Exploring Cultures of Collecting in the Early Modern World

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ABSTRACT: *Reconnecting Sloane* is an inter-disciplinary and multi-institutional project exploring the vast collection of the physician and naturalist Sir Hans Sloane (1660–1753). This article surveys recent scholarship within the different but overlapping methodological and conceptual approaches used by this collaborative team to understand early modern cultures of natural history collecting. Starting with the global geography of Sloane's botanical collections and material studies of natural objects, it then considers sociable practices of science and issues of trust and authenticity. Finally, it explores scholarship surrounding the organization of natural objects and its role in knowledge formation, before discussing how we might best approach current museum collections.

KEYWORDS: Hans Sloane – natural history – networks – trust – collaboration – history of collections

The collection, evaluation and systematisation of knowledge was a fundamental component of European expansion from the fifteenth century. When voyages of exploration opened doors to unknown lands, new information about the world and possible sources of wealth for emerging empires came to the fore, encouraging colonialism and long-distance trade (Müller-Wille 2003; Schiebinger 2004; Delbourgo and Dew 2007; Schiebinger and Swan 2007). Collecting encouraged discoveries, leading to a better understanding of the natural world and idea that it could be controlled by methods of organisation and classification (Miller and Reill 1996; Drayton 2000; Spary 2000; De Vos 2007: 230; Barrera-Osorio 2006). During the Renaissance, the collection of rare and wonderful natural and artificial objects became an integral part of aristocratic life, used as a

political tool to create and disseminate scholarly distinction and noble power in the form of gifts (Moran 1991; Biagioli 1993; Findlen 1994). Princes and scholars would visit noteworthy collectors during their Grand Tours, and admire their *Kunstkammern* or Cabinets of Curiosities: collections designed to inspire wonder, create discussion and further knowledge (Pomian 1990; Daston and Park 1998; Impey and MacGregor 2001). As more and more people were drawn into profitable processes of collecting, studying, selling and consuming nature and its representations, an increasing number of objects were exchanged and accumulated by a broad range of people for different reasons (Smith and Findlen 2002). This created a tension between ideas of natural history specimens as 'gifts' – the attainment of the fantastically singular – and 'commodities', several specimens that were easily comparable and representative (Ogilvie 2006; Daston and Gallison 2007). Individual engagement with objects shifted from scholarly 'wonder' to popular 'curiosity' (Swann 2001; Benedict 2002; Evans and Marr 2006). The European Enlightenment erected distinct disciplines of established, objectified knowledge, whether in physical or intellectual form, facilitated by careful cataloguing and classification (Sloan 2003; Anderson et al. 2004; MacGregor 2007). Collecting was a practice which defined the early modern period.

As awareness of the crucial importance of this activity has increased, the conception of what early modern cultures of collecting actually *were* is becoming harder to elucidate. The framework of a developing sub-culture of commercial or curious (as opposed to wondrous) collecting described above, for example, is not entirely appropriate in the case of England between 1680 and 1750, where encyclopedic and antiquarian collecting was being conducted across many different social levels for a number of different purposes (Arnold 2006). Overlooked within wider histories of European collecting practices, the *Reconnecting Sloane* project seeks to address this lacuna in order to expand our understanding of collecting activities. The collection of Sir Hans Sloane (1660–1753) is one of the most significant collections ever assembled in early modern Europe, encompassing books, manuscripts, plant specimens, animal remains, anatomical curiosities, coins, fossils, scientific instruments, antiquities and ethnographic artefacts. In his will, Sloane stated that he,

> *being fully convinced that nothing tends more to raise our ideas of the power, wisdom, goodness, providence, and other perfections of the Deity… than the enlargement of our knowledge on the works of nature, I do Will and desire that for the promoting of these noble ends, the glory of God, and the good of man, my collection in all its branches may be, if possible kept and preserved together whole* (London 1753).

He offered to sell it first to the nation for £20,000, then, if this was not achieved, to a number of European scientific institutions; only if these options failed would splitting the collection be considered. When he died in 1753, the UK Parliament raised a public lottery and bought the collection, founding the British Museum (BM) in what Kim Sloan has described as 'one of the most potent acts of the Enlightenment' (Sloan 2003: 13).

In the centuries since, Sloane's collection has been subject to dispersal, disintegration, reorganization, and changing curatorial practices as the BM over the years has shown 'a more utilitarian than reverential attitude towards its foundation collection' (Walker et al. 2012: 1). The natural history collections were physically removed to the Natural History Museum (NHM) in the nineteenth century, while most of Sloane's books and manuscripts were separated out with the opening of the British Library (BL) in 1997, severing the links between items that Sloane may well have kept together. Various duplicate books have been sold, objects have been damaged or lost, and there was a spate of bonfires which destroyed much of Sloane's collection of taxidermy (MacGregor 1994; Walker et al. 2012). Sloane's motivations for collecting remain largely a mystery due to the logistical and conceptual difficulties involved in uniting and understanding such diverse holdings, and there is relatively little actual understanding about the eighteenth century construction, curation, and use of his collection as a whole.

In 2012, curators at the BM, NHM and BL began collaborating with academics at King's

College London (KCL) and Queen Mary University of London (QMUL) to overcome this, securing funding through the Arts and Humanities Research Council (AHRC) to create three distinct but interlinked Collaborative Doctoral Awards (CDA). CDAs allow targeted academic research on collections to be conducted in partnership with museums, galleries and libraries, incorporating extensive museological and archival expertise within academic conceptions of the world, both past and present. The *Reconnecting Sloane: Texts, Images, Objects* project involves three PhD researchers – each with an academic and an institution-based supervisor - in the interdisciplinary investigation of three distinct material areas within Sloane's collection. Victoria Pickering is based in the School of Geography at QMUL and working with Sloane's collection of Vegetable Substances housed in the NHM. Under the guidance of Miles Ogborn (QMUL) and Charlie Jarvis (NHM), Victoria is establishing how this collection was created and what can be found within in. Alice Marples, based in the History Department at KCL, works on Sloane's extensive manuscript collection at the BL. Guided by Anne Goldgar (KCL) and Arnold Hunt (BL), she is reconstructing Sloane's scientific correspondence networks to consider diverse collecting practices and forms of information exchange. Finally, Felicity Roberts is based in the English Literature department at KCL and the Prints and Drawings department in the BM. Supervised by Elizabeth Eger (KCL) and Kim Sloan (BM), Felicity aims to explore strategies and systems of use within descriptions and depictions of the natural world.

This article is designed to showcase the *Reconnecting Sloane* project as an example of the ways in which an interaction of institutions and disciplinary approaches might offer new arguments and perspectives in future explorations of early modern natural history collections. The literature surveyed moves from the global (the spatial distribution of material objects) to the local (sociable practices of science and issues about authority, trust and access within exchange), and finally to individual organizations of natural objects. Ultimately, it aims to demonstrate why collaboration is fundamental for exploring diverse exchanges of knowledge within natural history collections, which arguably unite the broadest possible range of objects, individuals and motivations around the world,

spanning both temporal space and shifting systems of cultural values (Jardine et al. 1996). In doing so, this article seeks to outline directions for the future study of natural history within the early modern period and beyond.

SPATIAL AND MATERIAL PERSPECTIVES

Sloane's Vegetable Substances originally comprised of 12,523 items, including seeds, bark, wood and gums, most of which were contained within small wood and glass boxes, sealed with decorative paper (Jarvis et al. 2012). Their contents were described in a corresponding manuscript catalogue that was hand-written by Sloane. Found in this catalogue is this description for entry number 3,876:

> *no. 16. Bonqua of the Chinese druggs […] no. 1. of Mr. Petiver […], These are stalks leaves & flowers, the buds of the last grow in clusters like our woodbind or honysuckle. Its tea is used wt. great effect in inflammations of the eyes. Ib.*

This single example raises several key issues surrounding the role of diverse people in Sloane's collecting practices, questions about the utility and materiality of the object, as well as how this knowledge was produced and transferred across the globe.

The last few decades have seen increasing scholarly interest in *where* science took place and geographical methodologies have been exceptionally useful for interrogating scientific spaces in the early modern period (Naylor 2005; Finnegan 2008; Withers and Mayhew 2011). Ultimately, different places produced different types of scientific knowledge and academics now think beyond the 'laboratory' as the one site of scientific knowledge production, others include coffeehouses, public houses, botanical gardens, ships, in the field and at home (Secord 1994; Shapin 1998; Schramm et al. 2005; Livingstone 2003). In these spaces, the relationship between collecting and encounter is an important aspect of understanding the hybrid nature of early modern knowledge making - that is, that collecting took place in wider transnational contexts such as the slave trade

and long-distance commerce. Recognizing this complexity decentralises the social history of scientific knowledge production (Winterbottom 2011; Canizares-Esguerra and Breen 2013). This method, has for example, been crucial for exploring the role of colonies in the New World within Enlightenment science and understanding how European curiosity depended on indigenous expertise and access to unknown local practices (Scott Parrish 2006; Murphy 2013; Ogborn 2013).

But this relationship between encounter and collecting is not a simple narrative: in the case of the Caribbean, where local beliefs, interpretations and practices were nuanced in nature, elite colonials struggled to accept their alternative world-views and this raises issues about perspectives of knowledge encounter and exchange. As Shapin (1988) has suggested we need to understand not only how knowledge is made in specific spaces but also how transactions occurred between them. Questioning how material knowledge was acquired, transported and adapted for purpose, therefore allows scholars to embrace the diversity of information produced by such encounters (Harris 1998; Secord 2004). Exploring the social life of a single object can reveal important things about its social, cultural and geographical settings (Appadurai 1988). For example, if we return to Petiver's contribution to the Vegetable Substances (the Chinese tea), we could use it in the same way that recent scholarship has used exotic natural goods (including tulips, tobacco, tea and coffee) to explore a range of linked historical issues (Ellis 2004; Cowan 2005; Goldgar 2007; Romaniello and Starks 2009; Ellis et al. 2015). We could also situate it within a number of different contexts and, in so doing, unite discussions of exotica, trading networks, medical marketplaces and commodities, as well as consumption and luxury, thereby tracing their movements in place and time (Brewer and Porter 1997; Roche 2000; Berg and Eger 2007).

Whether object-centred or object-driven, material culture studies have provided various means to explore the shifting contexts through which objects acquire meaning through visual, tactile and sensual dimensions (Lubar and Kingery 1993; Daston 1999 and 2004; Findlen 2012; Jordanova 2012). Such approaches are difficult to use in relation to Sloane's Vegetable Substances because while their form and scale are unique, the majority of information about their contents, provenance

and use is gleaned from their catalogue descriptions and relevant correspondence rather than through the objects themselves. Such manuscript traces can, however, reveal how the content and meanings of this collection changed through space and time, and reflect interactions between people, places and objects.

Sloane incorporated local knowledge into his natural history collections and when in the Caribbean he had gathered plants and observed how they were used by local people. It had been Sloane's interest in the medicinal qualities of plants that had spurred his desire to travel to Jamaica and collect botanical specimens as physician to the governor of the island, the Duke of Albemarle; he returned to London with over 800 different plant specimens. Both Sloane's *Natural History of Jamaica* and his manuscript catalogues reveal how heavily he relied on local expertise to amass and observe natural productions, as well as how he accessed local medical knowledge through medical practitioners' treatments of patients. The Vegetable Substances should therefore be seen as representing a link between local or practical expertise and scholarly interest in the natural world (cf. Klein and Spary 2010). For example, the Jamaican physician Henry Barham (1670–1726) contributed Jamaican medicinal plants and discussed their virtues in letters to Sloane. According to Barham, the root of the *Nicker Tree* (*Caesalpinia bonduc*), described in the Vegetable Substances catalogue as Nickers, was used by Indians and Africans to purge and carry off venereal diseases (Barham 1712; Barham 1794: 114).[1] Other forms of indigenous knowledge in the catalogue reflect the extensive geographical scope of information that Sloane sought to access. Hundreds of references are made to an Indian druggist who played an important role in sending information about East Indian *materia medica* to London while local Chinese medical knowledge is communicated alongside the plants that Petiver delivered to Sloane. Descriptions of these 'druggs' are further evidence that Sloane incorporated local knowledge into his natural history collections.

But how does the information found in Sloane's collections now compare to its original form, and how and why did it change and alter during its transportation to Europe? Although Sloane depended on local knowledge to some extent, he showed his disapproval of indigenous medical

methods and practices – especially while he was in Jamaica (Kriz 2000). Plants, remedies and local understandings could all be rejected by Europeans; it was not uncommon to find intermediaries altering applications of native medicines to meet their own (commercial) ends and some local knowledge may have not been transferred at all (Walker 2009; Chakrabarti 2010; Schiebinger 2005). So, while hybrid knowledge produced in the New World may have involved encounters with, and the active participation of indigenous collaborators, it is difficult to ascertain the real extent to which local, enslaved and creolised people added to early modern knowledge about the natural world (Raj 2006).

Objects in Sloane's natural history collections were gathered together from all corners of the world by diverse individuals such as merchants, ship captains, physicians, scholars, gardeners, fellows of scientific institutions, and members of the aristocracy. All these individuals circulated early modern knowledge, natural commodities and accumulated information in their own way and for their own purposes. An awareness of the different and conflicting meanings which an object might hold has influenced scholars to think carefully about such global circulations of knowledge, and explore how travel, encounter and exchange influenced knowledge, practices, and networks (Raj 2010). For example, examination of East India Company (EIC) settlements in Madras has shown that plants, medicines and information circulated around and between colonial settlements rather than, as had previously been assumed, flowing to and from European capitals. People involved in these networks were not simply conduits of information for London, but were important nodes within their own networks of patronage, profit and trust (Winterbottom 2012).[2] The edited volume *The Brokered World* (Schaffer et al. 2009) analyses the mobile lives of agents who made and changed the contents and paths of knowledge across the world, thereby making the intelligence and expertise mediated by indigenous go-betweens more visible, leading to more thorough views of the development of reliable knowledge and techniques.

There are a number of significant contributors to Sloane's natural history collections who arguably existed outside of the 'closed circle' of enterprise that were dictated by codes of scientific

conduct (Lux and Cook 1998). Some were members of groups and societies which permeated the boundaries of scientific institutions, such as the Temple Coffee-House Club (Allen 1979; Coulton 2012). Neither the aristocratic Mary Somerset, Duchess of Beaufort (1630–1715) nor the school master Robert Uvedale (1642–1722) were Royal Society Fellows and yet they were two of the most significant contributors to Sloane's Vegetable Substances. Both had well-known gardens in and outside of London and established themselves as important nodes in international plant material exchange (Burnby and Robinson 1976; Chambers 1997; Munroe 2011; Laird 2014). Understanding these individuals on their own terms is important when investigating the natural history collections of someone like Sloane, who has been described as an 'information broker in the imperial capital' (Delbourgo 2011) and a 'supermediator' between overlapping international networks (Smith 2011). Until recently, their role tended to be overlooked, their authority to judge natural historical objects undermined by their lowly scholarly status or an absence of direct experience which was emphasised by the Royal Society. But it may be that in the contexts of exploration, trade and commerce – where many different agents acted as suppliers and conduits of information – it was the sheer number of 'weak ties' courted by someone like Sloane which mattered the most. Perhaps, as Cook (2007) suggests, meanings arose from the specific relationships between different merchants and collectors, and it was the trade and commerce between these people that had the ability to impart authority on whether natural objects were worth transporting and preserving.

This implies endless possibilities when it comes to researching early modern material culture. Recent endeavours such as the AHRC *Global Commodities* international network[3], or the *Commodity Histories* online public forum[4], have sought to embrace the broadest conceptions of contexts for objects, using collaboration, digital technologies and multiple disciplinary approaches to reveal the complex interactions between peoples, materials and environments, science and technologies, politics and power (Hazareesingh and Curry-Machado 2009; Curry-Machado 2013). Researchers must seek to simultaneously consider the movements of natural objects and knowledge, the multiple material interactions between human and non-human, as well as the diverse and

surprising roles played in each exchange by different sorts of people in order to fully understand the meanings of early modern knowledge objects.

COMMUNITIES OF KNOWLEDGE AND EXCHANGE

Many global networks linked spaces, materials and individuals in the circulation of early modern natural history; such networks included China, Peru, India, the Middle East and an Atlantic World (increasingly understood to embrace the Americas, the Caribbean, Africa, Europe, and the British Isles) (Fiering 1976). Transnational commercial encounters created diverse hybrid forms of knowledge which were, in turn, subsumed within European thought and behaviour (Withers 2007). Notions of centre and periphery make little sense when thinking about global patterns of scientific exchange (Cunningham and Williams 1993; Chambers and Gillespie 2000). Objects changed meaning across global, social and temporal contexts: the *Gardenia jasminoides J. Ellis (Rubia)*, a plant from southern China traditionally used as a dye, was transformed into a European garden ornamental after its introduction into Britain in the mid-eighteenth century (Jarvis et al. 2014). Additional networks or spaces of knowledge were often required to supplement new or unstable knowledge about objects: in facilitating exchange, contemporaries furthered these networks, sharing and intermixing experience and perspectives in order to create meaning (Bleichmar and Mancall 2011). The physician Charles Goodall (c.1642–1712), for example, enlisted the aid of John Locke (1632–1704) and a young Hans Sloane in collecting information about *Peruvian Bark (Cinchona)*. As Locke was in Holland enabling him to get information from the Dutch East Indies and Sloane was about to embark on his Jamaican voyage, both were well placed to access wider networks. Goodall sent Locke a list of specific queries dependent on who was being asked (such as a native, a long-time inhabitant of Peru or a passing merchant), including 'How and when the Natives bark these trees, whether the trees are not thereupon destroyed, if not, what use are made of them. When the KinKana bark came first into Rome or Spain, when into other parts of Europe: what different

prices it hath been sold at, how adulterated, what quantity hath been imported into Europe by the Spanish Galeons in one voyage' (Dewhurst 1962). Go-betweens of all descriptions therefore, were valuable because they could connect, control, facilitate or block the mobility of objects, as well as their significance and meanings across these overlapping networks.

It is not enough to register many centres or spaces of knowledge production, or the spread of the individuals who connected them; we need to explore the interactions within the human lives, institutional histories, and cultural or disciplinary contexts which invest material objects with meaning (Alberti 2005; Nyhart 2015). Applying social network theory to the humanities allows us to understand these relations by mapping structures of knowledge and interaction, facilitating the analysis of social organizations and the questioning of notions of power and influence within specific spaces (Shapin and Thackray 1974; Henstra 2008; Sairio 2009; Ahnert and Ahnert 2015). Correspondence reveals in exquisite detail the processes involved in managing the exchanges of colonials, travellers, merchants, indigenous peoples, and scholarly correspondents from around the world, linking daily interactions around the world with wider imperialist and intellectual impulses through natural history collection and exchange (Russnock 1999; Molho and Curto 2007: 165).

Sloane's letters demonstrate how colonial farmers such as John Bartram (1699–1777), jobbing surgeons-at-sea such as James Cuninghame (1698–1709), and other individuals who otherwise might be assumed to have a somewhat lowly status, were often the only way by which valuable new specimens and strange objects could be transported back to Europe, and so were often courted by scholars such as Sloane (Meyers and Pritchard 1998; Cooper 2007; Wulf 2008; Jarvis and Oswald 2014). The specialist knowledge of non-elite and artisanal individuals, built up in the course of their daily lives, was similarly sought through correspondence then carefully recorded, analysed and reapplied for scholarly purposes (Bennett 1986; Stewart 1992; Sorrenson 1996 and 1998; Johns 1998; Smith 2004; Harkness 2007; Hunter 2013).[3] In many cases, early modern scholars distanced themselves from their growing reliance on instrument-makers, artists, sailors and printers, separating their intellectual efforts from the input of such lowly technicians or informants,

relying on demonstrations of gentlemanly virtue to prove empirical judgement and scholarly worth (Sprat 1667; Dear 1985; Shapin 1989 and 1994; Goldgar 1995; Biagioli 1996; Leong and Rankin 2011).

Current intensive archival work seeks to by-pass such rhetoric by identifying and linking contributors (Mayhew 2004). Major research projects such as *The Electronic Enlightenment*[6]*, Cultures of Knowledge*[7]*,* and the *Circulation of Knowledge*[8], seek to reassemble and navigate these networks through digital technologies, producing searchable databases like *Early Modern Letters Online*[9], only possible through the digitization of the correspondence of major intellectuals and of libraries, cabinets of artefacts, and Grand Tour itineraries (Winterer 2012). These projects are designed to expand as external researchers collaboratively collect, collate, curate and critique this working research tool. Quantitative organization, spatial mapping and visualisation (like *Mapping the Republic of Letters*[10] or *Six Degrees of Francis Bacon*[11]) reveals hidden structures, institutions, behaviours and conditions, allowing us to bridge gaps between individual, highly-focused areas of scholarship created in different institutional settings around the world, whether museums, libraries, universities, archives or gardens. In this way, it is hoped that no invisible contributor will go long unnoticed, and we might explore how intricate interests overlap or align across social or conceptual boundaries through analysis of correspondence.

Yet even where diverse professional networks or individual social experiences are recognised, there is little acknowledgement of the different ways in which these communities handled information, exchanged objects and produced or assimilated natural history knowledge. As demand for knowledge about natural objects increased and became more commercial, new combinations of people and knowledge were created, and new authorities were created and disseminated, which altered the ways in which some social groups interacted. For example, gardeners, nurserymen and other tradesmen such as George London (d.1714), Henry Wise (1653–1738), Thomas Fairchild (1667–1729), Thomas Knowlton (1691–1781), Jacob Bobart (1641–1719) and Philip Miller (1691–1771) were all actively engaged in the cultivation and classification of

specimens, and were relied upon by scholars for their knowledge and skills in raising exotic plants in particular. When Herman Boerhaave (1668–1738) met Philip Miller in Leiden, he said of him: 'I know no one in your country who is more capable to identify and distinguish [trees and shrubs]' (Wulf 2008, 40). Metropolitan societies - containing numerous elite and non-elite interacting groups – became urban entrepôts which received, examined and disseminated material culture gathered from various peripheries. Agents from many different backgrounds competed and collaborated within overlapping marketplaces (Stewart 1999; Margóscy 2014). In such spaces, issues of access, trust and utility were necessarily dependent on a number of factors: the specific social, cultural and economic contexts of exchange, the materiality of the objects *being* exchanged, and the experience or expertise of the individuals involved (Goldgar 2008; Lamikiz 2010).

In recent research individual collectors such as Carolus Clusius (1526–1609) and René-Antoine Ferchault de Réaumur (1683–1757) have been de-centred within their own correspondence networks, contextualised in terms of competing agencies and increasingly examined as one exchange node among many (Egmond et al. 2007; Rey-Bueno and López-Pérez 2008; Hanson 2009; Delbourgo 2010; Roos 2011; Terrall 2014). However, even where the impetus for exchange is accepted as commercial, the notion of the all-powerful collector prevails: movement within these networks seems irretrievably bound up with assumptions of social power, status, and alliance within political structures, with strict, if malleable, patronage relationships based on the esteem of the patron and the worthiness of the subordinate, regardless of temporal context or the precise shape of the network (Stroup 1990; Spary 2000). There has been little analysis of the different modes of exchange between these diverse sub-groups and so, consequently, there is often misunderstanding over the purposes of exchange within different communities and confusion when assessing the often-conflicting ways in which individuals behaved when contributing to or maintaining collections, hence the somewhat sporadic treatment of British collectors in the early eighteenth century. This is particularly apparent when examining the role 'agents': intermediaries situated between patrons and surrounding networks, able to help in a variety of transactions to the benefit of

scholars. Their precise role may not be possible to define, referring to a function rather than an outright profession, and is therefore highly dependent on the precise contexts they occupy (Keblusek and Noldus 2006). An ECR research project entitled *Fighting Monopolies, Defying Empires 1500-1750: a Comparative Overview of Free Agents and Informal Empires in Western Europe and the Ottoman Empire*[12] is currently exploring how individuals within multitudinous self-organising networks protected their own interests in a changing world by mapping the ways in which they intersected.

Though Sloane only systematically preserved his incoming letters, the sheer size of his archive allows a similar analysis of agency at various intersections between mercantile, political, colonial, commercial and scholarly networks, providing a unique opportunity to explore the ways in which individuals from different social backgrounds built, maintained and navigated them. This allows us to reassess the structures of the networks themselves and explore conceptions of trust and authority. This is particularly useful when it comes to indigenous, non-elite or contested objects being exchanged within information-rich environments characterised by epistemological slippage, meaning that reliance on personal credibility was nigh on impossible (Breen 2013). This seems to have been the case in the botanical exchange networks of early modern Europe: objects in this context were particularly unstable – specimens could be notoriously fragile, difficult to collect or transport; scientific knowledge was often hard to communicate across conflicting classificatory systems. Mechanisms developed within these networks to address the contested nature of botanical knowledge, which in turn had an impact on the roles and relationships within those particular networks. Agents appear particularly active and powerful in this context: the need to meet the demand for up-to-date information ensured the importance of those who were able to bridge gaps within and between interlinked networks.

Sloane and his agent, the apothecary James Petiver, were two such intermediaries. Their relationship and correspondence, both with one another and with their respective clients (often the same), raises interesting questions regarding ideas of gift, patronage and social or professional

credit. Though both expended enormous amounts of effort creating and maintaining the correspondence networks required to furnish their immense collections, and did so using largely the same strategies, history treats them very differently. Sloane is the worthy collector, self-consciously creating a museum for public good and private glory, whereas Petiver is regarded as an 'artisan' collector – self-interested and profit-seeking – who does not have the skill or knowledge to organise his materials properly (Stearns 1953). Yet it is clear from their correspondence that the 'intermediary' roles of patron and client within the botanical community overlap because of the necessity to engage and encourage a number of different cultures of collecting simultaneously.

To better understand early modern collecting it is important to focus on how human engagement influenced the epistemic understandings of acquisition and exchange of objects; using correspondence it is possible to explore how and why objects were exchanged, and how this influenced the role and behaviour of the individuals involved (Latour 2005; Dietz 2006; Dupré and Lüthy 2011: 5). Breaking down registers of exchange in this way will allow us to truly assess the involvement and influence of all the merchants, travellers, midwives, painters, gardeners, noblewomen, apothecaries, publicans, priests, farmers and children who shared an interest in nature, and collected and catalogued it for their own ends. Exploring the correspondence in this way actively unites our understanding of the material, the corporeal, the social, the environmental, the circumstantial and the conceptual within early modern exchanges of knowledge.

MANAGING OBJECTS AND PEOPLE: ORGANIZATIONS OF KNOWLEDGE

Organizations of knowledge, whether in material, textual or institutional form, show us how individuals across time and space interacted with objects, indicating contemporary understandings. Just as one set of meanings for an object could be unlocked by its interaction with a specific individual, others could be created by connection with other objects through systems of management. Attempts to organise a collection began as objects were gathered and in 1698, Petiver

wrote '*Directions for George'* for George Harris, his eldest apprentice, whom Petiver had arranged to accompany Edmund Halley (1656–1742), requesting him to 'Procure Correspondents for me wherever you come, & take directions how to write them, & procure something from them [with whom] you stay, showing their Slaves how to collect things by taking them along with you when you are abroad.'[13] Such directions were created in what Thomas (2010: 5) has described as 'a spirit of pragmatism and of making the best of the collecting resources which happened to become available to them.' They increased the chances that the objects were obtained, prepared satisfactorily and transported appropriately, and also acted as instructional tools providing information and training for those with little experience of collecting natural history, so encouraging further exchange.

All such organisational technologies, paper and otherwise, reveal intellectual and practical traditions constantly being adapted for immediate and innovative uses (te Heeson 2000). Journals, lists, notes, boxes and cases, therefore, cannot be considered to be *separate* from the objects but rather, as with the correspondence, should be understood together as part of a continual process of interaction, investment and influence. Early modern naturalists such as John Ray (1627-1705) struggled to catalogue and classify the flood of new natural material into Europe and, as Műller-Wille has shown in the case of Linnaeus, their strategies for coping with this influx often had a discernible impact on the forms of knowledge produced (Műller-Wille 2007; Yale 2011). Similarly, the productive triangulation between drawing and writing through repeated representation and arrangement should be considered as both active research and training practice (Kusukawa and Maclean 2006; Bleichmar 2012; Hoffman and Wittmann 2013).

On arrival in Europe, natural objects were arranged in gentlemanly cabinets of curiosities, institutional repositories, apothecary's trays and botanical gardens, experiencing diverse forms of ordering and systematisation to create and transmit meaning. In a world where authorities of all kinds were much-contested, the empirical creation of knowledge necessarily required an engagement with diverse forms of knowledge – book, specimen, personal testimony, rumour and

drawing (Daston 1988; Shieber 2009). This meant a collaborative effort of cross-examination, not only from place to place but from age to age and material to material, defined natural historical knowledge in this period (Daston 2012). Paper and material technologies were created with the intention of referencing back and forth between library, museum, and the correspondence network; each organizational system informed and influenced the other (Hunter 1998; Shapiro 2000; Pomata and Siraisi 2005; Grafton 2006). None can be considered in isolation: they were designed to deal with an abundance of information, to assist with organisation and dissemination, as well as easy rearrangement for the future creation of knowledge (Charmantier and Műller-Wille 2012; Yeo 2014).

Sloane's natural history catalogues reflect the ambitions within natural history to classify both the old and the new: for example, Sloane mentions the work of Swiss botanist Caspar Bauhin (1560-1624) whose works include *Prodromos Theatri Botanici* (1620) and the *Pinax Theatri Botanici (*1623). In the absence of a universal language and trustworthy dictionary, it was very common for early eighteenth-century natural historians to rely on such encyclopedias to facilitate the identification and classification of plants; they were key for a successful international commerce in *naturalia* (Margócsy 2010). In comparing and contrasting new specimens with old observations, Sloane was increasing the scope and circulation of his collecting reach as well as providing a resource for himself and others who had access to his collections.

But Sloane was not consistent in his method of description; sometimes he included the origin, the contributor and utility of the object, but not always. The Sloane Herbarium similarly reflects the idiosyncratic nature of organising plant specimens in the early modern period. Out of 265 volumes, only nine of these actually contain material that was collected by Sloane (Jarvis et al. 2012). Sloane avidly sought and preserved the collections of others. After Petiver's death in 1718 he purchased the majority of his collection of over 50,000 dried plants from his sister incorporating it wholesale into his own. This caused quite significant organizational problems for Sloane, because Petiver organised his collections first geographically, and then within each volume or group of

volumes systematically, generally following Ray's taxonomy. This is in contrast to the structure of an earlier purchase, the collection of Leonard Plukenet (1642–1706), obtained from Dr Moore, Bishop of Norwich after Plukenet's death in 1706. Plukenet's 8000 specimens had been organised alphabetically and with exceptional neatness - especially in comparison to Petiver's collection which Plukenet had been notably scathing of for its alleged disarray (Dandy 1958). Perhaps this explains Sloane's tendency to keep the collections of other collectors distinct and separate within his wider collection; Sloane had all of Mark Catesby's (1682-1749) specimens bound together in two volumes.

When Sloane purchased these plant collections, one of his aims had been to go through the volumes to discover duplicates of dried plants and then 'to divide them amongst my curious friends', as he told Richard Richardson (1663-1741) on March 9 1720 (Turner 1835: 163). But when William Sherard (1659-1728) had wanted to borrow both Plukenet and Petiver's collections in the 1720s, Sloane was reluctant, wishing to use them himself for amending Volume Two of his *Natural History* and ordering his own herbaria. Sloane described Petiver's collection as 'had been in great confusion: but that, if the labels and references which lay loose were not kept with them, that neither he nor anybody else could ever putt them to rights' (Turner 1835: 163). As the specimens were 'all pasted on alphabetically, as he has publish'd them, but without names to them' it was going to be a difficult task to go through these volumes because the plants were 'mixt; and oft time one must run over the whole classe to find a name' (Turner 1835: 166). Indeed, the Vegetable Substances include thousands of references to the letter 'P' scattered throughout its entries. 'P & Pet' are indexed at the beginning of the catalogue as referring to 'Mr. James Petivers collections of all sorts wch. I bought likewise'.[14]

Sloane's herbarium is a useful tool for understanding the taxonomical difficulties present in early modern cultures of collecting, and the ways in which collectors conceived of the use of their collections in the future (Keller 2012). The specimens that it held actively preserved natural knowledge of the known world at that time, facilitating its use while offsetting any responsibilities

for mistakes which might have been made within their organization. The intention was that this knowledge would be scrutinised at some point, by someone with the expertise to do so, and this was facilitated by the continuous movement and creation of meaning through its diverse interactions with other objects. Early modern plant collections such as Sloane's herbarium were created as archives, designed to stretch into the ancient past as well as the unknown future – indeed, early modern herbariums are still being used in active scientific research today. Constantly revised, corrected, consolidated and curated, they thereby fulfil the purpose they were designed for.

THE FUTURE OF COLLECTIONS

Approaching collections as both objects and spaces for engagement with them requires us to think about how knowledge was represented (Nyhart 2015). Thinking about the spatial arrangement of Sloane's collection through contemporary accounts as well as cross-referencing catalogues and location codes helps us to engage with questions that remain difficult to answer with any real clarity (Caygill 2012). For example, how did Sloane use his collection? How did contemporaries understand the internal organization of his museum and incorporate it into their own practices of knowledge-making, and how did this change over time? Who was allowed access to what, and under what terms? How did the collection transition from an ostensibly 'private' one to a national 'public' one (Goldgar 2000)? These questions allow us to consider the evolution of museum practices, linking the past to the present day. Collections facilitated many different kinds of activities and were used as a space and resource for many different kinds of learning and interaction (Star and Greisemer 1989). Systems of use and description helped inform new taxonomies and develop disciplines, shaping our modern conception of 'science' and 'art' as distinct entities and influencing how objects are displayed as well as interpreted within modern collections (Sloan 2003).

Natural history collections continue to be vital spaces for knowledge production,

representing a particularly key meeting point between art and science, public and academia, and past and possible uses. The Centre for Arts and Humanities Research (CAHR) at the NHM and Perspektiven auf Natur (PAN) at the Museum fűr Naturkunde in Berlin are just two examples of museum departments designed to actively engage with the cultural value of their collections in new ways. Similarly, the opening of the Enlightenment Gallery in the restored King's Library of the British Museum in 2003 is a useful reflexive pedagogical tool to teach students about encyclopedic ways of viewing and understanding the world in the ages of Reason and Enlightenment, and the development of modern disciplines. In this same spirit of creativity and innovation, the BM, BL and NHM secured an AHRC 'Science in Culture' Exploratory Award in 2012, to put on a series of workshops allowing scholars, curators, librarians and other experts from the arts, humanities and sciences to share their research on Sloane and discuss their desires for future research. This resulted in the creation of the collaborative *Reconnecting Sloane* CDA project, which continues to combine skills, knowledge and expertise in order to learn more (and better) together.

By creating technological structures which would mirror the collaborative approach outlined here, we might effectively capture these interactions and overcome current obstacles such as institutional protocols, lack of resources and potential loss of vital information. Key Sloane resources such as the *Sir Hans Sloane Correspondence Online* searchable database[15] and the BM's online collections database[16], which currently lists and describes over 10,000 Sloane objects have proved indispensable tools for navigating vast collections and making links across them. In an ideal future, there would be an encyclopedic database stretching across all of Sloane's collections, as well as the research generated by them, widening horizons for further research by digitally representing the fluid boundaries between objects, textual and visual sources, individuals and institutions. Limitations in analysis due to the strictures of digitisation (which can often force information into rigid categories inappropriate for historical analysis) can be augmented by the continuous circulation of knowledge and communication of such research (Winterer 2012).

As we continue to delve ever deeper into Sloane's collections we continue to grapple with

new discoveries, strange connections and unanswered questions. This problem of having 'too much to know' (Blair 2010) was something which Sloane himself understood all too well, his famous acquisitiveness and penchant for absorbing other collectors and collections seeming to outstrip his capacity to organise them enough to publish a catalogue of his vast museum. He clearly believed in collecting, creating and keeping knowledge, in whatever form, for its own sake, and for the unknown future.

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NOTES

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