicited from across England and Wales. The reason for the increase lies partly in an article published in *The Teachers’ Aid* journal in May of that year. The journal had regularly featured articles on school museums with such titles as “How to obtain free specimens” and “A new list of specimens;” these were essentially lists of companies who would supply products to schools on request.⁴⁵ However, by 1894 specimens were proving harder to elicit, and “the tide of free specimens ... [had] begun to ebb”. The May article reported that the author had recently received a large donation of botanical specimens from Kew Gardens: “They represent a small museum in themselves, and are most valuable, consisting as they do of seeds, fibres, beans, and vegetable curios from all parts of the world.”⁴⁶ “From *The Teachers’ Aid* I find that you grant educational help in the way of plants, fibres, seeds, &c. to schools,” the headmaster of the Nant Peris Board School in Carnarvon wrote to the Kew Museum within the same week that the article appeared.⁴⁷ Those schools which subsequently applied for specimens were mainly elementary, ranging from Board Schools, through National and British Schools, to Church Schools, with both urban and rural areas well-represented.⁴⁸

The pattern of distributions activity in this phase also reflects the timing of international exhibitions and subsequent transfers of material on the closure of these events. Kew’s success in securing the residual botanical collections after such events becomes clear, with periodic flurries of transfer occurring in 1888, 1901, and 1911, following sizeable accessions into Kew from the Colonial and Indian Exhibition (1886), the Paris Exposition Universelle (1900), and the Japan-British Exhibition (1910) respectively.

⁴³ Anon, “School Museums,” *The Teachers’ Aid* 4, no. 90 (June 18, 1887): 265.

⁴⁴ RBGK, EBC, School Museums Correspondence, Vol.3, f.823 (see also f.826): letter to David Prain from the London School Board, May 31, 1900.

⁴⁵ G. Singleton, “How to obtain free specimens,” *The Teachers’ Aid* 18, no. 456 (June 23, 1894): 269–70; “Museum Specimens,” *The Teachers’ Aid* 18, No. 457 (June 30, 1894): 289–291.

⁴⁶ G. Singleton, “School Museums,” *The Teachers’ Aid*, 18, No. 452 (May 26, 1894): 169.

⁴⁷ RBGK, EBC, School Museums Correspondence Vol.3, f.148: letter to David Prain from Nant Peris Board School, Llanberis, Carnarvon, May 25, 1894.

⁴⁸ Caroline Cornish, “Curating Science in an Age of Empire: Kew’s Museum of Economic Botany,” (PhD thesis, University of London, Royal Holloway, 2013).

Phase 3 (1915–1938) reflects the impact of the First World War which heralded the advent of a new era for the Museum of Economic Botany. Distributions activity was much reduced during the war, with Ireland the only overseas destination. Towards 1920 exchanges with overseas institutions resumed, and thence there occurred an average of fifteen events per year to 1936. During this time, universities at home and abroad were frequent recipients, suggesting a resumption of international scientific collaboration after the hiatus of war-time. And although the British Empire was at its greatest territorial extent during this period, Britain was no longer expanding its overseas possessions, and that may be what is reflected in the relatively low levels of distributions to the colonies at this time.

Phase 4 (1939–1990) again reflects the impact of war, with distributions recovering in the post-war period, notably through Kew's engagement with scientific research institutes, a number of which were created in the 1950s, such as the Biophysics Unit at King's College London, established by physicist Sir John Randall, and the Central Laboratory at Spillers Ltd, opened in 1958 to serve its new animal foods division. In 1958 the report of a visiting group to Kew, known colloquially as the Ashby Report, recommended the immediate closure of two of the museums.⁴⁹ The Horniman, Pitt Rivers, and British Museums were targeted as destinations for the ethnographic material which had been in Museums 2 and 3, as the Museum Visitors' Book reveals (Figure 4). Approximately 2,000 ethnographic objects were transferred to the three institutions between 1958 and 1960.

As WP1 demonstrated, the 1970s and '80s were a time of reorganisation at Kew with the result that objects moved in both directions between the museum and herbarium. Old channels for redistribution were renewed, for example, the Rijksherbarium at Leiden, via wood technologist Pieter Baas; and new channels established, generally of a technical nature: the Metropolitan Police Forensic Science Laboratory, the National Gallery (for the supply of resins), and many of the new further educational institutions founded in the post-war period, for example, the London College of Furniture (est. 1964), Loughborough University of Technology (est. 1966), and the Polytechnic of the South Bank (est. 1970). Some of this activity was in preparation for the move in 1990 to the Centre for Economic Botany (CEB) in the Sir Joseph Banks Building. From 1990 onwards,

⁴⁹ *Report of a Visiting Group to the Royal Botanic Gardens, Kew (Chairman: Sir Eric Ashby) [in March 1957]* Great Britain. Ministry of Agriculture, Fisheries and Food [MAFF], 1958 was especially critical of Kew's museums.

1958			1958	
Date	Name	Address	Reason for Visit	
2.1.58	Mr Sampson	Horniman Museum	To see Japanese skins at No 5 Museum	2nd
2.1.58	Miss Dexter	Central Office of Information	Work at New King done for the Colonies	
9.1.58	Mr Atkley	Ethnology Dept, B.M. Museum	To see Totem Pole & other specimens No 5 Mus.	
27.1.58		H.M. Customs, Richmond	Identification of wood in Carbet imported from [unclear]	2nd
4.2.58	E.H. Ellis	Ellis Sawmills & Co, 118 Blandford Rd West, Mansfield, Notts	Wood production in S.A.: notably Pecan	2nd
12.2.58	Mr E. Andrews	64 Chelsea Crest, Stone Rd S.W.	Poisonous Plants	2nd
14.2.58	R. J. Garner	East Mallory Road, Sutton	Propagation of Hevea	2nd
11.3.58	Mr Stanley	Met. Supplies, Vic. 5022, Ind 100	Re moving of Museum cases	
17.3.58	Mr Albert	Chemical House, Rongomai	Guano	
	R.M. HERTI	Geographical - Mikau Holy	Sevilla Insects	
26.3.58	Miss Roberts	Central Office of Information	work being done for the Colonies	2nd
9/4/58	A. Goodman	Macfarlane Lang Co. Ltd.	Seed pods found in Suttana Supplies	
23/4/58	Mr Langton	B.M. Museum	To measure Totem pole in Mus B.	3rd
6/5/58	N. O. Ferinde	Nigmi Ho. 9 Northside Ave.	Possibility of mixed [unclear] of <i>Casipoua</i> from Nigmi	2nd
27.5.58	Mr Dyling	Linton Ltd, N. N. A.	To see oil palm & coconut palm for models	
	Mr Mancini			
9.6.58	Mr [unclear]	9, Wm. Booth, Nottingham	Called with seeds of <i>Clusia zumbonensis</i> from Pamba	
4.7.58	F.W. Schwoebel	Carols, Langston, Pa. Goods	Entered in <i>Evodia</i> spp. as leaf plants	1st
		Morris Distribution, Philadelphia		
7.7.58	F. L. S. O'Rourke	Dept. Horticulture, Michigan State University	To enquire into the work of Dept. Economic Botany at Kew	3rd T.A.R.

Figure 4. The Kew Museum Visitors' Book for 1958 records visits from curators at the BM and the Horniman to inspect ethnographic objects.⁵⁰

largely as a result of more targeted collecting, the incidence of duplicates and unwanted donations became less frequent, and this clearly affected distributions over this period. Today the practice of exchanging ethnographic duplicates in particular is "a relic of an earlier time;" indeed it has now ceased to be a recognised practice of the EBC.⁵¹

When compared with the accessions data (Chart 2), it is evident that, despite the later onset and earlier cessation of deaccessioning activity, from 1878 to 1990 there was a discernible correspondence between the practices of acquiring and distributing at the Kew Museum. We must remember here that we are looking at de-accessioning events rather than the volume of objects distributed. However, if we assume that exit and entry events during this period were composed of broadly similar numbers of objects, then where the incidence of exits was less frequent than entries, it would suggest that for most of the time frame, the collection was in a state of net growth. Only in two years—1901 and 1987—do the two lines meet, on the earlier occasion because donations to schools for school museums peaked in this year, accounting for 70% of all exit events, whilst at the same time, accessioning dropped dramatically, having peaked in 1900 after the Paris Exposition Universelle (which may well have led

⁵⁰ RBGK, Archives, Museum Records QX 93-0002, Box 3

⁵¹ Nichols, "A century of circulation," 155.

to a temporary cessation in accessions). In 1987 the low level of both accessions and distributions reflected the closure of Museum No. 1.

4.2 Geography

Chart 7 shows the historical geography of distribution, by deaccession events, which was concentrated in fewer geographical regions than was the case with accessions. Over the period as a whole, 84% of all distributions were to the **UK and Ireland**. It is important to emphasise once again that this data measures deaccessioning events, and not absolute numbers of objects, so it is a measure of frequency, rather than volume. Given this, it makes sense that distributions within the UK were more frequent, with factors of cost, as well as Kew's institutional commitments to UK schools and museums, at work. The large number of UK schools' distributions in the 1880s and 1890s, as we have seen, skewed this pattern still further. Many of these distributions were relatively small in terms of object numbers. We know from the exit books that distributions abroad—to the Smithsonian Institution, for example and to Sydney's Technological and Industrial Museum—were more likely to be less frequent but larger in volume than domestic ones.

Distributions to **Europe** constitute the next largest category, at 7% of all events over the time period. The peak period for European distributions covers the 1880s, 1890s, and 1900s when recipients fell into three main groups: museums, botanic gardens and universities. While this was a period of university expansion, a variety of institutions received objects from the Kew Museum, including some of Europe's oldest gardens, notably Pavia (established 1520), Leiden (1590), Montpellier (1593), and the Jardin des Plantes in Paris (1626). Others however, like Kew itself, had origins in earlier times but were very much nineteenth-century colonial apparatuses, such as Berlin, which moved to a new site in Dahlem in 1897, Hamburg (est. 1821), and Copenhagen, relocated in 1870. Indeed it is fair to say that all of the botanic gardens exchanging with Kew in the long nineteenth century had been repurposed or renewed to serve an economic botany agenda. Some, again like Kew, were funded directly by government or even private sources, whilst others, as in the case of Strasbourg, were governed by university departments of botany. Distributions to other botanic gardens and to universities were most likely to occur as exchanges between academics. At Kew, Professor Thiselton-Dyer was embedded in peer group networks extending across the continent and some of the key botanists of the century appear in the exit book columns: Eugen Warming at the Copenhagen Botanical Garden and Museum, Édouard Bureau at the Jardin des Plantes in Paris, Berlin Botanischer Garten and Museum under August W Eichler, and orchidologist Heinrich Gustav Reichenbach at the Hamburg Botanischer Garten. Social networks were at the heart of these transactions; a number of

these botanists, including Reichenbach, Friedrich Flückiger at Strasbourg University, and Jules Émile Planchon at Montpellier, had spent time at Kew, and such collaborations testify to the enduring strength of personal associations, working through social networks, in a time of competitive expansionism by European powers.

The European universities represented in the exit books, however, are not only those with well-established botany departments advocating a traditional emphasis on plant anatomy and taxonomy, but reflect in many cases the new physiological botany which arose in Germany in the 1850s, reaching Britain in the 1870s via figures such as Thomas Henry Huxley and Thiselton-Dyer himself.⁵² The series also reflects the growth in newer centres for the study of the applied sciences. Thus in 1882 we see the first mention of the Dresden University of Technology, itself dating from 1828 and one of the first technical colleges in Germany. One year later, woods were sent from Kew to the École forestière in Nancy, France, a technical institute which had been founded in 1824 to promote scientific forestry. A number of Kew donors and beneficiaries studied there, including James Sykes Gamble, director of the British Imperial Forest School at Dehra Dun, India, and the Irish botanist and sinologist Augustine Henry, a major donor of Chinese specimens to the Kew Museum.⁵³ By the latter years of the nineteenth century, pharmacognosy—the study of medicines derived from plants—had become a university discipline. So it was that in 1893, Professor Julius Pohl of the Institute of Pharmacology of Prague University, received assorted crude drugs, and in 1899 and 1901 the École supérieure de pharmacie of the University of Paris received shipments of various materia medica, including multiple species of cinchona bark and seeds of *Strychnos* from the 1900 Paris Exposition.

Many of the European museums whose names appear during this period, were also products of colonialism, such as the aptly-named Koloniaal Museum at Haarlem in the Netherlands (est. 1864), and the Muséum national d'histoire naturelle in Paris, established in 1793 but greatly augmented as part of the Exposition universelle de Paris of 1900. Museums were not only the preserve of governments and universities; the commercial sector was also amassing collections for the opportunities they might present. Examples of these in the Kew Museum records during the *fin de siècle* are the Union coloniale française, a league of French merchants which came together in 1893 with the aim of guarding and increasing opportunities for French colonial enterprise; the Handelsmuseum (trans: trade museum) in Hamburg, owned and directed by

⁵² Cornish, "Curating Science," 367–373; Graeme Gooday "'Nature' in the Laboratory: Domestication and Discipline with the Microscope in Victorian Life," *The British Journal for the History of Science* 24, No. 3 (September 1991): 321.

⁵³ Cornish *et al*, "The Economic Botany Collection at Kew: Analysis of Accessions Data," 15.

Carl Cordua; the Handelsakademie (trans: commercial college) in Vienna; and the Musée commercial-industriel at the private Maison de Melle College on the outskirts of Ghent.

North America accounts for 4.5% of total distributions, and here the key recipients mirror those discussed as donors in WP1, indicating the culture of exchange which existed across the Atlantic from the later nineteenth century. What is perhaps surprising is that the majority of transactions were directed towards universities and museums in the USA, rather than Canada. So whilst it might be expected that political allegiances would lead to greater activity between Britain and Canada, it is in fact the agency of personal and professional relationships—between William and Joseph Hooker and Asa Gray in particular—that appears to have been the greater driver of inter-institutional exchanges. Universities, both with and without museums, account for over three quarters of all distributions from the Kew Museum to North America. Asa Gray at Harvard Botanical Museum was the first North American recipient followed by his colleague, Charles Sprague Sargent at Harvard’s Arnold Arboretum. Through Gray’s and Sargent’s successors, networks of exchange were sustained with both these departments into the 1900s (Chart 8). 1882 marked the first exchange between the Kew Museum and the US National Museum of the Smithsonian Institution, again a highly fruitful collaboration for both parties (Chart 9). And from the same decade exchanges were underway between Kew and the National Museum of Agriculture at the US Department of Agriculture—the Smithsonian’s neighbour on the National Mall in Washington, DC.⁵⁴

Philadelphia, the “Athens of America” in the revolutionary and early national period, is seen by various writers as the cradle of North American science and of museums,⁵⁵ with Charles Peale’s museum opening in 1786, the American Philosophical Society founded by Benjamin Franklin in 1743, and, at the opposite end of the social spectrum, the Wagner Free Institute of Science in 1855. From the 1890s Kew was exchanging objects with the Provost of the University of Pennsylvania, William Pepper, and from the 1900s with the Philadelphia Commercial Museum, a museum with a similar remit to Kew’s. Aside from geographical proximity, the link between the university and the museum was botanist William P Wilson, a professor at Pennsylvania University, who had established the museum with acquisitions from the World’s Columbian Exposition of 1893 (Pepper was on the board of trustees). Another museum which had arisen in the wake of the 1893 exhibition was the Chicago Field Museum of Natural History and here the counterpart to Kew Assistant Director, Arthur William Hill, was the head of the botany department, Charles Frederick

⁵⁴ C.A. Browne, “A National Museum of Agriculture; The Story of a Lost Endeavor,” *Agricultural History*, Vol. 13, No. 3 (July 1939): 137-148.

⁵⁵ On US museums see Conn, *Museums and American Intellectual Life*.

Millspaugh. Unlike the US National Museum, however, this relationship did not endure, failing to extend beyond two shipments in the 1900s. After the second of these, in 1909, there was a lull in transatlantic exchanges until the 1920s when Yale replaced Harvard as the principal university destination for objects from the Kew Museum. Kew had opened its fourth museum, the Museum of British Forestry in 1910, which left spaces to be filled in the displays of Museum 3, the Timber Museum. This was achieved through exchanges with Samuel J Record, Professor of Forest Products at Yale's School of Forestry. From 1920 onwards, with the exception of the '40s, there was an unbroken record of North American exchanges, in the main with a range of universities, and to institutions such as the Smithsonian, which had been among the earliest American collaborators with the Kew Museum.

Australasia accounted for 2% of deaccessioning events. Whilst it appears relatively minor in terms of the overall frequency of distribution events, the region can be understood as a much more significant destination when we consider the quality, quantity and chronology of objects distributed. Dispersals from Kew were concentrated in a period running from 1868 to 1911, and had a particularly significant role in the development of colonial botany and museum practice in Australia. Here we examine two institutions which together dominate the record: the Museum of Economic Botany in Adelaide Botanic Gardens, and the Technological and Industrial Museum in Sydney.

Distributions to the Adelaide museum began in 1870. The driving force behind the museum was Richard Schomburgk, brother of Robert Schomburgk. Although Richard was the junior partner to Robert on their expedition to British Guiana (1840–44), it was Richard who wrote and published *Reisen in Britisch Guinea* on his return, a book which made his reputation as botanist and historian.⁵⁶ Like Ferdinand von Mueller,⁵⁷ Richard was part of the German scientific diaspora of the mid- to late nineteenth century. Unable to find employment in Germany, he and his brother Otto immigrated to South Australia in 1849. In Australia, the establishment and expansion of Australian colonial museums and universities between 1855 and 1885 led to many paid positions in science. In 1865 Richard was appointed the second director of the decade-old Adelaide Botanic Gardens. Describing it as “a sterile waste,” he set about energetically transforming the gardens for public enjoyment and economico-botanical research.⁵⁸

⁵⁶ Pauline Payne, “Science at the Periphery’: Dr Schomburgk’s Gardens in *Darwin’s Laboratory: Evolutionary Theory and Natural History in the Pacific*, ed. Roy MacLeod and Philip F. Rehbock (Honolulu: University of Hawai’I Press, 1994), 239–259.

⁵⁷ Cornish *et al*, “The Economic Botany Collection at Kew: Analysis of Accessions Data,” 30-31.

⁵⁸ Raoul F. Middelmann, “Schomburgk, Moritz Richard (1811–1891)”, *Australian Dictionary of Biography*, National Centre of Biography, Australian National University, accessed 5/08/2012 at <http://adb.anu.edu.au/biography/schomburgk-moritz-richard-4543/text7445>.

Adelaide became a centre for the exchange of plants, museum objects, texts and knowledge during Schomburgk's twenty-five year tenure. Through his brother he established a correspondence with George Bentham and Joseph Hooker, and exchanged plants with Kew. In 1866 he began collecting for a Museum of Economic Botany in the Adelaide gardens, "exhibiting all the commercial and economical plants in their raw state and different stages of manufacture," evidently modelled on the one at Kew (Figure 5).⁵⁹ The first distributions from the Kew museum were despatched in 1870 on the orders of "our kind and indefatigable contributor, Joseph Hooker", who sent about eighty specimens—seeds, resins, fibres, gums, dye stuffs, and so forth—the core stock of an economic botany museum.⁶⁰ The timing was perfect for Hooker, then engaged in "revising portions of the crowded collections of his economical museum;" and he took the matter further, by enrolling another actor into the network, Cesar Chantre, FLS, a private collector of economical botany objects, and a donor to the museums at Kew and the Pharmaceutical Society.⁶¹ In 1879 Schomburgk received from Chantre, "200 objects of the most interesting commercial produce of the vegetable kingdom," and more were to follow. Objects sent as part of exchanges stay put infrequently; rather we can see the act of distribution as one of propelling objects across circuits of circulation and in doing so, extending established networks. The Kew and Chantre donations left Schomburgk with a number of duplicate specimens, which, he was keen to report to his masters, had been distributed to other public institutions.⁶²

Kew Museum distributions to Adelaide continued over a twenty-year period to Schomburgk's death in 1891. Pauline Payne has shown that over that period Kew was the single most important donor to the gardens and museum, appearing in the records in twenty-two of the twenty-four years of Schomburgk's directorship.⁶³ Schomburgk's relationship with Kew can be compared to Mueller's in a number of ways: both were based on exchange,⁶⁴ and on scientific credentials, establishing a scientific association of mutual trust (Chart 10). His successor, Maurice Holtze, also sent objects to Kew on two occasions in 1892,

⁵⁹ RBGK, Archives, MR/393, Adelaide Botanic Gardens, 1866–89, f.1: South Australia. Report from Director of Botanic Gardens 1866; f.5 :South Australia. Report of Director of Adelaide Botanic Garden, 1871.

⁶⁰ RBGK, Archives, MR/393, f.5: South Australia. Report of Director of Adelaide Botanic Garden, 1870.

⁶¹ Linnean Society of London, *Proceedings of the Linnean Society of London* 5 (1875–1890): 31.

⁶² RBGK, Archives, MR/393, f.14: Report on the Progress and Condition of the Botanic Garden and Government Plantations during the year 1879.

⁶³ Payne, "Science at the Periphery," 249.

⁶⁴ Richard Schomburgk appears in the Museum Entry Books in the years 1872, 1873, 1876 1879, and twice in 1884.

but thereafter, the association appears to have stalled, demonstrating how networks must be continually re-made.⁶⁵



Image courtesy of the State Library of South Australia, SLSA B 26493, Public Domain.



Image: © GRANT HANCOCK

Figure 5. Adelaide Museum of Economic Botany, 1881 and present day.

⁶⁵ For more on the Adelaide Museum of Economic Botany, see Peter Emmett and Tony Kanellos (eds.), *The Museum of Economic Botany at the Adelaide Botanic Garden: A Souvenir* (Adelaide: Board of the Botanic Gardens & State Herbarium, 2010).

Kew's relationship with the Sydney Technological Museum was brokered by Archibald Liversidge, a British geologist and chemist who in 1874 was appointed as the Professor of Geology and Mineralogy at the University of Sydney. Through his position at Sydney University he had also become a trustee of the Australian Museum. He had known William Thiselton-Dyer since his days at the Royal School of Mines in South Kensington and the two were to enjoy a life-long correspondence.⁶⁶ In 1877, in advance of a trip to Europe to visit leading museums, universities and technical colleges, he wrote to Joseph Hooker, sending samples of diseased sugar cane he had collected in Queensland, and offering his services "in any other matter in the colonies."⁶⁷ When in London, he bolstered this new association by meeting with Joseph and William Hooker and Thiselton-Dyer in 1878 and visiting the Museum of Economic Botany.⁶⁸ The timing was fortuitous; in his absence, the trustees of the Australian Museum had voted to form a Technological and Industrial Museum in Sydney, in the building which had been constructed for the Sydney International Exhibition of 1879. Before Liversidge left London, therefore, he arranged with Joseph Hooker and Thiselton-Dyer for eight cases of specimens to be sent to Sydney from the Kew Museum.⁶⁹ The first of these, arriving in 1879, was sent to his university address and this begs the question of whether the objects found their way to the Technological Museum, the Australian Museum or were retained for the university. Research conducted by Jude Philp of the Macleay Museum indicates that some objects moved back and forth between the Technological Museum and the Australian Museum and that in addition Liversidge maintained teaching collections for his own use.⁷⁰ In any event, two further distributions in the same year were labelled to "The Technological Museum, Sydney,"⁷¹ with more arriving in 1880 and 1882. From the database of the Museum of Applied Arts and Sciences (MAAS), the successor to the Technological Museum, we have learnt that 100 objects from the 1882 distribution are extant in the MAAS collection.

But before the museum had even opened to the public, a fire destroyed the building and much of its contents. Liversidge, along with Joseph Maiden, the museum's curator, was obliged to solicit replacements from his donors.⁷² Replacements, addressed to Maiden, were despatched from Kew in 1883, when the Sydney museum re-opened in temporary accommodation. More objects were received in 1886, 1888, 1890 and 1891, in exchange for others sent to

⁶⁶ Roy Macleod, *Archibald Liversidge, FRS: Imperial Science under the Southern Cross* (Sydney: Sydney University Press, 2009), 70.

⁶⁷ RBGK, Archives, MR/384, Queensland, Plant Diseases, 1877–1929, f. 82: Liversidge to Hooker, April 13, 1877, cited in Macleod, *Archibald Liversidge*, 173.

⁶⁸ Macleod, *Archibald Liversidge*, 184.

⁶⁹ Macleod, 186.

⁷⁰ Jude Philp, email to author, October 18, 2017.

⁷¹ RBGK, EBC, Specimens Distributed, Book I, 67, 129 & 210.

⁷² Macleod, 206–207.

Kew; and in 1893 the museum moved into new, permanent premises in the western suburbs, and further objects arrived from Kew that year and in 1894. Liversidge had retired as a trustee of the museum in 1888, and in 1896 Maiden left to become Director of the Royal Botanic Gardens, Sydney. Whilst that marked the end of exchanges between Kew and the Technological Museum, through the person of Maiden, a new, rather less symmetrical set of exchanges was initiated, with objects accessioned from RBG Sydney between 1896 and 1921, and deaccessioned to Sydney in 1910 and 1911 (Chart 11).

4.3 Object type

For the purposes of analysis, as in Working Paper 1, object types have been classified as follows: *raw materials (wood)* are defined as blocks of wood forming part of the Kew wood collection or xylarium; *raw materials (other)* are non-wood unprocessed plants or plant parts, such as seeds, flowers, and leaves; *processed and manufactured material* refers to plant products (or derivatives) and manufactured objects, including processed fibres, vegetable oils and finished goods; *ethnographic objects* refers to hand-crafted objects of ethnographic interest from any region; and *images and publications* covers a range of interpretative material acquired for the museum, including illustrations, photographs, models, maps, and publications.

The presentation of data on object type is complicated by the fact that a significant proportion of the de-accession events as recorded in the exit books include objects of more than one type. Chart 12 shows the pattern of single-type and multiple-type distribution events across the whole dataset, indicating that certain types of objects (such as manufactured and ethnographic objects) were more likely than others to be distributed in combination with other types of objects (i.e. raw materials). For the purposes of comparative analysis of object type at the level of the event (presented in summary form in Charts 13 and 14 the frequency of each type has been counted for both single-type and multiple-type events: this means that the annual totals recorded in Graph 13 are significantly inflated above the total number of distribution events. What matters here conceptually is that an object type is recorded whenever it appears, alone or in combination with another type. Charts 13 and 14 therefore present an accurate picture of the relative importance of particular object types on an annual and cumulative basis, though there are, of course, a significant number of distributions where object types are not given. On this, it should be noted that the “unspecified” category looms especially large in the period for which schools accounted for a high proportion of distributions.

The data suggest changes in emphasis in the Kew Museum at different times (Chart 13). A number of spikes on the graph can be related to identifiable

events: the 1866 donation to the BM, the India Museum dispersals 1879–1881, and the large-scale de-accessioning of 1958–1961 to the BM, PRM and Horniman. Collectively raw materials dominate distributions for much of the period analysed and this reflects the Kew Museum’s core role in the investigation and display of plant raw materials. Here, too, certain peaks indicate activity further to distinct events: the international exhibitions of 1862 (South Kensington), 1886 (Colonial and Indian), 1900 (Paris) and 1910 (Japan-British Exhibition), and at a lower level, the British Empire Exhibition of 1924–25. Woods begin to feature strongly in the 1880s and this is attributable to Kew’s collaborations with the Indian Forest Department through James Sykes Gamble, Dietrich Brandis and Berthold Ribbentrop, and with other colonial partners— notably botanic gardens in Saharanpur, South Africa (King William’s Town), Mauritius, Singapore and Trinidad; and museums across Australia. A further spike in wood deaccessions occurred in 1911—a redistribution of duplicates acquired for the opening of Kew’s Museum of British Forestry in 1910. Among non-colonial recipients of woods, the United States National Museum in Washington, DC, and its neighbour, the US Department of Agriculture; and the Yale School of Forestry (in the 1920s and ‘30s), loom large. Data relating to the processed and manufactured category concern in the main partially processed plants such as extracted fibres, crude rubber, gums and resins and a distinct correlation is identifiable between raw materials and processed materials which can be attributed to the Kew Museum’s use of the “illustrative series demonstrate the stages from plant to finished object.”⁷³

More than any other object category, the accession and subsequent deaccession of ethnographic objects is highly sporadic, reflecting the channels through which it was circulated: individual colonial residents like William Colenso in New Zealand,⁷⁴ world’s fairs, and funded expeditions. Finally, the unspecified category is substantial during the years 1895–1912 and is largely accounted for by distributions to schools. Due to the volume of demand, these events were often recorded only as a total number, consequently the types of objects distributed cannot be known. This may remain one of the mysteries of the project as it is unlikely in the majority of cases that schools retained the specimens. We hope to fill in our knowledge gaps through the schools’ letters books and through those museums which were similarly sent “miscellaneous” sets of items.

⁷³ Caroline Cornish, “Botany behind Glass: The Vegetable Kingdom on Display at Kew’s Museum of Economic Botany,” in *Science Museums in Transition: Cultures of Display in Nineteenth-Century Britain and America*, ed. Carin Berkowitz and Bernard Lightman (Pittsburgh, PA: University of Pittsburgh Press, 2017), 206-207.

⁷⁴ For a detailed account of Colenso’s donation practices, see Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago, IL: University of Chicago Press, 2008).

Chart 14 gives the cumulative picture of distributions by object type over the period 1847 to 1990. Unspecified distributions, currently accounting for 17% of the total, may reduce as we progress and locate these objects in other collections. Woods, on the other hand, at 18%, are likely to be under-represented at this stage since the detail given in the exit books does not always permit a definitive coding for object type. In the processed and manufactured category (17% of all distribution events), the majority of objects we have surveyed were processed, rather than manufactured, that is, extracted from their original, natural state and existing in a state somewhere between plant specimen and finished item. Examples of such objects include raw plant fibres, crude drugs, and exudates such as rubber, gums, and resins. There are comparatively few manufactured objects represented in the figures. Ethnographic objects, at 8% of total distributions, reflects to a considerable extent Kew's role in distributing the objects collected on voyages of exploration. The large-scale clearance of ethnographic material from 1958 to 1961 to the BM, PRM and Horniman Museum is included in the data; it did not appear in the exit books but was recorded as marginal notes in the entry books (Figure 6). Images and publications is the smallest category for deaccessions at 5%. These objects were often purchased by the Kew Museum as interpretative aids, and their market value was widely recognised within and beyond museums. It is little surprise, therefore, that they were the least likely to be distributed elsewhere. Whilst most of the models included in this category are still in the EBC, the remaining objects were redistributed in the late 1980s to the library, illustrations, and objets d'art collections.

In Chart 15 we show an analysis by object type of an estimate of the actual number of objects distributed. For the purposes of compiling this data some estimates were required; for example, in a transfer which stated "618 woods and raw plant materials" the total was allocated evenly between raw materials (woods) and raw materials (other). Similarly, some numbers cannot be known: many transfers list "Seeds of *Atropa belladonna*," for example, but with no indication of the number of seeds. In this instance, we have recorded the object total as "1", if there is reference to one species only; if two species are named, for example "Seeds of *Atropa belladonna* and *Bombax malabaricum*," then the object total was recorded as "2". Occasionally the record will be minimal - "A box of specimens sent" is such an example - with an accompanying note adding information such as "similar to those sent to Glasgow." For the purposes of this analysis, the list of those sent to Glasgow was then used to estimate overall

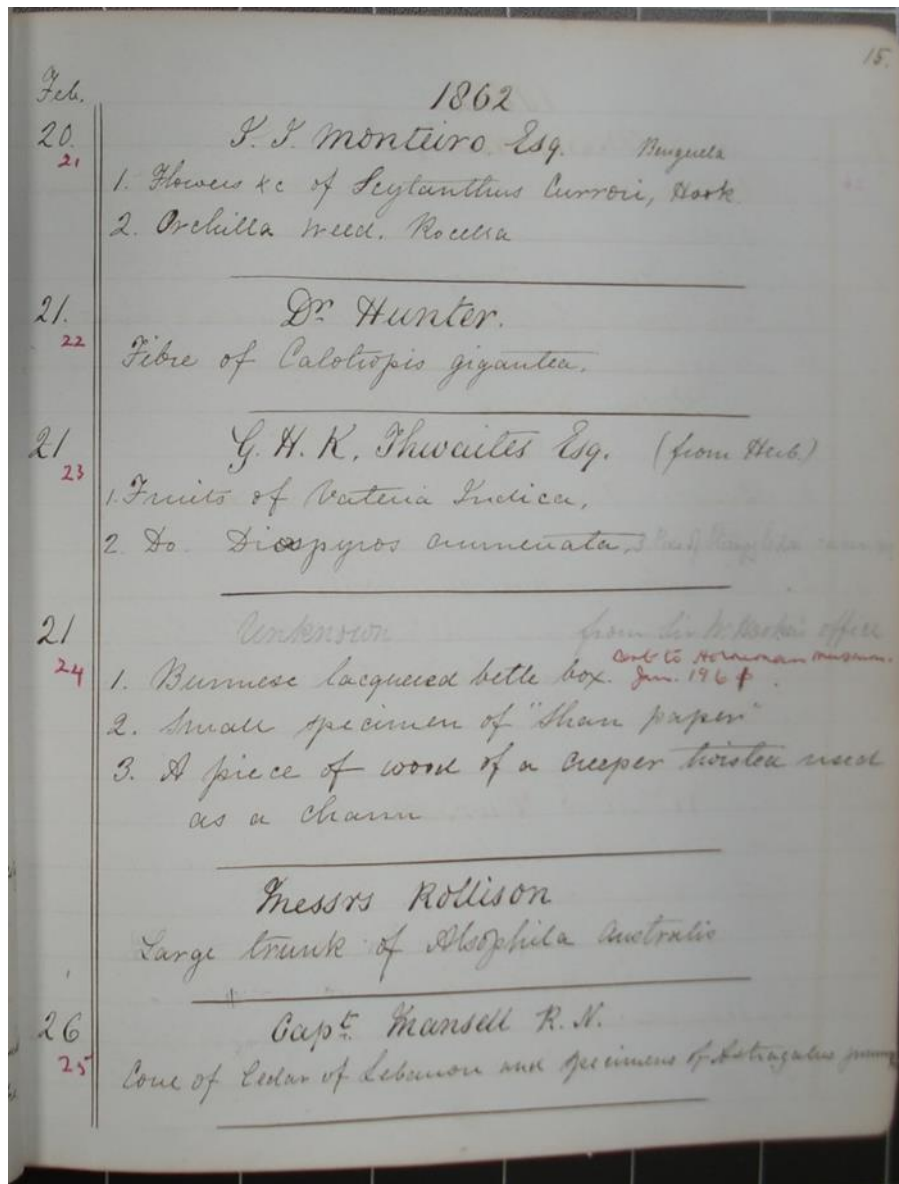


Figure 6. Example of marginal note indicating 1958-61 distribution of ethnographic material to the BM, PRM and Horniman Museum.

numbers and materials. In this scenario, raw materials (other) are more prominent, as is the unspecified category; woods and processed materials are slightly de-emphasised. Ethnographic objects remain the same. We wish to emphasise here that these figures reflect our knowledge of distributions at the present moment and are subject to change, particularly as we locate the objects and/or records of them in other museums.

4.4 Recipient type

Chart 6 shows the overall pattern of distributions in terms of recipient type for the distributions data as a whole, and Chart 16 shows the series over time, differentiated by recipient type. The extent to which the Kew Museum acted in networks of national and international museums is here made visible: museums

and exhibitions have a relatively steady presence throughout, with the exception of the twenty-year period from 1940 to 1960 when there was little activity of any kind. The BM was the earliest museum to receive Kew duplicates, as well as one of the more recent, on the closure of Museums 3 and 2 in 1958 and 1960 respectively (see case study below). By comparison, botanic gardens (including constituent museums and xylaria) represent a much less frequent level of distributive activity. A larger and more regular destination for museum duplicates from the mid-1870s to the mid-1930s was the university sector. Corresponding to the age of object-based teaching, during this period, universities began to accumulate collections for pedagogic purposes. Collections were understood as vital by universities and museums to their attempts to establish “primacy” in the production of scientific knowledge. By the first quarter of the twentieth century, it was clear that the universities had gained the advantage.⁷⁵ As the one sector grew, somewhat at the expense of the other, universities remained a destination category for the Kew Museum, even in the post-war period, when there were virtually no other transfers of objects taking place.⁷⁶

In what follows, we focus on the most active recipient institutions, measured by the frequency of distributions received. This provides a measure of the depth and duration of inter-institutional networks over the history of the Kew Museum. Chart 17 shows those institutions and individuals who received objects from Kew on ten or more occasions. Collectively these twenty-three institutions account for 23% of all known distributions from 1847 to 1990, indicating that the museum had a broad recipient base, rather than focussing on a select few (the total number of distinct recipients recorded on the database is 1,061). Those seven institutions receiving twenty or more distributions account for 13.1% of all distributions. Chart 18 shows comparative data on these recipients, shown by distribution events for each of the four phases identified above. It is this group that we focus on here.

In terms of frequency of distribution in the series as a whole, the Pharmaceutical Society of Great Britain (PSGB) is the leading recipient institution, with distributions occurring over a forty-year period largely coinciding with the curatorship of the PSGB Museum by Edward Morell Holmes from 1872 to 1922. Holmes was a botanist of some renown, as well as a pharmaceutical chemist, and both William Thiselton-Dyer and his successor, David Prain sent him specimens for chemical analysis, whilst JR Jackson and John Masters Hillier, as

⁷⁵ Stephen Conn, *Museums and American Intellectual Life, 1876–1926* (Chicago and London: University of Chicago Press, 1998).

⁷⁶ For details of the shift in funding in the US, see George W. Stocking, Jr, 1988, “Philanthropoids and Vanishing Cultures,” in *Objects and Others: Essays on Museums and Material Culture* (Madison, WI: University of Wisconsin Press), 110–144.

successive Kew museum curators, sent objects for the PSGB museum (Figure 7).⁷⁷ There is a wonderful symmetry to this particular story, as in 1983, all the plant drugs from the museum, representing the contributions of many leading pharmacologists, and very well documented, were re-acquired by the EBC, where they now form the cornerstone of the collection's nineteenth-century plant drugs holdings.



Figure 7. Museum of the Pharmaceutical Society in Bloomsbury Square, 1903 (Image courtesy of the Royal Pharmaceutical Society).

The case of the British Museum, with a total of 47 separate distribution events extended over a longer time period (from 1847 to 1985), is rather different. These included many hundreds of objects: zoological, palaeontological, mineralogical and ethnographic. The early distributions were not systematically recorded, and what we know has been pieced together from correspondence and records in both museums (see the detailed case study in section 5 below). The key Kew actor initiating dispersal was not in fact William Hooker, but his son, Joseph, acting independently of Kew in the period prior to October 1855, and as Assistant Director thereafter. As part of a process of "taxonomic triage," Joseph sent specimens of insects, molluscs and worms to the Department of Zoology, rocks to the Department of Geology, and plants to the Department of Botany from his own voyages to the Antarctic (1839–1843) and the Himalaya region (1847–1851), "propelling [the specimens] further along their epistemic

⁷⁷ RBGK, Archives, Directors' Correspondence (DC) 204, f.589: letter from E.M. [Edward Morell] Holmes to Sir William Thiselton-Dyer; from Pharmaceutical Society of Great Britain, 17 Bloomsbury Square, London, Museum Department; 17 Dec 1895.

Also, DC159, f. 132: letter from E.M. [Edward Morell] Holmes to John Masters Hillier; from Pharmaceutical Society of Great Britain, Museum Department, 17 Bloomsbury Square, London, [England].

journeys.⁷⁸ William, too, in his capacity as Director, passed on zoological specimens during this period which he had received from his network of collectors.⁷⁹ The first evidence of ethnographic distributions from Kew in the records of the BM dates to July 12, 1862, when Joseph donated to the Department of Oriental and Medieval Antiquities, "a bear-skin dress, mat, knife, two stone dishes & other miscellaneous objects" collected during the Romney Expedition to the American Northwest.⁸⁰ Transfers of ethnographic objects, however, were more firmly established following the death of Henry Christy in 1865 and the appointment of Joseph Hooker as a trustee of the Christy Fund. In 1866 Augustus Wollaston Franks, another trustee, was made Keeper of the new BM Department of British and Mediaeval Antiquities and Ethnography and this marked the start of an active period of exchanges extending into the 1890s (Chart 19). The association continued with Franks's successor, Charles Henry Read until 1901 but dwindled over the course of the twentieth century. It revived briefly in 1958 with the imminent closure of Kew Museums 2 and 3, when Keeper of Ethnography, Adrian Digby, was invited to visit Kew and select from the ethnographic objects; and again in 1984 when Kew gifted thirteen Richard Spruce objects to the Museum of Mankind.

Distributions to the University of Cambridge were, like those to the Pharmaceutical Society, concentrated in the 1880s, '90s and 1900s. This time the key actor was Walter Gardiner, appointed as botany demonstrator in 1884 and botany lecturer in 1888. Kew sent objects to furnish the museum at the new botanical laboratories which had been introduced to facilitate the physiological botany championed at Cambridge by Gardiner.

The South Kensington Museum, known from 1899 as the Victoria and Albert, was significant as a destination for Kew material in the late nineteenth century, especially over the five years from 1876 to 1880. This reflects the opening of the satellite museum at Bethnal Green in 1872 under the auspices of the Science and Art Department, and Kew's donations to the food and animal products collections. Two actors were pivotal in bringing about these distributions: the first was Professor Arthur Herbert Church, a chemist at Cirencester Agricultural College from 1863 to 1879, and at the Royal Academy of Arts from 1879 to 1911, who was engaged to accumulate the National Food Collection and write a guide to it. Particularly large distributions occurred in 1879 and 1880 as part of Kew's dispersal of the India Museum collections. The second key actor was Eleanor Ormerod. Through family connections she was acquainted with Joseph

⁷⁸ Lawrence Drietas, *Zambesi: David Livingstone and Expeditionary Science in Africa* (London and New York: I.B. Tauris, 2010), 139.

⁷⁹ British Museum (BM), Central Archives, "Book of Presents," Vol. 4, 1846–1854, and Vol. 5, 1854–1861.

⁸⁰ BM, Central Archives, "Book of Presents," Vol. 6, 1862–1865.

Hooker and his wife, and for that reason, and to pursue her interests in natural history studies, she and her sister moved in 1876 to Dunster Lodge on the Spring Grove estate which had formerly belonged to Sir Joseph Banks. She visited Kew daily for research and to collect insect specimens. Through Hooker she met Andrew Murray, Secretary of the Royal Horticultural Society, who was involved in the Committee of Advice and Reference on the Economic Entomology Collections for the Bethnal Green and South Kensington Museums. Along with Thiselton-Dyer, she became a committee member, (Huxley was Chair) and thus continued her relationship with Kew, even when, on Hooker's retirement, she moved further afield. Again, duplicate sets of objects acquired at Kew from the India Museum formed part of the material sent to South Kensington, and these included wasps and hornets and their nests, and specimens of silk and cocoons.

Fifth in the list of destinations is Kew itself. We saw in WP1 how internal transfers of objects between museum, gardens, and herbarium, have constituted a significant percentage of the total accessions into the EBC, and the same is true of distributions. At the museum this practice had its greatest impact in the twentieth century, with the herbarium as the chief destination. Such departmental interactions may be viewed collectively as exchanges, reflecting shifts in strategic direction, fluctuations in storage spaces, and changes in botanical practice at Kew and in the wider world.

The list of the most frequent recipients of Kew material concludes with two university museums: Harvard and University College London (UCL). Kew's relationship with Harvard was initiated through Asa Gray and William Hooker, whose correspondence began when Hooker was Regius Professor at Glasgow University. In 1858 Gray established the Museum of Vegetable Products at Harvard, "in humble imitation of Kew,"⁸¹ and although the time-poor William invited him to come to Kew and select duplicate specimens for himself, there is no evidence that this visit took place.⁸² An introductory course in economic botany, "Plants and Human Affairs," was taught at the University from 1876, using the collections Gray had accumulated, but the first documented Kew distribution to Harvard came about in 1880 under the directorship of Joseph Hooker, consisting of a duplicate set of the 1878 woods from the Indian Forest Department, and eight boxes from "the huge mass of duplicates" received at Kew on the closure of the India Museum.⁸³ By this point, George Goodale was

⁸¹ RBGK, Archives, DC 64, f. 229: letter from Asa Gray to Sir William Jackson Hooker; from Harvard University, Cambridge, MA, April 30, 1858.

⁸² Letter from William-Thiselton to Asa Gray, June 8, 1858, in "William Jackson Hooker letters to Asa Gray," contained in "Papers of Asa Gray," Asa Gray Correspondence Project, accessed 02/10/2017 at <https://www.biodiversitylibrary.org/item/225502#page/246/mode/1up>.

⁸³ Letter from JDH to Asa Gray, December 9, 1879 (seq. 154-158) in "Asa Gray correspondence files of the Gray Herbarium, 1838-1892," Harvard University Library, accessed 02/10/2017 at [https://iif.lib.harvard.edu/manifests/view/drs:49798782\\$154i](https://iif.lib.harvard.edu/manifests/view/drs:49798782$154i).

the director of what had been named the Harvard Botanical Museum, and in a letter to Gray, Joseph gave him free rein to utilise or distribute the specimens as he saw fit.⁸⁴ Under Goodale the collections grew significantly and the museum building, now with a more economic orientation, opened to the public in 1890.⁸⁵

Another Harvard destination for objects from Kew was the Arnold Arboretum at Brookline, under the charge of Charles Sargent Sprague, and the connection came about via Gray. In 1874 Sargent wrote to Joseph Hooker at Gray's suggestion, introducing himself as the newly-appointed director of the nascent arboretum. His aim was to introduce tree and shrub species from around the world. At this time Hooker was engaged in replanting the Kew arboretum after a severe drought in 1870,⁸⁶ and so Sprague suggested that "an interchange" of plants could be advantageous to them both.⁸⁷ As he went on to say, Kew had access to seeds and seedlings from many countries, whilst he could fill the gaps in Kew's collection of North American species. It was a case of trading their respective regional strengths—of geographically recalibrating their collections. The objects sent to Sprague from the Kew Museum were in the main woods and tree parts, such as cones and barks, for the arboretum's xylarium. He received, for example, a box of the Indian Forest Department woods,⁸⁸ and many more specimens from the surpluses Kew accrued as a result of world's fairs. A comparison of exits and entries between Kew and Harvard can be seen at Chart 9. The Harvard association was at its most intense in the 1880s and 1890s under Joseph Hooker and his successor, Thiselton-Dyer. But it rallied briefly in the 1970s and '80s under Richard Evans Schultes, who has been described as the father of modern ethnobotany.⁸⁹ Underpinning these two periods of exchange were shared botanical sensibilities relating to the economic, physiological, and ethnobotanical aspects of plant science, and to silviculture, and parallel commitments between Kew and Harvard to science and pedagogy.

Kew museum distributions to UCL were once again facilitated by personal associations, this time through Daniel Oliver, who had the unique advantage of a

⁸⁴ Letter from JDH to Asa Gray, January 14, 1880 (seq. 159–161) in Asa Gray correspondence files, Harvard University Library, accessed 02/10/2017 at [https://iif.lib.harvard.edu/manifests/view/drs:49798782\\$157i](https://iif.lib.harvard.edu/manifests/view/drs:49798782$157i).

⁸⁵ Richard Evans Schultes, Andrew H. Knoll, Elso S. Barghoorn, Phillip M. Rury, Leslie A. Garay, Scott E. Wilder, William A. Davis and Howard J. Allgaier, "The Botanical Museum of Harvard University in its 125th Year, 1858–1983," *Botanical Museum Leaflets* 30, no. 1: 1–21.

⁸⁶ Ray Desmond, *The History of the Royal Botanic Gardens, Kew*, Second edition (RBGK: Kew Publishing), 375.

⁸⁷ RBGK, Archives, DC 198, f. 724: letter from Charles Sargent Sprague to Sir Joseph Dalton Hooker, October 30, 1872.

⁸⁸ J. D. Hooker, *Report ... during the Year 1880* (London, 1881).

⁸⁹ See, for example, G. Z. Ramírez, "Conservation of the biological and cultural diversity of the Colombian Amazon Piedmont: Dr. Schultes' legacy," *Ethnobotany Research and Applications* 2005: 179; Ghilleen T. Prance, "Richard Evans Schultes (12 January 1915–10 April 2001): A tribute," *Economic Botany* 55 (2001): 347, <https://doi.org/10.1007/BF02866558>.

foot in both camps. Having been employed at Kew since 1858, where he authored the museum guidebook through six editions between 1861 and 1875, in 1864 he was appointed Keeper of the Kew Herbarium and Library, a post he held until 1890. In 1866 he was also awarded the “immediate control” of the museums, charged with the naming of the collections in the gardens and museum. He maintained control of the museum until 1875 when the newly reinstated post of Assistant Director was filled by Thiselton-Dyer. Oliver was simultaneously appointed as Quain Professor of Botany at University College in 1861, a post he held concurrently with his work at Kew.⁹⁰ It is therefore not surprising that he was in a good position to orchestrate transfers of botanical specimens from Kew to UCL and this he did in the early 1880s. In 1888, he retired from the Quain chair, but this did not spell the end of Kew-UCL relations, as he was replaced by his son, Francis Wall Oliver, who had spent his earliest years at Herbarium House, Kew.

Francis was the recipient of a number of distributions of botanical specimens between 1889 and 1916. They were requested for three different uses: for dissection by students; for the botanical museum at University College; and for his own research—“to be grown on.” Although these distributions were mostly one-way, there are occasional examples of Kew receiving specimens from UCL; as Francis explained in 1890, “I don’t quite see why the giving should always be on one side, and if you think that Dry-rot specimen I showed at the scientific committee would suitably decorate the Kew Museums I will hand it over to Mr Jackson.”⁹¹ Oliver’s interest in palaeobotany arose through his association with Dukinfield Henry Scott, a recognised authority on the subject. In 1892 Scott was appointed Honorary Keeper of the Jodrell Laboratory, and conducted research on the fossil plants of the Palaeozoic era there. In 1904 the two collaborated on a paper on the structure of the Palaeozoic seed *Lagenostoma lomaxi*.⁹²

After a gap of fifty years, there was a further episode in the EBC’s relations with UCL when archaeological chemist Gretchen Shearer of the Institute of Archaeology was sent specimens of various gums and resins for spectroscopic analysis as part of her doctoral research. In 1986 Ted Hill was the recipient of samples of sago starch (*Metroxylon sagu*), also for purposes of analysis.⁹³ And

⁹⁰ E. J. Salisbury, “Francis Wall Oliver. 1864–1951,” *Obituary Notices of Fellows of the Royal Society* 8, no. 21 (November 1952): 229–240.

⁹¹ RBGK, Archives, DC 97 English Letters NAP-OXL, 1859–1900, f. 347: letter to WTD, November 5, 1890.

⁹² Francis Wall Oliver (with D. H. Scott.), “On the structure of the Palaeozoic seed *Lagenostoma lomaxi*, with a statement of the evidence upon which it is referred to *Lyginodendron*.” *Phil. Trans. B*, No. 197 (1904): 193–247.

⁹³ Gretchen Louise Shearer, “An Evaluation of Fourier Transform Infrared Spectroscopy for the Characterization of Organic Compounds in Art and Archaeology” (PhD thesis, Institute of

the connection has continued past the era of distributions through the current curator of the EBC, Mark Nesbitt, an archaeobotanist and alumnus of the Institute. Exchanges of a different kind now take place regularly, in the form of students on the MA Museum Studies and Conservation courses who take up work placements on the collection, and research objects in the collection as a basis for their dissertations.

The preceding sketches of inter-institutional relationships provide the basis for further in-depth study of networks created and sustained through the circulation of objects.⁹⁴ In the following section we shall focus on a specific UK institutional context linking Kew with the British Museum and others.

5. The Christy Collection: between Kew and the British Museum

Henry Christy is known today primarily as the donor whose personal ethnographic collection underpinned the foundation of the Department of Ethnography at the BM. Christy's collecting interests had begun with botany and he had been advised by William Hooker, a close friend and contemporary, on how to collect and record botanical specimens. He later applied these skills to the collecting of ethnographic and archaeological specimens.⁹⁵ He had been a correspondent of William Hooker before the latter was appointed as Director of Kew in 1841,⁹⁶ and the association was extended to Joseph from the early 1860s.⁹⁷ From 1853 he donated to the Kew Museum objects collected on his travels.⁹⁸ When he died in 1865, the same year as William, he named Joseph as one of the trustees of his collection, along with Daniel Hanbury, John Lubbock and Augustus Wollaston Franks of the Department of Antiquities at the BM, who was simultaneously Director of the Society of Antiquaries. Christy's will authorised the trustees to donate his archaeological and ethnographic collections to "any public Collection or Museum of a permanent character in England or any other Country," on condition that they were exhibited as specified by Christy and that a catalogue be compiled. Five thousand pounds were also provided, to be invested an income could be generated for the upkeep and development of the

Archaeology, University College London, 1989); RBGK, EBC, Specimens Distributed, Book 2, 428–30.

⁹⁴ Working Paper 4 will provide a more detailed study of the role of international networks in object exchange.

⁹⁵ BM website, "Search the collection database," accessed 03/10/2017 at: http://www.britishmuseum.org/research/search_the_collection_database/term_details.aspx?bioId=40853.

⁹⁶ The oldest letter from Christy to William Hooker in the Kew Archives is dated February 26, 1840 (DC14, English Letters, A–H, f. 95).

⁹⁷ RBGK, Archives, Letters to JD Hooker, Vol. 4.

⁹⁸ RBGK, EBC, Museum Entry Book, 1847–1855, 48.1853.

collection.⁹⁹ In 1866 Franks was made Keeper of the new BM Department of British and Mediaeval Antiquities and Ethnography, and the trustees agreed to offer the collection to the BM. The Christy Collection of Ethnography, however, remained a separate legal entity due to the terms of Christy's will, and was initially housed in Christy's former home at 103 Victoria Street.

The same year saw the largest distribution from the Kew Museum since its foundation, when "an extensive collection illustrating the ethnology of various parts of the world, and chiefly composed of vegetable materials," consisting of over three hundred objects, was donated to the newly formed Christy Collection.¹⁰⁰ This distribution's contents were derived from a large number of collectors including those who had taken part in expeditions—Richard Spruce in the Amazon basin, William Baikie in the Niger, Eugène Bourgeau in Western Canada, and David Livingstone along the Zambezi. There were also items sent by colonial residents, such as Sir James Brooke, Rajah of Sarawak; James Wetherell, English consul in Bahia; and J. E. Stocks, Assistant-Surgeon to the Bombay Fusiliers in India. There were even pieces once donated by Christy himself to the Kew Museum (Chart 21).¹⁰¹ What they shared in common was that they were all cultural artefacts made of plant materials, in other words, biocultural objects.

The background to the 1866 distribution is given in a series of letters from John Reader Jackson, curator of the Kew Museum, to Franks, which accompanied the three consignments despatched from Kew.¹⁰² In one of these letters Jackson refers to the objects collectively as "the present," which suggests that this not a monetary transaction.¹⁰³ They were duplicate objects, selected from the Kew Museum by Jackson on Joseph Hooker's orders.¹⁰⁴ William Hooker had died the previous year, and the three museum buildings were severely overcrowded; Joseph had replaced William as Director and had awarded botanist Daniel Oliver "immediate control" of the museums, library and herbarium;¹⁰⁵ Franks, a fellow trustee of the Christy Collection, had recently been appointed curator in the BM's new Department of Ethnography. These factors combined to effect the largest distribution from the Kew Museum in its history thus far. What is interesting in this instance and on subsequent occasions is the shared agency of Hooker and

⁹⁹ RBGK, Kew Archives, Letters to J D Hooker, Vol. 4, f. 75; "Extract from the Will of the late Henry Christy of 103 Victoria Street, Westminster, 5th July 1863."

¹⁰⁰ BM, Central Archives, "Book of Presents," Vol. 7, 1866–68.

¹⁰¹ BM Merlin database.

¹⁰² BM, BEP Department Archives, Christy Correspondence (CC), pre-1896: letters from Jackson to Franks dated October 11 and 22, 1866, and November 13, 1866.

¹⁰³ See above; letter from Jackson to Franks dated 11 October 11, 1866.

¹⁰⁴ See note ¹⁰⁹

¹⁰⁵ J. D. Hooker, *Report on the Progress and Condition of the Royal Gardens of Kew for 1866* (London, 1867), 2.

Jackson in building the BM collections - ultimately, the decision as to what objects were sent was in Jackson's hands.¹⁰⁶ Furthermore, a final comment from Jackson in the letter accompanying the second consignment—"The botanical specimens arrived safely in the returned box"—suggests that Franks was acting in the capacity of passage point at the BM, co-ordinating exchanges with other departments there.¹⁰⁷ However, whether this status was achieved through his own efforts, or whether it was thrust upon him is unclear: in the letter with the final consignment, Jackson asked, "Will you be kind enough to forward the two parcels of birds' nests to the ornithological department of the British Museum?" suggesting that the agency may here, too, have been invested in Jackson, rather than Franks.

The 1866 distribution of Kew objects to the BM was followed by further exchanges and purchases between the two institutions, as indicated in Chart 19. Jackson's continuing role can also be seen in selective operations he conducted in forwarding objects to the BM; "I found the accompanying, which appear much more in your line," he wrote in 1872 of a pot and fire-sticks from Matabeleland; and again in 1879 of spear handles, arrows, bows, and hats: "Some have no labels but you may perhaps be able to make something of them" he wrote.¹⁰⁸ Such donations were part of a reciprocal system of exchange between the two institutions. As Thiselton-Dyer summarised the arrangement in a letter to the Museum in 1885: "We know it is more blessed to give than to receive. But still I think we receive well of you."¹⁰⁹ To facilitate such exchanges, Joseph Hooker and A. W. Franks had developed a negotiated system of equivalencing objects, based only indirectly on monetary values, and rather more on mutual trust and recognition of each other's scientific authority. Indeed it has been argued that the existence of museum exchange lists, issued by many institutions, affected market prices as much as the converse was true.¹¹⁰ In 1866, for example, Franks had described a collection of ethnographic specimens at the BM which he was trying to secure for the Christy Collection in exchange for a set of Norwegian silver ornaments as "capital stock in trade"; the use of a commercial metaphor here is striking.¹¹¹ And in 1869 Franks asked Hooker for two types of Fiji club then in the Kew Museum, in return for which he agreed to supply wood

¹⁰⁶ See also BM, BEP Department, CC, pre-1896: letters from Jackson to Franks dated January 6, 1868; January 8, 1879; and November 11, 1874.

¹⁰⁷ BL, BEP, CC: letter from Jackson, October 22, 1866

¹⁰⁸ BL, BEP, CC: letters from JRJ, November 11, 1872 and January 8, 1879

¹⁰⁹ BM, BEP, CC, f. 265; letter from Thiselton-Dyer, January 24, 1885.

¹¹⁰ Coote et al, "The nineteenth-century global trade boom in natural history collections," 10.

¹¹¹ RBGK, Archives, JDH Personal Papers, JDH/2/1/8 f. 235: letter from Franks to Hooker, September 13, 1869.

specimens from the same region.¹¹² However, perhaps the best example of equivalencing in their correspondence comes in a note attached to a letter from Franks dated 31 March 1870, in which he listed what he had to offer to Kew:



Figure 8. Equivalencing in action: note appended to a letter from Franks to Joseph Hooker, dated 31 March, 1870.¹¹³

Club Fiji, flattened head [*this was accompanied by a line drawing*]

Club Fiji inlaid with whale tooth, New Zealand carving on handle.

A bow from Rio Uaupes

Blow pipe & arrows from Sylhet

In exchange he wished to have, "if they can be obtained," a Khasian bow and arrows, and the same from Sikkim (Figure 8). Both sets of objects were

¹¹² RBGK, Archives, Joseph Dalton Hooker Correspondence, JDH/2/8, f. 235; letter from Franks to Hooker, September 13, 1869. Two clubs from Kew were accessioned in 1870: Oc.6703: "Club (bowai) of nokonoko wood and cachalot tooth" and Oc.6704: "Club of heavy dark red wood (vesi)." Curiously, in the Kew Entry Books, the only recorded accession from Franks close to that date was in 1871 and consisted of "1 Pods of Entada scandens, 2 Sticks of Camphor wood, 3 Leaves of Hypoxis from Natal. Used for making ropes." RBGK, EBC, Museum Entry Book 1861–1879, 37.1871.

¹¹³ RBGK, Archives, DC86, f. 141.

exchanged and those from Kew can be identified in the current BM collection as As.6699a, As.6699b–f, As.6701 and As.6700.¹¹⁴

5.1 From Sarawak to Oxford: the trajectory of a *kain kebat*

Although the 1866 distribution did not form part of an immediate exchange, Kew nevertheless benefitted from the transaction in a number of ways. For some of the objects transferred in 1866, the BM was not their final destination. In a letter to Hooker dated October 24, 1866, Franks asked whether any so-called duplicates included in the donation could be used by him for further exchanges, and Hooker's reply was definitive: "By all means exchange, give away, or otherwise dispose of what are not wanted of the things sent from these Museums, and according to your judgement."¹¹⁵ Hooker understood that in the end extended circulation led to greater knowledge production. Amongst the objects Franks was to redistribute in this way was an Iban skirt (Figure 9), now at the Pitt Rivers Museum in Oxford.



Figure 9. Iban Dayak textile (1886.1.259), Pitt Rivers Museum Collection (Image: Traude Gavin).

The skirt was one of a number originally sent to William Hooker in 1856 by Sir James Brooke, first Rajah of Sarawak. Two accessions were recorded that year from Brooke, the first, accessioned on May 14, 1856, consisted of "8 woven garments" and two of bark cloth. The term garment may refer to a tailored item, such as BM As.3422, a "sleeveless jacket made of vegetable fibre textile," now in the AOA collection (Figure 10),¹¹⁶ or a length of textile woven with a

¹¹⁴ Of the BM objects, only EBC 40759 and EBC 40780 are probable matches.

¹¹⁵ RBGK, Archives, DC86, f. 139: letter from Franks to Hooker, October 24, 1866. BM, BEP, CC: letter from Joseph Hooker to Franks, November 7, 1866.

¹¹⁶ Source: BM database.

particular usage in mind, such as a skirt. The PRM textile is one such textile.¹¹⁷ The second accession, on June 24, 1856 recorded "5 pieces of native cloth from Borneo."¹¹⁸ All of these woven cloths are now of great significance to historians of textiles, as they represent some of the earliest known Dayak textiles in Britain.



Figure 10. BM As.3422, "sleeveless jacket made of vegetable fibre textile.(Image © The Trustees of the British Museum).

The EBC still holds one of the textiles sent by Brooke (Figure 11). Described on the EBC database as "cloth manufactured by Serebus and Sakarran Dyaks from cotton grown in their own country," it has been allocated the accession date of 1852. However, in her ongoing research textile historian Traude Gavin contests this provenance. The entry book record for 1852 describes two cloths: one "manufactured by the Serebus and Sakarran Dyaks from cotton grown in their own country," and one "manufactured by the Millanows of the N.W. Coast of Borneo ... composed of the fibre of some plant and produces great irritation of

¹¹⁷ Traude Gavin, "Seven Early Iban Kain Kebat," Ms, 2017.

¹¹⁸ RBGK, EBC, Museum Entry Book 1855-1861, 57.1856 and 80.1856.

the skin if not well washed previously to being worn.”¹¹⁹ However, in Brooke’s accompanying letter to Joseph Hooker, from which the entry book text is excerpted, Brooke describes the first of these as white and the second as “the darker cloth.”¹²⁰ The Kew cloth EBC 65620 is not white, and is made of cotton, not a fibre that irritates the skin, so it does not conform to the descriptions of either of the objects sent in 1852. Its true provenance, therefore, has yet to be established.



Figure 11. Cotton cloth (EBC 65620), RBGK, Economic Botany Collection.

In any event, by 1855 a Dayak textile was on display in the Museum of Economic Botany under the Mallow or Malvaceae order, in cases four and five, room 1, on the first floor (Figure 12).¹²¹ It was described in the museum guide book simply as “Dyak Cloth of Borneo.” When the second Kew museum building, dedicated to dicotyledonous plants, was opened in 1857, the cloth was transferred there, again occupying a position amongst other “specimens of cotton cloths in various stages of manufacture, etc., both by civilised and barbarous nations,” with Malvaceae in Case 7, on the top floor of the museum.¹²² In 1883 the cotton display was augmented by a cotton plant from Georgia, donated by the US National Museum, Washington (EBC 65598), further

¹¹⁹ Serebus: now Saribas; Sakarran: now Skrang; Millanow: now Millanau.

¹²⁰ RBGK, Archives, DC55, f. 49: letter from J.[James] Brooke to Sir Joseph Dalton Hooker, from The Athenaeum, [London, England]; c.1851.

¹²¹ W. J. Hooker, *Museum of Economic Botany or Popular Guide to the Useful and Remarkable Vegetable Products of the Museum of the Royal Gardens of Kew* (London: Longman, Brown, Green, & Longmans, 1855), 23.

¹²² Daniel Oliver, *Official Guide to the Kew Museums: A Handbook to the Museums of Economic Botany of the Royal Gardens, Kew*, 6th Edition, (Museum, Kew, London: John R. Jackson, 1875), 11.

contextualising the textile as a signifier of the properties of *Gossypium sp.* (Figure 13).

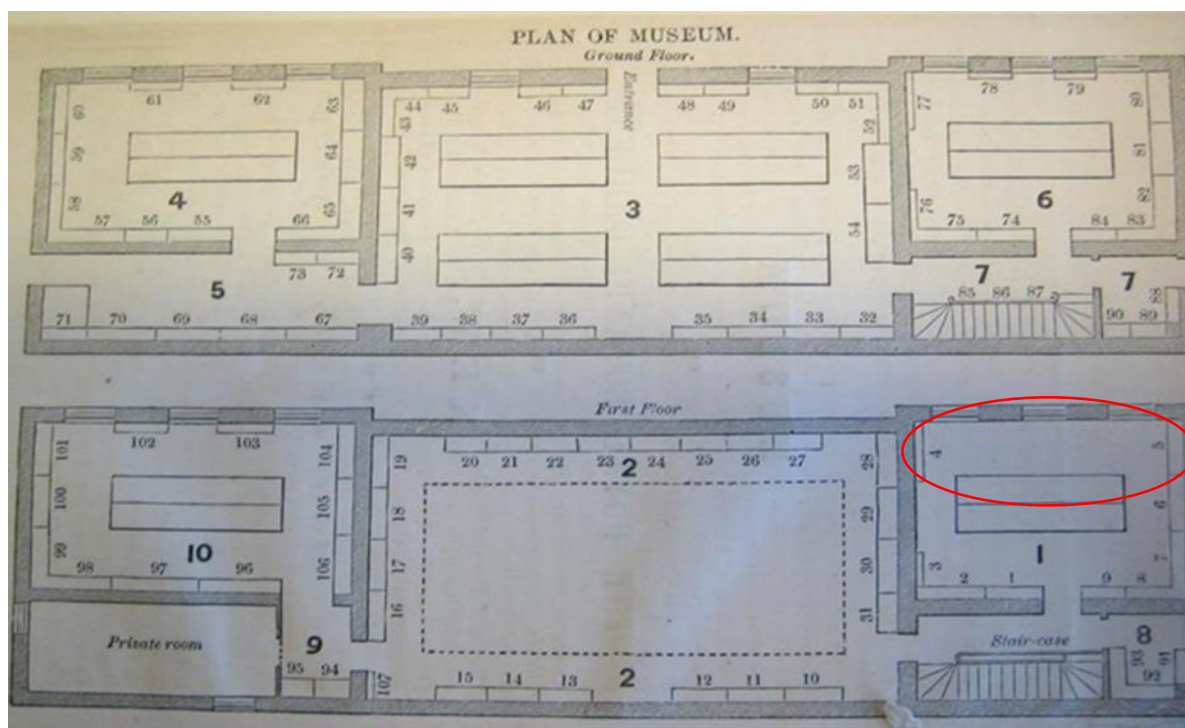


Figure 12. Museum of Economic Botany, 1855; cases containing cotton are circled (Image reproduced with the kind permission of the Board of Trustees, Royal Botanic Gardens, Kew).

The primary significance of the object to the Kew Museum and its commercial visitors was that cotton could be grown in a region of Borneo effectively under British rule in the form of the “white Rajah,” James Brooke. Brooke was an adventurer, prospector and mercenary who had made himself invaluable to the Sultan of Brunei by helping to crush a rebellion in the state of Sarawak, Borneo. By way of reward the Sultan offered Brooke the governorship of Sarawak in 1841.¹²³ Brooke’s relationship with the British government was, like his attitudes towards indigenous Borneans, at times ambivalent, however he was enthusiastic about economic development.¹²⁴ This idea is implicit in his donations to the Kew Museum of indigenous artefacts and local raw materials. In the context of this museum, a commercial concern was evident, not just by the textile’s classification as a representative of the cotton family, and its

¹²³ Nigel Barley, *White Rajah: A Biography of Sir James Brooke* (London: Little Brown, 2002).

¹²⁴ Ooi, Keat Gin, *Post-War Borneo, 1945–50: Nationalism, Empire and State-Building* (London: Routledge, 2013), 7; Alex Middleton, “Rajah Brooke and the Victorians,” *The Historical Journal*, Vol. 53 (2010): 381–400; Iik A. Mansurnoor, “Re-establishing Order in Brunei: The Introduction of the British Legal System during the Early Residential Period,” *Islamic Studies*, Vol. 52 (2013):155–182.

subsequent siting among the *Malvaceae* with botanical specimens and semi-processed cotton, but by its very mode of display: that it was originally



Figure 13. "A cotton plant, mounted specimens of cotton pods from China, Assam, Brazil and Cuba, and a collection, of Indian Cotton in various stages of manufacture are shown."¹²⁵

(Image reproduced with the kind permission of the Board of Trustees, Royal Botanic Gardens, Kew).

displayed folded—and therefore not visible to visitors as a whole object—can be deduced from the faded area on the upper side (Figure 14). When it reappeared in the *Plants+People* exhibit (1998–2016), a reconfiguration of objects from the EBC according to ethnobotanical principles, it was fully extended.

¹²⁵ Royal Botanic Gardens, Kew, *Official Guide to the Museums of Economic Botany. No. 1, Dicotyledons & Gymnosperms*, Second edition revised and augmented (London: HMSO, 1886), 21.

Five of the “duplicate” cloths which Brooke sent in 1856 formed part of the 1866 donation to the Christy Collection,¹²⁶ and may still be found there, now identified



Figure 14. Kew cotton cloth (EBC 65620), showing surface exposure to light.

as As.3426, As.3427, As.3428, and As.3429 and As. 3430 respectively.¹²⁷ It is likely that more than five were sent and that at the BM, a number of these were in turn designated as duplicates by Franks, as referred to in his letter to Hooker.

¹²⁶ BM, AOA Department Archives, Slip nos. 3426-3430.

¹²⁷ BM website:

http://www.britishmuseum.org/research/collection_online/search.aspx?people=70787&object=19911ðname=6582, accessed 05/10/2017.

They do not appear on the current BM database; as duplicates they would not have been assigned individual catalogue numbers.¹²⁸

The PRM textile was first sent to the Ashmolean Museum with numerous other specimens in 1869 as part of an exchange, but an accompanying letter from Franks advised, "If any of the specimens are duplicates of what you have it might be as well to set them aside for exchange but it is scarcely worthwhile to send them back."¹²⁹ Just as Hooker had granted permission to Franks to exchange any duplicates among the Kew donation, such permission from Franks to Keeper John Henry Parker, created the momentum necessary to further propel the cloth along networks of collection and exhibition where new knowledge might be produced from it, and valuable acquisitions made through further exchanges. Consequently the textile arrived at its present location at the PRM just as that museum was opening to the public in 1886.

From the fairly sparse description originally given by Brooke, considerable knowledge has been produced around the cloths since their departure from Kew. The cloth was described in the PRM accession register merely as "23. Piece of woven cloth. Dyaks. Borneo. (Kew)," and was unaccompanied by the characteristic line-drawing typical of the Museum's accessioning practices (Figure 15). The present database entry, however, reveals additional inscriptions:

Objects transferred from the Ashmolean Museum to the Pitt Rivers Museum in 1886 or later: 259. Borneo, Sarawak, Dyak. Cotton cloth, black, brown, and white. Sir J. Brooke, Rajah of Sarawak, 24.5.1854. Duplicate from Kew. By exchange, Trustees Christy coll., 1869.

Here the date is the only mystery: Kew accessioned the cloths on 24 June, 1856, a date which may have appeared on the hand-written labels accompanying the objects to the BM. That label, or, more likely, a later iteration of it penned at the BM, gave the date into Kew as "24/6/54." And this erroneous date was then transcribed onto the original PRM label, viz.:¹³⁰

Cloth ornamentally woven in colours. Borneo. Sir J Brooke
1854. Ash.Mus. Christy Coll (Exchange) 1869 [254]. Trans. to
Univ. Museum 1885-6.

¹²⁸ Duplicates generally were not assigned individual numbers; *pers. comm.* addressed to Traude Gavin from James Hamill, Department of Africa, Oceania and the Americas, The British Museum; 19 September 2017.

¹²⁹ Ashmolean Archives, f. 36, letter from Franks to Parker, February 17, 1869, cited in Traude Gavin, 2017.

¹³⁰ For more on the creation of knowledge absences, intentional or otherwise, see Robert Proctor and Londa L. Schiebinger, *Agnology: The Making and Unmaking of Ignorance* (Palo Alto, CA: Stanford University Press, 2008); Schiebinger, *Plants and Empire* (Cambridge, MA and London: Harvard University Press, 2009).

The mobility of the object between Kew, the BM and the PRM has both created and obscured aspects of its history. New knowledge continues to be generated by the study of the object and its associated archives. A visit to the PRM in 2000 by anthropologist Michael Heppell enabled the source community to be identified as either Kantu' or Iban. In 2002 Iban textiles expert Traude Gavin,

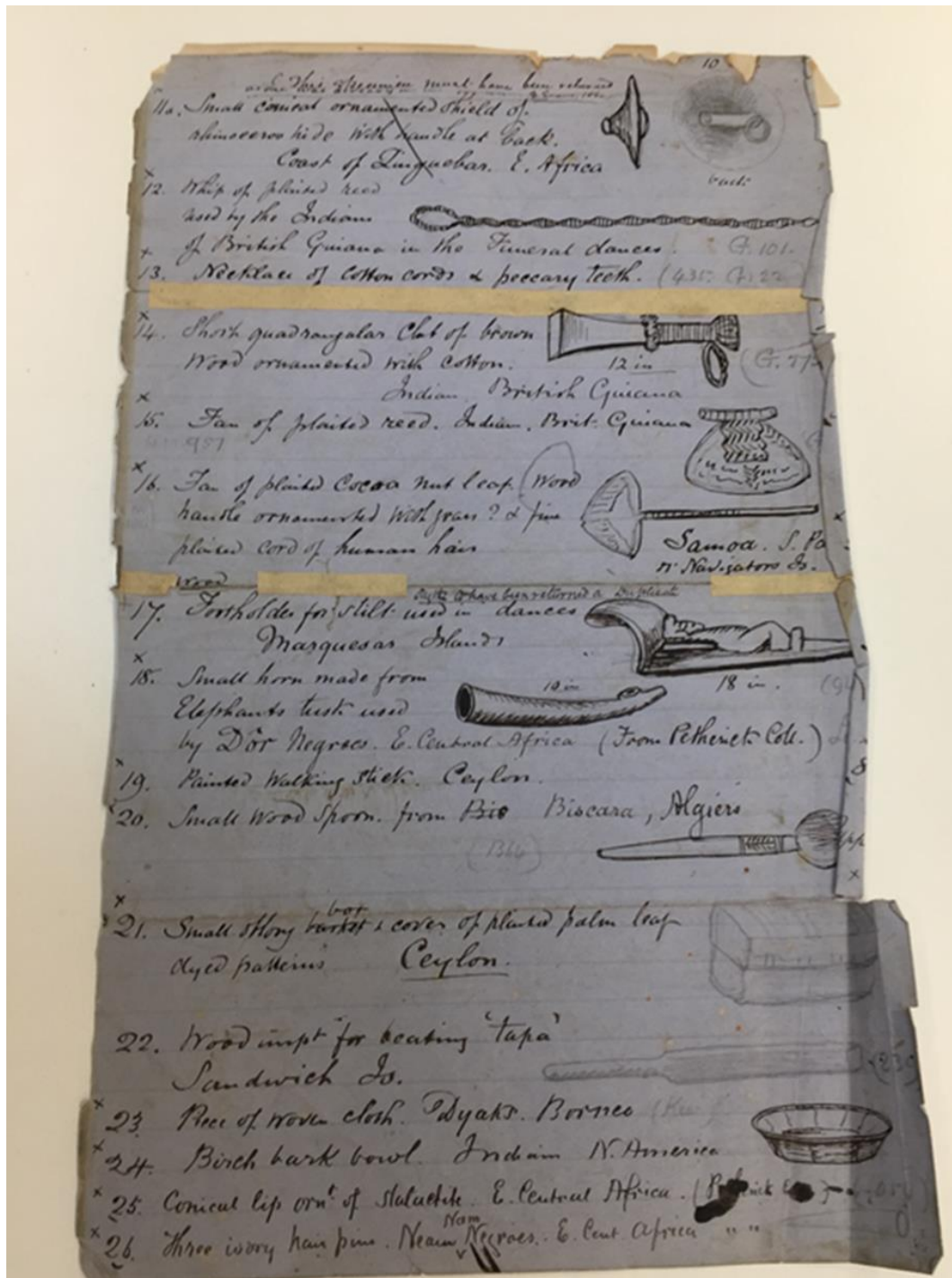


Figure 15. Entry for the 'piece of woven cloth. Dyaks. Borneo' on a list originally sent from the British Museum to the Ashmolean Museum, now in the PRM Archives (RDF 1886.1). (Image: Traude Gavin).

author of *The Women's Warpath*, was similarly able to confirm the local name for the object as "kain kebat," or "kain pandak" in the Saribas area, meaning *ikat* cloth. *Ikat* is a dye-resist method of creating patterns on textiles whereby warp or weft threads (in this case the warp threads), are tie-dyed before weaving. At Kew, too, a visit by Gavin in 2017 confirmed that the Kew textile was a skirt length, and that the red dye was from *Morinda citrifolia* (known in Dayak as "engkudu"), details which have since been added to the record. These additional details render this object more visible to those searching and researching in the fields of anthropology, material culture, and textile history and design.

Conclusions

In conclusion, we summarise our key findings concerning patterns of distribution from the Kew Museum, and explore wider implications for the Mobile Museum project and its core themes of mobility, exchange and circulation.

6.1 Key findings

1. The pattern of distribution over the life of the collection can be characterised as four phases of activity: Phase 1 (1847–1875) when the museum was in its initial phase of development and focussing more on growing its collections than redistributing them; Phase 2 (1876–1914) when the practice of distribution was at its most intense; Phase 3 (1915–1938) a period of reduced activity; and Phase 4 (1939–1990) a period where de-accessions responded to museum closures and structural changes at Kew from the late 1950s, and ceased as a practice in the EBC in 1990.
2. There is a clear correlation between the overall pattern of the acquisition and distribution event series, although acquisition events are more frequent than distribution events overall.
3. Distribution was geographically concentrated in particular regions, and considerably more than acquisition: the vast majority of deaccessioning events were to British institutions (84%), followed by Europe (7.4%), North America (4.5%), and Australia (2.2%).
4. Raw materials other than wood represented 35% of all distribution events over the time period; wood itself accounted for 18%, although we suspect that is an under-estimate; distributions of processed and manufactured objects were closely aligned to raw materials distributions at 17%; ethnographic objects accounted for 8%, and images and publications only 5%. The number of instances where no object type is specified is substantial, at 17%, though we believe this will reduce as we locate objects and their records in other institutions. This object profile reflects the types of objects the Kew Museum found easiest to accumulate as a result of its networks of acquisition, and as an

effect of its primary function—the investigation and display of the economic properties of plant materials.

5. Distributions from the Museum of Economic Botany took a variety of forms, including donations to UK schools and regional museums as part of wider institutional and governmental initiatives; exchanges with large national and international institutions, for example, the Smithsonian Institution (specifically the United States National Museum), the British Museum, and the Sydney Technological Museum; and distributions organised as part of Kew's role of clearing house for the dispersal of material from international exhibitions and other museums.

6. The largest single type of institution receiving objects from the Kew Museum was schools, accounting for more than a third of all de-accessioning events from 1847 to 1990.

7. Distributions were made to a large variety of recipients, those institutions receiving multiple donations over a long period of time, such as the BM, forming part of sustained inter-institutional relationships of exchange.

8. Case studies indicate that exchanges can occur at multiple points during the life of an object, and that this ongoing mobility is directly related to processes of knowledge production and knowledge loss.

6.2 Wider implications

As we have stated, specimen exchange was a well-established and universally understood practice in natural history long before the advent of the Museum of Economic Botany. In the context of ethnological and archaeological material, we have argued, the use of duplicates as the currency of exchange proceeded via a process of negotiated equivalencing which rested on a foundation of mutual trust and, as seen in the case of the Kew Museum and the BM, a highly-developed awareness of the exchange values of ethnographic objects and antiquities. Exchanges might occur on an object-for-object basis, with both parties specifying their desiderata, or on one of region-for-region, in a process of geographical recalibrating across institutions. As Nichols and Parezo have argued, the mechanism for regulating the system was the motivation of curators to preserve their reputations through the observation of fair market evaluations.¹³¹ At the same time, curators helped shape those market evaluations through the publication in catalogues of exchange lists providing bilateral values, to facilitate transactions with other museums. The Smithsonian

¹³¹ Nichols & Parezo, "Social and Material Connections," 64.

Institution and the Natural History Museum in Leiden were amongst this number.¹³²

In this paper we have introduced the concept of a biocultural economy as a way of conceptualising the exchange of economic botany specimens and artefacts, which underwent considerable expansion in the second half of the nineteenth century in parallel with the growth of the trade in natural history specimens.¹³³ In their study of the increasingly global market in zoological specimens, Coote *et al* trace the economic geography of this “boom,” effected through economic, scientific and technological change.¹³⁴ Greater agreement on the scientific classification of species—through the increase in state-funded centres of calculation—enabled greater agreement on their relative values and hence on pricing. Technological advances in transportation and communication facilitated collecting from afar and delivering specimens within a reduced time-frame. Developments in methods of preservation meant that a greater number of species could be returned in saleable condition from distant places. All of this was supported by a modernised financial infrastructure which allowed for international money conversion and transfers and made long-distance trading more attractive to buyers and sellers. And marketing and branding techniques assisted traders in reaching a broader clientele, whilst advertising and publicity began to play a greater part in the formation of reputations than did networks of personal trust.

Our research has demonstrated that all of these factors applied as much to collecting in economic botany and indeed anthropology as they did to zoology. The notion of duplicates in the collecting of human material culture, however, raises wider issues of comparability given the specificity and historicity of such forms of production. Anthropologists have long demonstrated how patterns of production amongst indigenous populations can change in response to situations of encounter.¹³⁵ A telling example cited by Thomas occurred in Fiji in the late 1880s, where the market demand for “cannibal forks” was reported to have

¹³² Coote *et al*, “The nineteenth-century global trade boom in natural history collections,” 16–17.

¹³³ “Museums and the Market” was the theme of a Museums History Group conference in 2010; see MGHG website, “Past events,” <http://www.mghg.info/past-events/> for the programme. See also Christopher Plumb, “In fact, one cannot see it without laughing’: The Spectacle of the Kangaroo in London, 1770–1830,” *Museum History Journal*, Vol. 3 (2010): 7–32; Sophie Everest, “Under the Skin’: the Biography of a Manchester Mandrill,” in Samuel J. M. Alberti (ed.) *The Afterlives of Animals* (Charlottesville, VA and London: University of Virginia Press, 2011), 75–91; Henry A. McGhie, *Henry Dresser and Victorian Ornithology: Birds, Books and Business* (Manchester: Manchester University Press, 2017).

¹³⁴ Coote *et al*, “The nineteenth-century global trade boom in natural history collections”.

¹³⁵ See, for example, Nicholas Thomas, *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific* (Harvard University Press, 2009); (ed.) *Artefacts of Encounter: Cook’s Voyages, Colonial Collecting and Museum Histories* (University of Hawaii Press, 2016).

prompted white settlers to manufacture them for sale to travellers.¹³⁶ Demand from visitors, then, can generate a market for particular objects which are created solely for sale and may be subsequently subsumed into museum collections, rather than for more traditional (domestic and ritual) usage. Indeed, it can also lead to the creation of entirely new forms of objects: Aldona Jonaitis relates how the Haida of Northwest Canada began producing miniature totem poles for the collectors' market in the 1820s; by the 1860s the model pole had become the most popular of Haida artefacts amongst white consumers.¹³⁷ These models circulated widely, entering into museum collections such as the Pitt Rivers in 1884 and 1891.¹³⁸ We also know that collectors charged with acquiring multiples of a given object might in some circumstances commission objects from particular makers, thus exerting considerable agency over the design, scale and medium. Explorer Richard Spruce, we know from his journals, did this on at least one occasion.¹³⁹

The distribution of agency in such transactions is a matter for further investigation.¹⁴⁰ Whilst these situations create new contexts and meanings for traditional objects and influence the production of cultural artefacts, as James Clifford asserts, this may take place "in relation to [white power] and sometimes in defiance of it."¹⁴¹ Returning to the Haida example, Ruth Kirk describes how the advent of iron tools and commercial paints provided the media for new types of formal expression.¹⁴² It is therefore possible to read the introduction of new colours and forms as a medium of resistance, fashioning a non-sacred, non-personal aesthetic for purposes of trade. Similarly, Cornish has argued that the detail and individuality accorded to ninety-five figures of Indian labourers in an 1886 model of an indigo factory in the Kew Economic Botany Collection, represents a form of agency on the part of the artist, working within the confines of a museum commission.¹⁴³

¹³⁶ Thomas, *Entangled Objects*, 167.

¹³⁷ Aldona Jonaitis and Aaron Glass, *The Totem Pole: An Intercultural History* (Seattle, WA and London: University of Washington Press, 2010), 95–104.

¹³⁸ Pitt Rivers website, "Objects online": http://databases.prm.ox.ac.uk/fmi/webd/objects_online accessed 05/10/2017.

¹³⁹ "I have already commissioned a number of the beautiful painted cuyas, made only at Monte Alegre, through Dr. Campos, whose wife is a native of that place;" Richard Spruce, "Botanical Excursion on the Amazon by R. Spruce, Esq.," *Hooker's Journal of Botany and Kew Garden Miscellany* 3 (1851): 89.

¹⁴⁰ Thomas, *Entangled Objects*.

¹⁴¹ James Clifford 1991, "Four Northwest Coast Museums," in Ivan Karp and Stephen D. Lavine (eds.), *Exhibiting Cultures: The Poetics and Politics of Museum Display* (Washington and London: Smithsonian Institution, 1991), 218.

¹⁴² Ruth Kirk, *Wisdom of the Elders: Native Traditions on the Northwest Coast* (Victoria/Vancouver and Toronto: Royal B.C. Museum/Douglas & McIntyre, 1986).

¹⁴³ Caroline Cornish, "Curating Global Knowledge: The Museum of Economic Botany at Kew Gardens," in Diarmid A. Finnegan and Jonathan Jeffrey Wright (eds.), *Spaces of Global Knowledge:*

The collection and re-circulation of artefacts as “duplicate” specimens had consequences within Western museums as well as source communities. Two consequences in particular may provide the focus for further research: firstly, the use of so-called duplicates as an exchange reserve, to be deployed, as it was by Franks at the British Museum, as a form of currency in further exchanges; and secondly, the stimulus that the idea of the duplicate gave both to collectors in the field and to curators in their search for a “complete” and “representative” collection. There is evidence of both in recent work on the Vienna ethnological collections, for example, for which Christian Feest has meticulously reconstructed the role of duplicates in object exchange with museums in Berlin, Dresden and Hamburg.¹⁴⁴ Such work requires requires patient archival research and, in particular the linking of accessions and deaccessions records in donor and recipient institutions, exactly the kind of work we have embarked on in the case of the Kew Economic Botany Collection, reflected here in the study of the links between Kew, the British Museum and the Pitt Rivers Museum (section 5 above). In this case, however, we have the advantage of relatively complete and relatively continuous documentation of museum distributions. Even here, however, major distributions have escaped the archival net: and so the task of linking records between institutions remains fundamental to the study of circulation.

In this paper we have provided an overview based on a comprehensive though interim analysis of collections-level data. Further research in the archives of recipient institutions will further refine the analysis. The schools data will provide a starting-point for a separate analysis to come in Working Paper 3 (2018). Some questions however require different methods, and in this paper we have also introduced case study material and elements of object biography to be developed in future Working Papers. The case of the Iban textile at Kew discussed above raises further questions concerning what is gained and what is lost when an institution selects one object from a heterogeneous assemblage and redistributes the rest. In this case study of the dispersal of Brooke’s fifteen textiles across the BM, the Ashmolean, the V&A, and the PRM provides ample evidence of the contingency of the production of object-based knowledge on spatial and temporal context. This example also serves to underline the provisional nature of the idea of the duplicate: in the epistemology of the economic botany museum, an artefact’s value lies in its ability to illustrate the properties of particular plants and the human skills required to effect the transformation from plant to product. According to this view, the twelve

Exhibition, Encounter and Exchange in an Age of Empire (Farnham and Burlington, VT: Ashgate Publishing, 2015), 119–142.

¹⁴⁴ Christian Feest, “The ethnographic collection of Johann Natterer and the other Austrian naturalists in Brazil,” *Archiv Weltmuseum Wien* 63-64 (2013-14), 79-81.

distributed Iban textiles were, indeed, duplicates. It is in their subsequent contexts that they have become, variously, signifiers of Dayak culture, Eastern art objects,¹⁴⁵ and epitomes of design history or pedagogic aids.¹⁴⁶

¹⁴⁵ "Eastern Art Online: Yousef Jameel Centre for Islamic and Asian Art," Ashmolean Museum, accessed 16/11/2017 at <http://jameelcentre.ashmolean.org/welcome>.

¹⁴⁶ Pitt Rivers Museum website, "Governance," accessed 16/11/2017 at <https://www.prm.ox.ac.uk/governance>.

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- Christy Collection Correspondence

AOA Department Archives

- Christy Collection Correspondence

BEP Department Archives

- Christy Collection Correspondence

Economic Botany Collection, Royal Botanic Gardens, Kew

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- Vol. II 1902–1990

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Report (Year)	Details
1856	p. 5: "This Museum of Economic Botany, the first ever formed, has set an example which is already wisely followed in many European capitals, and in our Colonies, &c; and to some of the most important of these Establishments we have had the good fortune to contribute"
1862	p. 5: "The distribution of duplicate named specimens has been very large, amounting to upwards of 30,000, sent to public and private Herbaria and Museums; this is exclusive of the North American Boundary Line collections of Dr Lyall, amounting to upwards of 3,000, all named at Kew and distributed by himself, at the expense of Admiralty"
1868	p.8: "Collections of duplicate specimens have been made up, and sent to Trinidad, Demerara, Wellington, New Zealand, and (at the request of the Belgian government), to the University of Liege."
1876	p. 27: "No separate collections of merely technological interest will be kept, and those already existing have now been broken up and distributed. A large number of duplicates and of other objects which on various grounds did not seem to be properly congruous with the object of the museums as illustrating structure and usefulness throughout the vegetable kingdom, have been as far as possible placed at the disposal of other Government institutions. Amongst these I may particularise the British Museum:- Botanical Department, Christy Collection, Library, Zoological Department; India Museum; Museum of Economic Geology; South Kensington Museum:-collection of Economic Entomology and Food Collection; Bethnal Green, Collection of Naval Models; Museum of Saint Thomas's Hospital; City Industrial Museum, Glasgow; University Museum, Cambridge; Jardin des Plantes, Paris. The work of revision necessarily requires great care, and will occupy a considerable space."
1877	p. 44 "the revision of the collections in No. 1 Museum has been proceeded with ... The duplicates have also as before been distributed to most of the public institutions enumerated in my last Report, with the addition of the following:- Museum of St Bartholemew's Hospital; Musée Industriel, Ghent; Parkes Museum of Hygiene, University College."
1878	p. 50: "As in former years, the duplicates have been distributed to kindred institutions at home and abroad."
1879	p. 38: "the vast accumulated collections of vegetable products and matters relating to them were transferred from the department of the Secretary of State for India to the First Commissioner of Works, and deposited at Kew under conditions which were still under consideration at the end of the year."

Report (Year)	Details
1880	<p>p.56: "The magnificent collection of forest produce received from the Government of India in 1878 has been examined, selected from, and incorporated in the permanent collections and the duplicates distributed"</p> <p><i>Plus:</i> "the entire Economico-botanical collections forming part of the Indian Museum at South Kensington"</p>
1882	<p>p. 43: "The detailed revision, with a view to the removal of duplicates so as to relieve crowding, which has been in progress for the last six years, as time would admit, under the superintendence of the Assistant Director, has been finally concluded The distribution of duplicates has been continued.</p> <p>The largest recipients have been:- Adelaide, Botanic Garden Brookline, United States; Arnold Arboretum; Indian, Australian, and New Zealand timbers. Cambridge, United States; Botanic Gardens of Harvard College. Mauritius, Botanic Gardens; Sydney, Australian Museum. Washington, United States; National Museum."</p>

Chart 1. References to museum distributions in Kew Annual Reports 1847-1882.

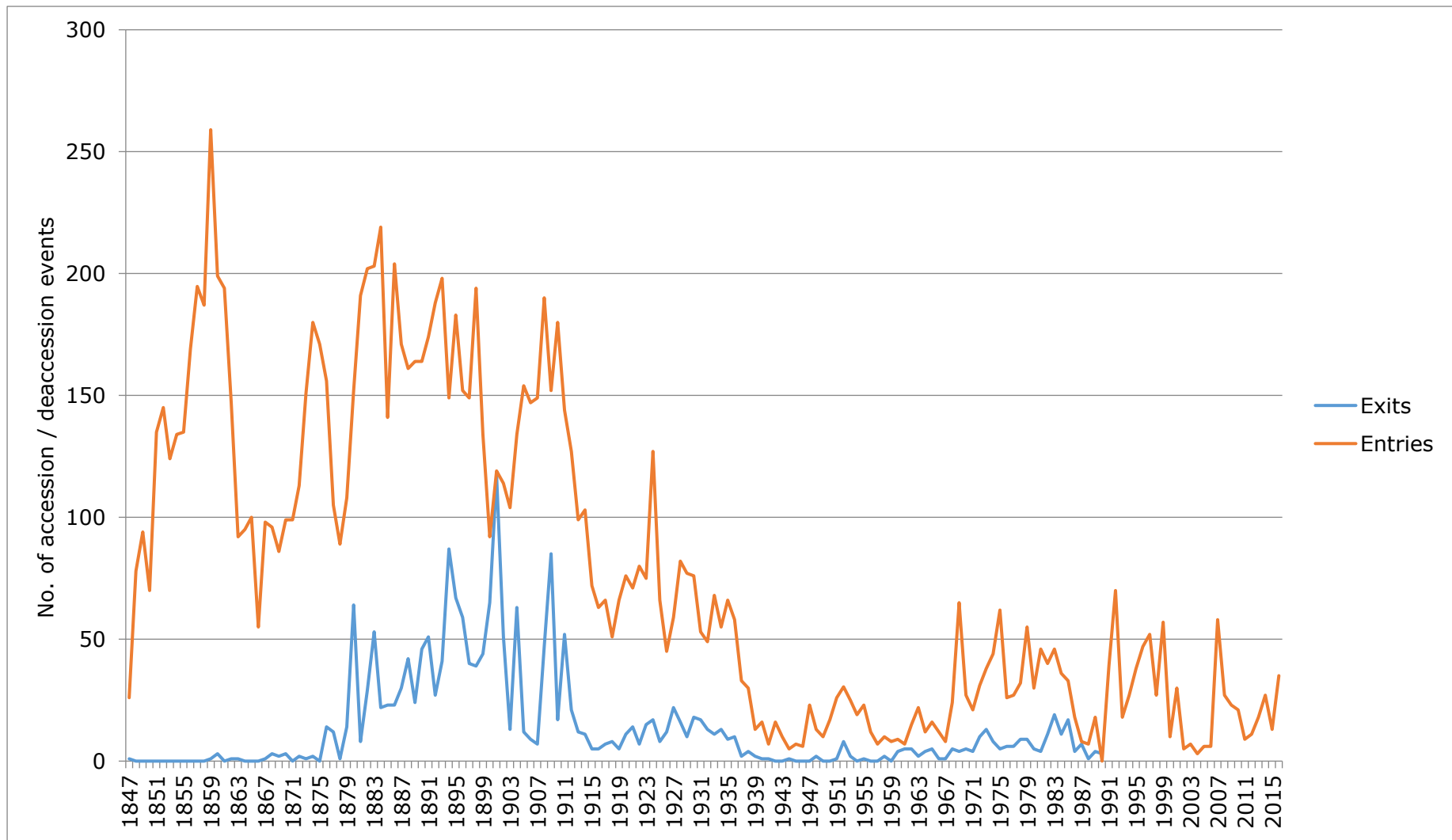


Chart 2. Comparison of accessions and deaccessions (entries and exits), Museum of Economic Botany, 1847-1990. N.B. The systematic recording of deaccessions from the Economic Botany Collection ceased in 1990.

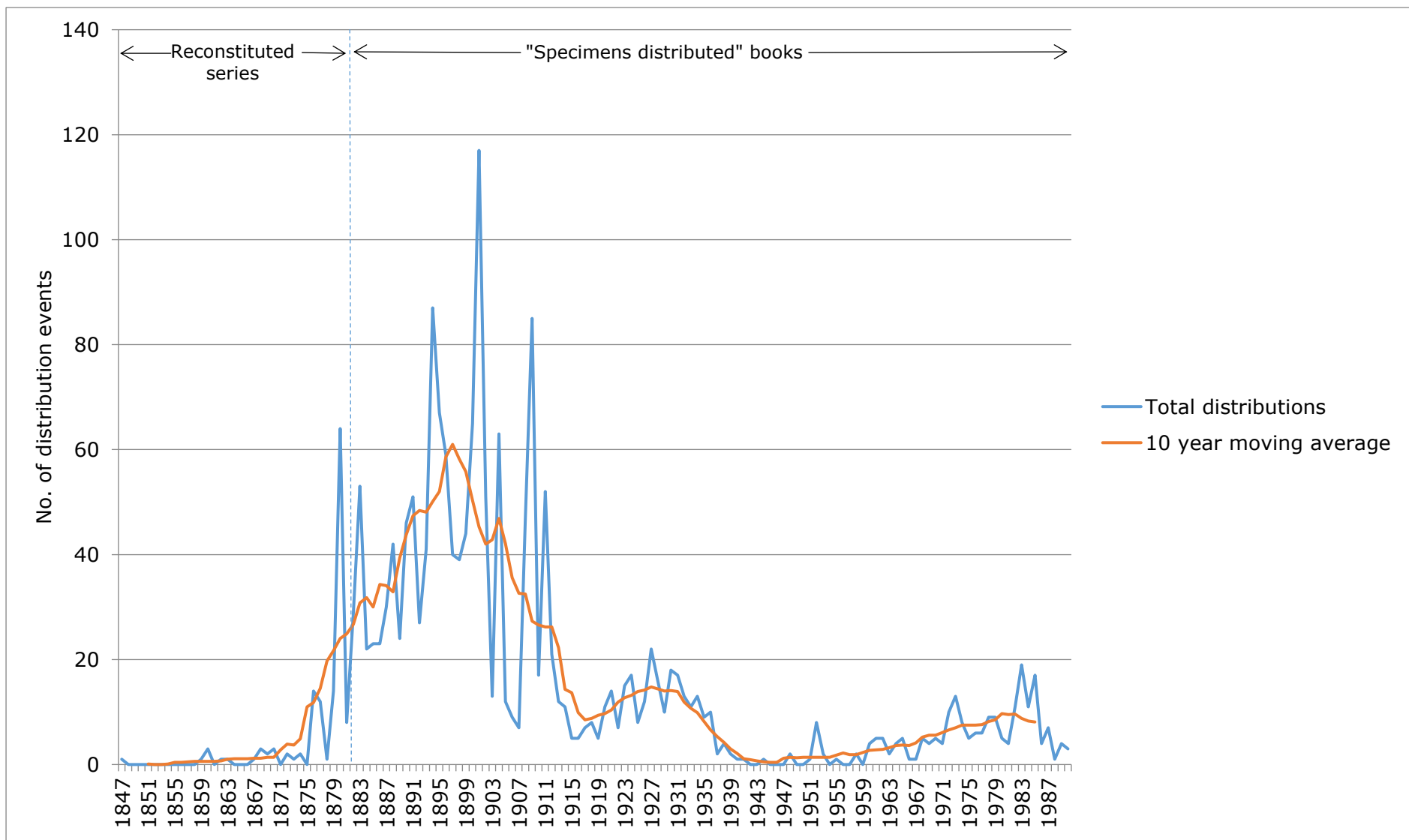


Chart 3. Total annual distribution events from the Museum of Economic Botany, 1847-1990.

Blackburn, Museum	Box of vegetable products
Copenhagen, Botanic Garden	Box of wood from Indian Forest Department*
Dundee, Museum	Large swing-case containing collections of fibres
Edinburgh, Museum of Science & Art	126 specimens of vegetable products
Edinburgh, University	Collection of Indian drugs
Exeter, Albert Museum	Box of vegetable products
Glasgow, City Industrial Museum	7 exhibition cases containing arranged collections of dyes, drugs, tea, coffee, cereals, cotton, &c; carved black-wood sideboard; 8 boxes containing 581 specimens of miscellaneous vegetable products
Hamburg, Handelsmuseum	Two boxes of vegetable products
Harvard University, Massachusetts, Arboretum	Six boxes and packages of Indian woods from Forest Department*
Harvard University, Massachusetts, Museum	Three boxes of woods from Forest Department* and eight boxes vegetable products
London, Bethnal Green Museum, Animal Products Collection	19 drawers illustrating Indian silk, 20 specimens of silk products
London, Bethnal Green Museum, Food Collection	446 specimens of Indian wheats, 2102 miscellaneous samples of vegetable food-products.
London, British Museum, Botanical Department	121 large specimens of Indian woods, two boxes of woods from Forest Department,* large bamboo stem.
London, British Museum, Christy Collection	21 miscellaneous ethnographical objects.
London, India Office	Royle collection
London, Pharmaceutical Society	Ten boxes of pharmaceutical products
London, University College	Collection of Indian drugs
London, Parkes Museum of Hygiene	Four boxes of food-products
Mauritius, Bowen Museum	Six boxes vegetable products
Melle-lez-Gand, Musée Industriel-commercial	Two boxes vegetable products
Newcastle-upon-Tyne, Museum	Two framed specimens of cotton plants
Oxford, Indian Institute	Collection of agricultural models, photographs illustrating cotton industry; 16 boxes of

	miscellaneous vegetable products.
Paris, Jardin des Plantes	Box of vegetable products
Strasbourg, University	Collection of Indian drugs
Sydney, Technological Museum	5 boxes of vegetable products
Sydney, Economic Museum, Botanical Gardens	Box of vegetable products
Taunton, Museum	Box of vegetable products
Washington, Department of Agriculture	2 boxes of woods from Forest Department*

Chart 4. Recipients of the India Museum vegetable products collections distributed from Kew, 1878-80. (Source: *Report on the Progress and Condition of the Royal Gardens at Kew during the year 1880*).

*Duplicate set of woods from 1878 Paris Exposition Universelle, donated by the Indian Forest Department and received at Kew 1878.

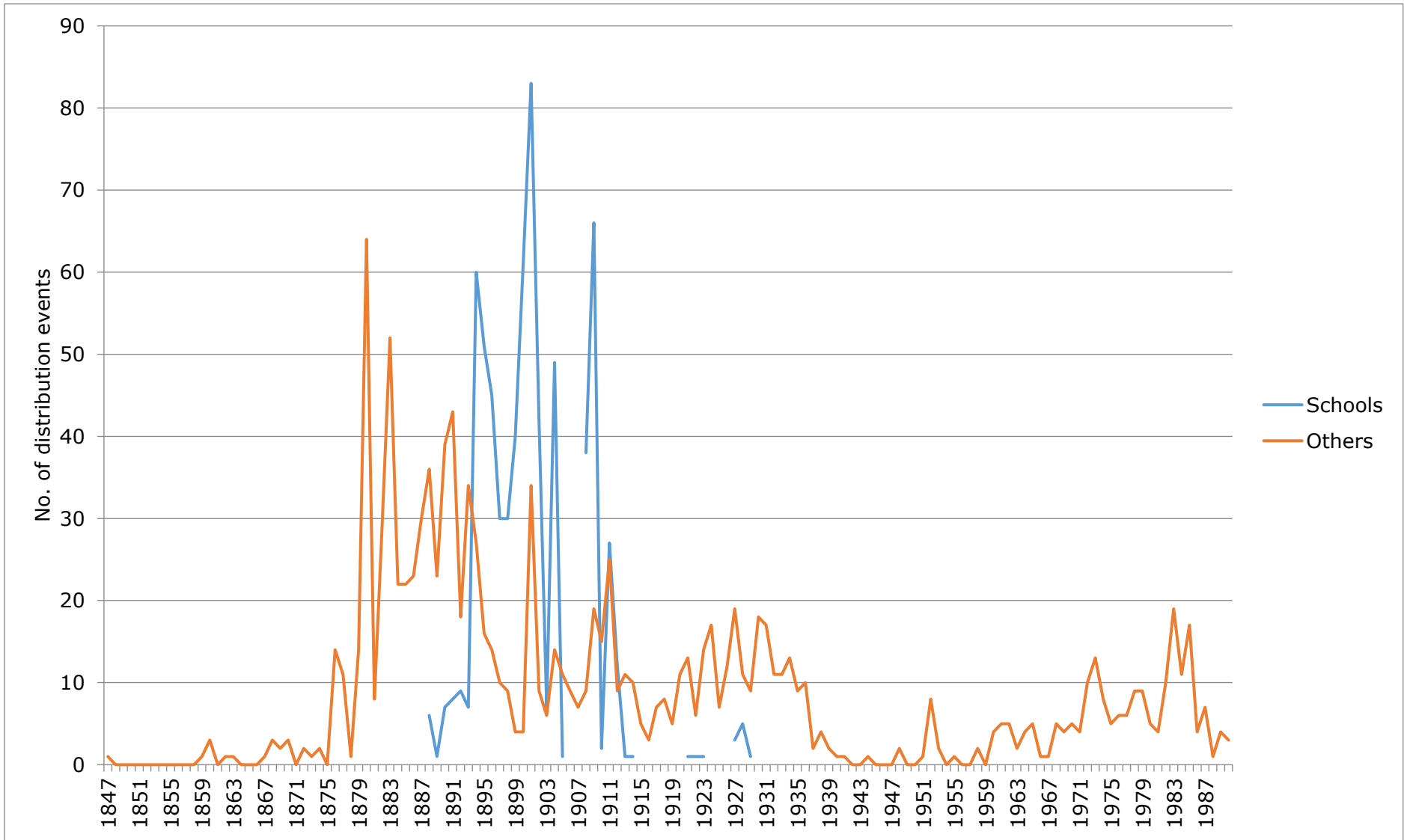


Chart 5. Annual distribution events to schools and others, 1847 - 1990.

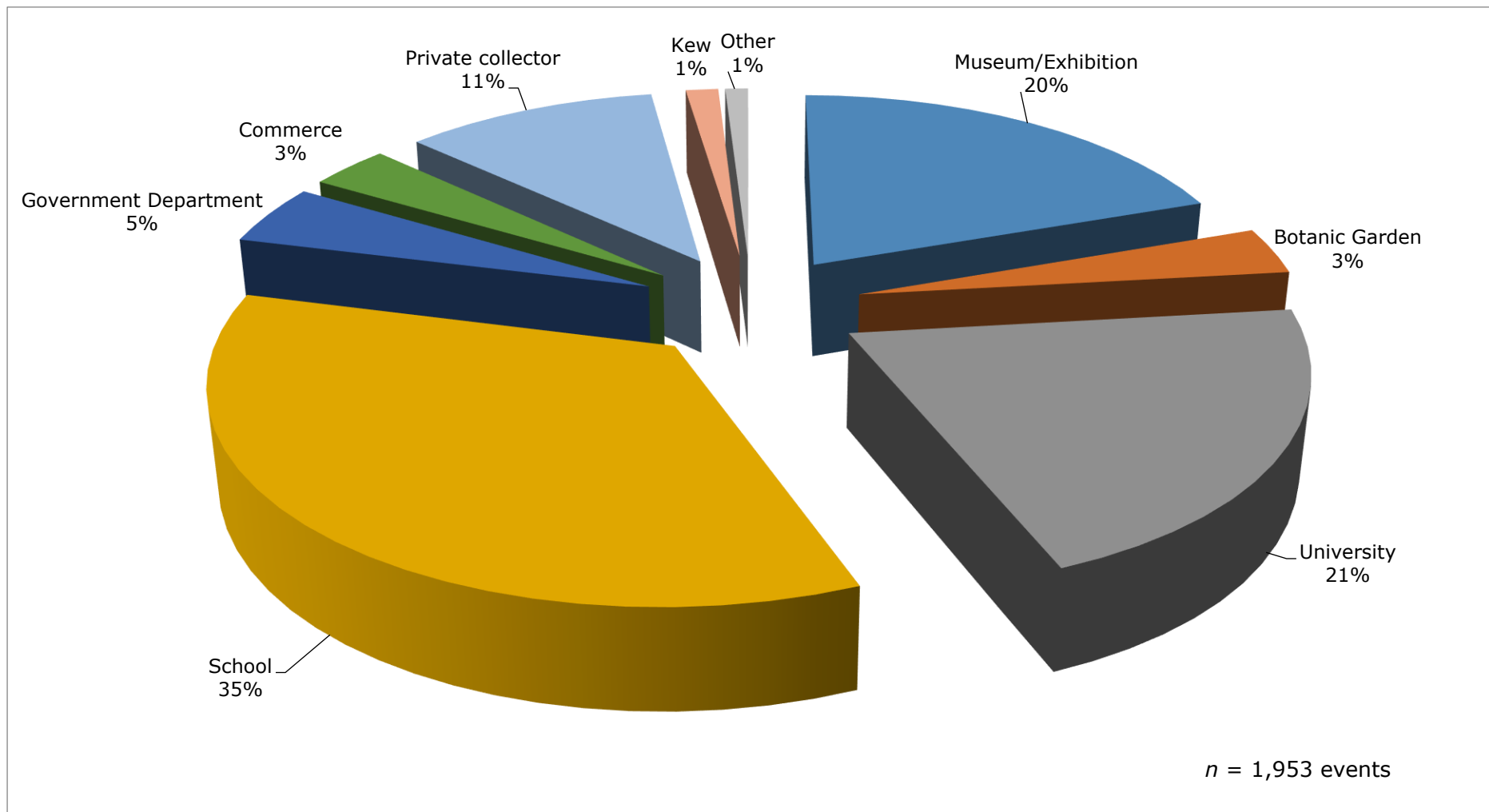


Chart 6. Total distribution events 1847-1990, by recipient category.

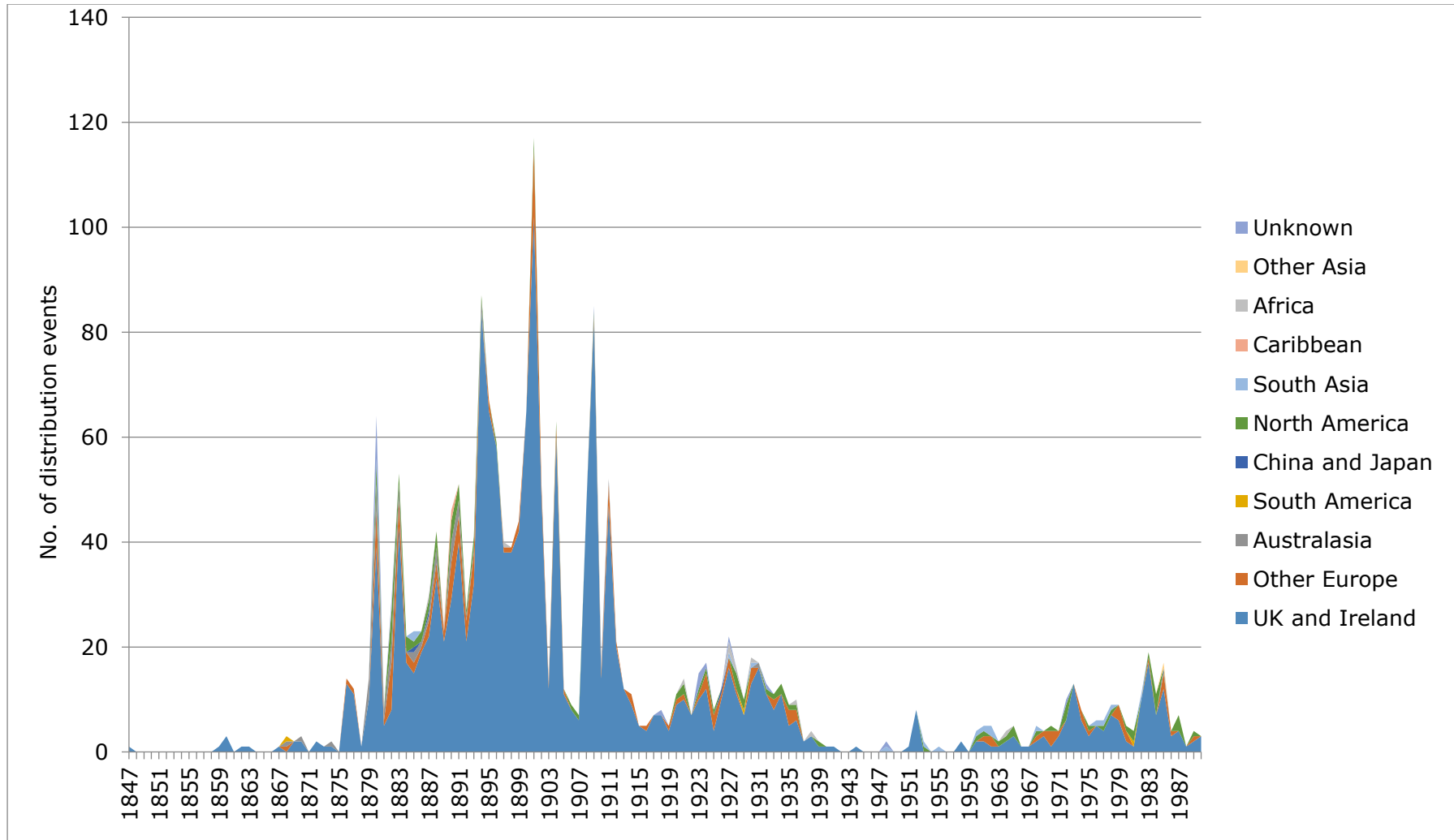


Chart 7. Annual distribution events by region, 1847-1990.

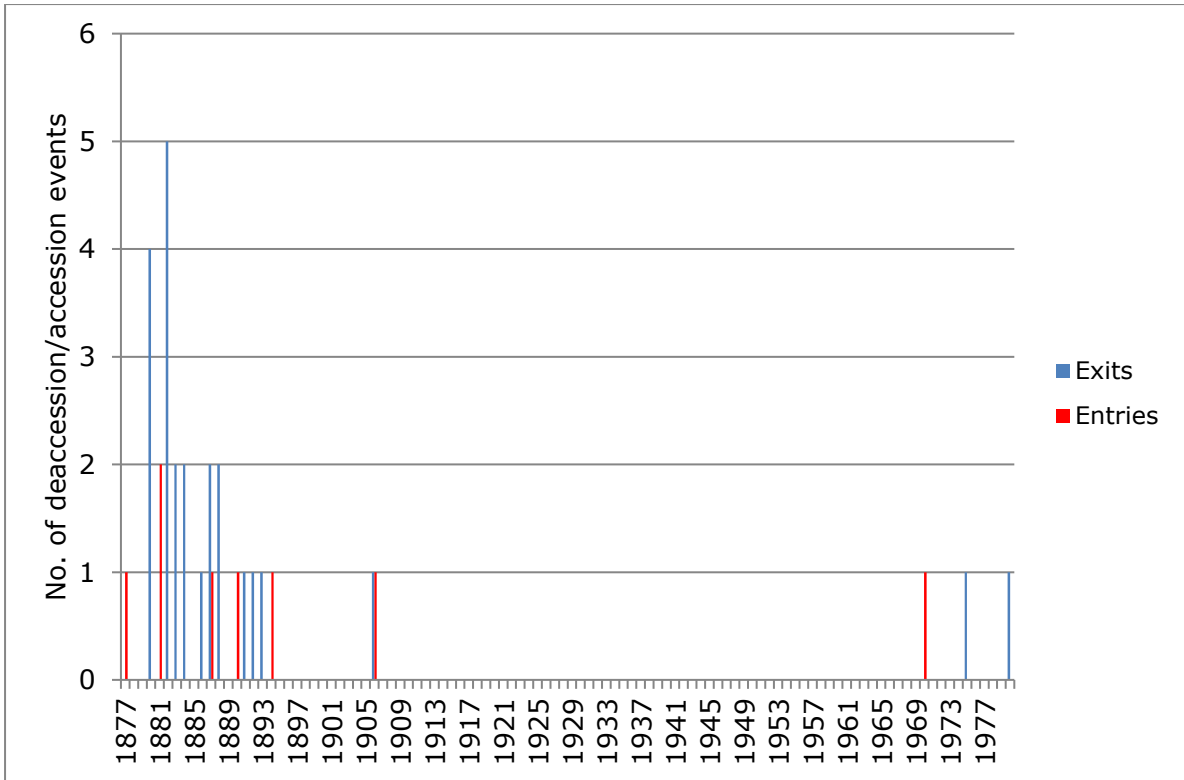


Chart 8. Pattern of exchanges between Harvard and the Kew Museum

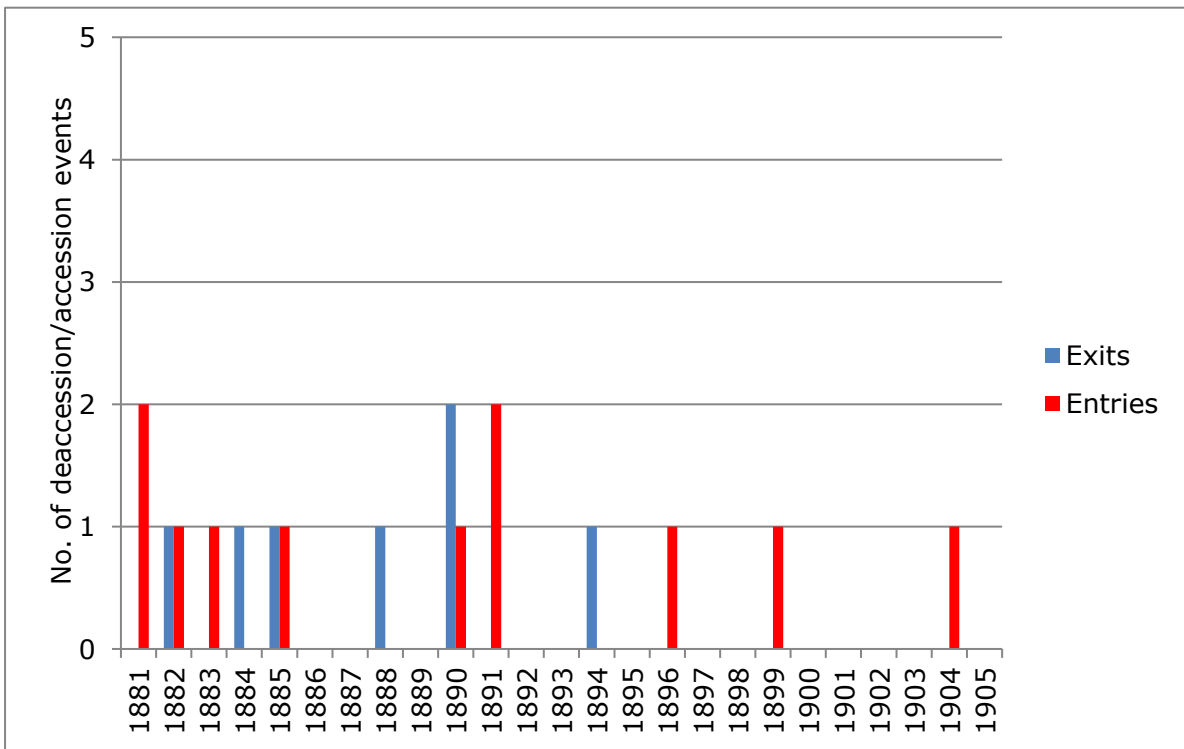


Chart 9. Pattern of exchanges between the Smithsonian Institution and the Kew Museum

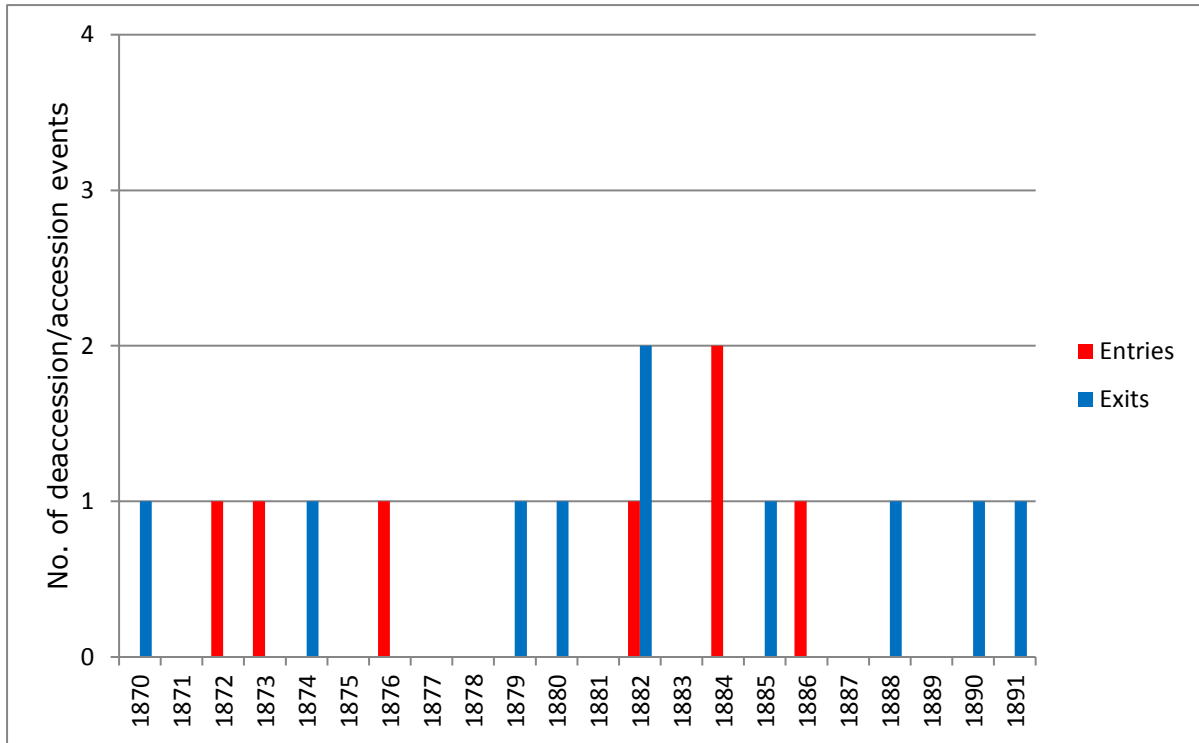


Chart 10. Exchanges with the Museum of Economic Botany, Adelaide and the Museum of Economic Botany, Kew

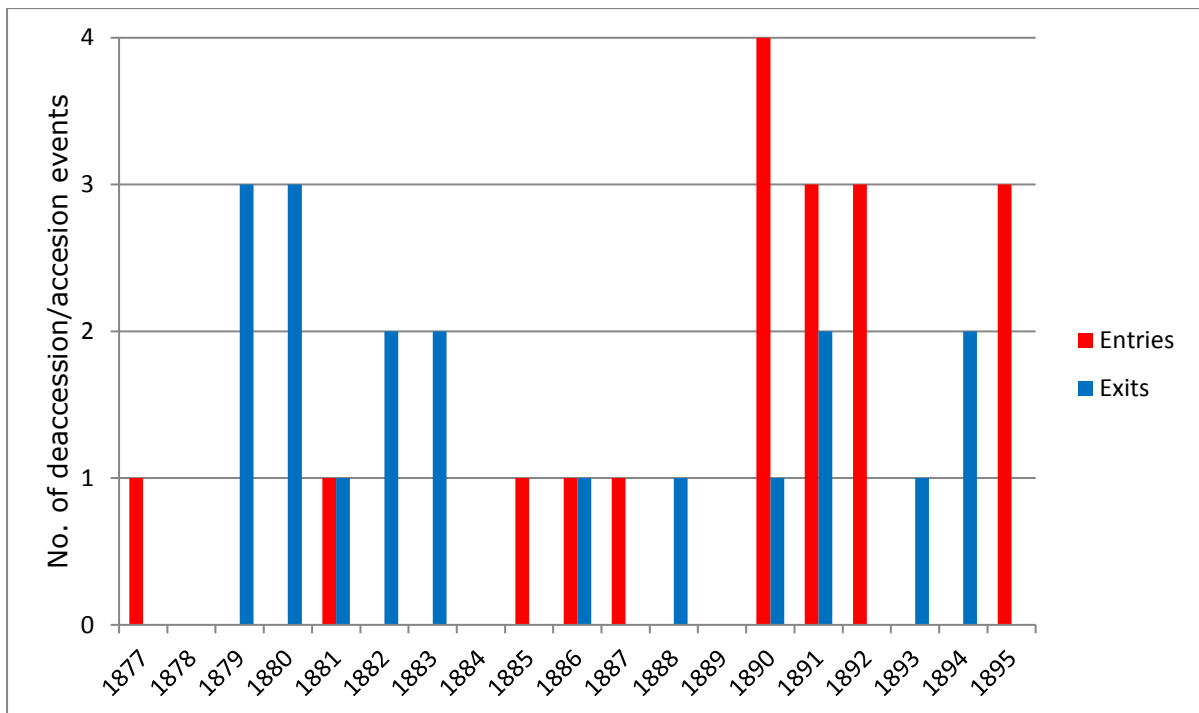


Chart 11. Exchanges with the Sydney Technological Museum and the Museum of Economic Botany, Kew

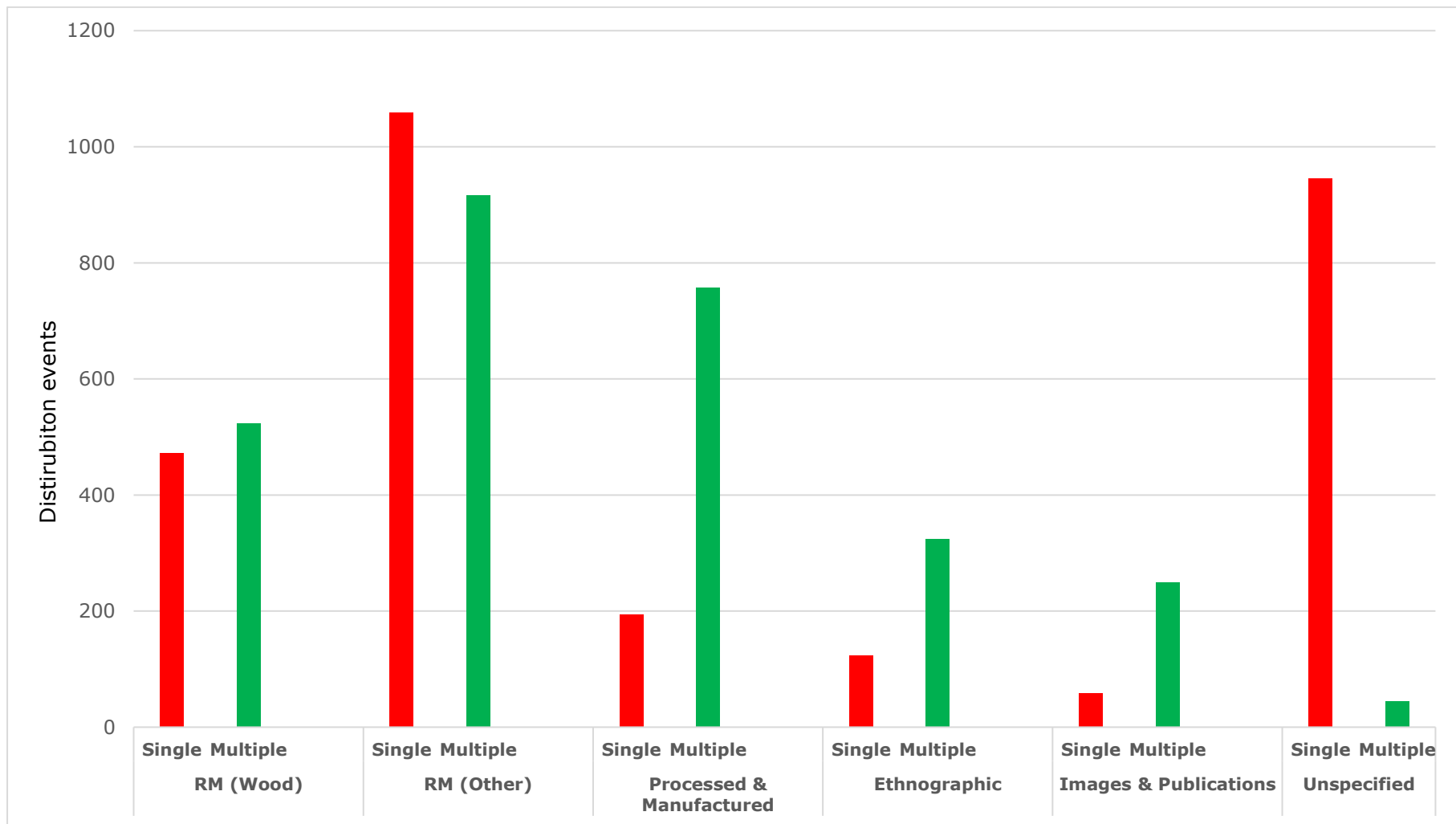


Chart 12. Pattern of deaccession events by object type, 1847-1990, distinguishing single-type and multiple-type events.

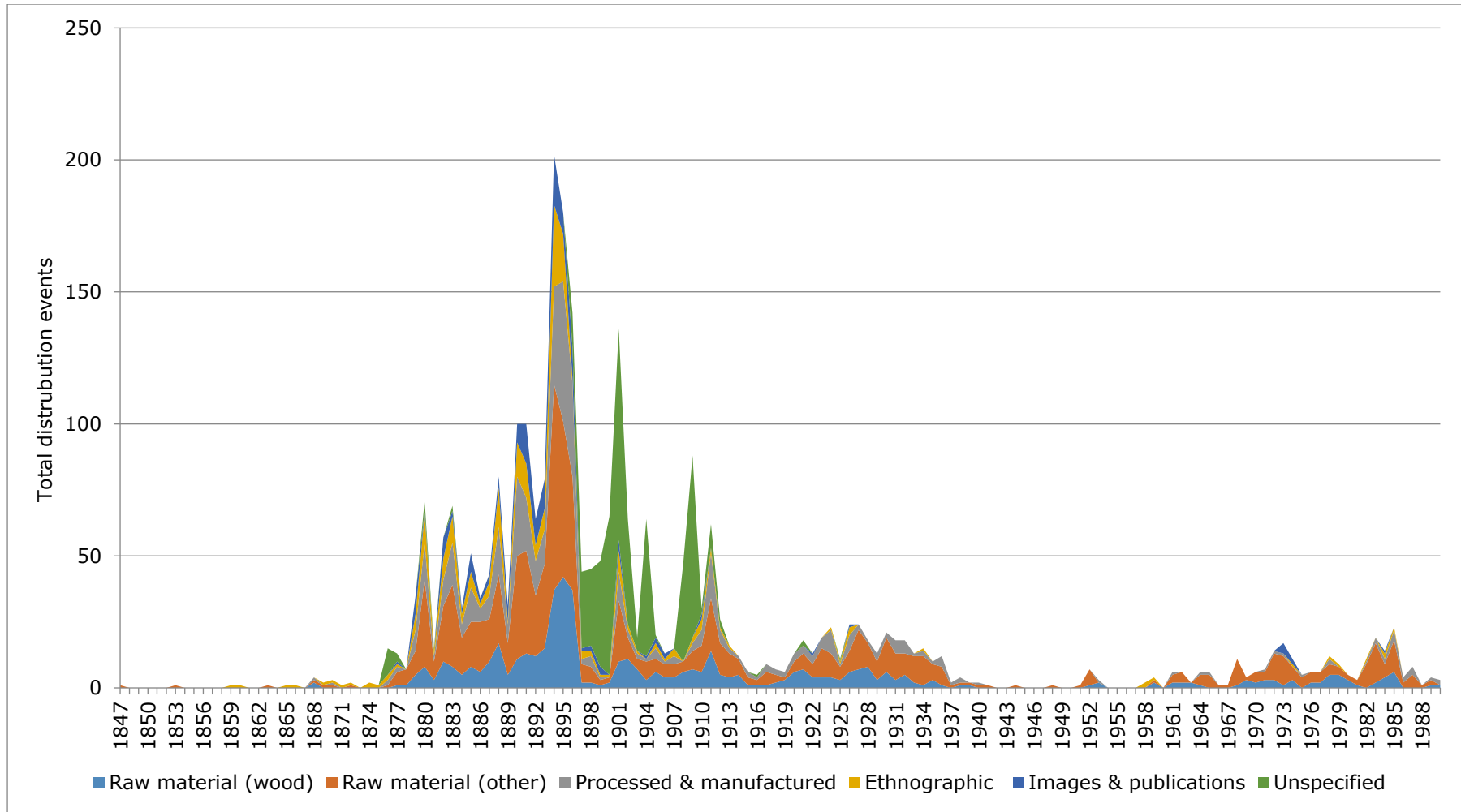


Chart 13. Total annual distribution events, by object type, 1847-1990.

(Note: the annual figures record frequencies of each type as recorded in the exit books, including events where multiple object types are recorded. The totals therefore exceed the total number of events).

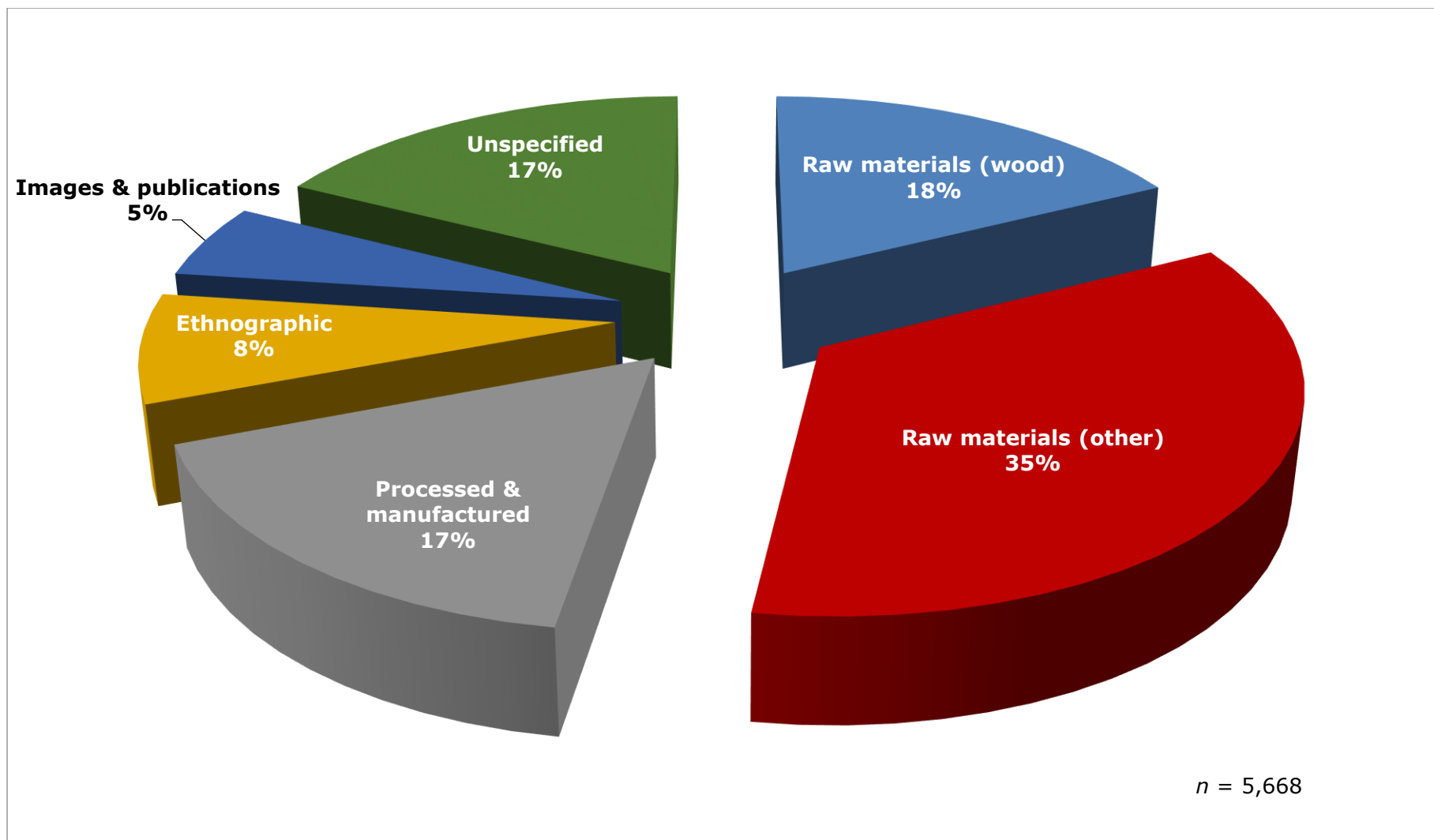


Chart 14. Analysis of distribution events, by object type, 1847-1990.

(Note: the total figure includes events where multiple object types are recorded).

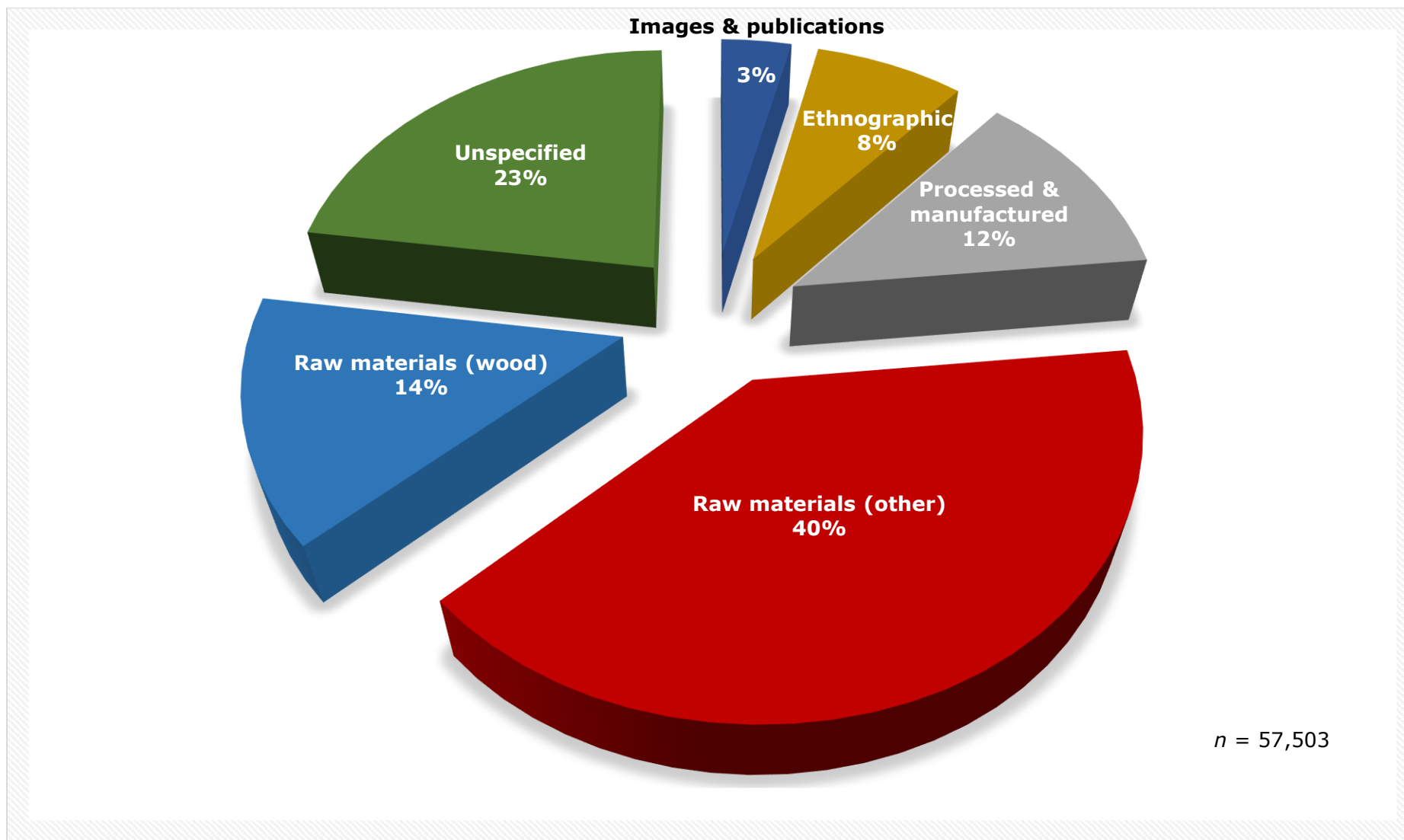


Chart 15. Analysis of distributions by object type, 1847-1990, based on estimated number of individual objects.

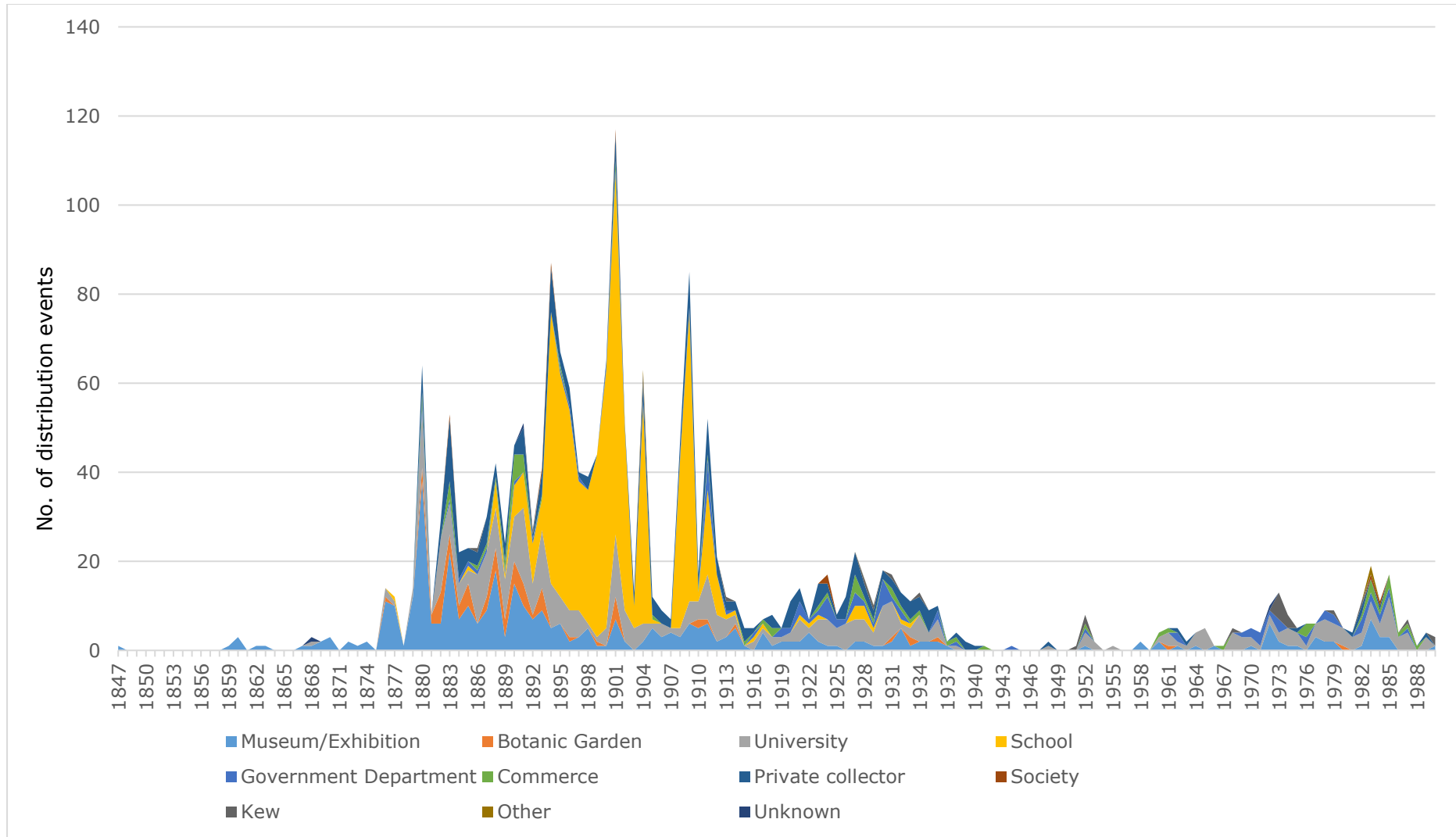


Chart 16. Distributions by recipient type, annual totals, 1847–1990.

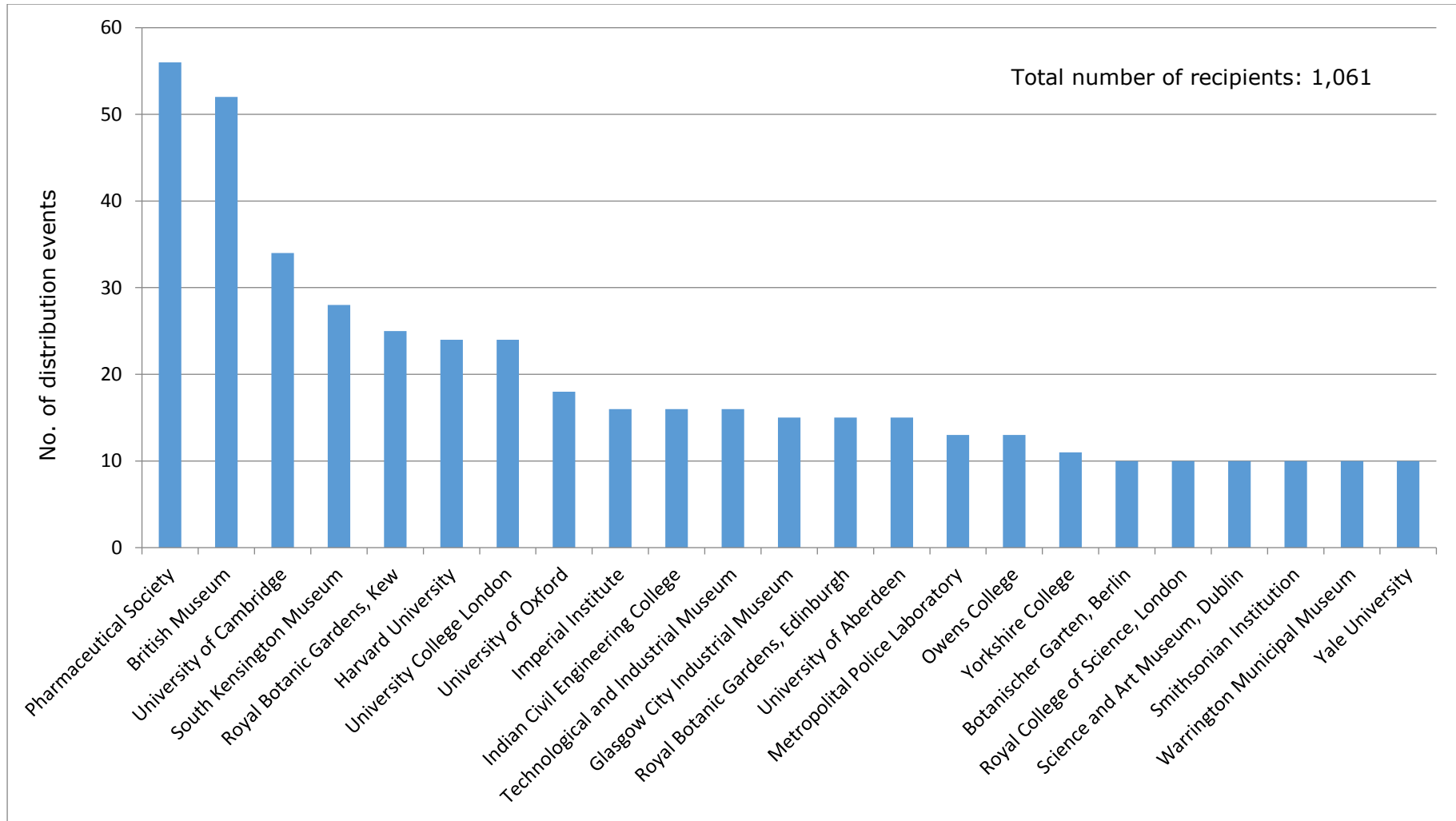


Chart 17. Top recipients of Kew distributions, 1847-1990; these 23 institutions account for 23.1% of all distribution events over the period.

	1847-75	1876-1914	1915-38	1939-90	Total
Pharmaceutical Society		53	3		56
British Museum	12	29	1	5	47
University of Cambridge		29	3	2	34
S. Kensington Museum		28	2		30
RBG Kew		6	4	15	25
Harvard University		22		2	24
University College London		16	2	6	24

Chart 18. Distribution events for the top 7 destination institutions by phase.

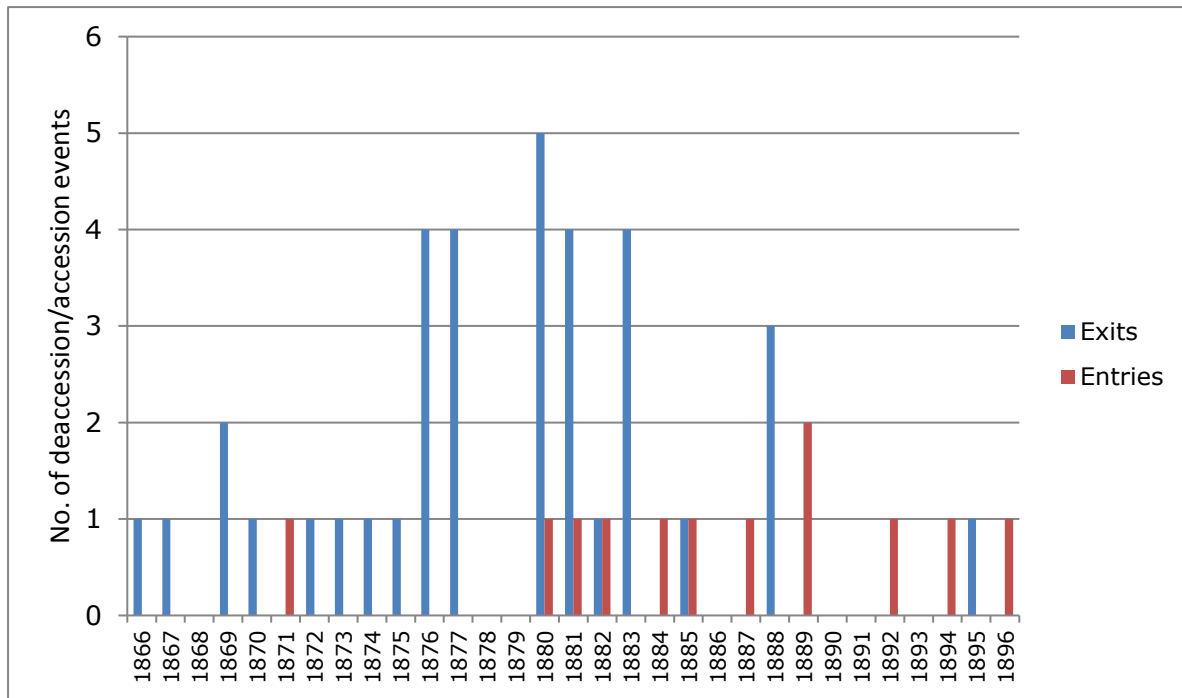


Chart 19. Pattern of exchanges between the BM and the Kew Museum 1866-96.

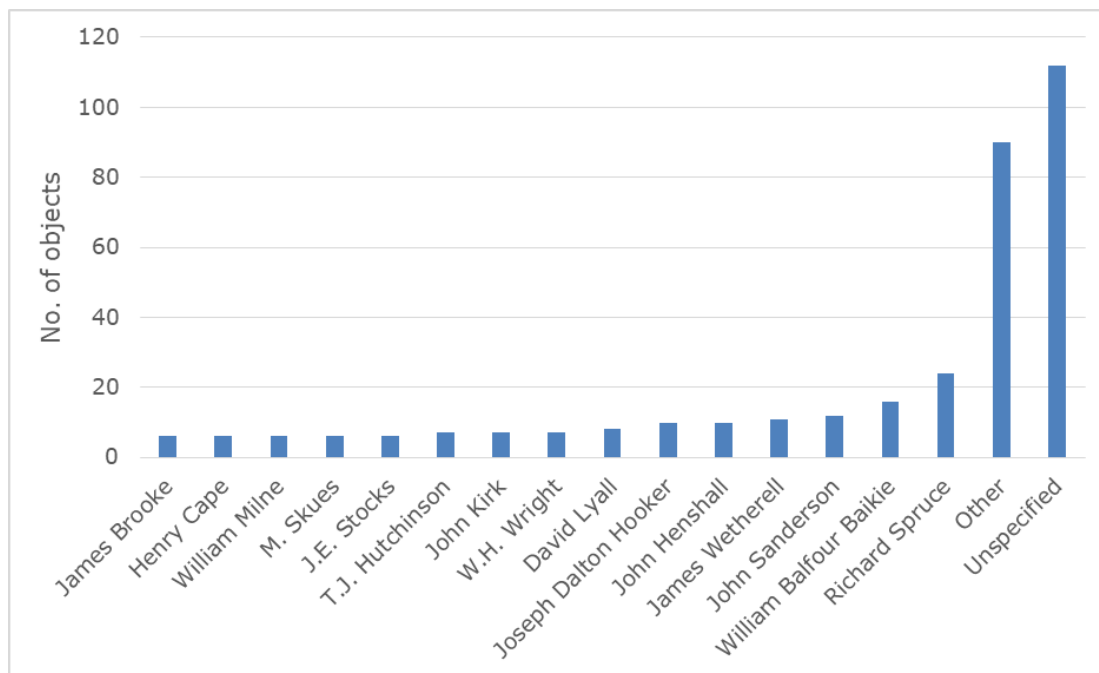


Chart 20. 1866 Kew Museum distribution to BM Department of Ethnography expressed in terms of the collector of the objects.

N.B. Data in this chart relates to absolute numbers of objects (Source: BM collections database).