

# Building the Museum

## Knowledge, Conflict, and the Power of Place

*By Sophie Forgan\**

### ABSTRACT

This essay argues that museums are complex sites, standing at the intersection of scientific work and display. Three complementary approaches to analyzing museum buildings are suggested. The first focuses on the physical aspects of the buildings, their visual vocabulary and the ability to encode knowledge in material forms, and argues that architecture provided an arena where conflicts between the different parties involved were worked out. The second concerns the now familiar argument about the located nature of scientific knowledge, the particularity of sites and their relation to civic cultures, urban activities, or metropolitan concerns, and suggests further directions for research. The third approach treats the museum visitor as an active participant and examines the impact of buildings in terms of their architectural appeal to the emotions through sensory experience. Finally, buildings have enormous transformative potential and, as a manifestation of the material culture of science, tell us much about the changing place of the science museum in culture.

In designing museums, architects seem to pay little regard to the special purposes they are intended to fulfil. They often adopt the general arrangement of a church, or the immense galleries and lofty halls of a palace.

—Alfred Russel Wallace, 1869

“Man, Know Thyself,” *Descriptive Catalogue of the Liverpool Museum of Anatomy*, 29 Paradise Street (Only Three Minutes’ Walk from Church Street, Lord Street, and the Sailors’ Home).

—Front cover of catalogue, circa 1871

Visitors approach the museum from the north-west. They emerge from a tunnel-like entrance to find themselves midway in the volume of space, facing the nose of the B52 Stratofortress. Around and beyond the enormous B52, they can survey a panorama of aircraft on every scale, some suspended from the roof, and some on the floor below, before proceeding with their tour.

—Foster and Partners, American Air Museum in Britain, AD Profile, 1997

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MUSEUMS STAND AT THE INTERSECTION of scientific work and public display and, as such, must be of major interest to scientific historians. Themes studied in recent years have included the museum's didactic role, the ways in which it has helped to shape knowledge, its civic status, and its diverse social and cultural roles. Buildings, however, pose particular difficulties for historians. There are differences in language and disciplinary training that have to be surmounted, not just between scientists and architects but also between museum people and historians working in a variety of scientific, architectural, and historical fields. This is illustrated at one level by the epigraphs that stand at the head of this article. The first, by a scientist, formed part of a practical critique of architects' tendency to build gloriously unsuitable buildings for the display of collections—a familiar complaint. The second is a production by a small owner-entrepreneur, concerned above all to draw the visitors in and careful to assist them in finding the museum. The third is by a member of a major international architectural practice, writing primarily for other architects in a lavishly illustrated journal, who is concerned with aesthetics and the spatial impact of the building as a key part of the visitor experience.<sup>1</sup>

Studies of museums and their histories is an area that encompasses many fields and relates to larger national and even international cultural debates. Recent trends in such study are useful for scientific historians. Historians generally have moved beyond respectful institutional histories, and their characterizations have been influential. Thus we are accustomed to thinking of museums as cathedrals (sometimes of urban modernity), as ritual spaces or worthy monuments, as examples of colonial imitation of metropolitan institutions, as disciplinary structures, or even as ways to reimagine the city.<sup>2</sup> That these characterizations have frequently emerged from studies of art rather than scientific museums has not altered their appeal, and historians have used many of them, whether as metaphors or as exact descriptions. However, most historians today use such labels to reinforce the significance of place, as reminders that rationality was situated and that science was always part of the larger culture of its time and place. Before going further, it is important to remember the sheer number and variety of museums and what is actually constituted by the term "museum." At its core, a museum was (and still is) a collection, or series of collections, although there might be additional functions and other activities happening on the site. Collections enabled museums to be places where the most modern and up-to-date scientific knowledge was displayed and worked on. The museum site, however, might house a number of different organizations. In addition to cabinets and collections, a museum might contain the rooms of the local learned society, a library, a lecture theater, laboratories, and various official or professional offices as well as private apartments. For example, the Museum of Practical Geology, built in London between 1847

<sup>1</sup> Alfred Russel Wallace, "Museums for the People," *Macmillan's Magazine*, 1869, 19:249; "Man, Know Thyself," *Descriptive Catalogue of the Liverpool Museum of Anatomy*, n.d. [ca. 1871], copy in author's possession; and "Foster and Partners, American Air Museum in Britain, Duxford," in *Contemporary Museums: Architectural Design Profile*, 1997, 130:63–67, on p. 63. Throughout this essay I use the term "museum" to refer to scientific museums or museums with a substantial scientific component, unless stated otherwise.

<sup>2</sup> J. Pedro Lorente, *Cathedrals of Urban Modernity: The First Museums of Contemporary Art, 1800–1930* (Aldershot: Ashgate, 1998); Carol Duncan, *Civilizing Rituals: Inside Public Art Museums* (London/New York: Routledge, 1995); Daniel J. Sherman, *Worthy Monuments: Art Museums and the Politics of Culture in Nineteenth-Century France* (Cambridge, Mass.: Harvard Univ. Press, 1989); 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); Tony Bennett, *The Birth of the Museum: History, Theory, Politics* (London/New York: Routledge, 1995); and Michaela Giebelhausen, ed., *The Architecture of the Museum: Symbolic Structures, Urban Contexts* (Manchester/New York: Manchester Univ. Press, 2003).

and 1851, housed the Mining Records Office, the headquarters of the Geological Survey and its collections, and the Royal School of Mines. Universities and hospitals frequently had museums, sometimes in distinct buildings but more often than not housed in apartments as transitory as the homes of the departments to which they were related. The museum, therefore, was not necessarily a single site but one that might overlap with other sites and other building types—botanical gardens, anatomy theaters, lecture halls, libraries, panoramas, exhibitions, even the field and the laboratory.<sup>3</sup> How the spaces for different functions evolved and what the relationships were between them provide fruitful areas for study.

How do the museum's architecture and location relate to developing themes in the history of science? I have chosen three angles from which to approach the subject, but they should not be regarded as mutually exclusive. First, we may ask what possibilities study of the physical materiality of the building reveals. To do this we have to locate the building in its own time and culture and then examine the degree to which ideologies might be encoded into its actual structure, through style and layout. Second, we may assess how location and the particularity of place have helped to shape the museum's credibility and relation to knowledge, which in turn have helped to shape aspects of the urban landscape. Finally, we may ask whether the analysis of spaces and of what are sometimes termed the "practices of place" provides a useful avenue to help us understand the nature of the museum experience, both for those who worked in museums and for their more transient visitors. As the title of this essay indicates, recurring themes run through the analysis. These relate, naturally enough, to knowledge—and to how particular sorts of knowledge relate to material culture. A further theme highlights the frequency of conflict between the various parties involved, both in the creation and throughout the life of the museum, though instances of harmony can also be found. A third raises questions about how to evaluate the role of buildings in creating an effect on the individual, as foregrounded in the notion of "practices of place" and the "museum experience." In reality, architecture, place, and experience are inextricably linked, and the following sections will focus on each in turn.

#### MATERIAL STRUCTURES AND EXPRESSIVE ARCHITECTURE

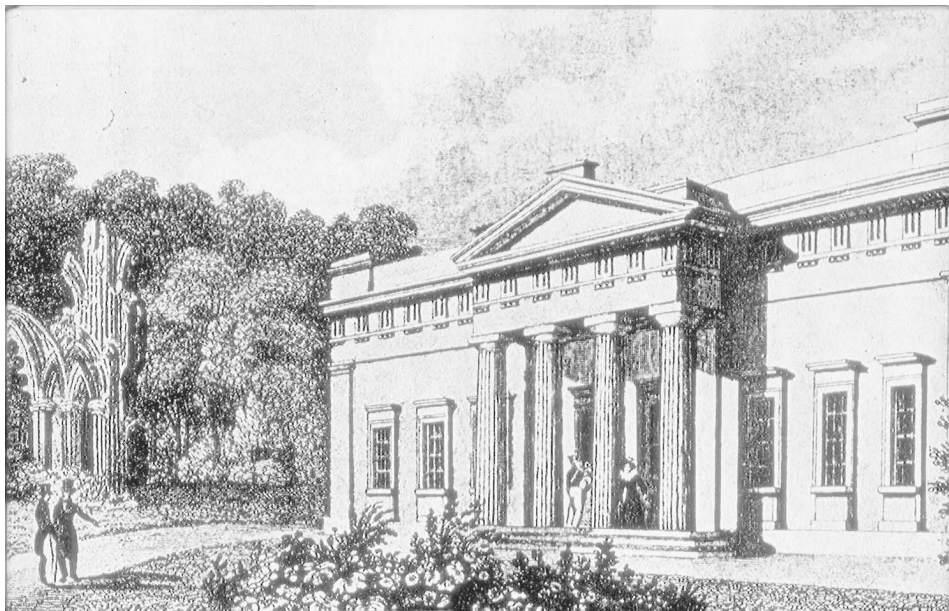
Buildings are artefacts in themselves, created at considerable expense and reflecting the intellectual and material context of the society in which they were founded.<sup>4</sup> In the case of a museum, the actual building (or its articulation within an existing building) is an integral part of the collection—and indeed this was the case long before the development of the formal museum building type. The degree to which the building exemplified a

<sup>3</sup> E.g., the Smithsonian Institution, started in 1847 and added to fairly continuously ever since, housed several different museums (artistic, historical, and scientific), a library, laboratories, and lecture theaters, as well as the International Exchange Office and, of course, private apartments for the director. See Cynthia R. Field, Richard E. Stamm, and Heather P. Ewing, *The Castle: An Illustrated History of the Smithsonian Building* (Washington, D.C.: Smithsonian Institution Press, 1993). For the relationship of the field and the laboratory to the museum see Dorinda Outram, "New Spaces in Natural History," in *Cultures of Natural History*, ed. N. Jardine, J. A. Secord, and E. C. Spary (Cambridge: Cambridge Univ. Press, 1996), pp. 249–265. Peter Galison has emphasized how diversely science was sited; see Galison, "Buildings and the Subject of Science," in *The Architecture of Science*, ed. Galison and Emily Thompson (Cambridge, Mass.: MIT Press, 1999), pp. 1–25. This volume includes studies of a number of museums.

<sup>4</sup> This is nicely brought out in Brigitte Schroeder-Gudehus, "Patrons and Publics: Museums as Historical Artefacts," *History and Technology*, 1993, 10:1–3.

“type,” the details of its initial design and construction, the development of the design, and the range of possible expressive meanings are always important. (See Figure 1.) Obviously the point of creation is the key moment at which scientific ideas are given material form, but the same opportunities arise if a museum expanded, moved to a new location, or did substantial rebuilding and refurbishment. Architecture indeed often provided the arena in which issues were thrashed out; sometimes such resolution was left too late, by which time it was impossible to change the design.

In the case of a museum, the client might be one person, a board of trustees, a government department, a city council, or any combination of all of these. Scientists were generally involved, but not always as closely as they might have liked. Relations between architects and their clients were, not surprisingly, often fraught, bedeviled by issues of cost as well as the inability of clients to visualize precisely what they were getting.<sup>5</sup> Furthermore, the architect was not always a qualified professional in the modern sense but might



**Figure 1.** *A Temple of the Muses—The Yorkshire Museum.* From Thomas Allen, *A New and Complete History of the County of York* (London: Hinton, 1828–1831), Vol. 1, facing p. 461. As befitted an institution with regional rather than local aspirations, the Yorkshire Museum adopted an impressive facade in Greek revival style, designed by the well-known architect William Wilkins (1778–1839), who also designed University College, London, in this style. An earlier design by Richard Hey Sharp with a simpler facade was revised by Wilkins, though the internal plan remained very similar. The museum is instantly recognizable as an institution devoted to culture and learning; its position in well-wooded gardens alongside the ruins of St. Mary’s Abbey gives it a romantic and reflective air, despite its location close to the center of the city.

<sup>5</sup> There is a perceptual difficulty in viewing a worked-up perspective presented for approval and then seeing it translated into an actual building. The use of painterly presentation drawings became a normal part of the design and approval process from the late eighteenth or early nineteenth century and was occasionally used earlier. For a useful introduction see Jill Lever and Margaret Richardson, *The Art of the Architect* (London: Trefoil, 1984).

instead be an amateur, a local builder or surveyor, a civil engineer, or even an army engineer.<sup>6</sup> Ideas about museums may also be studied through the competitions that took place periodically, and these in turn lead to other sources of contemporary comment.<sup>7</sup> In the later twentieth and the twenty-first centuries, the architectural competition is almost a *sine qua non* of any self-respecting museum board of trustees, eloquently indicative of visions and ambitions. A new museum building is a prestigious commission, offering architects the opportunity to make their mark on the international scene. But the degree to which architects, or indeed patrons, took account of the collections their designs were intended to house provides clues about the distance between architectural discourse and an understanding of science, as well as the personal relationships in each case.

For historians attempting to analyze historic buildings as buildings, the language of architectural writers is not always immediately helpful. Writers in the older historiographic tradition focused on the architect as individual creative genius. Analysis was therefore directed toward formal qualities of style and disposition; but this has changed radically over the last three decades.<sup>8</sup> Nevertheless, the architect and his attitude to style and disposition should not be dismissed as irrelevant. It is important to realize that Alfred Waterhouse's design for the Natural History Museum in London reflects its hidden metallic structure and, hence, that its style is not properly "Gothic" but, rather, a flexible eclecticism based on iron structures and terracotta facings. This is a building that is often referred to as a "cathedral of science," though that certainly does not encompass its architectural significance. "Cathedral" certainly was a term used by nineteenth-century writers, commentators, and even the occasional scientist, and it was therefore employed in the service of many different agendas.<sup>9</sup> Likewise, a "Gothic" style did not automatically confer some superior and respect-inducing status upon a building; nor did it always symbolize the

<sup>6</sup> Henry Cole's preferred designers and builders for the South Kensington Museum were army engineers. From the later nineteenth century relations were at times further complicated by architects' adoption of scientific practices, theories, materials, and even values, which did not necessarily make communication easier. Several of the essays in Galison and Thompson, eds., *Architecture of Science* (cit. n. 3), tackle these questions, particularly those in Sect. 4.

<sup>7</sup> Architectural competitions have been exhaustively analyzed in the case of certain iconic buildings, such as the Oxford University Museum, but not for many other lesser museums. For Britain there is an excellent (though not completely comprehensive) source in Roger H. Harper, *Victorian Architectural Competitions: An Index to British and Irish Architectural Competitions in "The Builder," 1843–1900* (London: Mansell, 1983). For the United States an index of competitions is available on the Web site of the Society of Architectural Historians, [www.sah.org](http://www.sah.org), which is being added to continuously. The Canadian Centre for Architecture in Montreal has extensive collections, including more recent competition papers.

<sup>8</sup> This may be exemplified in David Watkin, *The Rise of Architectural History* (London: Architectural Press, 1980), which charted the development of architectural history from 1700 and viewed with some skepticism Marxist theories that there was any necessary relation between social and economic conditions and architectural forms. Since that time, a number of different theoretical approaches have radically changed architectural writing; a selection is usefully set out in Neil Leach, ed., *Rethinking Architecture: A Reader in Cultural Theory* (London: Routledge, 1997).

<sup>9</sup> For this aspect of Waterhouse's design see J. Mordaunt Crook, *The Dilemma of Style* (London: Murray, 1989), pp. 143–144. Alfred Waterhouse was also unusually good at handling difficult clients and interpreting their desires; for his work and practice generally see Colin Cunningham and Prudence Waterhouse, *Alfred Waterhouse, 1830–1905: Biography of a Practice* (Oxford: Clarendon, 1992). Historians should be cautious about referring to the Natural History Museum, for example, as "Gothic revival," which was not how a contemporary architect would have described it; a "temple of science" it certainly was, in the eyes of its visitors and many in the scientific community. The distinction may seem trivial, but stylistic labels had expressive meanings attached to them that otherwise may be misread. Furthermore, such buildings were often treated in a thoroughly irreverent fashion by their visitors (mothers breast-feeding, children racing round the galleries). There is evidence both for and against a reverential attitude, though first-time visitors were more likely to be awestruck; see David N. Livingstone, *Putting Science in Its Place* (Chicago: Univ. Chicago Press, 2003), pp. 38–39.

wresting of authority by science from ecclesiastical hands. It might simply have been the preference of an architect who could very well have chosen any of a number of styles in an eclectic age when a Gothic style was deemed equally appropriate for railway stations, public toilets, and drinking fountains. One feature of competitions is the variety of stylistic entries and, likewise, the variety and ferocity of the arguments as to which among them should be chosen. Style was certainly one way in which buildings were meant to express and convey meanings, and never more so than in the nineteenth century. However, that same visual vocabulary always allowed for a range of meanings, and we should be alert to the differences of opinion, both then and since, as well as to the fact that quite unintended meanings might be drawn from particular buildings.

In a more general sense, buildings for museums were frequently sites where disputes about knowledge or institutional claims between rivals might be worked out. London's Natural History Museum was the center of complex overlapping conflicts about nature, about the purpose of the institution, between proposed architects, and within the scientific community, the press, and the wider London public.<sup>10</sup> The Smithsonian Institution was the focus of recurring battles about what purposes should be served by its castellated building, designed to be reminiscent of an Oxbridge college.<sup>11</sup> In Stockholm, the building of the new Swedish Museum of Natural History, completed in 1916, was dogged by sixteen years of intense debate and conflict between botanists and zoologists about its layout and architecture and which design would best capture the institutional identity of the new museum and the curators' needs.<sup>12</sup> In other cases, particularly where there was a strong director, building proceeded fairly smoothly, even where the scientific field concerned might be contested, such as at the Museum of Practical Geology in London. Here indeed a system of knowledge was encoded into the building, as was also the case with the Oxford University Museum.<sup>13</sup> Equally, changes in and adaptations of buildings indicate how particular systems became outmoded—or even did not fit from the beginning.

The physical aspects of the museum are important too when grappling with problems of usage and audiences. (See Figure 2.) Paula Findlen has shown that when the collector's *studio* became the *galleria* in early modern Italy, it was transformed from a place of solitude to a place of conversation and civil society, where pathways of friendship, collecting, and

<sup>10</sup> Carla Yanni, *Nature's Museums: Victorian Science and the Architecture of Display* (London: Athlone, 1999), provides an excellent account, her chapter on the Natural History Museum being titled "Nature in Conflict." A comparative example may be found in Mary P. Winsor, *Reading the Shape of Nature: Comparative Zoology at the Agassiz Museum* (Chicago: Univ. Chicago Press, 1991).

<sup>11</sup> The disputes are somewhat downplayed in the official history of the building, which provides a useful architectural history: Field *et al.*, *The Castle* (cit. n. 3). See also Kenneth Hafertepe, *America's Castle: The Evolution of the Smithsonian Building, 1840–1878* (Washington, D.C.: Smithsonian Institution Press, 1984). The battle between Joseph Henry and Charles Coffin Jewett over the shape of the Smithsonian ended in Jewett's being sacked; see Joel J. Orosz, *Curators and Culture: The Museum Movement in America, 1740–1870* (Tuscaloosa: Univ. Alabama Press, 1990), p. 206. Orosz argues that Joseph Henry and George Brown Goode of the Smithsonian laid the foundation for a dismissive history of pre-1870 U.S. museums as not properly professional, hence reinforcing a historiography that effectively sharply divided pre- from post-Smithsonian museums. Goode's influence on museum historiography is more fully examined by Sally Gregory Kohlstedt in her essay in this Focus section.

<sup>12</sup> Jenny Beckman, "Nature's Palace: Constructing the Swedish Museum of Natural History," *History of Science*, 2004, 42:85–111. The author argues that conflicts arose from a redefinition of its role as an educational institution, its banishment from central Stockholm to a suburb, problematic interactions between academics, and the continuing involvement of amateurs in different ways in botany as opposed to zoology.

<sup>13</sup> On the Museum of Practical Geology see Sophie Forgan, "Bricks and Bones: Architecture and Science in Victorian Britain," in *Architecture of Science*, ed. Galison and Thompson (cit. n. 3), pp. 181–208. For Oxford see Yanni, *Nature's Museums* (cit. n. 10), Ch. 3.



**Figure 2.** *Museum of Practical Geology, Jermyn Street, 1851.* From *Illustrated London News*, 24 May 1851, Vol. 18, no. 446. The entrance on Jermyn Street was relatively unassuming, but once inside the visitors' attention was first caught by a few well-placed cases, large exhibits (the oversized tazza on the right), colorful marbles and stones used on the walls and for plinths, busts of the founding fathers of geological science, and light penetrating from the galleries overhead (top right). The internal volume and spaciousness of the museum, which adeptly used the entire area between Piccadilly and Jermyn Street, could not be guessed from the outside.

visiting became an integral part of scientific culture.<sup>14</sup> The articulation of rooms and their layout within larger buildings marked how such changes took place. More recently, differentiation of users and their relative status has been encapsulated in the idea of a “front” and a “back,” spaces for the public and spaces for those who worked in museums or, perhaps, for those who could be regarded as qualified to work with collections not on show, as in the design for the Natural History Museum in London. The idea of front and back is still used today, in part to justify the museum as the site of important scholarly and educational functions and in part to entice the visitor with the promise of glimpses of things going on out of sight, a hint of inclusion as an insider.<sup>15</sup> The analysis of divisions

<sup>14</sup> Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley/Los Angeles: Univ. California Press, 1994), esp. Ch. 3.

<sup>15</sup> See, e.g., Andrew Burnett and John Reeve, *Behind the Scenes at the British Museum* (London: British Museum Press, 2001). The theatrical metaphor “behind the scenes” is strikingly appropriate for an institution devoted to display and relates to a history in nineteenth-century London where crossovers in genre and techniques between the theater, the lecture hall, and the museum were not infrequent. See Iwan Morus, “More the Aspect of Magic Than Anything Natural’: The Philosophy of Demonstration in Victorian Popular Science,” and Bernard Lightman, “Sites of Amusement and Instruction: Popular Lecturing in the Economy of Science”: papers presented at the conference “Popular Science: Nineteenth-Century Sites and Experiences,” York University, Toronto, 2004. Another variant is the division between “upstairs” and “downstairs,” which was used to encode a hierarchy of world cultures into the fabric of the building housing the University of Pennsylvania Museum of Archaeology and Anthropology; see Steven Conn, *Museums and American Intellectual Life, 1876–1926* (Chicago: Univ. Chicago Press, 1998), pp. 87–98.

within buildings derives from Foucauldian ideas of maps of knowledge and disciplining audiences through surveillance, but it also draws on notions about heterotopias, centers of attraction and places of exclusion.<sup>16</sup> While useful in revealing a particular moment in the institution's history, physical divisions were, however, apt to change, and walls are more permeable than they might at first appear. A valuable additional dimension therefore is provided by examining the larger context of sites and place.

#### FROM SPACES TO SITES: LOCATION AND THE PARTICULARITY OF PLACE

Recent work has explored the conundrum that while science ostensibly derives its authority from its universality and placelessness, historians increasingly emphasize the way authority is closely related to how and where it is sited; hence the shorthand phrase "situated rationality." David Livingstone's synoptic survey, *Putting Science in Its Place*, adeptly emphasizes the defining character of location, whether in terms of site, region, or the circulation of knowledge.<sup>17</sup> For Livingstone, the museum occupies a distinctive niche in the development of scientific enquiry, both as a site of accumulation where objects were arranged in specified orders and as the location where people were taught to look at the world, to value the past, and to visualize relations between specimens. Other writers have emphasized the importance of museums in configuring geographies of power and space or the role of metropolitan museums in constructions of knowledge that endorsed imperial policies.<sup>18</sup>

It is indeed almost taken for granted that museums in towns were sites of civic status and reputation, where buildings denoted respectability and acceptance into the ranks of the local bourgeois elite. There is, however, more to be learned about the ways that museums were both an ornament to the city and, as such, an ornament to science. Museums and their associated activities should be placed within current work on urban cultures, where the themes deal with the public sphere and the varying ways that culture was constituted, with ritual spaces and the rites of civic culture. Even small societies in relatively remote places ensured that they were seen as publicly useful bodies that contributed to the common good, and their public presence often centered on the creation of a local museum.<sup>19</sup> But were these simply variations on a theme, without real variations in local

<sup>16</sup> Eileen Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London: Routledge, 1992), remains a classic Foucauldian analysis, which was partially modified but also reinforced, particularly with regard to surveillance and self-policing, by Bennett, *Birth of the Museum* (cit. n. 2). See also Thomas A. Markus, *Buildings and Power: Freedom and Control in the Origin of Modern Building Types* (London: Routledge, 1993).

<sup>17</sup> Livingstone, *Putting Science in Its Place* (cit. n. 9). See Crosbie Smith and Jon Agar, *Making Space for Science: Territorial Themes in the Shaping of Knowledge* (Basingstoke/London: Macmillan, 1998), for an examination of "spaces" as opposed to "sites," which is more often used by historians of science at present and carries perhaps a lesser freight of theorization.

<sup>18</sup> Bennett, *Birth of the Museum* (cit. n. 2), has emphasized both aspects. On the latter see Annie E. Coombes, *Reinventing Africa: Museums, Material Culture, and Popular Imagination in Late Victorian and Edwardian England* (New Haven, Conn.: Yale Univ. Press, 1994); and Tim Barringer and Tom Flynn, eds., *Colonialism and the Object: Empire, Material Culture, and the Museum* (London: Routledge, 1998). Exploitation of colonial objects was not entirely one-way, however, as shown by Ruth Barton, "Haast and the Moa: Reversing the Tyranny of Distance," *Pacific Science*, 2000, 54(3):251–263.

<sup>19</sup> On museums as sites of civic status and reputation see, most recently, Kate Hill, *Culture and Class in English Public Museums, 1850–1914* (Aldershot: Ashgate, 2005). On nineteenth-century urban culture more generally see Simon Gunn, *The Public Culture of the Victorian Middle Class: Ritual and Authority and the English Industrial City, 1840–1914* (Manchester: Manchester Univ. Press, 2000). A recent investigation of the work of some small local societies is Diarmid A. Finnegan, "Natural History Societies in Late Victorian Scotland and the Pursuit of Local Civic Science," *British Journal for the History of Science*, 2005, 38:53–72; he also explores the various ways in which women were allowed to be involved.



knowledge or local forms of organization? Much work has been done on natural history and its museums, but comparative studies are still generally lacking. Such studies would help us to see whether the sorts of conflict described earlier were radically dissimilar in different places, how problems arising from location were faced, and how scientific museums in different places and countries related to the larger museological world of which they were a part.

The importance of museums in major metropolitan centers cannot be overstated. This is obvious from the nineteenth century onward, especially in the clustering of museums—arts and sciences together—in museum quarters, such as in South Kensington in London or the Museumsinsel in Berlin. In Vienna, museums were part of a formal urban design scheme aimed at enhancing the city and impressing the visitor with the magnificence and importance of its institutions. Location and expertise together helped to create trust in the authoritative nature of knowledge. To site the Smithsonian in The Mall in Washington, D.C., was to give it immediate clout. We should also be alert to the fact that while in the nineteenth century only capital cities or major provincial towns established prestigious museum buildings, this is happening today in a host of other places. In part this is driven by competition and by urban regeneration schemes, both in the United States and in Europe, although it should be noted that using museums as agents of urban development is nothing new, and sensitivity to the politics of urban growth may be suggestive of rather different civic attitudes to the value of museums.<sup>20</sup> Another possibility is that museum creation in the European Union may be a response to the submerging of nations and a reemphasis on the region as the key unit. Regions build museums as a badge of identity, though they may choose international architects to convey that identity. The type and style of a museum, whether scientific or otherwise, is a response to geopolitical imperatives, but couched in a particular cultural language.<sup>21</sup>

While the respectability of institutional buildings, at least initially, lends credibility to the knowledge embedded within museum displays and activities, there are other aspects that may be examined. A site may be acquired and a suitable edifice erected, but the resulting building is rarely isolated from its context and may be affected by the type and reputation of neighboring urban elements. Historians of science should be alert to such possibilities, and we can employ a “close focus” on the particularity of each element, such as the street or the square or the urban district, looking at the life lived in them and the

<sup>20</sup> Not all museums managed to obtain, or retain, central sites in good positions. Some were encouraged to build in marginal areas in the hope that development there would be stimulated—e.g., the Museum of Natural History in Boston (1864) in Back Bay, a fill-in project, or the American Museum of Natural History in New York (1877), on the outskirts of the new Central Park. The timing of urban development in such cases was clearly crucial. For a survey of American natural history museums, which includes this suggestion and much useful material on their architecture and organization, see 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).

<sup>21</sup> This was the view of one Austrian commentator: “Today, decentralisation no longer means simply the actual regionalisation of arts policy, but is an expression of the equal standing of developed cultural-historical landscapes in a large-scale supra-national European context. The Europe of the future will also be a Europe of regions.” Wolfdieter Dreiholtz, *Museums-Positionen/Museum Positions* (Salzburg: Residenz, 1992), p. 226. Frankfurt in the 1980s sought to redefine itself through the creation of a number of new museums. However, science and technology were not among the subjects covered, which says much about the place of science in contemporary urban public culture. On Frankfurt see Michaela Giebelhausen, “Symbolic Capital: The Frankfurt Museum Boom of the 1980s,” in *Architecture of the Museum*, ed. Giebelhausen (cit. n. 2), pp. 75–107.

ways in which it was represented. What, for example, were the effects—if any—on the Museum of Practical Geology of the two Turkish bath establishments in the same street, one of rather questionable reputation? At a broader level, there are questions of how the particular class of institutions that museums are fits within studies of urban modernity, such as that undertaken by Lynda Nead in *Victorian Babylon*.<sup>22</sup> Questions of gender, with regard both to curators and to audiences, raise important issues that are only beginning to be studied, as Sally Gregory Kohlstedt argues in her essay in this Focus section. Questions relating to commodification need to be probed, rather than taken for granted. For example, museums in Britain from at least the 1880s—and in some cases earlier—were open on Sundays. A museum that is open on Sunday stands in a different relationship to the city than a museum that is open only on weekdays, when shops are also open and pedestrians or *flâneurs* easily metamorphose into customers. How do museums mediate between culture and commerce, a challenge that is all too obvious in the modern museum, which has ever-increasing space devoted to consumption? The activities of those on the premises may be predicated on any number of assumptions; and that leads us to the problem of how to analyze individual behavior.

#### PRACTICES OF PLACE: SPACES AND THE MUSEUM EXPERIENCE

Buildings—their sites and surroundings, their internal spaces, their external facades—all have qualities that affect both regular inhabitants and temporary visitors. The skilled architect deliberately manipulates the internal volumes, the solidity of walls, the play of light and shadow, the effects of scale and atmosphere, in order to create a building that is memorable and achieves the desired impact. Although architects often talked about “form” as merely the consequence of proper attention to a building’s “function,” we should not forget that, in the often-quoted words of Le Corbusier, “architecture is the masterly, correct and magnificent play of masses brought together in light.”<sup>23</sup> Architecture is designed to appeal first to the emotions and then to the intellect.

Several areas of scholarship are relevant here. The first concerns the emphasis on wonder, long embedded in the vocabulary of museum display, as the term *Wunderkammer* suggests. The chronology and attributes of wonder are being reworked.<sup>24</sup> What is now termed the “Wow!” factor is arguably a direct descendant. Wonder is, moreover, linked to the well-acknowledged fact that museums were places for civilizing the working classes by diverting restless minds into acceptable forms of learning and encouraging a reverential frame of mind at the magnificence of a God-created world. Hence the extraordinarily long hours that the South Kensington Museum stayed open, so that it might be available to

<sup>22</sup> Lynda Nead, *Victorian Babylon: People, Streets, and Images in Nineteenth-Century London* (New Haven, Conn.: Yale Univ. Press, 2000). A close focus of the sort I have in mind may be seen in the emphasis on “science in the city as local practice” by the editors and in several of the essays in Sven Dierig, Jens Lachmund, and J. Andrew Mendelsohn, *Science and the City, Osiris*, 2003, 18.

<sup>23</sup> Le Corbusier, *Towards a New Architecture* (London: Architectural Press, 1946), p. 31 (first published in France in 1923).

<sup>24</sup> Wonder is today recognized as having been an integral part of museum display through to the nineteenth and even the twentieth century. The extensive scholarship on spectacle and the emphasis on showmanship is part of this historiography, from Richard D. Altick’s monumental *The Shows of London* (Cambridge, Mass.: Belknap, 1978) to, e.g., Iwan Rhys Morus, *When Physics Became King* (Chicago: Univ. Chicago Press, 2005), esp. Ch. 4: “The Science of Showmanship,” and Barbara M. Benedict, *Curiosity: A Cultural History of Early Modern Inquiry* (Chicago: Univ. Chicago Press, 2001), which covers the period from the seventeenth century to the 1820s.

working men after hours. Other scholars have characterized the museum as a ritual space where a variety of civilizing rituals might be enacted, “in which all aspects of the museum play their part.”<sup>25</sup> In the modern museum, therefore, we find a range of supporting facilities, such as quiet spaces, sitting areas, tearooms, or even sculpture courts for reflective meditation. The ways in which scientific museums were “civilizing” is a fruitful direction for research, investigating how the “proper” frame of mind was created in the visitor.<sup>26</sup>

Recent work on embodiment—the importance of the body of the scientist and, indeed, of the reader and the spectator—is relevant here.<sup>27</sup> If we consider the museum visitor as an active participant, we can begin to relate buildings and spaces to types of audience reception, both intended and unintended. A consequent advantage is that such an approach gets away from a narrative that is centered on displays of knowledge disseminated to a passively receptive audience or on buildings that are similarly mutely accepted by visitors. A building or a space is saturated with qualities that have both an emotional and an intellectual impact. While rationality is situated, so too are people. Museum spaces are spaces of lived experience, for individuals and groups of people.<sup>28</sup> One example—a description of a visit to the Museum of the Royal College of Surgeons (see cover) in 1850—may serve to demonstrate the complexity of the visiting experience:

[The building] presents a cold stone, stately classic front, adorned by a row of tall Grecian columns, under which we pass to enter the place. In two minutes we are in a different world. Without, we left an atmosphere of life and living bustle; within, we find a stiller, calmer company. We walk amidst an abundant harvest yielded by death to teach the lesson of how life continues, and we come in absolute contact with some things that moved upon the earth before the Flood. About us are innumerable forms in which life has been. Now all are quiet in the serene dignity of death.<sup>29</sup>

There are numerous elements here that could be highlighted—wonder, repulsion, awe, lessons of morality and mortality, the chill of contact with long-dead beings, reverence, silence, serenity. The experiences of audiences are infinitely variable and may be linked

<sup>25</sup> Michael Brawne, *The New Museum: Architecture and Display* (New York: Praeger, 1965), p. 203. More generally, see Carol Duncan, *Civilizing Rituals: Inside Public Art Museums* (London: Routledge, 1995). There has also been renewed interest in recent years in the work of sociologists such as Norbert Elias on ritual and behavior as a force in the “civilizing process.”

<sup>26</sup> E.g., Sam Alberti argues that while a sense of wonder might be induced, at the same time the imagination was stimulated by feelings of horrid fear or disgust: Samuel J. M. M. Alberti, “The Museum Affect: Visiting Collections of Anatomy and Natural History in Victorian Britain,” paper presented at the conference “Popular Science: Nineteenth-Century Sites and Experiences,” York University, Toronto, 2004.

<sup>27</sup> Christopher Lawrence and Steven Shapin, eds., *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago: Univ. Chicago Press, 1998). The introduction provides a survey of the relevant literature on the self, the body, and society and how historians have responded to these philosophical and sociocultural theories. The authors in the recent *Isis* Focus section on “Scientific Readers” also emphasized the role of the body: *Isis*, 2004, 95:420–448.

<sup>28</sup> A new sensitivity to this sort of approach by historians of urban history is summed up in their current call for papers on “Lived Time in the City” for a conference to be held in 2006. A relevant direction too is the attention paid by some architectural historians to phenomenology, with arguments for a greater openness to the realm of the sensory as revealing a potentially deeper truth; see, e.g., Dalibor Vesely, *Architecture in the Age of Divided Representation: The Question of Creativity in the Shadow of Production* (Cambridge, Mass.: MIT Press, 2004). Phenomenology, however, is not so widely studied or regarded in the Anglophone world as in Europe, though see the remarks of Christopher Lawrence and Steven Shapin, “Introduction,” in *Science Incarnate*, ed. Lawrence and Shapin (cit. n. 27), p. 6.

<sup>29</sup> [Frederick Knight Hunt], “The Hunterian Museum,” *Household Words*, 14 Dec. 1850, pp. 277–282, on p. 279. Hunt was a medical journalist; see *Oxford Dictionary of National Biography* (Oxford: Oxford Univ. Press, 2004), Vol. 28, p. 838.

to the inner world of the imagination. The imagination is not simply stimulated by the eye but is shaped by all five senses, including even taste.<sup>30</sup> As early as 1856–1857 the South Kensington Museum erected temporary Refreshment Rooms, and such a facility was soon incorporated into the permanent buildings.<sup>31</sup> While obviously the eye is the most important, studies of museums have perhaps privileged it over the other senses to an inappropriate extent; some balance could be restored by looking more comprehensively at the body of the visitor. “Looking” in the museum requires standing in space, movement through space, and mobilizing the senses to create attention, before any response or understanding of what is exhibited can be achieved. (See Figure 3.)

#### AN ARCHITECTURE OF MUSEUMS IN HISTORY OF SCIENCE?

Museums have many claims on the historian’s interest. There is still much uncharted territory—for example, the personality museum, which is often located in the birthplace, home, or former workplace of a scientist.<sup>32</sup> Few would deny the importance of Down House for understanding Darwin’s career and the shaping of his science. The scientific museum may also be the result of specific regional or political imperatives—the creation of numerous atomic museums is testimony to the pervasive influence of nuclear agencies in the postwar United States.<sup>33</sup>

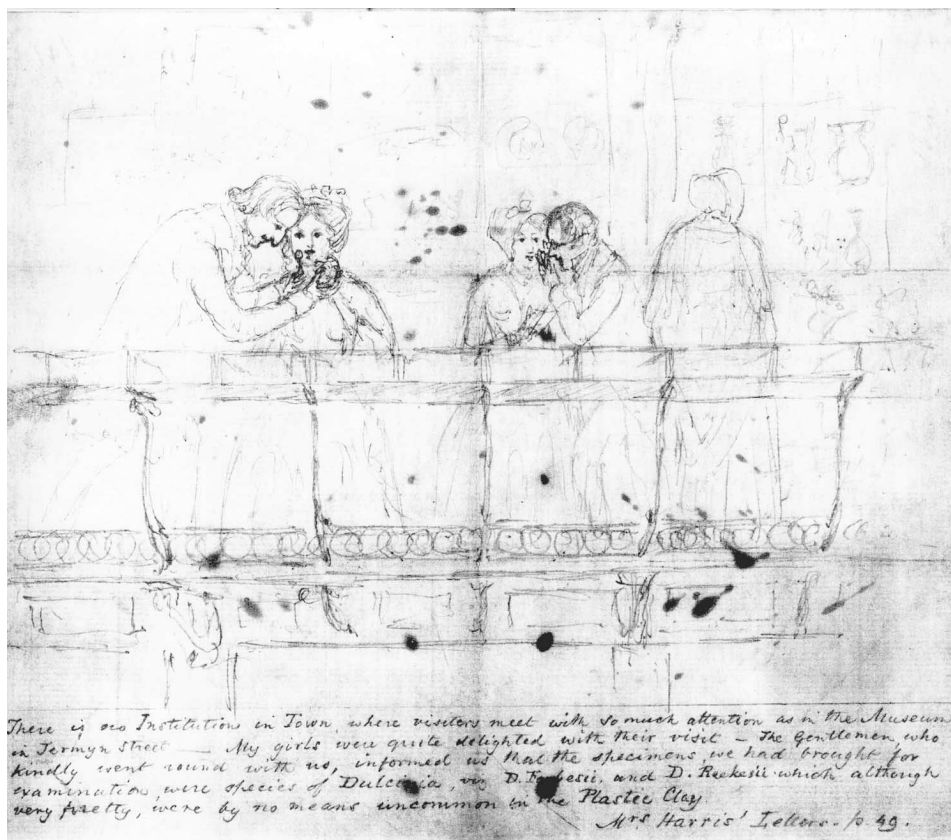
At the beginning of this essay, I wrote that museums “stand” at the intersection of science and display. It would be more precise to say that the intersection is never stable, that the physical, intellectual, and material context of the museum is constantly changing. Buildings were, and still are, expressive of ideologies encoded into their structure, though those ideologies were not necessarily long-lived, and we should be careful not to overanalyze the role of architecture. Struggles over knowledge, conflicts of disciplinary and personal interest, were acted out in the architectural arena, where communication and understanding between architects and nonarchitects was already difficult. The particular location of a museum could materially affect its standing and its outlook in a multitude of different ways. Individual scientists and curators regarded the visitor as a distraction or, occasionally, as having some degree of usefulness, depending on the contemporary shape of their discipline. Visitors’ experiences of buildings and displays were, and still are, mediated by contemporary norms of sensory response and practices of place, and there are exciting ways that we may start to study these. Science museums today have to struggle to retain

<sup>30</sup> This may not seem so surprising when one remembers that the modern museum designer increasingly employs devices to touch all the senses—canned music, noises, silence, space, touchy-feely exhibits, touch screens, responsive exhibits, talking heads, smells, and so on. Barbara J. Black’s study *On Exhibit: Victorians and Their Museums* (Charlottesville: Univ. Virginia Press, 2000) examines links with the inner world of the imagination, looking chiefly at the literary representation of the museum.

<sup>31</sup> John Physick, *The Victoria and Albert Museum: The History of Its Building* (London: Victoria & Albert Museum, 1980), pp. 30–31, 109–110. There were first-class and second-class rooms, with different menus, thus ensuring that appropriate sensory satisfaction was linked to social norms.

<sup>32</sup> Such museums commemorate, e.g., Darwin, Newton, Freud, Jenner, Faraday, the Herschels, and many others. In some cases the location provides intriguing insights—e.g., the museum erected to honor that expatriate Scot, Alexander Graham Bell, near his holiday home at Baddeck, Cape Breton Island, which includes the contents of his workshop.

<sup>33</sup> Janet Browne entitled the second volume of her magisterial study *Charles Darwin: The Power of Place* (London: Cape, 2002). I am indebted to her for allowing me to borrow the phrase as part of the title of this essay. On Down House as a shrine see also Sophie Forgan, “Darwin and the Museum,” in *Thinking Path*, ed. Shirley Chubb (Shrewsbury: Shrewsbury Museums Service, 2004), pp. 37–41. On atomic museums see Arthur Molella, “Exhibiting Oak Ridge,” *Hist. Technol.*, 2003, 19(3):211–226.



**Figure 3.** Species of close attention at the Museum of Practical Geology, Jermyn Street, Papers of A. C. Ramsay 4/5/3. Ramsay worked in the Geological Survey and was also Professor in the Royal School of Mines from 1852. The caption reads: "There is no institution in town where visitors meet with so much attention as in the Museum in Jermyn Street. My girls were quite delighted with their visit. The gentlemen who kindly went round with us, had informed us that the specimens we had brought for examination were species of the *Dulcinea*, viz. *D. Forbesii*, and *D. Reekesii* which although very pretty, were by no means uncommon in the Plastic Clay. Mrs. Harris." This is of course an elaborate joke about Edward Forbes and Trenham Reeks of the Survey paying particular attention to pretty visitors (*Dulcinea*—"sweetness"), which perhaps reveals something of the attitude of professionals who worked within the museum to the supposed ignorance of visitors, as well as the normal pleasures of flirting. The scientific museum, however, does not seem to have featured often as a site of romantic assignation. Reproduced by courtesy of the Archives of Imperial College, London.

their place as a principal forum for the display of science, in competition with other sites and spectacular technologies, often by appropriating the techniques of their rivals.<sup>34</sup>

A final thought for the historian: buildings have enormous transformative potential.

<sup>34</sup> These rivals include shopping centers, science centers, television, and the Web. The response of museum designers in architectural and display terms is studied in Luca Basso Peressut, *Musei per la scienza/Science Museums* (Milan: Lybra Immagine, 1998) (text in Italian and English), which includes a worldwide discussion of traditional museums, discovery centers, themed museums, and the "scattered science museum" or large-scale ex-industrial site. With regard to the appropriation of techniques, note the crossover between entertainment and science in the London Science Museum's 2005 exhibition on the film of *The Hitchhiker's Guide to the Galaxy*, which includes a button for the Improbability Drive!

Museums die only if their collections are dispersed, but buildings may be changed and altered at will—and never more so than today. Shrines of industry and technology are metamorphosed into museums—as when power stations become art galleries (Tate Modern) and textile mills are turned into working museums (as in Manchester and Leeds in the United Kingdom or Lowell in Massachusetts) and steel mills into science centers (“Magma” in Rotherham, U.K.). Museums may be marvels of architectural bravura, drawing on technological expertise and images.<sup>35</sup> Cities become museums, with their cultural quarters and conservation areas, and suburban districts claim World Heritage status (Greenwich and Kew, London). Attention to the complexities of museum architecture, alongside studies of location, practices, and audiences, will lead to a greater understanding of how science is constantly and competitively repositioned within the economic, cultural, and intellectual spaces of the age.

<sup>35</sup> The architecture may in some cases overshadow the exhibits, and there has been some criticism of superb buildings that contain collections of only marginal interest. See, e.g., Keith Stewart Thomson, “Museums: Dilemmas and Paradoxes,” *American Scientist*, 1998, 86(6):520.