# Designing Penfield: Inside the Montreal Neurological Institute


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# Designing Penfield: Inside the Montreal Neurological Institute

Annmarie Adams

SUMMARY: Neurosurgeon Wilder Penfield (1891–1976) envisioned hospital architecture as a powerful medical tool. Focusing on two key interiors in the 1934 Montreal Neurological Institute (MNI)—the operating room and the foyer—this article engages newly accessible textual and material evidence to show Penfield's intense involvement in the design of the building. A unique, tri-level surgical room, with a sophisticated setup for photography, made the MNI's surgery interactive. The OR is discussed with regard to the relationship of doctors and architects and Penfield's penchant for architectural travel. Subsequently, we visit the foyer as a spatial counterpoint to the operating room. Its design enabled a particular, Penfield-inspired view of the brain and recounted neurological history in the language of Art Deco design. An emphasis on axial movement pushed visitors to "consume" a work of sculpture, meticulously copied from another in Paris. The architecture of the MNI thus monumentalized Penfield's accomplishments, by his own design.

KEYWORDS: architecture, design, interiors, photography, sculpture, neurosurgery, Wilder Penfield, neurology, Montreal Neurological Institute, hospitals

The Montreal Neurological Institute (MNI or "the Neuro") opened on September 27, 1934, to great fanfare. Dozens of well-known medical personalities came from afar to congratulate Wilder Penfield (1891–1976), their colleague and the MNI's founding director, and to officially inaugurate the long-planned building. Located just to the east of Montreal's Royal Victoria Hospital (RVH), it was also adjacent to McGill University,

I am grateful to McGill students Justin Bouttell, Leina Godin, Ipek Mehmetoglu, Magdalena Miłosz, Adriana Mogosanu, Laura O'Brien, and Jennifer Tu-Anh Phan for research assistance with this article over several years. Also thanks to Duncan Cowie, Richard Leblanc, and Rolando Del Maestro for access to the MNI and its rich archives; and to Kate Williams at Magog Meadows. Alexandra Kohn, Yves Lapointe, Chris Lyons, Gwendolyn Owens, Lily Szczygiel, Mary Yearl, and the staff at the Osler Library were extremely helpful. Daniel Chartrand, Delia Gavrus, Jeremy Greene, Mary Hunter, and David Theodore read early versions of this work and made useful suggestions.

with which it was closely affiliated. Funded by the Rockefeller Foundation, the new MNI was the product of many years' collaboration between Penfield and Montreal-based architect Robert Macdonald (1875–1942).

Historian of medicine Delia Gavrus writes that "medical identity is negotiated through various cultural practices, such as esthetic choices, public displays and iconography, and rhetoric."[1] Accordingly, I contend that Penfield used architecture, specifically the architecture of the new MNI, to express his place in the medical world. Some historiographical studies investigate the hospital as a site where professional identities were produced, negotiated, and communicated among various actors within and outside the hospital setting.[2] Others delineate the role of social and political forces or technological advancements in transforming diagnostical or organizational structures within the hospital since the nineteenth century.[3] I posit that Penfield saw hospital architecture not as a backdrop against which medical history unfolded but rather as an active agent with the power to facilitate scientific advancement and communicate medical professional identity to colleagues, patients, and medical students.

Stephen Casper and Gavrus encourage historians of science and medicine to engage with what they call "marginal" histories of neuroscience: histories that are perceived as unusual, small, or liminal in relation to dominant narratives.[4] Historian of medicine Rachel Elder makes such a

1. Delia Gavrus, "Men of Dreams and Men of Action: Neurologists, Neurosurgeons, and the Performance of Professional Identity, 1920–1950," *Bull. Hist. Med.* 85, no. 1 (2011): 57–92, quotation on 60; see esp. her notes 7 and 8.

2. For example, Susan C. Lawrence, *Charitable Knowledge: Hospital Pupils and Practitioners in Eighteenth-Century London* (Cambridge: Cambridge University Press, 1996).

3. See Brian Abel-Smith, *The Hospitals, 1800–1948: A Study in Social Administration in England and Wales* (London: Heinemann, 1964); Kenneth M. Ludmerer, "Writing the History of Hospitals: An Essay Review," *Bull. Hist. Med.* 56, no. 1 (1982): 106–9; Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1995); on the history of hospitals and communities, see Christopher Bonfield, Jonathan Reinarz, and Teresa Huguet-Termes, ed., *Hospitals and Communities, 1100–1960* (Oxford: Peter Lang, 2013).

4. Delia Gavrus and Stephen T. Casper, "Introduction: Technique, Technology, and Therapy in the Brain and Mind Sciences," in *The History of the Brain and Mind Sciences: Technique, Technology, Therapy*, ed. Stephen T. Casper and Delia Gavrus (Rochester, N.Y.: University of Rochester Press, 2017), 1–24, quotation on 12. For more sources on the history of neurology and neurosurgery, see Stephen T. Casper, *The Neurologists: A History of a Medical Specialty in Modern Britain, c. 1789–2000* (Manchester: Manchester University Press, 2014); Robert B. Aird, *Foundations of Modern Neurology: A Century of Progress* (New York: Raven Press, 1994); Frank Clifford Rose, ed., *A Short History of Neurology: The British Contribution, 1660–1910* (Oxford: Butterworth-Heinemann, 1999); Robert L. Grubb, *Neurosurgery at Washington University: A Century of Excellence* (St. Louis, Mo.: Washington University, 2011); Smith Ely Jelliffe, *Fifty Years of American Neurology: An Historical Perspective*, ed. Arthur S. Link and Leila M. Melson (Winston-Salem, N.C.: Stratford Books, 1998).

contribution in her article that focusses on the role of patients, rather than on Penfield himself, in advancing neurosurgery.[5] Here, I contribute a focused study on the unexamined connection between medical visualization, neurosurgery, and Penfield's fascination with architecture and design. By investigating two extraordinary interiors, I demonstrate how a famous neurosurgeon mobilized design in service of his legacy. Penfield was more than just a practitioner interested in architecture; he understood that architectural design could make his work more successful. His comfort in the realms of architecture, decoration, sculpture, drawing, and photography indicate a generalized interest in visualization. An underlying interest in visual communication may even have sparked his devotion to medical visualization. As we shall see, he understood the agency of architecture for medical innovation—that good design would facilitate good neurology—and used it to enhance the significance of his work.

Because of its close affiliation with the RVH, the new Neuro "resembled a high-rise, fortified castle" (Figure 1).[6] Architects Ross & Macdonald had looked to the RVH for inspiration, employing the same gray limestone, steeply pitched roofs, crenellated end walls, protruding bays and entryways, and multiple window sizes as had been used on the neighboring Victorian-era hospital. The architecture of nearby McGill University, too, was an inspiration for the neurological hospital. Designed in a similar style of isolated, villa-like, limestone buildings, McGill's architecture was an explicit nod to the Scottish roots of the university as well. The 1934 Neuro had this same look, featuring a central, narrow, ten-story tower that gave way to a picturesque grouping of smaller elements: some capped by a gable roof and others flat, almost appearing as if constructed at different times, as in a series. The organization of the plan and the building's unique cross section were specially designed to fit between the university's sports stadium, to its rear, and the venerable RVH, which it faced.[7] In every sense, that is, the new Neuro was custom designed for its site and its mission.

Although the Neuro's exterior recalled the nearby hospital, the university, and even the historic buildings of Scotland, its interior featured up-to-date and distinctive technologies. The entry lobby, for example, was

5. Rachel Elder, "Speaking Secrets: Epilepsy, Neurosurgery, and Patient Testimony in the Age of the Explorable Brain, 1934–1960," *Bull. Hist. Med.* 89, no. 4 (2015): 761–89.

6. Annmarie Adams and William Feindel, "Building the Institute," in *The Wounded Brain Healed: The Golden Age of the Montreal Neurological Institute, 1934–1984*, ed. William Feindel and Richard Leblanc (Montreal: McGill-Queen's University Press, 2016), 441–58, quotation on 449.

7. "The Montreal Neurological Institute," *Journal, Royal Architectural Institute of Canada* 11, no. 10 (October 1934): 140–45.

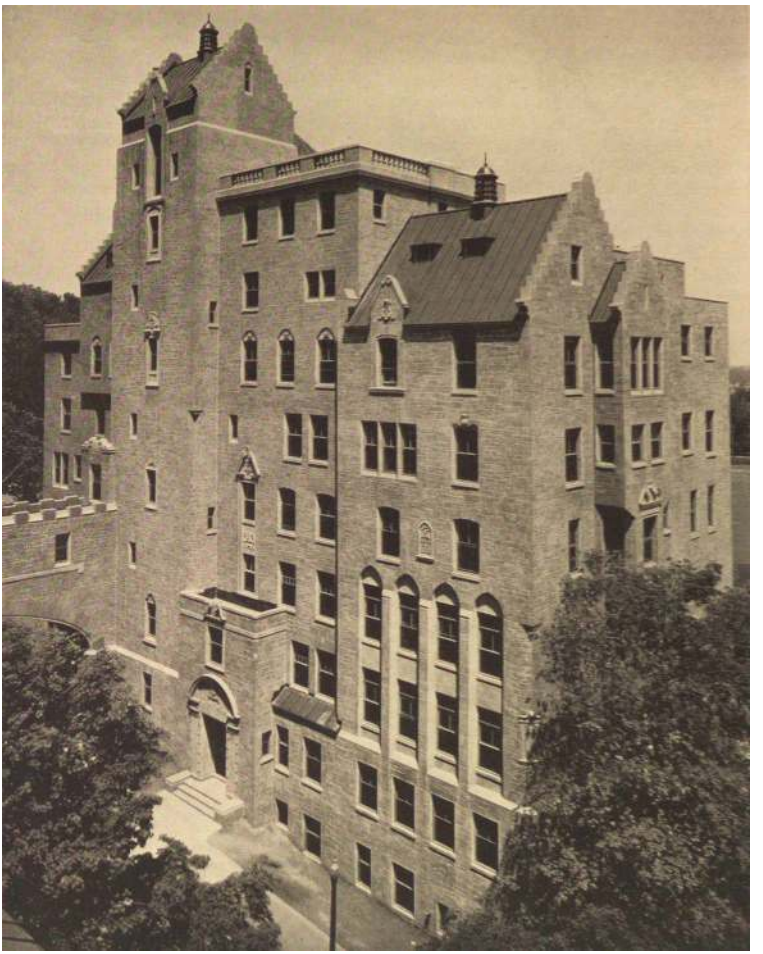

Figure 1. The Montreal Neurological Institute. Published in the *Journal, Royal Architectural Institute of Canada* 11, no. 10 (October 1934).

distinguished by its Art Deco styling, with coordinated décor, furniture, and art. Wilder Penfield understood the power of a building with a conservative exterior and cutting-edge interiors. "But the significance of the building lies in the thing which it houses. The building is only a shell," he said at the opening.[8]

8. Wilder Penfield, "The Significance of the Montreal Neurological Institute," in *Neurological Biographies and Addresses: Foundation Volume* (London: Oxford University Press, 1936), 37–54, quotation on 52.

This study thus examines two interiors at the MNI: the entry lobby and an operating room, known as OR1 (Figure 2). Both spaces are fully operational today. Located on the fifth floor, at the building's south-east corner, OR1 comprises three levels connected in a distinctive cross-sectional arrangement: a five-hundred-square-foot room for surgery, an observation gallery, and a sophisticated photographic setup below the gallery's seats, accessible by trap door (Figure 3).[9] Differentiated from most surgeries of the interwar years by its cross section, OR1 allowed viewers and a photographer to get a relatively close and mostly downward view of the patient, simulating the views of the surgeons performing the operation. The design also included an audio connection, enabling continuous verbal communication between the viewers, surgeons, and photographers. And a bell could summon colleagues from throughout the building to the space to see something special or particularly interesting during a surgical intervention.

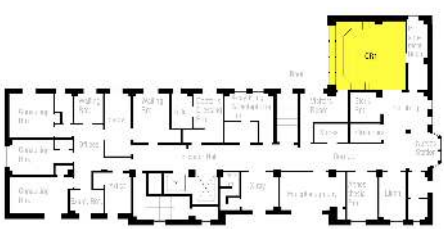

Figure 2. The fifth floor plan of the Montreal Neurological Institute showcases the unique planning of the operating room (OR1). Drawing by Leina Godin from an original drawing, 1933, Canadian Centre for Architecture/Centre canadien d'architecture.

9. Note that Guenther refers to this as a "neighbouring room," but it is part of the same space in architectural terms. Katja Guenther, "Between Clinic and Experiment: Wilder Penfield's Stimulation Reports and the Search for Mind, 1929–55," *Can. Bull. Med. Hist.* 33, no. 2 (2016): 281–320, quotation on 292.

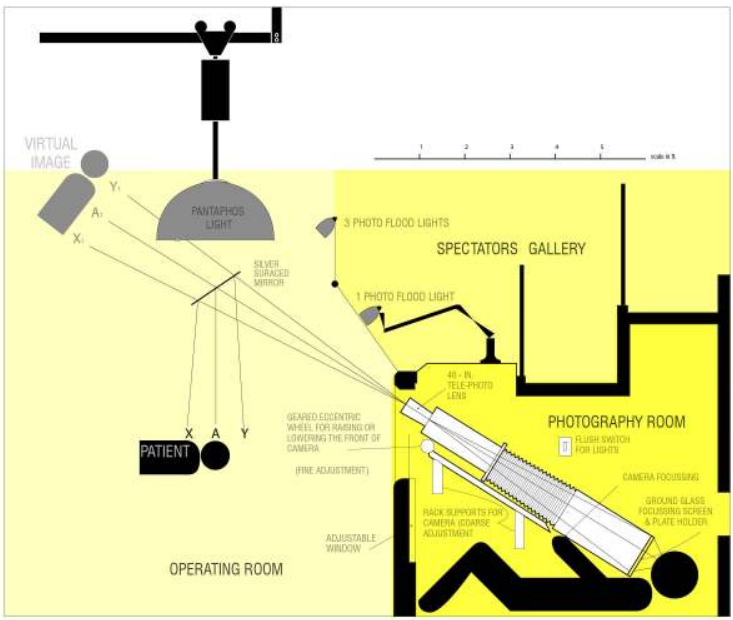


Figure 3. Sectional drawing showing the position of the photographer's perch beneath the operating room. Drawing by Leina Godin from an original published in H. S. Hayden, "A New Technique for Surgical Photography in the Operating Room," *Photographic Journal* 76 (April 1936).

In this "institutional ecosphere that Penfield constructed for himself in Montreal,"[10] then, surgery became much more than a "spectacle"[11] performed by surgeons, but rather was an interactive and multispace event, whereby "actors" in the operating room and beyond were involved in the performance.[12] A photograph from 1968 illustrates this unusual dynamic

10. Katja Guenther, "In the Operating Room: Wilder Penfield's Stimulation Reports and the Discovery of 'Mind,'" in *Localization and Its Discontents: A Genealogy of Psychoanalysis and the Neuro Disciplines* (Chicago: University of Chicago Press, 2015), 153–84, quotation on 161.

11. Thomas Schlich, "'The Days of Brilliancy Are Past': Skill, Styles and the Changing Rules of Surgical Performance, ca. 1820–1920," *Med. Hist.* 59, no. 3 (2015): 379–403, quotation on 385, 395, 398, 402.

12. Winter refers to those in the viewing gallery and beyond as a second "brain." See Alison Winter, *Memory: Fragments of a Modern History* (Chicago: University of Chicago Press, 2012), 80.

(Figure 4). Penfield does not appear as a surgeon but rather stands in the gallery, mimicking the precise angle of the glass and communicating with a colleague, William Feindel (1918–2014), below, who performs the surgery. The two surgeons see and hear each other even though they occupy different spaces, at different levels. Aural and visual communication to and from the gallery was thus key to this dynamic, two-way spatial dialogue and performance.

Figure 4. Wilder Penfield communicating from the gallery to William Feindel as he conducts surgery in OR1, 1968. Reproduced by permission of the Osler Library of the History of Medicine, McGill University.

Focusing on interiors to write an architectural history of a building is uncommon among architectural historians. In traditional architectural history, scholars more often consider the style, massing, and overall arrangement of a building.[13] We tend to privilege documents produced by architects: drawings, photographs, letters, and magazine reviews. The intentions of architects, that is, rather than clients, are typically the focus of such studies, with an implicit emphasis on the way a building looked

13. Andrew Leach, *What Is Architectural History?* (Cambridge, Mass.: Polity, 2010), 41.

or performed on opening day. In recent decades, however, many architectural historians have turned to what is sometimes described as "user-based" architectural history.[14] The rise of so-called vernacular architecture studies, too, has inspired historians to turn to alternative sources, and to explore how buildings change over time.[15] Significantly, and starting about 1980, architectural history has moved away from art history, especially its emphasis on formal analysis.

Unsurprisingly, these revolutionary changes to the field of architectural history have shaped studies of hospital design. Some of these works, for example, contextualize the rise of modernism in buildings for health care;[16] another significant theme is hospital architecture itself as a medical technology.[17] The relationship of medical theory to architectural form is a consistent theme in the literature, especially the link of the ubiquitous pavilion-plan hospital and the rise of the germ theory of disease.[18] While physicians are frequently mentioned in architectural histories of hospitals, and at least two book-length studies devote chapters to "designing doctors,"[19] the role of doctors as architectural clients or even users of hospitals is largely unexplored. By studying the MNI from the perspective of "designing Penfield," rather than from the intentions of his architect, we are thus able to revisit the neurosurgeon, the institution, and neurology through visual evidence.

14. See, for example, Kenny Cupers, *Use Matters: An Alternative History of Architecture* (London: Routledge, 2013). The earliest survey book to focus on use was Spiro Kostof, *A History of Architecture: Settings and Rituals* (Oxford: Oxford University Press, 1985).

15. Dell Upton, "Architecture in Everyday Life," *New Lit. Hist.* 33, no. 4 (Autumn 2002): 707–23.

16. Jeanne Susan Kisacky, *Rise of the Modern Hospital: An Architectural History of Health and Healing, 1870–1940* (Pittsburgh: University of Pittsburgh Press, 2017).

17. Alistair Fair, "'A Laboratory of Heating and Ventilation': The Johns Hopkins Hospital as Experimental Architecture, 1870–90," *J. of Architecture* 19, no. 3 (2014): 357–81; David Theodore, "The Decline of the Hospital as a Healing Machine," in *Healing Spaces, Modern Architecture, and the Body*, ed. Sarah Schrank and Didem Ekici (New York: Routledge, 2017), 186–202.

18. Adrian Forty, "The Modern Hospital in England and France: The Social and Medical Uses of Architecture," in *Buildings and Society: Essays on the Social Development of the Built Environment,* ed. Anthony D. King (London: Routledge & Kegan Paul, 1984), 61–93; Jeremy Taylor, *The Architect and the Pavilion Hospital: Dialogue and Design Creativity in England, 1850–1914* (London: Leicester University Press, 1997).

19. Annmarie Adams, "Architects and Doctors," chap. 4 in *Medicine by Design: The Architect and the Modern Hospital 1893–1943* (Minneapolis: University of Minnesota Press, 2008), 89–108; Kisacky, "The Vertical Hospital as an Attractive Factory, 1917–1929," chap. 5 in *Rise of the Modern Hospital* (n. 16), 235–95.

## Early Architectural Experiences

Penfield was already a world-class medical innovator when he became an architectural client in 1928. Even before he moved to Montreal and took charge of the MNI, he showed considerable interest in architecture, taking detailed notes on medical facilities and meticulously recording what he saw. As early as January 1929, when he sketched a cross section of what would become the MNI on a piece of Biltmore Hotel stationery (Figure 5), he had "plans" in his mind's eye. "The idea and the plans have been slowly taking form in my mind," said the accompanying note to Royal Victoria thoracic surgeon Edward Archibald.[20] By that time he had seen and drawn French and Red Cross military hospitals during World War I and worked in seven institutions in Europe and the United States. His forty-three-page wartime sketchbook (Figure 6), housed in the Wilder Penfield Archive (http://digital.library.mcgill.ca/penfield/) in the Osler Library at McGill University, showcases his remarkable drawing skill in depicting beds and other technologies designed to support orthopedic and common wartime injuries. Penfield's recording technique was to juxtapose small snapshots of patients in bed or supported by slings and splints, for example, on one side of the notebook, with his own drawings of the apparatus on the open page, including technical information on its constituent parts and showing considerable skill in capturing perspective views. Sometimes he cut and pasted drawings in the book from unidentified published sources and then copied the perspective views.

Was drawing the scene in the photograph a way of further understanding it? Why draw an image, for example, if he already had the photo? The wartime sketchbook also includes large-scale drawings of joints and bones, including embedded shrapnel and fractures, presumably observed during wartime surgeries as these are dated and described. The bones are drawn on sketching paper and then pasted into the book with great care, showing the young doctor's meticulous concern, too, for preserving his own sketches as keepsakes.

At Peter Bent Brigham Hospital (PBBH) in Boston, where Penfield worked from September 1918 to March 1919, he also made careful drawings and notes on various technologies and their use in routine operations. The Boston notes include more text than illustrations, with Penfield mentioning the preferred techniques of his mentor neurosurgeon Harvey Cushing and precise information on his patients. Over time, the drawings became more and more focused on the head, often drawn to scale

20. Letter from Wilder Penfield to Edward Archibald, January 18, 1929, A/N 1–1/2, Wilder Penfield Archive, P 142, Osler Library of the History of Medicine, McGill University.

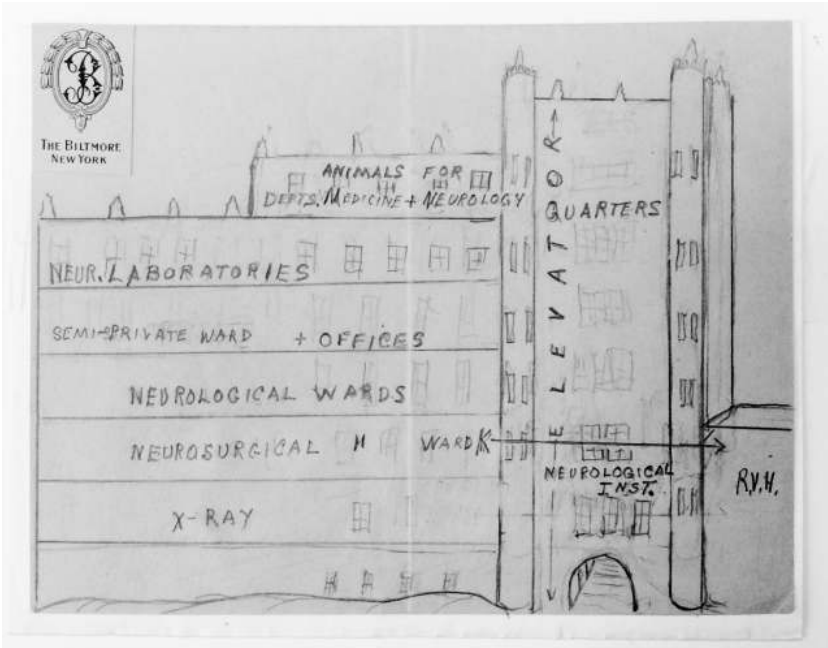


Figure 5. Wilder Penfield's drawing for the Montreal Neurological Institute, drawn on New York Biltmore Hotel stationery in January 1929. Reproduced by permission of the Osler Library of the History of Medicine, McGill University.

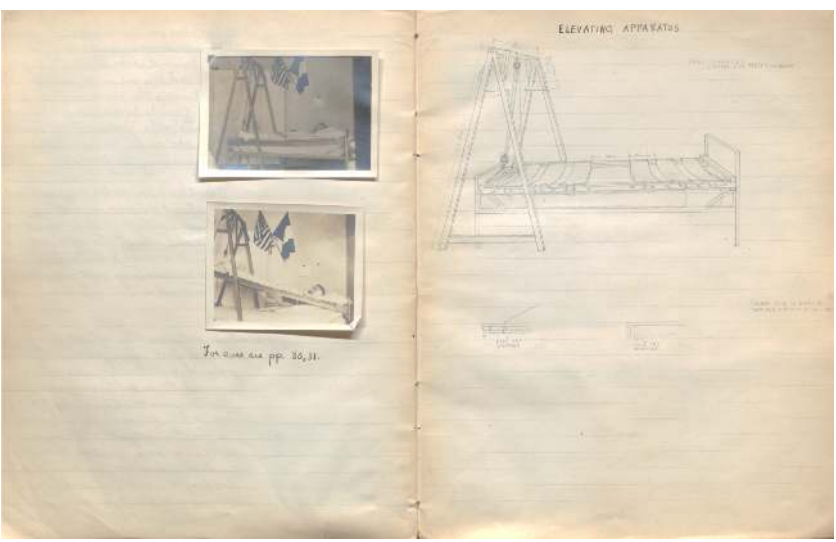


Figure 6. Pages from Wilder Penfield's wartime sketchbook, 1939–45. Reproduced by permission of the Osler Library of the History of Medicine, McGill University.

from above (like a map or floor plan) and from the side (like a building or room elevation).

It is unknown whether the design of operating rooms Penfield experienced before coming to Montreal caught his attention. Designed in 1913 by Codman and Despradelle Architects, the PBBH had surgery in a separate pavilion from patients and featured both large and small operating theaters.[21] The large operating theater (Figure 7), illustrated in a picture book of 1913, featured a double-height operating room with one wall of floor to ceiling glass.[22] At the top of this wall, angled glass allowed natural light to penetrate deeply into the large space (so ample, in fact, that no special surgical light fixture seems to have been specified). This large operating room had a second-story mezzanine on at least two sides, with seats for viewers. Only a metal railing separated those watching operations from the surgery below. In the small PBBH operating room, illustrated in the same book, there is a similar provision for natural light but no dedicated space or seating for viewers. Four light fixtures hang from simple chains. Note that here viewers were accommodated on purpose-built, movable seats, completely open to the operating field.

Just before his arrival in Montreal, Penfield had spent seven years (1921–28) at New York's Presbyterian Hospital, a time of dramatic change there. During his first few years the hospital was located on West Fifteenth Street, just off Fifth Avenue, in a complex of buildings opened in 1892, following a fire in 1889. Archival photographs from this time show the Presbyterian Hospital as a series of multistory brick pavilions with low-pitched roofs. The rows of windows, brick detailing, and other details reveal them to be vaguely Renaissance Revival. Interestingly, a smaller structure (than the wards) was purpose-built for surgery. By January 1925, however, the hospital and Columbia University began to build the Columbia-Presbyterian Medical Center in Washington Heights (now the Columbia University Medical Center), an ambitious, multistructure complex designed by architect James Gamble Rogers that opened in 1932 and shared many architectural features with the contemporaneously designed MNI: asymmetrical, tower-like massing, with wedding-cake-style setbacks, and streamlined Art Deco interiors (Figure 8).[23]

Penfield's personal experiences with these diverse hospitals prepared him well to be an architectural client. He and Macdonald worked closely

21. The architect is named and the building described in H. B. Howard, "The Peter Bent Brigham Hospital," *Boston Med. Surg. J.* 166, no. 24 (1912): 876–78.

22. *Peter Bent Brigham Hospital, Boston* (Boston: Barta Press, 1915?), 5.

23. For a good description of the medical center, see "The Medical Center, New York," *Architectural Forum* 44, no. 6 (1928): 776–93.

Figure 7. The operating room at Peter Brent Brigham hospital features a full wall of canted glass that served to illuminate the patient during surgery. Published in *Peter Bent Brigham Hospital* (Boston: Barta Press, 1915?).

together for years on the Montreal Neurological Institute project. Macdonald was not an obvious choice as architect of the MNI. His Montreal-based firm, Ross & Macdonald (called Ross & MacFarlane until 1913), inherited the project because they had done an earlier, unbuilt scheme for the project on the RVH site. Ross & Macdonald was better known for its commercial buildings than health care work. It had designed iconic Canadian buildings such as Toronto's Union Station and Royal York Hotel, Eaton's department store, and the famous hockey rink Maple Leaf Gardens; and Montreal's Dominion Square Building and the elegant Chateau Apartments. Ross & Macdonald had been hired by the RVH, adjacent to the MNI, to design its interns' building in 1930 (demolished in 1992) and laundry building/ambulance garage of 1931. Archival evidence suggests that this home for interns led directly to the commission for a neurological department nearby on the hospital site.[24]

24. Adams and Feindel, "Building the Institute" (n. 6), 442–43.

Figure 8. Photograph of the Columbia-Presbyterian Medical Center in New York by Sigurd Fischer. Published in the *Architectural Record* 77, no. 6 (June 1935).

Still, Macdonald brought considerable international experience to the project. Born in Melbourne, Australia, Macdonald had worked with architect Richard B. Whitaker there, arriving in Canada in 1895 to work for his cousin Robert Findlay in Montreal, perhaps on the Westmount Public Library of 1898 or the dozens of houses Findlay designed for prominent businessmen and their families.[25] From 1900 to 1907, Macdonald traveled extensively in Europe, New York, and New Zealand.[26] In New York, he had worked for George B. Post and Son in 1903–4, perhaps working on the firm's project for the New York Stock Exchange or the City College of New York. Employment with Post may also have drawn the young architect's attention back to Montreal, as the New York office designed Montreal's Stock Exchange in 1904 (now the Centaur Theatre). Significantly, during this time Macdonald also worked for William Welles Bosworth in New York, a connection that would come full circle in the MNI commission, as Penfield eventually commissioned Macdonald's former boss to oversee an important artistic commission for the Neuro foyer, as we will see.[27]

Penfield took on the project with enthusiasm. He worked on the project every day, calling it "the perfect little building we had planned,"[28] and was involved in every detail of its conception and construction. While the Biltmore sketch is perhaps the strongest graphic proof of Penfield's evolving architectural imagination (and skill), it was only the beginning of a long and nearly obsessive tweaking of the MNI's physical environment throughout his career. In his weekly letters to his mother, Jean Jefferson Penfield (1859–1935), he reveals his self-described role as designer of the building's plans: "Mr Chenoweth had an architect up working over the plans the day I left. They are pushing me for definite building outlines before I've had time to plan them out. At any rate, life isn't dull just now."[29] Penfield's subsequent letters and publications reveal more of his intense participation in the design of the institute, with Macdonald described almost as his scribe. For example, in his autobiography, *No Man Alone*, he

25. For a list of Findlay's work with links to primary sources, see Robert G. Hill, "Findlay, Robert," in *Biographical Dictionary of Architects in Canada, 1800–1950, http://dictionaryofarchitectsincanada.org/node/1566.* Other details from Isabelle Gournay and France Vanlaethem, *Montreal Metropolis, 1880–1930* (Toronto: Stoddart, 1998), 206.

26. Biographical information is from Macdonald's obituary: Gordon McL. Pitts, "Obituary, Robert H. Macdonald, (F), R.I.B.A.," *J. RAIC* 20, no. 2 (February 1943): 24.

27. Bosworth's prolific career has attracted relatively little academic attention. He is perhaps best known as designer of the MIT campus in Cambridge, Mass. I am grateful to Dustin Valen for information on him from the Rockefeller Archive.

28. Wilder Penfield, *No Man Alone: A Neurosurgeon's Life* (Boston: Little, Brown, 1977), 316.

29. Letter from Wilder Penfield to Jean Jefferson Penfield, October 13, 1931, D C/D 33–4, Wilder Penfield Archive.

describes his relationship with Macdonald: "I knew . . . exactly what was needed and Mr MacDonald [*sic*] allowed me to draw the original rough outlines."[30] Penfield's words demonstrate how he saw his own work on the MNI's design as primary, with Macdonald serving as a communicator of his ideas: "Floor by floor we have gradually developed the thing. I have drawn up the original for each, and the Architect takes each plan and moulds it. Then I work it all over and get criticisms and outside ideas and finally give them an altered scheme. Then they blue print it and we repeat again. We must have done 6 or 8 complete sets of blue prints. I worked until 4 a.m. this morning and they have the results to work on tomorrow,"[31] he wrote to his mother on July 28, 1932. Architects, to Penfield, were there to realize his ideas, rather than to design the building. On August 8, 1932, he writes, "The architects have finished two elevations of the Institute, neither one seems to me quite satisfactory, but many things about it are splendid. I think perhaps it will be best to make a model of it."[32] On September 12, 1932, Penfield writes that "the architects have almost done for me [*sic*] the last week, we are rushing to get information so that bids can be sent out."[33] And his architectural responsibilities continued even after construction began. On May 14, 1933, Penfield writes that construction of the MNI had begun and "now I shall be fussing about building details and organization for the coming year."[34]

Not only was his architectural work managerial, but it was also unceasing. As early as November 23, 1931, Penfield tells his mother he is hard at work designing the neurological institute floor by floor: "At present I am struggling with the plan of the Institute. It must be all worked out in detail. Six and one-half floors, each 100 × 36 ft. and each involving complete plans for personelle [*sic*] as well as the material things. It is slow work and even now the space seems small. I am planning 32 public and 12 private and semi-private patients. The rest is scientific laboratories etc. So you see I am bending every effort."[35] Penfield even used his urgent design work on the institute as a way to conclude weekly letters: "I must work over the

30. Penfield, *No Man Alone* (n. 28), 313.

31. Letter from Wilder Penfield to Jean Jefferson Penfield, July 28, 1932, D C/D 33–4, Wilder Penfield Archive.

32. Letter from Wilder Penfield to Jean Jefferson Penfield, August 8, 1932, D C/D 33–4, Wilder Penfield Archive.

33. Letter from Wilder Penfield to Jean Jefferson Penfield, September 12, 1932, D C/D 33–4, Wilder Penfield Archive.

34. Letter from Wilder Penfield to Jean Jefferson Penfield, May 14, 1933, D C/D 33–5, Wilder Penfield Archive.

35. Letter from Wilder Penfield to Jean Jefferson Penfield, November 23, 1931, D C/D 33–4, Wilder Penfield Archive.

plans now,"[36] he said on March 20, 1932; and on June 26 that year that he needed to "finish planning the details of the institute within the next month so they can start building this summer late," adding "you should see the prints which litter my desk!"[37]

Penfield's self-described role as chief designer of the MNI was not limited to plans and adjacencies. He takes full credit, for example, for details on the exterior of the building, almost suggesting that the inclusion of medical imagery, a standard aspect of Art Deco hospital architecture, was his invention:

> I also sketched a shield with a rising sun at the top on either side a brain with its curving spinal cord to outline the side of the shield. I don't know whether the architects will find it satisfactory. It has been a little difficult to get them to accept my crude and unexpected anatomical suggestions as they do not fit in with the usual conceptions of architectural design. They could not bring themselves to put a brain into stone until I brought them a drawing of one—done by Christopher Wren, and now they have sketched it just over the door.[38]

The precise level of "difficulty" Penfield faced with his architects is unknown. The post–World War I era, in general, was a time of strengthening architectural specialization in hospital design, but that specialization relied heavily on medical collaboration, sometimes as contentious as it was harmonious. The Boston- and Toronto-based firm Stevens and Lee, for example, designed more than a hundred hospitals in North America in the interwar decades.[39] Edward Stevens frequently worked closely with physicians; a handful of physicians in the United States became highly sought-after consultants.[40] The best known of these is Sigismund Schulz Goldwater, commissioner of New York City's hospitals from 1934 to 1940, who worked on dozens of hospitals with architects, including two Montreal institutions: the Jewish General Hospital and the Pathology Institute. New York–based obstetrician and medical educator Samuel W. Lambert "formed plans, never entirely carried out as he planned them, for the development of a teaching hospital."[41] As dean of Vanderbilt Medical

36. Letter from Wilder Penfield to Jean Jefferson Penfield, March 20, 1932, D C/D 33–4, Wilder Penfield Archive.

37. Letter from Wilder Penfield to Jean Jefferson Penfield, June 26, 1932, D C/D 33–4, Wilder Penfield Archive.

38. Letter from Wilder Penfield to Jean Jefferson Penfield, September 10, 1933, D C/D 33–5, Wilder Penfield Archive.

39. Adams, *Medicine by Design* (n. 19), 17.

40. Kisacky, *Rise of the Modern Hospital* (n. 16), 290–93.

41. Philip Van Ingen, "Samuel W. Lambert, 1859–1942," *Bull. New York Acad. Med.* 18, no. 4 (1942): 293–96.

School, George Canby Robinson oversaw the design and construction of the game-changing medical school building that opened in 1925. Architectural historian Katherine L. Carroll describes his work on the first medical school hospital in the United States, with architects Coolidge and Shattuck (and the General Education Board), as "a model collaboration."[42] Three years later he brought that knowledge and experience to another institution when he became director of the Cornell Medical School in New York.

Penfield was not so well versed in the intricacies of hospital design that he was considered a consultant, like Goldwater. Also, because he remained at the MNI for his entire career, his knowledge and experience didn't travel, like Robinson. There are no records, for example, of him giving advice on other hospital design projects or of lecturing on the subject of architecture. His role was as an innovative medical practitioner with a deep understanding in the power of design, focused on a single project.

What we do know is that Penfield's architectural interests extended to his domestic life. On July 27, 1929, in his weekly letter to his mother, he said he hoped to be able to do some "drawing" while at his weekend retreat called Magog Meadows in East Bolton in the Eastern Townships (often referred to as "the farm" in letters), ninety miles east of Montreal, which the Penfields had purchased in 1929. On August 12, 1929, Penfield writes that he had been practicing sketching his four children. The usefulness of drawing for domestic architectural projects was also not lost on the neurosurgeon. In retirement, he and his wife Helen Kermott Penfield (1891–1978) managed renovations to the farm, communicating their ideas through drawing. For example, on April 4, 1935, Penfield writes to his mother about a plan of Helen's that includes to "move the Barn down a little way and run a colonnade from house to barn and so use the barn as part of the house as in the sketch. That would move garage and ice house too and make a much better arrangement with little outlay."[43] So sacred to Penfield was this self-styled architectural project that he and other families were eventually interred there. At the end of his life, too, he turned to an unconventional painting project, on a large rock, to express his ideas about the relationship of mind and body. His writing cabin looked out to the rock, underscoring the significance Penfield placed in visual and architectural expression.

42. Katherine L. Carroll, "Creating the Modern Physician: The Architecture of American Medical Schools in the Era of Medical Education Reform," *J. Soc. Architectural Hist.* 75, no. 1 (March 2016): 48–73, quotation on 62.

43. Letter from Wilder Penfield to Jean Jefferson Penfield, April 4, 1935, D C/D 33–5, Wilder Penfield Archive.

## Penfield's Architectural Tourism

While Macdonald presumably taught the neurosurgeon much about architecture, Penfield gleaned deep and precise architectural knowledge through personal experience of key hospital environments. Remarkably, his correspondence shows that he used medical opportunities to fund his architectural interests. For example, on April 22, 1932, he wrote to his mother that he had gone to Chicago for a meeting of the Society of Clinical Surgery but that he was really there on an all-expenses-paid trip "to see the Chicago hospitals for pointers on building and to discuss clinic organization with a number of men."[44] Particularly influential was a dedicated trip Penfield took in July 1932 to observe a handful of American buildings: the Yale School of Human Relations, New Haven; New York Presbyterian Hospital Neurological Institute, New York; and Lakeside Hospital and the Cleveland Clinic Hospital in Cleveland. Accompanying Penfield on this architectural research trip was Macdonald and MNI colleague Colin Russel, who had been a neurologist at the Royal Victoria Hospital when Penfield had first arrived in Montreal and presumably brought some historical context to the project. Penfield described this trip to his mother on July 17, noting how he derived concepts from other places, the distinctiveness of the MNI project, and the high architectural standards he set for himself: "Made a flying trip with Colin Russel and MacDonald [*sic*], the architect, to New York and Cleveland this past week. We saw many Medical Schools and buildings and drew ideas from them. Our scheme is different than anything that has been done. . . . I would like to think the whole place will be perfect for the study of neurological disease."[45]

While these passages clearly suggest Penfield absorbed the architectural ideas of other hospitals while traveling, they also suggest that he wanted to see those schemes to know what to avoid. For example, in the summer of 1932 he states,

> There is another Neurological Institute on the Continent, that in NY City, that [Frederick] Tilney brought into the world, but they have a huge staff and aim to fill their 200 beds by any means. They care for chronic patients for whom nothing active can be done. Their laboratories and other activities are all scattered. We shall have a few beds, not over 50, and shall focus all our attention on them from laboratories and every angle, sending away chronic patients to be cared for elsewhere.[46]

44. Letter from Wilder Penfield to Jean Jefferson Penfield, April 22, 1932, D C/D 33–5, Wilder Penfield Archive.

45. Letter from Wilder Penfield to Jean Jefferson Penfield, July 17, 1932, D C/D 33–4, Wilder Penfield Archive.

46. Ibid.

He even sent people back to these same places to take measurements and perhaps photographs, proving they served as models. On October 17, 1932, for example, neurophysiologist John Fulton of the Yale New Haven Hospital wrote to Penfield, "Your two nice engineers appeared a day or two ago and spent the whole day here. I believe they saw a good deal of Fitkin and Tompkins ward, and they spent the afternoon in Yerkes's department and in our animal quarters. . . . I hope they were able to carry away a few useful ideas."[47] Fulton also notes in his diary from July 7, 1932:

> Wilder Penfield, who has just been given a large grant by the Rockefeller Foundation for a new neurological institute at Montreal, telephoned me yesterday and asked my leave to come down and see the laboratories. He and Dr. Colin Russel, also from Montreal, arrived this morning at seven o'clock and we had early breakfast for them. I spent the whole morning showing them the new Extension of Sterling Hall, and we were joined about 10:00 by Wilder's architect, MacDonald [*sic*], who seemed to be much impressed by our various facilities. I attempted to point out architectural mistakes as well as the successful features of the building, and ended up the morning by going over to the hospital and showing them the new Fitkin and Tompkin [*sic*] wards. Wilder was very much stirred by the clinical facilities in the public wards, and I should imagine that his visit here will influence him a good deal in planning his building.[48]

The Raleigh Fitkin Memorial Pavilion and Sarah Wey Tompkins Memorial surgical unit, designed by New York architect Henry Pelton, were new buildings when Penfield's team revisited to take measurements. Fitkin opened in February 1930, offering patients "freedom from the traditional hospital atmosphere" in the form of small wards, murals, and special ventilation.[49] Surgery and its associated spaces, however, were in the Farnam Memorial Building. Perhaps this distinctive arrangement caught the attention of Penfield, though he made no formal note of it. Certainly, the arrangement is very different from the eventual plan of the MNI, where surgery is well integrated. In archival photos of surgery at Farnam, for example, there is no built-in provision for viewers, but rather a series of elevated platforms separated from the surgical field only by a metal chain (Figure 9).

47. Letter from John Fulton to Wilder Penfield, October 17, 1932, C/D 16, Wilder Penfield Archive.

48. John Fulton diaries, Yale University Manuscript and Archives. Thanks to Susan Dee, Melissa Grafe and Christopher Zollo for sending this reference to me.

49. "Abram E. Fitkin Presents N.H. Hospital Wing," *J.-Courier*, February 10, 1930.

Figure 9. Operating Room in the Farnam Memorial Building, ca. 1931. Reproduced by permission of the Yale New Haven Hospital Archives.

## Photography + Surgery

Penfield's interest and talents as a photographer rivaled his architectural skills. As mentioned, OR1 comprised an observation gallery and a sophisticated photographic setup designed to capture full-scale images of the exposed brain during surgery. Below the gallery was a camera, poised to capture close views of the surgery via a carefully positioned mirror. Photographs taken in OR1 were developed and printed on site and included in each patient's file. A relatively expansive photography department was planned and constructed on the ground floor of the original building, managed by pioneering British photographer Henry S. Hayden until 1945, and then by Charles "Charlie" Hodge who was "trained" to a great extent by Penfield.[50]

50. Feindel refers to Hayden as Peter in the obituary for Charles Hodge in the MNI newsletter. See William Feindel, "Charles Hodge, MC, FRPS, FBPA, FIMI (1924–2001): Neurophotographer Extraordinaire," *NeuroImage* 17, no. 3 (July 2001), http://neurostudyclub.mcgill.ca/july2001/index_july2001.html. He is Henry S. Hayden in the MNI's annual reports. I am grateful to Daniel Chartrand for this confirmation.

Hayden described with some pride the design of the photographer's room in OR1, "beneath the visiting surgeon's gallery," which was connected to the operating room by a sliding plate glass window, operated by the photographer. He would lie on the floor on a rolling stretcher, below the eight- by ten-inch field camera, with a long-focus lens, supported on a "rigid sub-bed" of wood.[51] The mirror (twelve by eighteen inches) was suspended below the lighting fixture by an elaborate mounting system that would be coated in glycerin during surgeries, to avoid dust. It had to be angled to clear the heads of the surgeons and not cast a shadow on the surgical field. Still in situ today, the camera occupies a space that is only two and a half feet wide, wedged between structural walls that support the gallery above (Figure 10). A decorative carpet shows in many of the images, softening the bunker-like atmosphere of the photographer's space and perhaps adding some padding to the cold, hard floor.

Penfield's interest and knowledge of photography and film comes through strongly in the letters to his mother. On April 27, 1930, he writes to his mother from New York that based upon observations of a patient on which he had recently operated, he was sure the patient's epileptic attacks were the result of the "spasm of the blood vessels."[52] In order to collect evidence of this apparent cause, he says that he was trying to find a camera with which he could "have the brain photographed during a convulsion."[53] Historian Alison Winter has noted how in the 1950s Penfield engaged media technologies like wire recordings and audiotapes to understand mechanical records of time, perhaps inspired by his earlier interest in photography.[54] "I hope to find one that will magnify enough to take good pictures at the operating table and I want them at frequent intervals,"[55] he says in April 1930 in a rare, preconstruction reference to the camera.

## Foyer Architecture

The MNI's stunning Art Deco foyer (Figure 11), located just inside the front door of the institute, is an exquisite and careful arrangement of furniture, finishes, colors, and motifs that were the responsibility of interior

51. H. S. Hayden, "A New Technique for Surgical Photography in the Operating Room," *Photographic J.* 76 (April 1936): 207.

52. Letter from Wilder Penfield to Jean Jefferson Penfield, April 27, 1930, D C/D 33–4, Wilder Penfield Archive.

53. Ibid.

54. Winter, *Memory* (n. 12), 93.

55. Letter from Wilder Penfield to Jean Jefferson Penfield, April 27, 1930 (n. 52).

Figure 10. Photographer Charles Hodge kneeling on a small carpet in the dedicated space below the gallery. Reproduced by permission of the Montreal Neurological Institute Archives.

Figure 11. Photograph of the MNI foyer. Published in the *Journal, Royal Architectural Institute of Canada* 11, no. 10 (October 1934).

designer Barnet Phillips.[56] He may have known Penfield through his work on Montreal's Royal Bank building, with Macdonald supervising the work as architect. Often called the reception room in correspondence (and now officially the Feindel Foyer, after William Feindel), the MNI foyer (Figure 12) is relatively simple in plan and section: a rectangular-shaped room of roughly 270 square feet, open on one short side to the institute's main hallway, which runs north-south, parallel to the street outside. Located just inside the main entrance, it is accessible from the street via a short staircase and a set of wooden doors.

Today, the space's stone veneer walls are beige, which likely corresponds to its original hue. The principal pieces of furniture are four floor lamps, two settees, and a round table. The settees were intended to sit against the long walls, framed by the floor lamps, while the round table was planned for the center of the room, on the line where the hallway intersects the foyer (Figure 13). Phillips's furniture was specially designed to communicate research on the brain. The lamp stands were based on drawings of the spine, the inlay on the table was in "the form of a cross-section of the human hemispheres,"[57] and the room was topped

Figure 12. The first floor plan of the Montreal Neurological Institute shows the axial relationship between the foyer and the entrance. Drawing by Adriana Mogosanu from an original drawing, Canadian Centre for Architecture/Centre canadien d'architecture.

56. The full name is Barnet Phillips Company, Architectural Decorators from New York. There is a selection of his work from 1930 in New York State and Connecticut; also, he decorated Montreal's Royal Bank building (architects York and Sawyer).

57. Penfield, "The Significance of the Montreal Neurological Institute" (n. 8), 44.

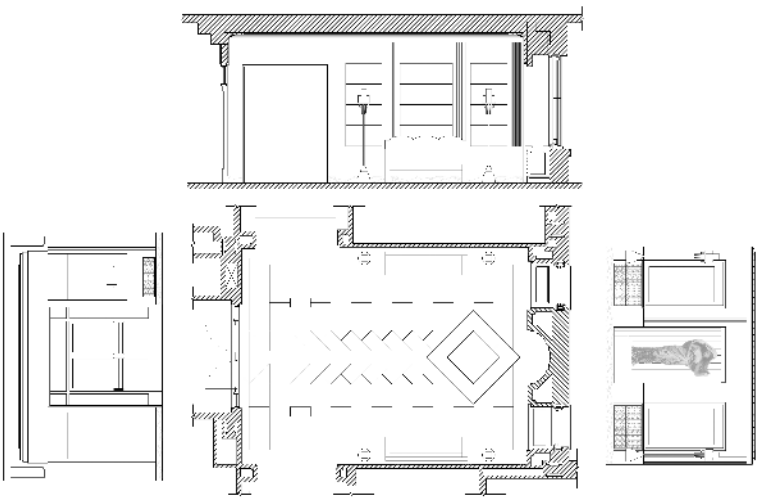

Figure 13. Plan and elevation drawings of the foyer, 1933. Drawing by Adriana Mogosanu and Jennifer Tu-Anh Phan from original drawings, Canadian Centre for Architecture/Centre canadien d'architecture.

by a ring of names of influential neurologists. The other end of the room included a small niche, framed by two curtained windows with elaborate radiators below. The foyer as planned was axial, proceeding from the exterior door eastward to the niche, and thus it has a somewhat ecclesiastical atmosphere. This prescribed axial movement is reinforced in the tile floor pattern, which directs visitors to the round table and beyond, to a statue in the niche. The statue, *La Nature se dévoilant devant la Science*, is even visible from the street, further emphasizing this axial movement from the street to the niche.

A ram's head is at the ceiling's center, "the head of 'Aries,' symbolic of the brain,"[58] with four hieroglyphic symbols for the word "brain" contained inside concentric circles. Phillips's firm was inspired by a fourth-century BCE Greek marble ram's head in the Boston Museum of Fine Arts, and worked from photographs of it for the Neuro ceiling.[59] The circle with ram's head was surrounded by a graphic pattern of "tissue or

58. Letter from Barnet Phillips to Wilder Penfield, March 28, 1934, A/N 1–1/6, Wilder Penfield Archive.

59. Letter from Barnet Phillips to Wilder Penfield, April 6, 1934, A/N 1–1/6, Wilder Penfield Archive.

nerve membrance [*sic*] disseminating or leading to the knowledge of later days,"[60] according to Phillips. During the design process, Penfield hesitated on the choice of the ram's head. The first sketch was of a full ram's body, but he worried that this would be too distracting. He finally advised the decorators to put the ram in a circle with the four hieroglyphic representations of the brain, instructing Phillips to find them in a book, *The Edwin Smith Surgical Papyrus*.[61] For the legend, Penfield insisted on EGKEPHALON TROTHENTA EIDOMEN IATHENTA, explaining its importance to the designer: "This has an excellent meaning for our purposes. Galen is commenting on the Aphorisms of Hippocrates. I believe that Hippocrates has made the statement that a wound of the membranes of the brain ends in death. Galen adds the above, namely 'We have seen a wounded brain healed.' As you see, this could mean a great deal allegorically to us."[62]

Every aspect of the foyer decoration showed that Penfield was a cultured intellectual with an awareness of ancient history, whose design choices resonated with Egyptian and classical references to the brain. The historicist decoration may have brought a sense of comfort and understanding to patients and medical staff, too, because it linked the space to thousands of years of medical and philosophical studies of the brain. By inference, then, it established both the history and respectability of the specialty. For example, the ram's head on the ceiling cued medieval physicians who believed that the position of the stars influenced parts of the body. Historian of medicine Nancy Siraisi includes in her introduction to medieval and early Renaissance medicine a diagram from 1420 showing the special power of each zodiac sign on parts of the body.[63] Inclusion of the ram's head on the ceiling thus illustrated that Penfield saw his own work flowing from this longer history, touching medieval medicine and even reaching back to Hippocrates.

Penfield's sources for the decorative program may have functioned almost like footnotes for visiting neurologists.[64] He was determined that the representations in the architecture be wholly accurate.[65] He urged the

60. Letter from Barnet Phillips to Wilder Penfield, March 28, 1934 (n. 58).

61. James Henry Breasted, *The Edwin Smith Surgical Papyrus* (Chicago: University of Chicago Press, 1930), 166.

62. Letter from Wilder Penfield to Barnet Phillips, March 23, 1934, A/N 1–1/6, Wilder Penfield Archive.

63. Nancy Siraisi, *Medieval & Early Renaissance Medicine: An Introduction to Knowledge and Practice* (Chicago: University of Chicago Press, 1990), 112.

64. Photos of nerve cells were included in his letter to Phillips. Letter from Wilder Penfield to Barnet Phillips, March 1, 1934, A/N 1–1/6, Wilder Penfield Archive.

65. A good description of the ceiling is found in Penfield, "The Significance of the Montreal Neurological Institute" (n. 8), 42.

decorator to get a book by Camillo Golgi from the New York Academy of Medicine, citing specific page numbers as references for nerve fibers, pointing out that they are linear and can curve in various ways (and therefore are good for decoration). Even the iron gratings over the radiators represent a nerve fiber by neuroanatomist Jean Nageotte. "The axone is shown with the radiating structure within the nerve sheath about it," explained Penfield in *Neurological Biographies and Addresses*, a book produced in 1936 to commemorate the opening of the building.[66]

Not surprisingly, given Penfield's interest in historical research, the names of famous neurologists decorate the walls of the room, organized by nationality. Phillips produced a simple plan (Figure 14) with the following names, moving in a clockwise direction from the entrance: Jean Charcot, Weir Mitchell, Ivan Pavlov, Ramon Y. Cajal, Camillo Golgi, Charles Sherrington, Hughlings Jackson, Victor Horsley, Nissl-Alzheimer, Const. Von Monakow, Wilhelm Erb, Harvey Cushing, and Claude Bernard. Intriguingly, the ceiling arrangement as constructed is a reflected version of this plan, which shows the spot over the entrance purposefully left blank. Today, Wilder Penfield and Thomas Willis occupy this space (with Charcot and Bernard). Penfield prefigured this eventual addition of names in 1936: "it is quite obvious that other names could well be added and that certain countries might well contribute a larger number than they have,"[67] perhaps referring to the fact that no Canadian neurologists had been included in the original list.[68]

The foyer also expressed the active role played by patients in Penfield's work, by engaging them in the imagery of the brain. "The centrality of the brain and nervous system to modern concepts of self facilitated a different type of doctor-patient interaction, medical work process and patient identity,"[69] reports Rachel Elder. Alison Winter, too, asserts that Penfield's "most important collaborators of all were not the scientists but the patients."[70] Many Canadians know this interactive aspect of Penfield's work from a popular "Heritage Minute," broadcast on public television, where a patient declares she smells burnt toast before having seizures

66. Ibid., 43.

67. Ibid., 44.

68. Artist Mary Filer's mural in a nearby meeting room, *The Advance of Neurology* (1954), which depicts a number of these figures, may also serve to "complete" Penfield's roster of names. See Feindel and Leblanc, "The McConnell Wing," in *Wounded Brain Healed* (n. 6), 259–64.

69. Elder, "Speaking Secrets" (n. 5), 764; Katja Guenther has also studied the active role of the patient in the culture of neurosurgery. See Guenther, "In the Operating Room" (n. 10), 172.

70. Winter, *Memory* (n. 12), 80.

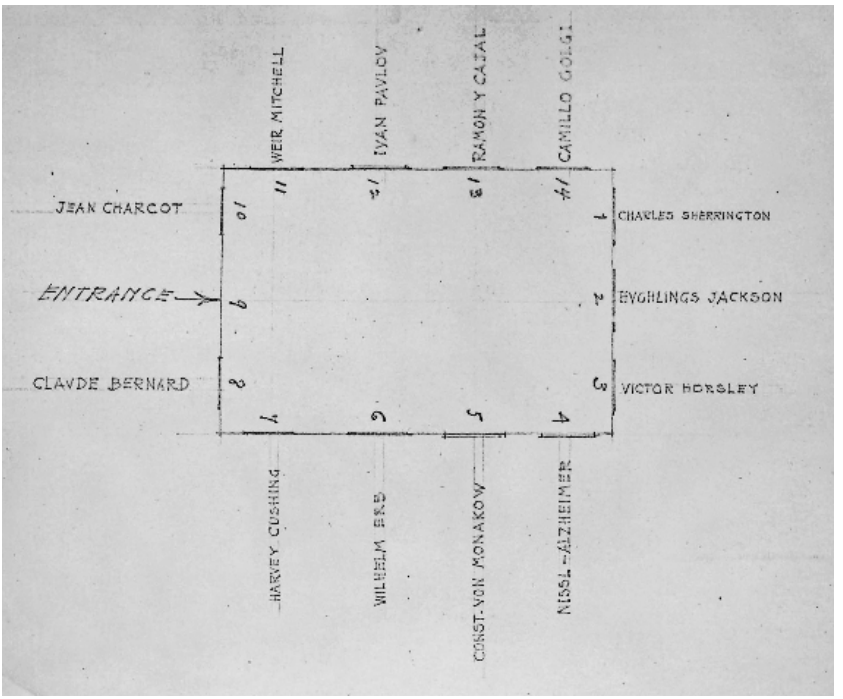


Figure 14. In a 1934 letter to Penfield, interior designer Barnett Phillips asks for comments on the distribution of names of famous neurologists carved into the wall around the MNI foyer. Reproduced by permission of the Osler Library of the History of Medicine, McGill University.

and Penfield uses this sensation to map her brain.[71] While the tables, chairs, lamps, and walls did not "speak" like the patient in the television commercial, I contend that they spoke to the patients. For example, the positioning of the central table's brain section behind a sheet of glass echoes the experience available from the gallery looking down into the brain from the gallery. As mentioned, Penfield would call colleagues to witness particular cases with a specially positioned bell, which Katja Guenther sees as a symbol. He would ring this bell "when a lesion is completely exposed,"[72] calling fellows to gather and observe the operation through the canted glass of the gallery.[73] Patients, however, were called upon by

71. Available on YouTube: Historica Canada, "Heritage Minutes: Wilder Penfield," March 2, 2016, www.youtube.com/watch?v=pUOG2g4hj8s.

72. Penfield, "The Significance of the Montreal Neurological Institute" (n. 8), 47.

73. See Guenther, "In the Operating Room" (n. 10), 162. On the significance of sounds in the hospital, see Tom Rice, *Hearing and the Hospital: Sound, Listening, Knowledge and Experience* (London: Sean Kingston, 2013).

Penfield's voice and his surgical tools. Penfield himself acknowledged the significance of this interaction, admitting that he "must take time for talk before and during the operation," in order to become "the patient's trusted friend."[74] Novelist Michael Bryan captured the magic of the famous neurosurgeon's laid-back way with patients through his Penfield-inspired protagonist named Jamieson MacNeill in *Intent to Kill*, a novel of 1956: "Lights were switched on in the green tile operating room. The patient was waiting, fully conscious. MacNeill, strange and unreal in his green operating gown, chatted with the patient in an informal, affable voice. It's part of his secret, McLaurin thought. He can be as easy as an old shoe."[75]

The subtle colors of the lobby walls and intricate maze of gold lines making up the connective tissue of the human brain must have dazzled visitors. In addition, the foyer's statue, list of medical names and symbols, and ceiling with paintings of nerve membrane just out of reach of the foyer's occupants must have given it a sublime quality, echoing the vast scale of neurological knowledge. Even today, the abstract grandeur of the medical unknown gives the foyer a distinctive, meditative atmosphere, relaxing those of us who enter and making us complacent to Penfield's (and his successors') authority.[76]

## Nature Unveiled

The marble copy of a female figure (see Figure 11) of 1899 by Ernest Barrias, with which Penfield was preoccupied, is a major focus of the lobby. The significance of *La Nature se dévoilant devant la Science* is measured in Penfield's attention to the project, throughout his life, and also because he believed the sculpture encapsulated and expressed his intention for the MNI. It was on the aforementioned hospital research trip to Cleveland in July 1932 that he first had the idea about a statue as a fitting addition to the MNI. He describes a colored marble statue at the foot of the stairway in the medical library at the Université de Paris, a space filled with portrait busts of well-known medical figures from history: "There is a statue which stands at the foot of the stairway leading up to the Medical Library in the University of Pars [*sic*]. It was done by a man named Barrias in coloured marble. It is the figure of a young woman, heavily cloaked. Only her face and part of her breasts can be seen. The gown seems to be held up to the white breast by a scarab. At the base of the pedestal are the words in

74. Wilder Penfield, *The Mystery of the Mind: A Critical Study of Consciousness and the Human Brain* (Princeton, N.J.: Princeton University Press, 1975), 13.

75. Michael Bryan, *Intent to Kill* (London: Eyre & Spottiswoode, 1956), 21.

76. I am grateful to Justin Bouttell for these insights.

French 'Natureing [*sic*] herself before Science.'"[77] The moment of the epiphany and the statue's role in receiving those who entered the building are clearly described to his mother: "The other day in Cleveland it occurred to me while I was walking along the street, that we might have a copy made and placed in such a position at the entrance that it would suggest to one entering the ideal I have in mind for the whole Institute."[78]

Helen and Wilder Penfield traveled to Paris in November 1932 to see the statue. "Four days in Paris passed quickly. First of all, the statue by Barrias seems to me altogether fitting and Helen feels so without question. We went immediately to the Ecole de Medicin [*sic*] to see it, and then went to the Restaurant nearby called the 'Milk-Fed Pig' to have lunch and lay plans. How to get permission to copy it and who to do it was a problem … in the evening I got an American architect on the phone—Mr. Walter [*sic*] Bosworth. He has been in charge of the reconstruction of art treasures in Belgium and Versailles, using the money of Mr Rockefeller. Next day he phoned that he had secured permission from the Paris authorities to copy it, and had the best copies of sculpture in the world! A M. Gallie [*sic*] who did the sculpture for Barnard for 6 years."[79] Penfield immediately hired Bosworth to serve as his representative, and they arranged for Adolphe Galli to order Carrara marble for the job, estimating that they needed six months.[80]

In mid-October 1932, Penfield had asked Arthur Currie for a letter from the university to secure permission to copy the Paris statue, describing it to McGill's principal as "the only thing I know of in art which expresses the ideal of scientific investigation."[81] The architect Penfield mentions above, Welles (not Walter) Bosworth, agreed to secure the copy of the statue on the doctor's behalf for the fee of US$250.[82] The copying in total was not to exceed 50,000 francs, payable from a special account Penfield set up in the Bank of Montreal, titled "Welles Bosworth Special." Educational reformer Abraham Flexner introduced Bosworth to Penfield via a note on letterhead from the Institute for Advanced Study in Princ-

77. Letter from Wilder Penfield to Jean Jefferson Penfield, July 17, 1932 (n. 45).

78. Ibid.

79. Letter from Wilder Penfield to Jean Jefferson Penfield, November 27, 1932, D C/D 33–4, Wilder Penfield Archive.

80. Ibid.

81. Letter from Wilder Penfield to Sir Arthur Currie, October 17, 1932, A/N 1–1/7, Wilder Penfield Archive.

82. Letter from Wilder Penfield to Welles Bosworth, November 26, 1932, A/N 7–4/1, Wilder Penfield Archive.

eton, New Jersey.[83] Sculptor Galli and Penfield signed a formal contract on November 26 for 50,000 francs that would cover the purchase of Carrara marble and production of the full-size copy. Important differences were noted between the Paris original and the copy: the original was in varied marble while the MNI copy would be tinted in tea to show a difference between the representation of flesh and drapery. The copy was to be paid for by Montrealers Mr. and Mrs. Archibald Hodgson and Dr. and Mrs. Lewis Reford.

The Penfield-Bosworth correspondence is animated and fascinating, as the Paris-based architect provided Penfield with an almost weekly account of progress on the project to copy the Paris model. From the late arrival of the stone (not until April 25, 1933) to the final shipping of *Nature* to Montreal, Bosworth sent the neurosurgeon minute details of progress. On March 1, 1934, Bosworth writes, after an absence of six weeks, "The work seems to me to be as near perfection as anything of the kind could be. . . . Galli says it is the most difficult thing he has ever had to cut, because of the position of the hands in relation to the head drapery, which made it almost impossible for him to hammer his tools from the back. He is greatly relieved to have been able to complete it without breaking one of the fingers, which he was very anxious about."[84] At the end of the sculpting period, both Galli and Bosworth recommended to Penfield that it not be colored with tea, as planned: "both felt that the statue has immensely more quality and dignity, as well as more real beauty, in the pure stone, which will take on an ivory-like patine [*sic*] very soon."[85] Under Bosworth's careful guardianship, the sculpture was packed and stored in a warehouse on rue Cardinet, with plans for it to go on the *SS Ausonia* on April 20, arriving in Montreal in early May. It was characteristic of Bosworth's penchant for details that he even instructed Penfield on how to open the crate and urged that the workmen in Montreal wear cotton gloves, to avoid fingermarks. Finally, on September 6, Penfield reported back to Bosworth that the statue was in place and "looks very well indeed."[86]

83. Letter from Abraham Flexner to Wilder Penfield, October 27, 1932, A/N 7–4/1, Wilder Penfield Archive. Flexner is also identified in a letter from Penfield to C. F. Martin. Letter from Wilder Penfield to Charles Ferdinand Martin, March 14, 1933, A/M 1–2/2, Wilder Penfield Archive.

84. Letter from Welles Bosworth to Wilder Penfield, March 1, 1934, A/N 7–4/1, Wilder Penfield Archive.

85. Ibid.

86. Letter from Wilder Penfield to Welles Bosworth, September 6, 1934, A/N 7–4/1, Wilder Penfield Archive.

*Nature Unveiling Herself Before Science* is the artful, genteel and decidedly masculinist parallel to the view of brains offered from the surgical gallery.[87] Historian Ludmilla Jordanova has explained how "veiling is an idea particularly associated with women and with female sexuality," and thus how men with special sexual privileges undertake an act.[88] While Jordanova cites dissection as a medical corollary to unveiling, Penfield may have associated the act of unveiling with surgery. In neurosurgery, the brain was opened by surgeons to "reveal" its mysteries to them, viewers in the gallery, and even to the patient himself or herself. In the foyer, however, the act of revealing is eroticized by the invitation to visitors to undress a young woman. Both the foyer and OR1 are thus about exposing or "unveiling" the brain; in the foyer it is about undressing, pulling back the clothing/textile that is hiding the passive female body and inviting the viewer to see her face and her breasts, not to see inside her, but perhaps to take, occupy, or possess her.[89]

Penfield showed an extraordinary personal devotion to the statue. Astonishingly, he carried around a photograph of the statue in his pocket for a time;[90] he admitted to his mother during the time that the copy was being made that he even had romantic feelings toward the work of art: "I have a sort of guilty feeling about this, as the statue is an early love of mine and it seems somehow wrong to have it now."[91] In *No Man Alone*, he describes this self-conscious interest in the sculpture as a longing, admitting, "I have always longed to have a copy of that statue."[92] This recalls a passage in Penfield's diaries where he describes his general yearning for women as a mark of his weakness as a scientist. "I have always been puzzled that I can not ignore the women about me. If I were a real scientist + really engrossed in great undertakings, surely I'd never notice smiles + eyes and hair and grace," he writes on October 7, 1941. In Lynn Buckham's 1972 portrait of Penfield (Figure 15), his white lab coat, shirt and hair almost merge with the white marble of *Nature*, which looms large behind the seated eighty-one-year-old doctor, almost like a guardian angel.

87. On the sculpture in Paris, see Mary Hunter, *The Face of Medicine: Visualising Medical Masculinities in Late Nineteenth-Century Paris* (Manchester: Manchester University Press, 2016), 135.

88. Ludmilla Jordanova, "Nature Unveiling Before Science," chap. 5 in *Sexual Visions: Images of Gender in Science and Medicine between the Eighteenth and Twentieth Centuries* (Madison: University of Wisconsin Press, 1989), 87–111, quotation on 89.

89. Jordanova devotes a whole chapter to the statue. See Jordanova, "Nature Unveiling Before Science" (n. 88).

90. See Penfield, *No Man Alone* (n. 28), 314.

91. Letter from Wilder Penfield to Jean Jefferson Penfield, November 27, 1932 (n. 79).

92. Penfield, *No Man Alone* (n. 28), 314.

Penfield designed the foyer of the MNI as a frame for his beloved *Nature*. He urged the decorator "to make the ceiling not too striking so that it will in any way detract from the rest of the room" and assured Phillips that he was not worried that the small table would block the view of the statue.[93] Commissioning a well-known American architect with Bosworth's pedigree to oversee the project in Paris, too, shows its significance for Penfield. It also reveals a Rockefeller-inspired network outside of medicine for the production of art and architecture. Bosworth's involvement linked Penfield back to the Rockefellers—Bosworth had

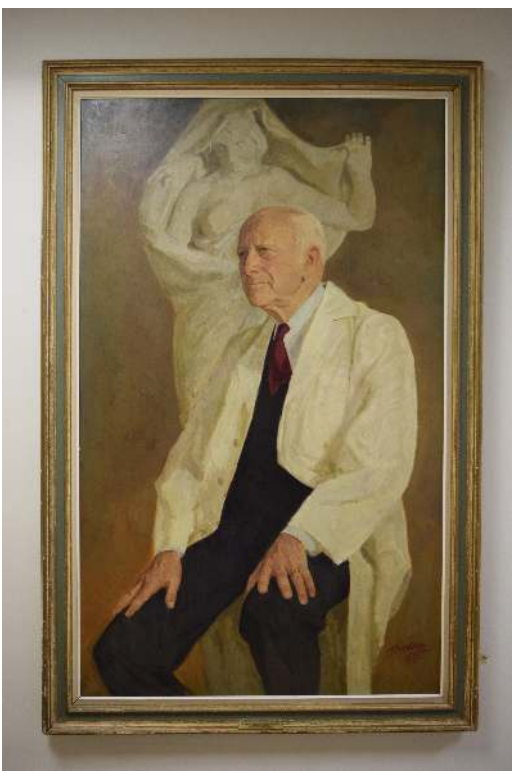

Figure 15. Portrait of Penfield hanging in the MNI, by artist Lynn Buckham, 1972. Courtesy McGill Visual Arts Collection, accession number 90-020. Photograph by Magdalena Miłosz.

93. Letter from Wilder Penfield to Barnet Phillips, March 28, 1934, A/N 1–1/6, Wilder Penfield Archive.

restored the Palace of Versailles for them—whose family foundation had of course funded the Neuro. A further connection was that Macdonald had worked for Bosworth from 1906 to 1907, a fact that goes unmentioned in all the correspondence between the neurosurgeon and Bosworth. Considering Macdonald's firm was not Penfield's choice as designers of the Neuro but rather a situation he inherited from an earlier project, the two men's worlds certainly overlapped significantly once they started working together.

## Conclusion

An architectural history of the Montreal Neurological Institute focusing on two interiors—OR1 and the entrance foyer—reveals the intense involvement of neurosurgeon Wilder Penfield in its design. His letters to his mother and to various designers show how he oversaw every decision, including the smallest details. This architectural side of Penfield is little known to historians of medicine, who have focused instead on his remarkable career as a surgeon. It is my contention that his comfort in the realms of architecture, decoration, and sculpture, like his interest in drawing and photography, came from a general interest in visualization. Alternatively, perhaps an underlying interest in visual communication sparked his devotion to medical visualization.

British architect Sir Edwin Lutyens famously said, "There will never be great architects or great architecture without great patrons."[94] I believe Penfield understood this link between "greatness" and architecture and worked assiduously to ensure his architectural output, the MNI, would be a mainstay of his legacy. The particular view of neurology articulated by the architecture monumentalized his personal accomplishment as a neurosurgeon, in both OR1 and the foyer. The design of OR1 showed Penfield at the height of his significance as an innovator, enabling visitors to observe awake surgery and even to participate in its choreography. At the same time, the photographer nestled below the seats recorded the process for posterity. Before arriving at OR1, however, and on a daily basis, staff, patients, and visitors experienced the notable iconography and design of the building's entrance foyer, which even merited a specialized designer. Here they were immersed in brain imagery, chosen by Penfield, and then encircled by an all-star list of medical men. *Nature*, simultaneously, invited all to consume her. At the same time, designers left space (literally) to insert Penfield's significance, adding a final point of exclamation to the distinctive building.

94. Edwin Lutyens, "The Work of the Late Philip Webb," *Country Life* 37, no. 8 (1915): 618.

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