

FOCUS: MUSEUMS AND THE HISTORY OF SCIENCE

Objects and the Museum

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ABSTRACT

This survey outlines a history of museums written through biographies of objects in their collections. First, the mechanics of the movement of things and the accompanying shifts in status are considered, from manufacture or growth through collecting and exchange to the museum. Objects gathered meanings through associations with people they encountered on their way to the collection, thus linking the history of museums to broader scientific and civic cultures. Next, the essay addresses the use of items once they joined a collection, whether classificatory, analytical, or in display. By thus embedding the study of scientific practice in material culture, this approach contributes to constructivist histories of science. The final section addresses the role of objects in the experience of the visitors, emphasizing how fruitful the history of museum objects can be in the study of the public engagement with science.

FOR THE LAST TWO DECADES, historians of science have been drawing on the century-old academic museum history tradition. Richly detailed histories of specific institutions have been supplemented by broader studies of the museum's role in society, often with a strong Foucauldian focus on discipline and power.¹ More recently, as Sophie Forgan discusses in her contribution to this Focus section, scholars have turned their at-

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¹ David Murray, *Museums: Their History and Their Use*, 3 vols. (Glasgow: MacLehose, 1904), has yet to be surpassed in scope. For specific institutions see, e.g., Ronald Rainger, *An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890–1935* (Tuscaloosa: Univ. Alabama Press, 1991); W. T. Stearn, *The Natural History Museum at South Kensington: A History of the British Museum (Natural History), 1753–1980* (London: Heinemann, 1981); and Mary P. Winsor, *Reading the Shape of Nature: Comparative Zoology at the Agassiz Museum* (Chicago: Univ. Chicago Press, 1991). Wider studies include Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London/New York: Routledge, 1995); Eileen Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London: Routledge, 1992); and Susan M. Pearce, *Museums, Objects, and Collections: A Cultural Study* (Leicester: Leicester Univ. Press, 1992).

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tention to the space and architecture of the museum. The history of museums has also contributed to our understanding of the role of natural knowledge in the construction of empire (and vice versa).²

Here I approach the history of museums through the objects in their collections. Drawing on anthropological work on the cultural biography of things, I seek to explore some ways that historians of science might approach the study of collections through the trajectories of specific items and the relationships they form with people and other objects. Material culture is thus afforded a metaphorical “life” or “career.” As Igor Kopytoff has suggested, we can ask of objects questions similar to those we raise when writing biographies of people.³ What are the key moments in the career of this thing? How has its status changed over the course of its life—what have been its significant “ages”? What makes it different from other, similar, objects? How has the political and social climate impacted on its trajectory? To study object biographies in this way is particularly fruitful in the museum context, not only because so many museum objects have exotic provenances, from far away or long ago, but also because of what we can learn from the lives of the most common of specimens.

Object biographers can build on a number of active fields of scholarship. Instrument scholars and other historians of technology have long studied scientific artefacts as primary sources—history with, of, and through things. In the history of science, Lorraine Daston and others have traced the biographies of objects of study, both material and epistemological.⁴ In museum scholarship, meanwhile, the object biography approach has most commonly been applied to ethnology and archaeology. The method I advocate here lies at the intersection of these fields. We can trace the careers of museum things from acquisition to arrangement to viewing, through the different contexts and the many changes of value

² Tim Barringer and Tom Flynn, eds., *Colonialism and the Object: Empire, Material Culture, and the Museum* (London: Routledge, 1998); Alice L. Conklin, “Civil Society, Science, and Empire in Late Republican France: The Foundation of Paris’s Museum of Man,” in *Science and Civil Society*, ed. Lynn Nyhart and Thomas H. Broman, *Osiris*, 2002, 17:255–290; Sally Gregory Kohlstedt, “International Exchange and National Style: A View of Natural History Museums in the United States, 1850–1900,” in *Scientific Colonialism: A Cross-Cultural Comparison*, ed. Nathan Reingold and Marc Rothenberg (Washington, D.C.: Smithsonian Institution Press, 1987), pp. 167–190; Maria Margaret Lopes and Irina Podgorny, “The Shaping of Latin American Museums of Natural History, 1850–1990,” in *Nature and Empire: Science and the Colonial Empire*, ed. Roy MacLeod, *Osiris*, 2000, 15:108–118; and Susan Sheets-Pyenson, *Cathedrals of Science: The Development of Colonial Natural History Museums during the Late Nineteenth Century* (Kingston/Montreal: McGill-Queen’s Univ. Press, 1988).

³ Igor Kopytoff, “The Cultural Biography of Things,” in *The Social Life of Things: Commodities in Cultural Perspective*, ed. Arjun Appadurai (Cambridge: Cambridge Univ. Press, 1986), pp. 64–91, on pp. 66–67. This anthropological work on the cultural biography of things grew out of a body of scholarship published in the decade around 1990 on exchange theory and material culture, including Appadurai, ed., *Social Life of Things*; Stephen Harold Riggins, ed., *The Socialness of Things: Essays on the Socio-Semiotics of Objects* (Berlin/New York: Mouton de Gruyter, 1994); Nicholas Thomas, *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific* (Cambridge, Mass.: Harvard Univ. Press, 1991); and Annette B. Weiner, *Inalienable Possessions: The Paradox of Keeping-While-Giving* (Berkeley: Univ. California Press, 1992). For the early impact of this scholarship in museum studies see Pearce, *Museums, Objects, and Collections* (cit. n. 1), pp. 15–35; and Charles Saumarez Smith, “Museums, Artefacts, and Meanings,” in *The New Museology*, ed. Peter Vergo (London: Reaktion, 1989), pp. 6–21.

⁴ On instruments as primary sources see, e.g., Jim Bennett, “Knowing and Doing in the Sixteenth Century: What Were Instruments For?” *British Journal for the History of Science*, 2003, 36:129–150. Daston’s work in this area includes Lorraine Daston, ed., *Biographies of Scientific Objects* (Chicago: Univ. Chicago Press, 2000); and Daston, ed., *Things That Talk: Object Lessons from Art and Science* (New York: Zone, 2004). Neither is the method unfamiliar to historians of medicine—in 1827, the physician and librarian William MacMichael traced the provenance of the gold-headed cane presented to the Royal College of Physicians by the widow of Matthew Baillie through its four previous owners: William MacMichael, *The Gold-Headed Cane* (1827; London: Royal College of Physicians, 1968).

incurred by these shifts. In doing so we study a series of relationships surrounding objects, first on the way to the museum and then as part of the collection. These are relationships between people and people, between objects and objects, and between objects and people. We encounter not only collectors, curators, and scientists but also visitors and audiences. In this conception, the museum becomes a vessel for the bundle of relationships enacted through each of the thousands of specimens on display and in store. Echoing Chris Gosden and Chantal Knowles, I “seek to answer how human relations were realised . . . by producing, exchanging and using objects.”⁵

In selecting particular objects’ “lives” and viewing the history of collecting and museums from their perspectives, however, I do not attribute too much power to the things themselves. To do so would be to diminish the agency of the humans in the story—things did not act in their own right but, rather, material culture was acted *upon*.⁶ People imbued things with value and significance, manipulating and contesting their meaning over time. Objects prompted, changed, and acted as a medium for relationships but were nonetheless inanimate. We are looking from the standpoint of the object, but we are looking *at* people (especially their practices and institutions). Throughout their lives, museum objects were attributed varied meanings and values: collectors, curators, and audiences encountered objects in very different ways.

At its most basic, the object biography provides an appealing narrative hook. Used well, however, there are a number of further insights that can be gleaned from such an approach that are particularly relevant to historians of science. Things collected in the field can be firmly connected to institutions and practices in metropolitan centers via the identity and meaning they accreted during their trajectory. By studying what curators then did with objects in their collections, this approach contributes to constructivist histories of science by embedding the study of scientific practice in material culture. Exploring the status and personnel involved in this museum work provides insights into the role of museums in scientific and civic culture. Finally, I argue that a museum object can be a prism through which to view various publics’ experience of science.

I structure the following survey according to three phases in the life of a museum object. First, I consider the mechanics of the movement of objects from their manufacture or growth through collecting and exchange to the museum, along with the accompanying shifts in meaning and status. I then consider the use of the item once it joined a collection, whether classificatory, analytical, or in display. In the final section I consider the role of the object in the experience of visitors to the museum and the nature of the relationship between the object and its viewer. Of course the category of “museum object” is broad and flexible. The various types of objects of interest to historians of science, technology, and medicine present different challenges and raise distinct issues: they can be artificial

⁵ For the object biography approach in museum studies see Chris Gosden and Chantal Knowles, *Collecting Colonialism: Material Culture and Colonial Change* (Oxford: Berg, 2001) (the quotation is from p. xxi); Gosden and Yvonne Marshall, “The Cultural Biography of Objects,” *World Archaeology*, 1999, 31:169–178; Janet Hoskins, *Biographical Objects: How Things Tell the Stories of People’s Lives* (New York: Routledge, 1998); and Fred R. Myers, ed., *The Empire of Things: Regimes of Value and Material Culture* (Oxford: Currey, 2001).

⁶ This has been argued in the work of a number of anthropologists, including Christopher B. Steiner, “Rights of Passage: On the Liminal Identity of Art in the Border Zone,” in *Empire of Things*, ed. Myers, pp. 207–231; and Gosden and Knowles, *Collecting Colonialism*, pp. 22–24. We may thus draw some insights from actor-network theory without necessarily subscribing to the program in its entirety and ascribing agency to objects as actants. Nevertheless, to look at objects within networks, one must acknowledge two decades of debate surrounding this approach. See John Law and John Hassard, eds., *Actor Network Theory and After* (Oxford: Blackwell, 1999).

or natural, dead or alive, human or animal, organic or inorganic, unique or representative. Although I am interested in techniques that can be applied to them all, I am primarily concerned with nineteenth- and twentieth-century museums in North America and Europe (especially Britain), reflecting my own focus on collections of natural history and human anatomy.

COLLECTING AND OBJECT PROVENANCE

The prehistory of the object, its original context, changes radically when it is collected. We might assume that at this point of “discovery,” the collector conferred upon the object a stable meaning that endured through its museum career. But for many objects, this was but the first in a convoluted series of meaning and context shifts. Moreover, the motivations for collecting were rarely straightforward. There is a considerable body of work on the psychology of collecting that provides models for sophisticated treatments of the relationship that then forms between collector and collected.⁷ This work tends to privilege the biography of the individual collector over the object and does not generally address the motives behind scientific collecting. In the history of science, biographical studies (of people rather than objects) have long included detailed and sophisticated analyses of scientific collectors and collecting. For Charles Darwin, for example, Janet Browne’s biographies and the work undertaken by the Darwin Correspondence Project give powerful insights into the traffic of specimens between collectors in the nineteenth century and the use of objects as “cultural capital” to lubricate patronage networks and build careers. Similarly, Rebecca Stott’s accessible account of Darwin’s barnacle work emphasizes his place in a web of collectors—in which “each of the thousands of letters he wrote in the barnacle years created another delicate skein in that web.”⁸ Furthermore, it can be read as a biography of the barnacle “Mr Arthrobalanus” (*Cryptophialus minutus*), from Chilean beach via the *Beagle* to Down House and, finally, to the Cambridge University Museum of Zoology. Mr Arthrobalanus and thousands of other specimens were the physical manifestations of Darwin’s reputation and expertise.

We can learn about Mr Arthrobalanus from Darwin’s own meticulous records. Other specimens’ premuseum lives can be traced through accession registers, receipts, sale catalogues, accompanying correspondence, relevant contemporary publications, and even text on the object itself. These diverse sources reveal that museum objects moved along complex and varied paths in the acquisition networks to and between individuals and museums. Many natural history specimens began their journeys through this network when they were collected in the field. Others were purposefully manufactured or grown for a museum. Some scientific instruments were crafted specifically for a collection, while others were made to be used and only later collected. In the King George III Collection of scientific

⁷ John Elsner and Roger Cardinal, eds., *The Cultures of Collecting* (London: Reaktion, 1994); Werner Muensterberger, *Collecting: An Unruly Passion: Psychological Perspectives* (Princeton, N.J.: Princeton Univ. Press, 1994); and Susan M. Pearce, *On Collecting: An Investigation into Collecting in the European Tradition* (London: Routledge, 1995).

⁸ Janet Browne, *Charles Darwin: Voyaging* (London: Pimlico, 1996); Browne, *Charles Darwin: The Power of Place* (London: Cape, 2002); Charles R. Darwin, *The Correspondence of Charles Darwin*, ed. Frederick H. Burkhardt et al., 14 vols. (Cambridge: Cambridge Univ. Press, 1985–2004); and Rebecca Stott, *Darwin and the Barnacle: The Story of One Tiny Creature and History’s Most Spectacular Scientific Breakthrough* (London: Faber & Faber, 2003), p. xxv. See also Sophie Forgan, “Darwin and the Museum,” in *Thinking Path*, ed. Shirley Chubb (Shrewsbury: Shrewsbury Museums Service, 2004), pp. 37–41.

instruments now in London's Science Museum, for example, there is a marked contrast between the instruments the king commissioned from George Adams for his own collection and those actually used for public lectures by Stephen Demainbray, later Superintendent of Kew Observatory (where the royal collection was housed).⁹

Natural history museums drew heavily on zoological and botanical gardens for their specimens, establishing acquisition networks that stretched across the “exhibitionary complex” to menageries and circuses.¹⁰ Take, for example, Zarafa, the first giraffe ever seen in France, who was a gift to Charles X from the Ottoman Viceroy of Egypt. Following her journey down the Nile and across the Mediterranean, in 1827 she walked from Marseille to Paris in the company of the celebrated naturalist Étienne Geoffroy Saint-Hilaire to take up residence in the menagerie at the Jardin des Plantes. She died in 1845 and was initially displayed in the Muséum d'Histoire Naturelle; today, her mounted carcass stands in the Musée Lafaille in La Rochelle. Maharajah the elephant, who in death stands in the Manchester Museum, spent his life traveling with Wombwell's Royal Number One Menagerie and giving rides at Belle Vue Zoo.¹¹ The animals' audiences and meanings shifted as they passed—living or dead—through these different spaces.

Human anatomy museums (and especially those in teaching hospitals) gathered their specimens from the unfortunate patients of the adjacent wards, whose body parts radically shifted in meaning during transferral and preservation. By working on these “preparations,” the surgeon-curator rendered them property, in practice if not in law.¹² Human remains collected from elsewhere moved along the same acquisition routes as plants, animals, and books, in the process shifting from subject to object. As Ruth Richardson writes, this process demonstrated “the capacity of the human body itself to become artefact.”¹³ Natural history objects are prone to a comparable slippage between “natural” and “artificial” as they became material culture through the process of collecting, storage, and display.

⁹ On the fieldwork in natural history see Robert E. Kohler, *Landscapes and Labscapes: Exploring the Lab-Field Border in Biology* (Chicago: Univ. Chicago Press, 2002); and Henrika Kuklick and Robert E. Kohler, eds., *Science in the Field, Osiris*, 1996, 11. For the King George III collection see Alan Q. Morton and Jane A. Wess, *Public and Private Science: The King George III Collection* (Oxford: Oxford Univ. Press, 1993).

¹⁰ Richard D. Altick, *The Shows of London* (Cambridge, Mass.: Belknap, 1978); Brenda Assael, *The Circus and Victorian Society* (Charlottesville: Univ. Virginia Press, 2005); Eric Baratay and Elisabeth Hardouin-Fugier, *Zoo: A History of Zoological Gardens in the West*, trans. Oliver Welsh (1998; London: Reaktion, 2002); R. J. Hoage and William A. Deiss, eds., *New Worlds, New Animals: From Menagerie to Zoological Park in the Nineteenth Century* (Baltimore: Johns Hopkins Univ. Press, 1996); Abigail J. Lustig, “Cultivating Knowledge in Nineteenth-Century English Gardens,” *Science in Context*, 2000, 13:155–181; and Richard Drayton, *Nature's Government: Science, Imperial Britain, and the “Improvement” of the World* (New Haven, Conn.: Yale Univ. Press, 2000). On the exhibitionary complex see Bennett, *Birth of the Museum* (cit. n. 1), pp. 59–88.

¹¹ Regarding Zarafa see Michael Allin, *Zarafa: A Giraffe's True Story, from Deep in Africa to the Heart of Paris* (New York: Walker, 1998). On the early history of the Jardin du Roi, the Jardin des Plantes, and the Muséum d'Histoire Naturelle see Emma C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago: Univ. Chicago Press, 2000). On Maharajah see David Barnaby, *The Elephant Who Walked to Manchester* (Plymouth: Basset, 1988); and John L. Middlemiss, *A Zoo on Wheels: Bostock and Wombwell's Menagerie* (Burton-on-Trent: Dalebrook, 1987).

¹² Susan C. Lawrence, “Beyond the Grave—The Use and Meaning of Human Body Parts: A Historical Introduction,” in *Stored Tissue Samples: Ethical, Legal, and Public Policy Implications*, ed. Robert F. Weir (Iowa City: Univ. Iowa Press, 1998), pp. 111–142. On the gift economy and postmortem “social life” of transplant organs see Margaret Lock, *Twice Dead: Organ Transplants and the Reinvention of Death* (Berkeley: Univ. California Press, 2002), pp. 315–346.

¹³ Ruth Richardson, “Human Remains,” in *Medicine Man: Henry Wellcome's Phantom Museum*, ed. Ken Arnold and Danielle Olsen (London: British Museum Press, 2003), pp. 319–345, on p. 323. On less savory acquisition sources see Maritha Rene Burmeister, “Popular Anatomical Museums in Nineteenth-Century England” (Ph.D. diss., Rutgers Univ., 2000); Richardson, *Death, Dissection, and the Destitute*, 2nd ed. (London: Phoenix, 2001); and Robert Bogdan, *Freak Show: Presenting Human Oddities for Amusement and Profit* (Chicago: Univ. Chicago Press, 1988).

The web of collectors and sites that eventually channeled objects to the museum was extensive and heterogeneous. The point of collection was often only the first in a series of exchanges on the way to the museum. Objects would commonly pass through the hands of a number of private collectors and dealers. The distinction between museum and commercial spaces was not always absolute: many dealers' businesses were showcases for natural knowledge, and many collections were displayed with a view to sale. In the sciences as in the arts, auction houses were regular sources of objects, and it behooves historians of science to pay further attention to their role in the traffic of material culture, as book historians have done (indeed, many houses sold specimens—human and animal—alongside tomes).¹⁴ Among those present at one London sale in 1828 (of the museum of the renowned comparative anatomist Joshua Brookes) were the geologists William Buckland and Gideon Mantell; Robert Grant, bidding for his new museum at the University of London; William Clift of the Hunterian; and Reverend William Clark, professor of anatomy at Cambridge. The auction was a social process that resolved ambiguities of classification and value—a public forum in which worth was established. The catalogues, the ballyhoo, the provenances, and the buyers all contributed to establishing the net worth of the instruments, specimens, or body parts on sale, to putting a price on the unpriceable. Accession records and catalogues (and especially their annotations) allow us to trace the paths of individual objects through this “museum economy.”¹⁵

Many of the exchanges involving the object en route to the museum were without remuneration, however, and may be characterized as gifts: from a collector to a patron or a private collector to an institution. As with any process of gift exchange, donation constituted a reciprocal relationship between benefactor and recipient. An isolated practitioner, collector, or manufacturer sent a specimen to a metropolitan museum with the hope of securing potentially useful patronage or, even better, the minor fame of a label or catalogue mention. As Susan Pearce writes, “to give material freely to museums is a meritorious act which conveys famous immortality.” And so although donors rid themselves of the problems of storage and upkeep, they retained symbolic ownership—a manifestation of what Annette Weiner calls “the paradox of keeping-while-giving.” Collecting was civilizing; subsequently to donate to a worthy museum ensured that such an act remained visible in perpetuity and secured a lasting connection between person and object. The least subtle evidence of this was that donors kept an eye on their gifts; in Glasgow, the Hunterian

¹⁴ On dealers see Mark V. Barrow, “The Specimen Dealer: Entrepreneurial Natural History in America’s Gilded Age,” *Journal of the History of Biology*, 2000, 33:493–534; and Anthony Turner *et al.*, “The Archives of Scholars, Collectors, and Dealers: Their Place in the Study of the History of Scientific Instruments,” *Nuncius*, 2001, 16:675–766. On auction houses see J. M. Chalmers-Hunt, ed., *Natural History Auctions, 1700–1972: A Register of Sales in the British Isles* (London: Sotheby Parke Bernet, 1976); Robin Myers, Michael Harris, and Giles Mandelbrote, eds., *Under the Hammer: Book Auctions since the Seventeenth Century* (London: British Library, 2001); C. Davies Sherborn, *Where Is the—Collection?* (Cambridge: Cambridge Univ. Press, 1940); and Charles W. Smith, *Auctions: The Social Construction of Value* (New York: Free Press, 1989).

¹⁵ The concept of “museum economy” is used by Simon Chaplin—Senior Curator of the Hunterian Museum—in his work on John Hunter’s collecting, recently incorporated in the redisplay of the galleries at the Royal College of Surgeons. See also Lawrence, “Beyond the Grave” (cit. n. 12), pp. 125–132; and Krzysztof Pomian, *Collectors and Curiosities: Paris and Venice, 1500–1800*, trans. Elizabeth Wiles-Portier (Cambridge: Polity, 1990). Regarding the participants at the 1828 sale see Gideon A. Mantell, *The Journal of Gideon Mantell, Surgeon and Geologist: Covering the Years 1818–1852*, ed. E. Cecil Curwen (London: Oxford Univ. Press, 1940), p. 74; Adrian Desmond, *The Politics of Evolution: Morphology, Medicine, and Reform in Radical London* (Chicago: Univ. Chicago Press, 1989), p. 160; George Robins, *A Catalogue of the Anatomical and Zoological Museum of Joshua Brookes* (London: Taylor, 1828); and Benjamin Wheatley and George Adlard, *Museum Brookesianum* (London: Taylor, 1830).

curator Henry Darwin Rogers endured an angry missive from one such patron in 1859 because a particular fish donated fifteen years previously was not on display.¹⁶

Objects are thus inalienably associated with their collector, donor, or benefactor. This was most visible for the case of whole collections—the King George III Collection of instruments in South Kensington, the Hunterian collections in London and Glasgow, or Marshall Field's eponymous museum in Chicago.¹⁷ Each of these men was only one of a number of collectors and donors, however, and such examples illustrate how the most famous (or wealthy) individual may then remain indelibly connected with a collection. As with whole museums, so particular objects retain a relationship with persons involved in their trajectory, principally those of the highest status. Thus objects scattered across the world from the Wellcome Collection are associated with Sir Henry, rather than with the collectors who supplied him with them or the curators who have exchanged them since.¹⁸

LIFE IN THE COLLECTION

Through all these various routes, then, objects accrue meaning and identity from the interaction with donors, collectors, and previous owners. Such associations wax and wane—the connection between a Galapagos Finch and the young Charles Darwin may be forgotten and then rediscovered in a collection, thus reestablishing a frame of meaning (see Figure 1).¹⁹ Clearly the biography of an object did not stagnate once it arrived at the museum. Nevertheless, its incorporation into the collection was perhaps the most significant event in the life of a museum object—and the point at which documentation tends to be richest.²⁰

The impact of arriving at the museum on the meaning and value of the object could work in different ways. On the one hand, the object was removed from circulation and rendered singular and inalienable. On the other, a rare specimen joined ranks of unusual items, and what might have been a prize find to an individual collector was just one of thousands of objects in the collection. The object's provenance in turn affected its status once it became part of the collection. From Charles Byrne, the "Irish Giant" at the Hunterian Museum in London (see cover), to the *Enola Gay* at the Smithsonian Institution, objects with very peculiar provenances were afforded particular status within the mu-

¹⁶ Pearce, *On Collecting* (cit. n. 7), p. 407; Weiner, *Inalienable Possessions* (cit. n. 3); James Banks to Henry Darwin Rogers, 9 Sept. 1859, MR 50/33, Glasgow University Special Collections; and John W. Gregory, *Henry Darwin Rogers* (Glasgow: MacLehose, 1916).

¹⁷ Morton and Wess, *Public and Private Science* (cit. n. 9); Simon Chaplin, "John Hunter and the Anatomy of a Museum," *History Today*, June 2005, pp. 19–25; C. Helen Brock, "Dr. William Hunter's Museum, Glasgow University," *Journal of the Society for the Bibliography of Natural History*, 1980, 9:403–412; and Sally Gregory Kohlstedt and Paul Brinkman, "Framing Nature: The Formative Years of Natural History Museum Development in the United States," *Proceedings of the California Academy of Sciences*, 2004, 55(Suppl. 1, no. 2):7–33 (this article was part of a special issue, entitled *Museums and Other Institutions of Natural History: Past, Present, and Future*, edited by Alan E. Leviton and Michele L. Aldrich). See also Samuel J. M. M. Alberti, "Owning and Collecting Natural Objects in Nineteenth-Century Britain," in *From Private to Public: Natural Collections and Museums*, ed. Marco Beretta (Sagamore Beach, Mass.: Science History Publications, 2005), pp. 141–154.

¹⁸ Arnold and Olsen, eds., *Medicine Man* (cit. n. 13).

¹⁹ Russell Jenkins, "Darwin's Forgotten Finch Goes on Display," *The Times*, 14 Oct. 2003; Frank D. Steinheimer, "The Whereabouts of Darwin's Bird Collections," *Bulletin of British Ornithologists' Club*, 1999, 119:141; Steinheimer, "Darwin, Rüppell, Landbeck & Co.—Important Historical Collections at the Natural History Museum, Tring," *Bonner Zoologische Beiträge*, 2002, 51:175–188; and Frank J. Sulloway, "The Beagle Collections of Darwin's Finches (Geospizinae)," *Bulletin of the British Museum (Natural History): Zoology*, 1982, 43(2):49–94.

²⁰ Here I will not seek to define what constitutes a collection. See Pearce, *On Collecting* (cit. n. 7), pp. 3–27.



Figure 1. A Galapagos Warbler Finch (*Certhidea olivacea*) collected by Charles Darwin in September 1835, described by the ornithologist John Gould at the Zoological Society of London two years later. After a spell at the British Museum (Natural History), it was transferred with other specimens to the Manchester Museum in 1895. There it languished in storage, and twentieth-century curators thought it had been destroyed; but in 2003 its provenance was reestablished. Copyright the Manchester Museum, University of Manchester.

seum.²¹ There are also many more quotidian examples in which objects with less striking stories became central to and emblematic of an institution. Take large mammals in small museums. Provincial natural history collections in England often boasted a particularly iconic specimen: Maharajah the elephant in Manchester, a tiger at Leeds, a whale in Hull, a gorilla in Nottingham, a rhinoceros in Ipswich. The status of these objects was intimately connected with their individual histories (often in these cases evocative of imperial adventure). But this emblematic status was only one of their meanings; they also had a place in the classification of the collection. Elephants were (ostensibly) no more privileged than the humble snails and wild grasses. Taxonomically dissimilar objects that might have shared an acquisition route were categorized, isolated from each other, and reordered.²²

²¹ Chaplin, "John Hunter and the Anatomy of a Museum" (cit. n. 17); Thomas F. Gieryn, "Balancing Acts: Science, *Enola Gay*, and History Wars at the Smithsonian," in *The Politics of Display: Museums, Science, Culture*, ed. Sharon Macdonald (London/New York: Routledge, 1998), pp. 197–228; and Martin Harwit, *An Exhibit Denied: Lobbying the History of Enola Gay* (New York: Copernicus, 1996).

²² On the iconic specimens see Barnaby, *Elephant Who Walked to Manchester* (cit. n. 11); Samuel J. M. M. Alberti, "The Bengal Tiger in Context: The Leeds Museum in the Nineteenth Century," *Leeds Museums and Galleries Review*, 2001–2002, 4:13–16; Thomas Sheppard, *Guide to the Municipal Museum, Royal Institution, Albion Street, Hull* (Hull: Hull Museum, 1904); J. F. Blake, *The Free Natural History Museum, Nottingham: Descriptive Guide to the Collections* (Nottingham: Free Museum, 1882); and R. A. D. Markham, *A Rhino in High Street: Ipswich Museum—The Early Years* (Ipswich: Ipswich Borough Council, 1990). More broadly, see John M. MacKenzie, *The Empire of Nature: Hunting, Conservation, and British Imperialism* (Manchester: Manchester Univ. Press, 1988). On the rich history of classification see, e.g., Harriet Ritvo, *The Platypus and the Mermaid and Other Figments of the Classifying Imagination* (Cambridge, Mass./London: Harvard Univ. Press, 1997).

That process did not always strictly follow the rules of taxonomy set down at the time, however, and the history of classification can be enriched by contrasting text-based theory with practice enacted through material culture.

Like other objects, then, museum specimens were polysemic. They were open to multiple interpretations, from icon to datum. There have been thought-provoking synchronic studies of the ways different groups viewed the same “boundary object”—“those scientific objects which inhabit several intersecting social worlds . . . and satisfy the informational requirement of each of them [with] different meanings in different worlds.”²³ Historians can profitably supplement such studies with diachronic accounts, tracing how interpretations shifted over time. Things in collections changed; in addition to their physical movement and deterioration, the meanings and interpretations of specific items were contested. The object biography is also a valuable way of tracing the changes in classificatory schema, theoretical frameworks, and debates surrounding the objects. Simon Schaffer has explored the debated meanings of objects in science museums—for example, the museological potential of meteorite “ALH84001” (found in Allan Hills ice field, Antarctica, in 1984) and its role in the debates about the existence of life on Mars. Anita Guerrini’s rich account of the wrangles over the anatomical collection of the Paris anatomist Joseph-Guichard Duverney (1648–1730) demonstrates the contrasting meanings of the same skeletons at the Jardin du Roi and at the Académie des Sciences (where they were defined according to medical instruction and natural philosophy, respectively).²⁴

We should not then assume that objects and their meaning are frozen once they join a collection. The museum was not a static mausoleum but a dynamic, mutable entity where specimens were added and preserved, discarded, and destroyed. Museum objects were subject to considerable work during their life in the collection, as Sally Gregory Kohlstedt emphasizes in her essay in this section. Preservation, preparation, and, especially, taxidermy are all abundant avenues of study for the historian of scientific practice. Objects were catalogued, stored, and researched. They were subject not only to classification and categorization—an extended natural history that included artefacts and instruments—but also to analysis and comparison. John Pickstone terms these latter practices “museological science.”²⁵ In museums of all kinds, from comparative anatomy to engineering, objects were broken down and analyzed according to their constituent parts.

²³ Susan Leigh Star and James R. Griesemer, “Institutional Ecology, ‘Translations,’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907–39,” *Social Studies of Science*, 1989, 19:387–420, on p. 393. See also Joan H. Fujimura, *Crafting Science: A Sociohistory of the Quest for the Genetics of Cancer* (Cambridge, Mass.: Harvard Univ. Press, 1996).

²⁴ Simon Schaffer, “Temporary Contemporary,” in *Here and Now: Contemporary Science and Technology in Museums and Science Centres*, ed. Graham Farmelo and Janet Carding (London: Science Museum, 1997), pp. 31–39; Schaffer, “Object Lessons,” in *Museums of Modern Science*, ed. Svante Lindqvist (Canton, Mass.: Science History Publications, 2000), pp. 61–76; and Anita Guerrini, “Duverney’s Skeletons,” *Isis*, 2003, 94:577–603.

²⁵ John V. Pickstone, “Museological Science? The Place of the Analytical/Comparative in Nineteenth-Century Science, Technology, and Medicine,” *History of Science*, 1994, 32:111–138; and Pickstone, *Ways of Knowing: A New History of Science, Technology, and Medicine* (Manchester: Manchester Univ. Press, 2000), pp. 60–134. On the history of preservation techniques see Rosina Down, “‘Old’ Preservative Methods,” in *Conservation of Natural History Specimens: Spirit Collections*, ed. C. Velson Horie (Manchester: Univ. Manchester, 1989), pp. 33–38; and J. J. Edwards and M. J. Edwards, *Medical Museum Technology* (London: Oxford Univ. Press, 1959). On taxidermy see Paul Lawrence Farber, “The Development of Taxidermy and the History of Ornithology,” *Isis*, 1977, 68:550–566; Cristina Grasseni, “Taxidermy as Rhetoric of Self-Making: Charles Waterton (1782–1865), Wandering Naturalist,” *Studies in History and Philosophy of Biological and Biomedical Sciences*, 1998, 29:269–294; Pat Morris, “An Historical Review of Bird Taxidermy in Britain,” *Archives of Natural History*, 1993, 20:241–255; Susan Leigh Star, “Craft vs. Commodity, Mess vs. Transcendence: How the Right Tool Became the Wrong One in the Case of Taxidermy and Natural History,” in *The Right Tools for the Job: At Work in*

In most museums in the last 150 years, the majority of objects in collections were never put on display. The trajectories of those that were, however, offer historians of science the opportunity to study in detail not only the classification schemes in which they fit but also the wider cultural and intellectual movements at play in the museum. Tony Bennett's extensive study of the exhibition of the historical sciences in Britain, Australia, and North America in the decades around 1900, for example, reveals the prevalence (or otherwise) of evolutionary sequences of natural and artificial objects and their role in the colonial project. In his interdisciplinary account of U.S. museums in the same time period, Steven Conn argues convincingly that museums across the exhibitionary sector presented their objects in progressive narratives and that American thought was dominated by the material realm. By plundering museum archives for the display techniques employed for objects in this stage of their life, we can explore curators' appropriation or rejection of particular theoretical approaches. Objects with such markedly different life histories as fossils and boomerangs could find themselves in the same exhibitionary narrative. Meanwhile, similar objects distributed to different museums might find themselves put to very different uses. The employment and position of a specimen were markedly different in Richard Owen's comparative anatomy displays at the British Museum (Natural History) and in William Boyd Dawkins's evolutionary displays at the Manchester Museum.²⁶

The meanings of an object were impacted upon not only by its arrangement and place in the overall classification—which were more often intellectual than physical—but also by its immediate display environment. Provocative studies of the meanings imbued by particular techniques include Donna Haraway's account of the construction of imperial patriarchy through Carl Akeley's big game displays, Sally Gregory Kohlstedt's exploration of the gendered character of American museum exhibitions, and Karen Wonders's history of the development of the habitat diorama as a setting for the display of stuffed birds.²⁷ As Kohlstedt demonstrates, such techniques and their political implications were chronologically and geographically contingent, and so to track one object through the decades and centuries of changing modes of exhibition is to present a rich history of the cultures of display in the context of that museum/city/nation.

VIEWING THE OBJECT

The meanings of an object varied not only over time and space but also according to who was viewing it. That is to say, an object on display had relationships not only with other

Twentieth-Century Life Sciences, ed. Adele E. Clarke and Joan H. Fujimura (Princeton, N.J.: Princeton Univ. Press, 1992), pp. 257–286; and Karen Wonders, "Bird Taxidermy and the Origin of the Habitat Diorama," in *Non-Verbal Communication in Science Prior to 1900*, ed. Renato G. Mazzolini (Florence: Olschki, 1993), pp. 441–447. For a detailed study of medical museum practice see Erin Hunter McLeary, "Science in a Bottle: The Medical Museum in North America, 1860–1940" (Ph.D. diss., Univ. Pennsylvania, 2001).

²⁶ Tony Bennett, *Pasts Beyond Memory: Evolution, Museums, Colonialism* (London: Routledge, 2004); and Steven Conn, *Museums and American Intellectual Life, 1876–1926* (Chicago: Univ. Chicago Press, 1998). For a revealing examination of the role of the museum in the dissemination of Darwinism in Ireland see Juliana Adelman, "Evolution on Display: Promoting Irish Natural History and Darwinism at the Dublin Science and Art Museum," *Brit. J. Hist. Sci.*, in press. On Owen's and Dawkins's displays see, respectively, Nicolaas A. Rupke, *Richard Owen: Victorian Naturalist* (New Haven, Conn.: Yale Univ. Press, 1994); and Thomas Henry Huxley, "Suggestions for a Proposed Natural History Museum in Manchester," *Report of the Proceedings of the Museums Association*, 1896, pp. 126–131.

²⁷ Donna J. Haraway, *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (London: Routledge, 1989); Sally Gregory Kohlstedt, "Masculinity and Animal Display in Nineteenth-Century America," in *Figuring It Out: Visual Languages of Gender and Science*, ed. Bernard Lightman and Ann B. Shteir (Hanover, N.H.: Univ. Press New England, forthcoming); and Karen Wonders, *Habitat Dioramas: Illusions of Wilderness in Museums of Natural History* (Uppsala: Almqvist & Wiksell, 1993).

items and with its collectors and curators but also with its audiences. Viewers observed and reacted to the object, and these responses (and their traces) are symptoms of the relationship between thing and observer.²⁸ This relationship is historically and culturally contingent, but it is never one-way. However didactic and interpreted an exhibition, responses were a combination of that which was elicited by the display and that which came from within the visitor—things remembered and felt.²⁹

Objects are thus afforded a new set of meanings and values that have too often been ignored in the histories of science and museums. Shifts in visitor constituencies and in the ways they viewed things meant that museum objects were never stable. And so, as Forgan points out in this Focus section, the study of visitor responses is potentially a profitable area for the historian of science. In museum studies, visitor theory and contemporary surveys are replacing the passive audience with active participants in the construction of meaning. Cultural theorists, mass communication scholars, and book historians see the communication process from both sides.³⁰ Visitors were not vessels waiting to be filled but autonomous agents with their own agendas. Just as reader-response theorists are seeking to recover not only the meaning of texts but also the practices of reading, so historians now examine not only the intentions of curators but also the reasons, experiences, and sensations of visiting. It will come as no surprise that the curatorial intention and the visitor response did not always tally. As with reading scientific texts, so in viewing museum objects there is evident (however elusively) a struggle for the control of meaning. The pages of contemporary museum periodicals and guidebooks offer plentiful resources for studying the way visitors *ought* to encounter objects, how they should see them, and how they should behave. Increasingly, historians of science are turning to how they *did* behave and, in particular, how they interacted with the objects.³¹

There is a good deal of material that takes on new importance when visitors are viewed in this way. Museums since the Renaissance have kept visitor books, so that we may at least discern the presence of visitors if not divine their responses. The rise of the “public” museum in the nineteenth century shifted not only the status of visitors but also the methods of monitoring them, as institutions began to chart gross visitor figures. We may compare these with studies of the intentions of museum professionals regarding access to their

²⁸ David Freedberg, *The Power of Images: Studies in the History and Theory of Response* (Chicago: Univ. Chicago Press, 1989), on p. xxii; and Pearce, *Museums, Objects, and Collections* (cit. n. 1), pp. 210–227.

²⁹ Samuel J. M. M. Alberti, “The Museum Affect: Visiting Collections of Anatomy and Natural History,” in *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, ed. Aileen Fyfe and Bernard Lightman (Chicago: Univ. Chicago Press, in press); Gaynor Kavanagh, *Dream Spaces: Memory and the Museum* (Leicester: Leicester Univ. Press, 2000); and Bernadette T. Lynch, “Access to Collections and Affective Interaction with Objects in the Museum” (Ph.D. diss., Univ. Manchester, 2004).

³⁰ On ways of viewing—“scopic regimes”—see, e.g., Teresa Brennan and Martin Jay, eds., *Vision in Context: Historical and Contemporary Perspectives on Sight* (London: Routledge, 1996). On the construction of the observer in the history of science see Caroline A. Jones and Peter Galison, eds., *Picturing Science, Producing Art* (New York/London: Routledge, 1998). For work that sees the communication process from both sides see Robert Darnton, *The Kiss of Lamourette* (London: Faber, 1990); James Hay, Lawrence Grossberg, and Ellen Wartella, eds., *The Audience and Its Landscape* (Boulder, Col.: Westview, 1996); James L. Machor and Philip Goldstein, eds., *Reception Study: From Literary Theory to Cultural Studies* (New York: Routledge, 2000); and Jonathan R. Topham, “Scientific Publishing and the Reading of Science in Nineteenth-Century Britain: A Historiographical Survey and Guide to Sources,” *Studies in History and Philosophy of Science*, 2000, 31:559–612.

³¹ On museum guidebooks see Aileen Fyfe, “Reading and Visiting: Natural History at the British Museum and the Pictorial Museum,” in *Science in the Marketplace*, ed. Fyfe and Lightman (cit. n. 29). For studies of actual visitor behavior see Vicky Carroll, “The Natural History of Visiting: Responses to Charles Waterton and Walton Hall,” *Stud. Hist. Phil. Biol. Biomed. Sci.*, 2004, 35:31–64; and Clare Haynes, “A ‘Natural’ Exhibitioner: Sir Ashton Lever and His *Holosphusikon*,” *British Journal for Eighteenth-Century Studies*, 2001, 24:1–14.

collections. This much will tell us about the opportunity (some) people had to engage with the object whose biography we recount. But just as book historians study both the external history of reading (access to books, and which ones) and its internal history (how people read and why), so historians of museums may study not only the external but also the internal history of visiting.³² The latter is more elusive, but sources are available. Visitors recorded their responses in diaries and published them in travelogues and memoirs; if we are suitably sensitive to genre and context, there are rich pickings available. In writing the history of museum visitors in the twentieth century, historians of science can draw on a body of sociological and museological literature on audiences, which will supplement the promising avenues for research offered by oral history.³³ Of a piece of moon soil put on display barely two months after Neil Armstrong collected it from the Sea of Tranquillity, one visitor was heard to remark, "I've seen something like that in our grate."³⁴

From all these sources, and from the inexhaustible meanings that *could* be attributed to an object, it is possible to chart the changes in what Sharon Macdonald terms the "repertoire of prevalent interpretations." We can extract from the mass of possible interpretations the responses, if not to a particular object, then to particular *kinds* of objects. The reaction to human remains, for example, has changed radically over time, and in charting the responses elicited by body parts during their afterlife in a museum we may draw conclusions touching on issues as wide ranging as the status of the body and the changing role of disgust in society. The mobs that wrecked anatomy museums in Britain and the United States were displaying only the most extreme of a range of responses. Similarly, the changing reactions to a particular taxonomic mount may illuminate shifts in social attitudes connected to hunting or to vivisection. We can read the naturalist and writer Eliza Brightwen's sympathetic reaction to a zoological display in this light. "Looking at the section of the ox-horns," she wrote in 1892, "one shudders to think of the agony of suffering the animal must endure when its horns are sawn off near the skull, and then seared with a hot iron to stop the bleeding."³⁵

³² For early modern visitor books see Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley/Los Angeles: Univ. California Press, 1994). On public museums see, e.g., Kate Hill, *Culture and Class in English Public Museums, 1850–1914* (London: Ashgate, 2005). For a survey of work on internal and external histories of reading see Jonathan R. Topham, "A View from the Industrial Age," *Isis*, 2004, 95:431–442.

³³ Gordon Fyfe and Max Ross, "Decoding the Visitor's Gaze: Rethinking Museum Visiting," in *Theorizing Museums: Representing Identity and Diversity in a Changing World*, ed. Sharon Macdonald and Gordon Fyfe (Oxford: Blackwell, 1996), pp. 127–150; Eilean Hooper-Greenhill, *Museums and Their Visitors* (London: Routledge, 1994); Kenneth Hudson, *A Social History of Museums: What the Visitors Thought* (London: Macmillan, 1975); and Brian Longhurst, Gaynor Bagnall, and Mike Savage, "Audiences, Museums, and the English Middle Class," *Museum and Society*, 2004, 2:104–124. The Office of Smithsonian Institution Archives, e.g., has been undertaking oral histories of the Smithsonian since 1973. I currently have a project under way, "Re-collecting at the Manchester Museum: An Oral History Project," that explores memories of the visiting experience in the period 1960–1990.

³⁴ Jack Zussman, interview by Samuel J. M. M. Alberti, MD recording, 4 Mar. 2005, Manchester, "Re-collecting at the Manchester Museum," disc S8, track 3, Manchester Museum Central Archive. Zussman, then a professor of geology at Manchester University, was one of the principal investigators to whom the National Aeronautics and Space Administration sent one of three hundred samples brought back by *Apollo 11*; he arranged for a sample to be displayed for five days at the Manchester Museum. See R. Michael C. Eagar and David E. Owen, "Moon Rock in Manchester," *Museums Journal*, 1970, 69:159–160.

³⁵ Sharon Macdonald, *Behind the Scenes at the Science Museum* (Oxford/New York: Berg, 2002), p. 220; Michael Sappol, *A Traffic of Dead Bodies: Anatomy and Embodied Social Identity in Nineteenth-Century America* (Princeton, N.J./Oxford: Princeton Univ. Press, 2002) (wrecking of anatomy museums); Eliza Brightwen, *More about Wild Nature* (London: Unwin, 1892), p. 219; and Barbara T. Gates, *Kindred Nature: Victorian and Edwardian Women Embrace the Living World* (Chicago: Univ. Chicago Press, 1998).

In studying the history of response, it is soon evident that the relationship between viewer and viewed was not enacted through sight alone. We know that visitors responded to objects viscerally, gawking in awe and wonder or recoiling in horror. They touched things—from the virtuoso in a *Wunderkammer* picking up an object to examine it more closely to visitors to the U.S. National Air and Space Museum touching the moon rock brought back on *Apollo 17*.³⁶ Visitors also smelled objects (especially “wet” specimens of anatomy and zoology). They talked about them, agreed or disagreed on their meaning, engaged in disputes, or reached consensus. Their reactions wrapped the objects in further layers of meaning.

What conclusions, then, can we draw concerning the lives of things in museums? Here I have echoed Simon Chaplin’s recent plea for “a deeper knowledge of the biographies not just of . . . collectors but of the objects themselves.” Objects are themselves mute, at least in pragmatic terms, and many museum things have insufficient associated literature and provenance details to sustain an in-depth study.³⁷ But thousands upon thousands do, and a wealth of material waits in museum archives to help historians of science give these objects voices. We can construct the life histories of objects from these sources and from other stories in which the objects play a part. We can explore the ways in which even such apparently stable objects as scientific specimens are mutable and polysemic. Objects channeled and enabled a series of relationships—between collectors, manufacturers, curators, scientists, conservators, and visitors—and the museum object was inalienably connected to those in its trajectory. And so we can study not only what it means for an object to be in the museum—the qualitative changes incurred by being in a collection and by the practices enacted upon it—but also what is particular about the institutions that house them. We can write about the museum not only in terms of its space and politics, but also as a conduit for the relationships that involved the objects it housed. That these relations involved visitors means that the history of things in museums is clearly a fruitful area for the study of the public experience of science, which is especially interesting when meanings were contested and there was a disparity of value attribution between the purported producers and consumers of science. These, I argue, are the benefits of an object-centered historiography of museums of science, technology, and medicine.

³⁶ Alberti, “Museum Affect” (cit. n. 29); and David J. Meltzer, “Ideology and Material Culture,” in *Modern Material Culture: The Archaeology of Us*, ed. Richard A. Gould and Michael B. Schiffer (London: Academic, 1981), pp. 113–125.

³⁷ Simon Chaplin, review of Ken Arnold and Danielle Olsen, eds., *Medicine Man: Henry Wellcome’s Phantom Museum*, *Brit. J. Hist. Sci.*, 2005, 38:243–244, on p. 244. On things speaking for themselves see Lorraine Daston, “Speechless,” in *Things That Talk*, ed. Daston (cit. n. 4), pp. 9–24; for a lament on insufficient documentation see Richardson, “Human Remains” (cit. n. 13), pp. 320–322.