



Prosthetic Theory: The Disciplining of Architecture

Author(s): Mark Wigley

Reviewed work(s):

Source: *Assemblage*, No. 15 (Aug., 1991), pp. 6-29

Published by: [The MIT Press](#)

Stable URL: <http://www.jstor.org/stable/3171122>

Accessed: 21/02/2012 14:28

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



The MIT Press is collaborating with JSTOR to digitize, preserve and extend access to *Assemblage*.

<http://www.jstor.org>

Mark Wigley

Prosthetic Theory: The Disciplining of Architecture

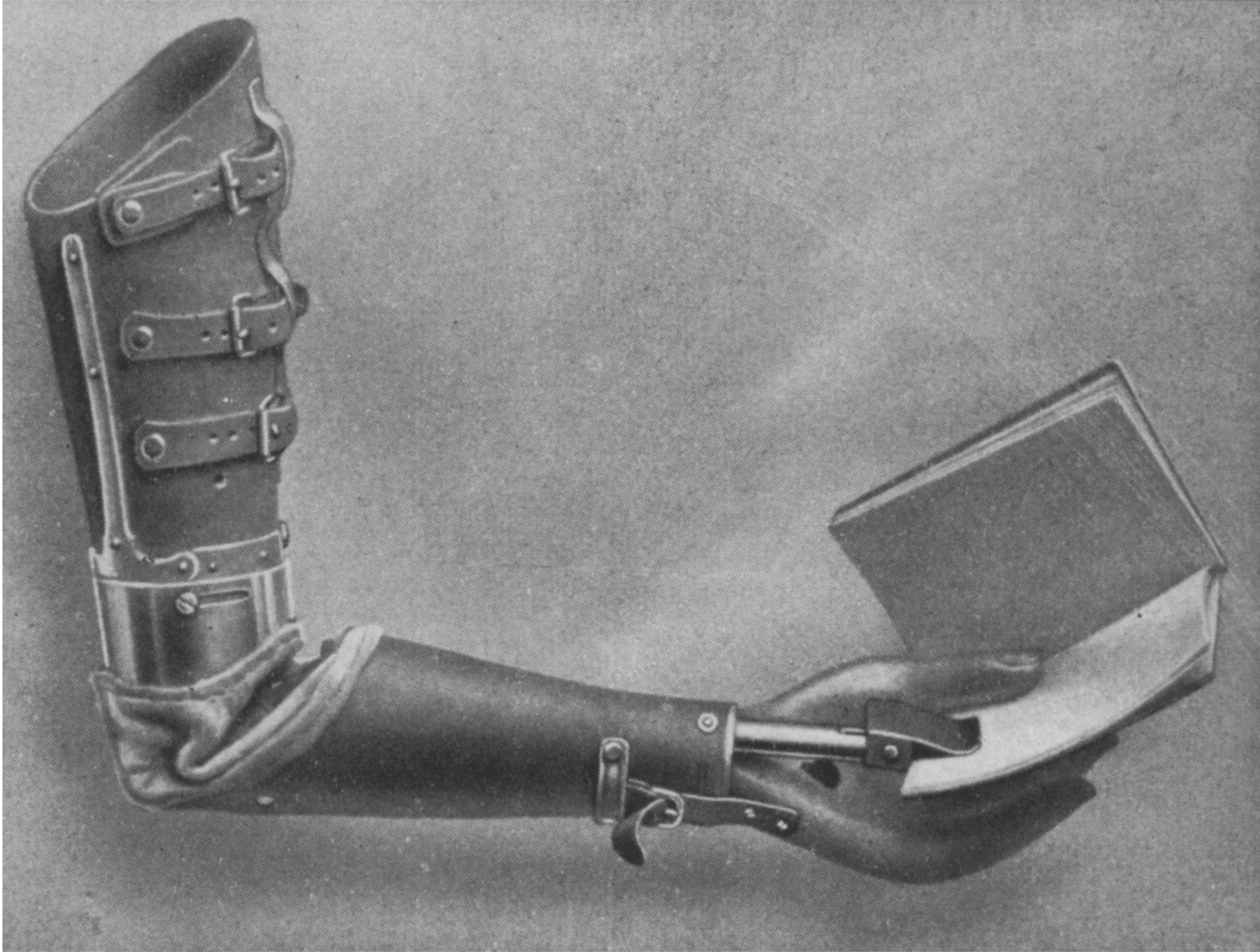
Mark Wigley is Assistant Professor of Architecture, Princeton University.

What is it to talk of prosthesis here in architectural discourse? Or, rather, what is it to talk of it again, for was not modern architecture simply the thought of architecture as prosthesis? Displaced from artifice into the artificial, architecture became a technological extension of the body that is neither natural nor cultural. Modern architecture is the space of the artificial. As Le Corbusier argues,

*We all need means of supplementing our natural capabilities, since nature is indifferent, inhuman (extra-human), and inclement; we are born naked and with insufficient armor. . . . The barrel of Diogenes, already a notable improvement on our natural protective organs (our skin and scalp), gave us the primordial cell of the house; filing cabinets and copy-letters make good the inadequacies of our memory; wardrobes and sideboards are the containers in which we put away the auxiliary limbs that guarantee us against cold or heat, hunger or thirst. . . . Our concern is with the mechanical system that surrounds us, which is no more than an extension of our limbs; its elements, in fact, *artificial limbs*.¹*

This concern with buildings as “human-limb objects” worn like clothing would even become as literal as Gideon’s identification of the nineteenth-century interest in “the problem of mechanically operated artificial limbs” with the development of mechanized furniture as an extension of the mobile body, which, in turn, he identifies with modern architecture.² In modern discourse, architecture is no longer simply the supplement of the body of the building. The classical relationship between structure and ornament, always understood as that between a body and its clothes,

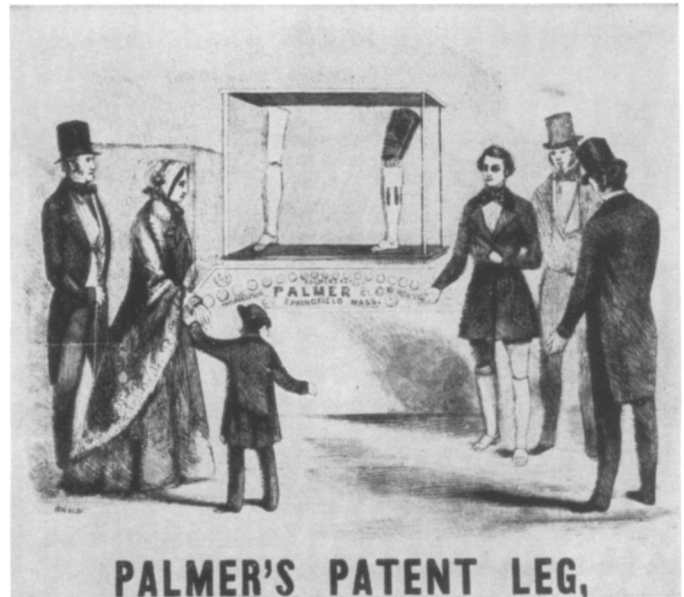
1. Artificial intelligence? From *Orthopadische Behandlung Kriegersverwundeter*, 1915.



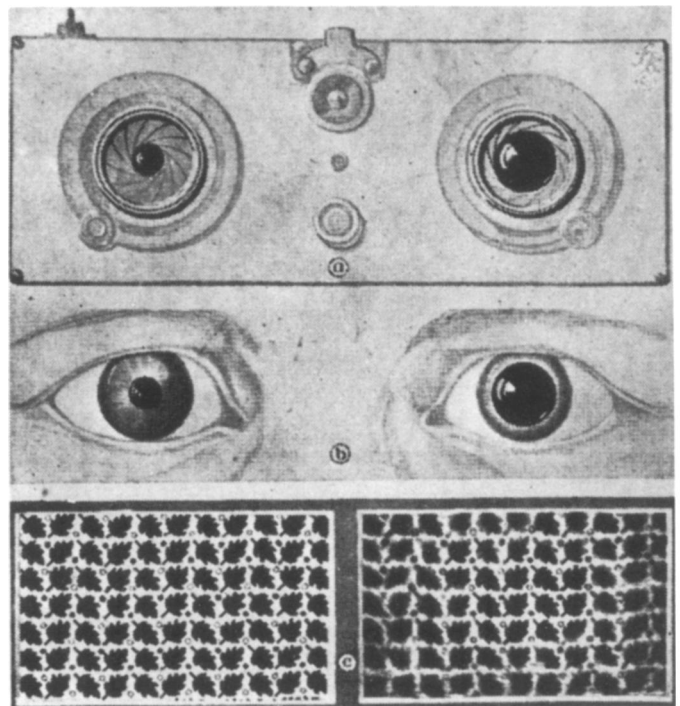
has been displaced onto that between body and building. Traditional ornamentation appears to be removed from the building at the very moment when the building itself becomes a kind of ornament worn by its occupant. But this mechanized ornament is structural. Indeed, it restructures the body that wears it.

Prosthetic architecture becomes a surrogate body “intended to second the person as such”;³ in this it recalls Freud’s claim, in *Civilization and its Discontents*, that, like the other technologies of communication and perception — the aircraft, the telescope, the photographic camera, the telephone, and writing — the dwelling is a prosthetic extension, an “auxiliary organ,” but one worn as a substitute for the woman’s body, “the first lodging.”⁴ That is, the building is the prosthetic substitute for a body already occupied, in fantasy, as a building. The categories of body, prosthesis, and architecture slip into one another. Freud wrote this during the time he was himself wearing a prosthetic jaw, which his friends called “the monster” and with which he was waging, as he put it, a “small-scale war.”⁵ A year after it was installed, in a letter to Lou Andreas-Salome, Freud asked what she thought the difference was between a person’s relationship to such a prosthesis, “which tries to be and yet cannot be the self,” and to his body.⁶ Seeing the prosthesis as the exemplar, rather than a deviation, of the condition of the body, she replied, “For that is after all the most quintessentially human thing in man, that he both is and is not his own body — that his body despite everything is a piece of external reality like any other, which can be identified by him with the help of his sense organs from outside himself.”⁷ The body itself is a prosthesis of consciousness. But then Freud had argued much earlier that even consciousness is itself a prosthetic attachment, worn as a kind of “garment” like any other tool.⁸

Such a blurring of identity is produced by all prostheses. They do more than simply extend the body. Rather, they are introduced because the body is in some way “deficient” or “defective,” in Freud’s terms, or “insufficient,” in Le Corbusier’s terms. In a strange way, the body depends upon the foreign elements that transform it. It is reconstituted and propped up on the “supporting limbs” that



2. Artificial limb, 1850s. From Sigfried Gideon, *Mechanization Takes Command*, 1948.



3. “The iris diaphragm of the camera and that of the eye.” From Walter Gropius, *Scope of Total Architecture*, 1943.

extend it. Indeed, it becomes a side effect of its extensions. The prosthesis reconstructs the body, transforming its limits, at once extending and convoluting its borders. The body itself becomes artifice.

Of course, the mechanical eyes, ears, and skin provided by modern systems of construction/representation have given way to technologies that relocate architecture within an electronic space (first mapped by Marshall McLuhan's *Understanding Media*, which is, significantly, subtitled *Extensions of Man*)⁹ within which the human body, no longer natural, is but an appliance attached to digital memories. So to raise the question of prosthesis in architecture again would be to update the discourse of modernity by examining this strange space of the artificial today. But before reviving the question of the prosthesis in architectural discourse, we should hesitate at least twice. First, because the concept of prosthesis is always already architectural and, again, because architectural discourse is itself a prosthesis.

The meaning of prosthesis depends on that of the root *thesis* from the Greek for "placing," a "position," a "proposition," "laid down," to be "maintained against attack," to "make a stand." This figure of standing in a place organizes the Western philosophical tradition in which theory is understood as the construction of arguments that can be defended, theses that stand up. Theory has always described itself as a kind of building. The philosopher is a kind of architect who pays attention first to the ground, establishing secure foundations, and then applies structural principles in order to construct a sound thesis, a solid structure standing in a place, or, more precisely, a structure that places, a standing that defines place.¹⁰ A "prosthesis," then, is always architectural. It is always the supplement of a structure — but one that cannot simply be removed. Grafted on to repair some kind of structural flaw, it is a foreign element that reconstructs that which cannot stand up on its own, at once propping up and extending its host. The prosthesis is always structural, establishing the place it appears to be added to.

So in thinking about the status of architectural discourse, something as apparently simple as a "theory of architecture" becomes complicated because the concept of theory

is itself established with a certain concept of architecture. Some of these complications can be unpacked here by tracing the role of architecture in the "home" of philosophy — the university.

Nowhere is the constitutional nature of the architectural "metaphor" more evident than in the university. The university is literally the space of the thesis. Since its origin at the beginning of the thirteenth century, its central activity has been the "disputation" in which "theses" would be defended. The test for all degrees was the ability to defend a thesis by identifying what makes it stand up. This was done by correctly applying the accepted structural/logical rules taken mainly from Aristotle's *Topics*, a "theory of places" that specified all the different ways a thesis could be either "constructed" or "demolished." The key function of these dialectical ceremonies was to define the place of things by establishing their structural relationship to certain accepted grounds. This idea everywhere organizes the university. As Heidegger argues, the concept of the university is based on the search for grounds and foundations that is philosophy.¹¹ In this sense, the university is everywhere philosophical. Hence the long debate as to whether philosophy should have a designated place within the university just like the other faculties or have a higher place or occupy each faculty in an organizational role. What each of the different accounts of the university share is the claim that it is, first and foremost, a space of construction. All of the conceptual oppositions that define the limits of the university turn on this architectural figure. The inside of the university is the space of the well-constructed thesis whereas the outside requires structuring, control.

The university has an architecture before it has buildings. Universities were legally established as such with a "deed of foundation" (originally solicited from the Pope) that set up the faculty as a "corporation" (*universitas*) with certain rights. Indeed, the faculty were themselves "founded" and "erected" in a place. Eventually, such an erection would define the place of a discipline, as in a professorship that would be established with its own deed of foundation. The university, then, is a system of such places, a topology, governed by a theory of place. But while its primary role was to define the place of things by developing theses, it



4. Temple of Knowledge: in the building of liberal arts grammar occupies the ground floor and theology and metaphysics the top. From Gregorius Reisch, *Margarita Philosophica*, 1583.

was itself essentially placeless. The universities emerged out of *studium generale*, schools that attracted both students and teachers from outside a local region, but not to a fixed place. The teaching would be done in rented spaces in the old cities that would frequently be changed.¹² Universities would often move from space to space within cities, between cities, and even between countries. The university is, by definition, a “corporation,” a body of faculty independent of any particular physical location. This constitutional placelessness was written into the original papal bulls of foundation that established the key right of the corporation as *ius ubique docendi* — the right of any master to teach at any other similarly recognized school. Thus the spatial context of the university is not a group of buildings or a city or even a nation, but other universities, a space defined solely by a set of institutional practices. These practices are seen to “shape” the mind, to “build” it up through the endless repetition of architectonic principles.

The first university was established in Paris in response to the growing demands for such an institution to control teaching practices, of which the final and most influential came from Stephen of Tournai, who distinguished between the space of the mind and that of the body. The “stable” mind is constructed by restricting its mobility:

The freedom of wandering [*libertas vagandi*] is divided into two: the movement of the body through different places and the movement of the mind through different images. The curious wander with their eyes going from place to place, kingdom to kingdom, city to city, province to province. . . . Those fickle and unstable in mind also wander. . . . This freedom of wandering in the mind through different images tires and impedes scholars in their studies and the cloistered in their prayers.¹³

The institutional architecture built into the practices of the university resists the “wandering mind” before actual buildings are constructed to resist the “wandering body.” Architecture was only used to “stabilize” an already operating university when cities would offer buildings permanently dedicated to teaching in order to persuade the highly mobile faculty and students to remain in one place.¹⁴ Only then was a deed of foundation granted over the land and

buildings.¹⁵ For the first time, the institutional metaphor of building was applied to actual buildings. In fact, it was this very metaphor that the buildings were called in to protect. Architecture was used to protect the architectural concepts that structured the institution. The first buildings established solely for the university were special churches used for the disputation of theses;¹⁶ the first thing to be given a physical place, then, was the thesis, the concept of placement itself.

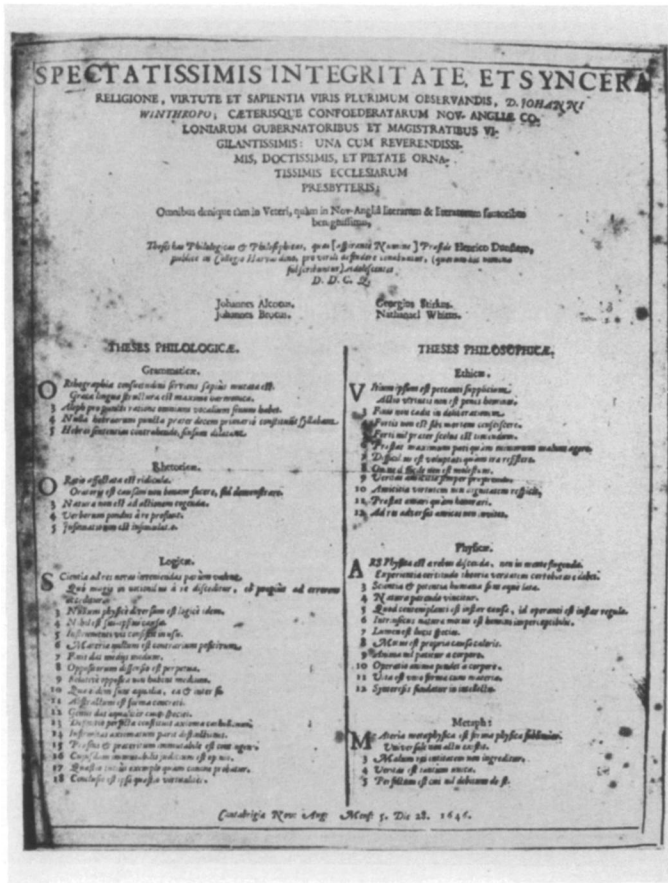
These buildings, prosthetic supplements to the corporation, remain foreign to the concepts they protect. There is no place for the study of architecture within this institution. As a “mechanical” art, it has no place in the home of the “liberal” arts. But this distinction between mechanical and liberal depends on the architectural metaphor. It follows from Aristotle’s description of the theorist as an architect (*arkhitekton*) placed above the manual laborer.¹⁷ It is precisely the figure of architecture that is used to exclude architecture. Ironically, architecture cannot simply enter the space of the thesis because this space is already organized by a certain theory of architecture, or rather, an architectural theory, architecture itself remaining untheorized.

Nevertheless, in the nineteenth century, architecture was incorporated within the university. This recent development, begun in the United States, rehearses familiar exchanges from the long history of architecture’s negotiation for a place as a discipline. But it uniquely focuses the terms of this negotiation because it involves architecture claiming a place within the same institution that houses philosophy rather than within those institutions (like the academies) whose own place was determined by the application of the philosophical distinctions the universities were set up to protect.

The call for architecture to enter the university to establish its grounds came at a time when it was seen as groundless. Repeatedly, American architecture in the mid-nineteenth century is described as existing in an “abyss.”¹⁸ This abyss was a scene of theoretical and stylistic “chaos” and “confusion,” produced by the growing realm of architectural publications that disseminated multiple, partial, and false ideas about the art. A series of letters to editors, articles, hand-

books, and treatises began to identify architecture as a privileged “public” art urgently in need of institutional control.¹⁹ The tradition of architecture as an “extra of education” was opposed in favor of controlling both the education of the architect and publications on architecture.²⁰ It was argued that were architecture grounded in every level of the educational system, from high school up to the university, “publishers would soon fill the chasm.”²¹ Architecture thus became a public art precisely by occupying the space of publication.²² One of the central functions of the university has always been the control of publication, regulating both the production and distribution of books. The architectural profession, in the form of the American Institute of Architects, which was set up in 1856, immediately promoted the founding of both an architectural periodical and a school of architecture.

Such a school became possible because of a transformation in the status of the university. Until then, American universities faithfully maintained the original institutional structure turning around the disputation of theses. Like the very first university students, the American student had to be “ready to defend his theses or positions.”²³ Indeed, many of the theses being defended originated in the thirteenth century. This traditional structure was itself defended by employing the accounts of the university as providing a “liberal education” that had been developed to counter the early nineteenth-century critics of the English university.²⁴ These accounts reaffirmed the core of the university as architectonic in order to resist its “extension” with new disciplines such as the emerging sciences. They opposed not only the attachment of prosthetic disciplines to the body of the university but also the idea that the university was already a kind of prosthesis, an “instrument” for “extending the boundaries of our knowledge.”²⁵ At the same time, they offered architectural education as an example of what should be excluded from the university.²⁶ Architecture remained at once the model for reason and foreign to it. And yet it needed to be governed by reason, along with the other fine arts, which “are apt to forget their place, and, unless restrained with a firm hand, instead of being servants, will aim at becoming principal . . . laying down the law in cases where they should be



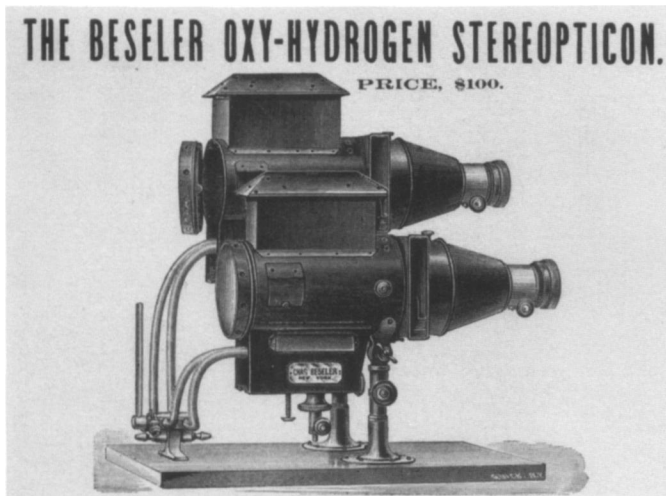
5. List of theses publicly defended at Harvard University in 1646

subservient.”²⁷ Again, the architectural metaphor was used to exclude, subordinate, and control architecture.

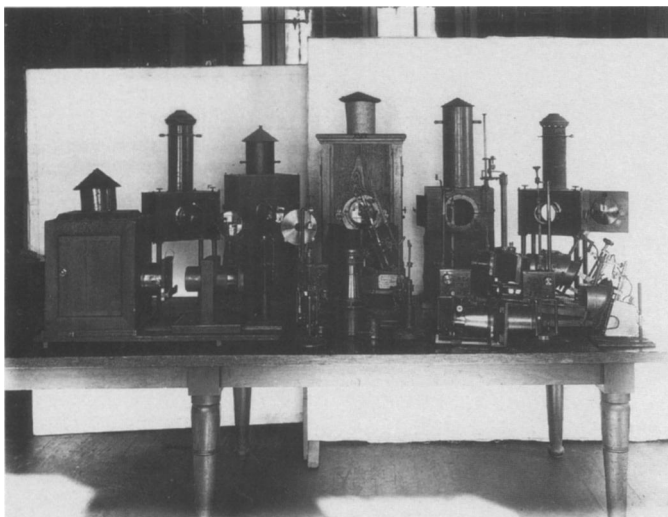
But the university was eventually expanded through the addition of both the sciences and the fine arts. They were admitted by extending the domain of the architectonic principle rather than abandoning it. Both sets of disciplines were redefined as an extension of the traditional scholarly search for grounds and added as the “superstructure” to the old “foundation” of the university. This displacement of the university was accelerated with the Morrill Land Use Act of 1862, which established a number of Land Grant Colleges throughout the country “in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.” Gradually, the differences between these new universities and the old ones were blurred. The more technical universities accommodated a liberal program while the liberal colleges accommodated the sciences. By the end of the nineteenth century, the modern American university had been established in a stable form combining liberal arts, fine arts, sciences, and professional schools. The institution had extended itself into the traditional gap between liberal and practical but redefined this territory to preserve its basic (architectural) principles. This disruption of the traditional limits of the university created a double opening for architecture: first, to join the sciences, which were added from 1847, and, second, to join the fine arts, added from 1870.

The first school of architecture in a university was established in the first Land Grant College to be founded, the Massachusetts Institute of Technology.²⁸ It opened as a department within the School of Industrial Science in 1866. The year before, its founder, William Ware, described the strategy by which it would occupy the university: just as architecture exceeds the building it supplements, the new discipline would graft itself onto the sciences, rationalizing building with the existing technology courses, but then importing the disciplinary “apparatus” of the library to rationalize that which exceeds building to become fine art. It was this “essential equipment” that would establish a place for architecture.

The photograph, in the form of prints, postcards, and stereoscopic views for study and lantern slides for lec-



6. Beseler Oxy-Hydrogen Stereopticon lantern slide
"used by all the Normal Schools in the State of New York." From *The Magic Lantern and Its Applications*, 1886.



7. Lantern slides used at the Massachusetts Institute of Technology

tures,²⁹ was to play the same role with regard to the university that the drawing had played in helping architecture to gain a place in the first academies in the Renaissance. The photographic image enabled the materiality of buildings to enter the immaterial space of the university. All the different sizes and types of buildings in the world could be brought into the same frame of the camera, assembled, and compared. The photograph literally provided the frame of reference for a new discipline. Ware proposed that the architecture school would be organized around a library of photographs, supported by models, casts, prints, drawings, specimens of decorative materials, tiles, stained glass, lecture diagrams, and books. In the teaching of both building and architecture, the central concept was that of the "collection."

The trouble is technological; there is a want of system and method, and of means for general collection, and a general diffusion of their results. . . . Modern science . . . has happily brought it within our power to form collections of any nature and to any extent, illustrating the history of art in all its forms. . . . Photography offers to bring the whole world to our door; and a systematic collection of architectural photographs, both of the ensemble and of the detail of buildings, so arranged as to be of easy reference, would be an invaluable and indeed indispensable auxiliary.³⁰

In emphasizing the collection, Ware had picked up some of the arguments William Rogers had used in his original proposal for the university circulated in 1861 to raise financial and intellectual support for the venture. Rogers argued for the creation of a central "Museum of Industrial Art" in which objects would be classified in a way that would in itself be an important source of "instruction."

Nor, in regard to any part of the Museum, should the great purpose of *instruction* be lost sight of in the multitudinous gathering of materials. A mere miscellaneous collection of objects, however vast, has little power to instruct, or even to incite to inquiry. The practical teaching and the real suggestiveness of a Museum is almost wholly dependent on the clear and rational arrangement of its parts, and the leading ideas which rule in their classification.³¹

Ware appropriated and developed this theme in his letter of 27 April 1865 to the original members of the institute, responding to Rogers's proposal of the previous year that

MIT would, from the start, include an architecture school.³² This letter, which ends with Ware offering his services and which undoubtedly led to his appointment as the first professor of architecture, begins with the optimistic suggestion that a school of architecture would only involve a “comparatively slight extension of your programme.”³³ Ware identifies “design” as this “extension.” But “between” this prosthetic supplement and the main body of the university is an “extensive region” that is “necessary to be gone over by the student, but which is at present almost unexplored and in which a great deal of labor must be spent before a road can be established through it and made practicable for your classes.”³⁴ The exploration of this uncharted territory between the scholarly space of the thesis and the architectural prosthesis, which includes areas of both the study of architecture as a fine art and the study of building as a technological science,³⁵ requires practices of systematic collection. These practices are meant to map this territory and thereby rationalize the connection of design to scholarship. The lines of the map, the network of “roads” established through the region, would stitch design, and therefore architecture, onto the university.

Ware presents the teacher as, first and foremost, a collector, assembling all the available fragments of architectural theories and designs in order to extract authorized lines of argument that can be passed on to students and thereby “fix” architectural practice.

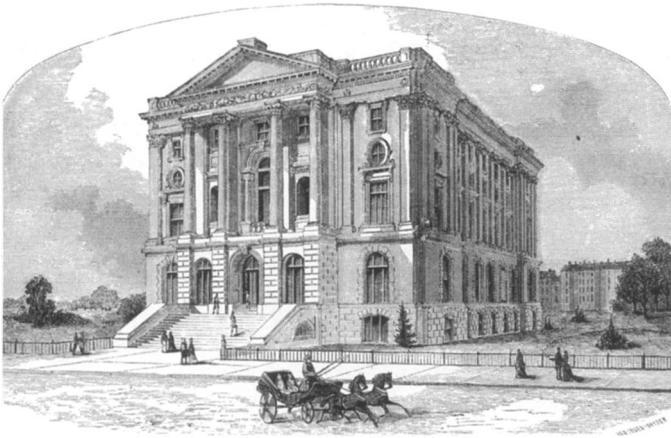
Any intelligent person by collecting and collating what has been said on this subject, discerning the points of agreement and contradiction among his authors, would be able at the end of his studies to form a more intelligent opinion of the general question than is probably in existence, and to convey to your classes a greater amount of useful information upon it than ever was imparted. . . . The Institute could not do a greater service than to collect opinions and authorities, and by organizing discussion do something to fix professional usage.³⁶

This “labor” of collection was required because there were no definitive scholarly publications on architectural theory and practice that could be employed in the university. Indeed, it was as the preliminary work toward preparing the set of such textbooks that Ware himself would go on to publish throughout his career.³⁷

When Ware developed this lengthy letter into his proposed course of instruction after being given the professorship, he elaborated its suggestion that the student, too, might be understood as a collector, not merely surveying a field that has been newly “classified and arranged in an accessible and available shape” but even participating in the process of classification.³⁸ Students would rehearse the teacher’s analysis of the archive rather than simply receiving its results.³⁹ Over the years, Ware gradually designed a series of exercises, known as “tours,” by which students would work their way through every object within the collection.

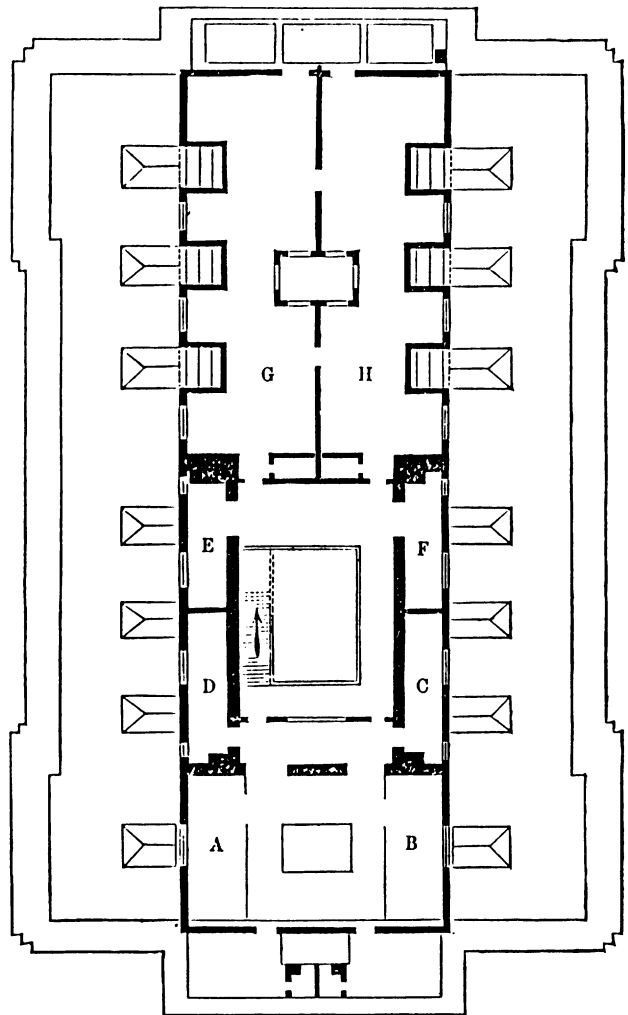
The opening of the school had to be delayed for a year while Ware toured Europe, collecting, in addition to books and papers, “2,000 photographs, 500 prints, 400 plaster casts, 200 crayon drawings, 40 water-colors, mostly of architectural subjects, and 30 manuscript architectural drawings, large and small, besides 100 sheets of working drawings, mostly tracings, and some specimens of tiles, pottery and stained glass.”⁴⁰ This collection established the library around which the school was organized; it grew so rapidly that by 1894 it included fifty thousand slides.⁴¹ In the Rogers Building, where all the departments of MIT were originally housed, a space was designated for Ware’s collection: the “architectural museum and library.” Located above the institute’s main lecture hall, scene of the grand public demonstrations of the advances of research, it marked the beginning of the territory in the building specific to the school of architecture. It lay between the general spaces of the university and the most idiosyncratic of architectural spaces, the design studios that occupied what was, in effect, the attic. The superstructural quality of this roof space was symbolically opposed to the scientific laboratories that filled the first floor and the foundational space of the basement (propping up, as it were, the lecture halls), the sites of research that would, indeed, become the spaces upon which the university would build its reputation. Architecture was grafted on top of the structure provided by the sciences, its key rooms occupying the vestigial space of the building, the leftover space, or, more precisely, the supplementary space.

This space was, in fact, the subject of a protracted conflict between Rogers and the architects, Jonathan Preston (a



8. Rogers Building,
Massachusetts Institute of
Technology, 1864–65

founding member of the institute) and his son William. Having argued, following a tour of European schools, that their design for the institute could follow no known precedent, the construction of the building began in April 1864, but in February 1865 Rogers wanted to change the roof form to a mansard roof to provide more teaching space. The architects resisted, proposing to add a clearstory space behind the building's classical pediment. The argument became so heated and deadlocked that another architect was called in to design the roof before the Prestons's proposed addition was, for structural reasons, reluctantly approved in May 1865, by which time Ware had entered the picture and was negotiating for the unique requirements of architectural teaching.⁴² Symptomatically, architectural design occupied this prosthetic supplement to the building. A space had been made for architecture in the university that was not completely inside the university. The world of the collection, and the lectures based on its classification, inserted itself into the traditional interior of the building, but the world of design remained outside this interior, above the original ceiling line and yet underneath the roof. Architecture was inside the university, but inside as an outsider.



9. Plan of Rogers Building,
fourth floor, showing design
studios



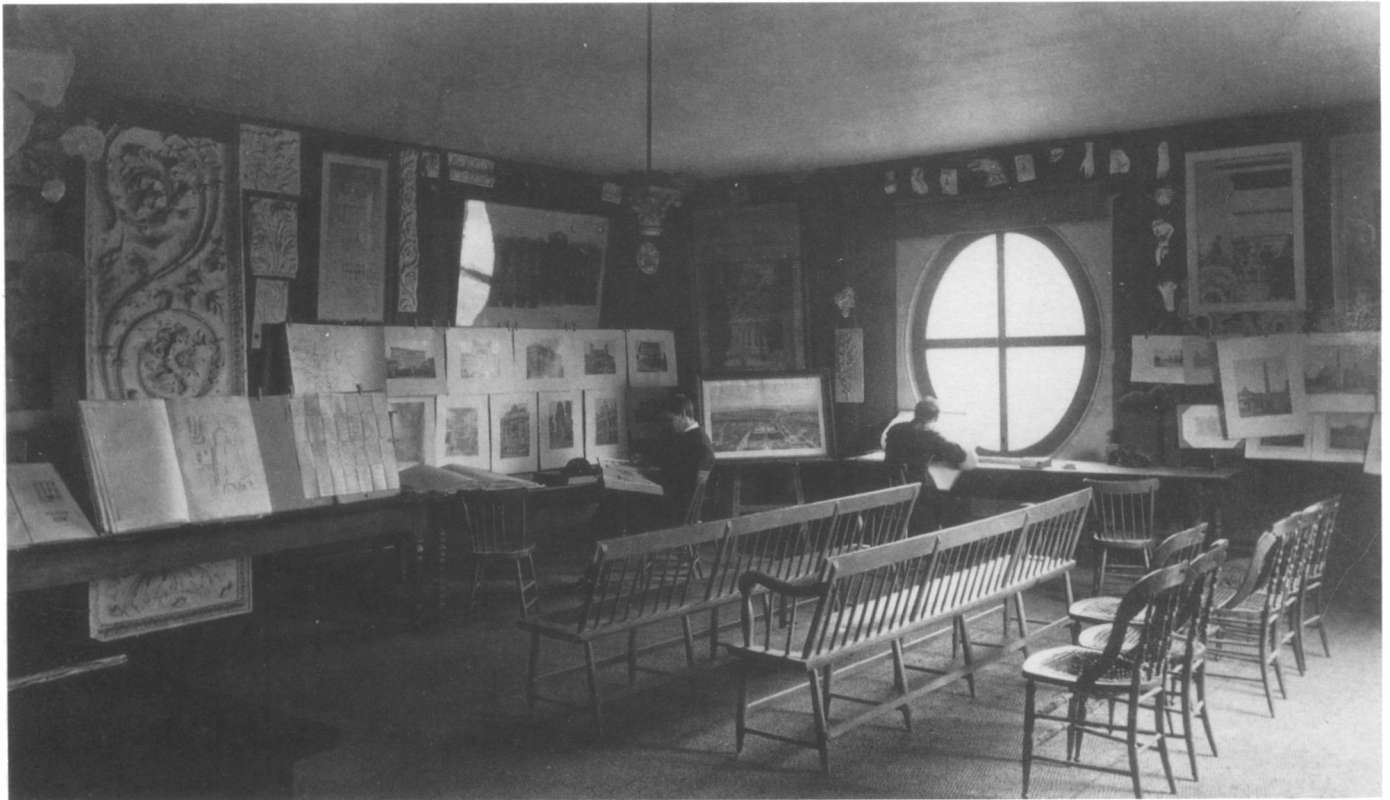
10,11. Rogers Building,
architectural drawing rooms,
1876



12. Rogers Building,
architectural lecture and
drawing room, 1876

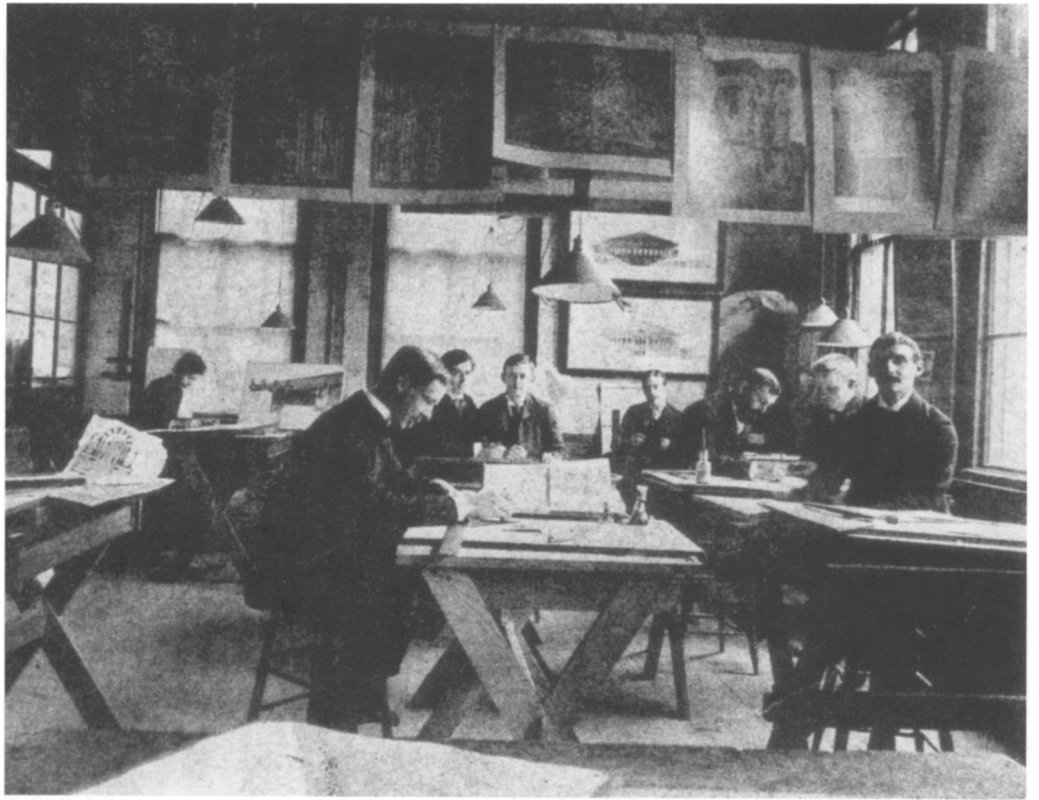


13. Rogers Building, design studio, 1876



14. Rogers Building, architectural lecture and drawing room, 1876

15, 16. Walker Building,
Massachusetts Institute of
Technology, design studio
and studios leading into the
library, 1880s





17. Pierce Building,
Massachusetts Institute of
Technology, architectural
lecture room, controlled by
Stereopticon lantern slide, 1904

But the architectural collection, far from staying within its designated space, spilled out into all the architectural spaces, covering every surface. The space of architecture in the university literally became the space of the collection. The school immersed itself in its collection. While the walls of the lecture rooms were covered with drawings and projected lantern slide images, those of the drawing and design rooms were lined with photographs, prints, drawings, casts, tiles, stained glass — every type of representation that had been collected. These objects packed together systematically so obscured the walls that the collection became the walls, defining, subdividing and rearranging the space. Students produced and displayed their drawings under the critical eye of the assembled exemplars. This fetishistic layering of worshipped objects acted as a kind of defence, protecting architecture from the claim that might come from below that design is not scholarly, that the prosthetic extension, in the end, does not really belong in the university.

This close relationship between the collection and design was preserved when the school of architecture moved into the Walker Building in 1883, where it occupied the space above that given to chemistry and physics, and again when it moved into the Pierce Building in 1892, before returning to the Rogers Building in 1916 when the rest of the university had moved to a new campus. Architecture occupied the original center of the university only when it had been effectively turned into an extension. In 1938 architecture left the Rogers Building to rejoin the rest of the university in its own building, but one that was, yet again, an extension of the main university building. With each move, the ideology of the collection was sustained. But as the place of architecture in the university became successively more secure, the objects of the collection began to be separated off into a discrete but accessible space.⁴³ The need for the defensive walls of representations began to fade away.

The design studios alone remained lined with representations, as they are in most architecture schools today. The space of design continues to be defined by layers of photographs, models, xeroxes, posters, designs, sketches, magazines, mottos, books, advertisements, fabrics, and so on, which act as fetishistic substitutes for what exists outside

the studio: other places, other times, other architects, other schools, and other disciplines. These tokens bring all of these issues “into” design. The designer is seen as detached from the physical space of the studio and set adrift among the conceptual space of these representations. Inasmuch as these tokens are held to be representations of something “other,” something “outside” the studio, they act to define the interior, the space of design, the paradigmatic space of architecture. The whole series of symbolic forms of ritualistic interaction with these objects, by students and by teachers, sustains architecture’s convoluted relationship with the institutional structure of the university. They at once define and defend the space of architecture relative to both the traditional interior of the university and its exterior. They construct and maintain a space for architecture that is neither inside nor outside the university.

The defensiveness needed to maintain this vulnerable space was written into the arguments by which architecture was first able to occupy the university. Even though in his proposed course of study Ware had argued that building could be classified with technological science and architecture with the technologies of the emerging science of art history, “design” as a fine art still threatened to escape classification and hence the university. But Ware contended that this, too, was to be rationalized by “sound reason” in order to restrain architectural education to the “middle ground” between utility and pure art. In describing each stage of architectural education, he employed the traditional architectural rhetoric that organized the university. Indeed, the curriculum culminated in traditional fashion with a “thesis” project meant as the equivalent of the written theses with which students in all the other schools in the university completed their degrees.

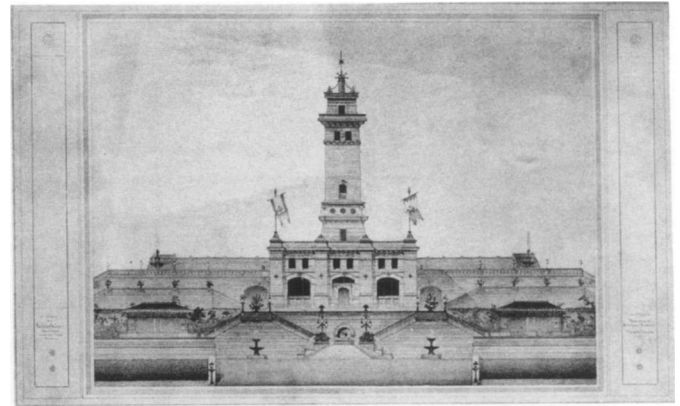
Rogers had specified the need for such a dissertation in the original course of instruction he had proposed for the university in 1864.⁴⁴ Ware’s first announcement that an “original design” would fulfill this requirement in architecture came in 1868 in a supplement to the university’s annual description of its courses. But the word “thesis” was not used officially to describe such a design until after the first one had been successfully completed by Henry A. Phillips in 1873.⁴⁵ Entitled, in full, “Design for the Buildings of the Water Works of a City, embracing the treatment of a

system of Beams, of an Iron Arched Rib with bracings, of the Stability of the Chimney and of the Tower, and of the pieces of a Roof Truss covering a small building,” its topic was specified by the school and aimed to exhibit architecture’s role as both a science and an art. Its defence involved the submission of a set of drawings and forty-two pages of “explanation” that identified the issues addressed by the thesis and gave a detailed account of the design’s programmatic, aesthetic, and technical properties, along with extensive structural calculations. Such scholarship was seen to finally place architecture within the traditional space of the university.

The graduating architect assembles arguments analogous to those constructed by the traditional scholar; only what is being constructed and defended is literally a construction, what is being placed is literally a place. This strange encounter between architecture and its metaphor was even written into Ware’s claim that not only could architecture assume the role of a liberal art, but that it was playing the essentially public role of the liberal arts before the constitution of the university.⁴⁶ Consequently, in entering the university, architecture reclaimed its own space.

Ware’s convoluted application to architecture of an architectural metaphor, and the resulting course structure organized around the dematerializing and classifying effect of the photographic image, provided the basic strategy for all the new schools of architecture, including those that soon developed within the new discipline of the fine arts. Architecture was seen to be central within the fine arts. In fact, departments of fine arts often emerged out of architecture.

This peculiar disciplinary genealogy can clearly be seen in the school of architecture that Ware founded in 1881 at Columbia University after he left MIT. Ware reelaborated his original strategy for occupying the university by adding the “apparatus” of the collection to the preexisting institutional structure; he argued that as architecture is a fine art it “must always be, so far as relates to design, not quite one” with the scientific body of the university onto which it is grafted.⁴⁷ Founded in the sciences, the school soon detached itself from them, being for some years suspended without a proper place, then becoming the basis of the new department of fine arts, and, ultimately, detaching



18. Henry A. Phillips, design for a “Water Works,” first architectural thesis completed at the Massachusetts Institute of Technology, 1873

itself from that to form an independent school.⁴⁸ This mobility resulted from the demands for independence that grew as soon as the form of the modern university had stabilized.⁴⁹ Architecture schools began to detach themselves from their hosts in both the sciences and the fine arts to occupy the gap between them — the “middle ground” identified by Ware. This independence, however, was not achieved until well into the twentieth century.

But, in fact, a certain discomfort remains. Architecture is still a “misfit,” a “black sheep.”⁵⁰ The discipline is itself always a prosthesis. The crucial excess, the supplement by which building is extended into architecture, however much subject to control, always remains external to the architectonic order prescribed by the university. Even Ware’s canonic strategy for occupation concedes that some part of design exceeds the (university) reason that attempts to control it.⁵¹ That is to say, architecture remains foreign to the architectural concepts it applies to itself. Because these concepts organize the university, architecture is at once more of an insider than any other discipline in the university and more of a foreign agent. This ambivalence is nowhere more evident than in the final “thesis” project. On the one hand, the project, as creative art, could not be more foreign to the university. But, on the other hand, its public oral defence by the student is the most faithful maintenance of the oldest and most central institution of the university.

Architecture remains a prosthetic intrusion into the domain of the thesis. But as such, it cannot simply be removed. Like all prostheses, it occupies the host because there is a gap in the main body; it supplements a deficiency in the thesis, a crack in the solid foundations of the university. Suspended between art and science, academic and professional, pure and applied, theoretical and practical, it fills all the gaps that once defined the outer limits of the university but now inhabit and divide its core. Architecture incorporated itself into the institution by exploiting this convolution of the borders of the university that went unacknowledged until the nineteenth century. The old myth of the autonomy of the university, as a clearly defined place separate from the material world it theorizes, breaks down. In the modern university, the theoretical

cannot be separated from the technical. Indeed, for Heidegger, the modern domination of technology is precisely the dominance of the architectonic principle that organizes the production of theory.⁵²

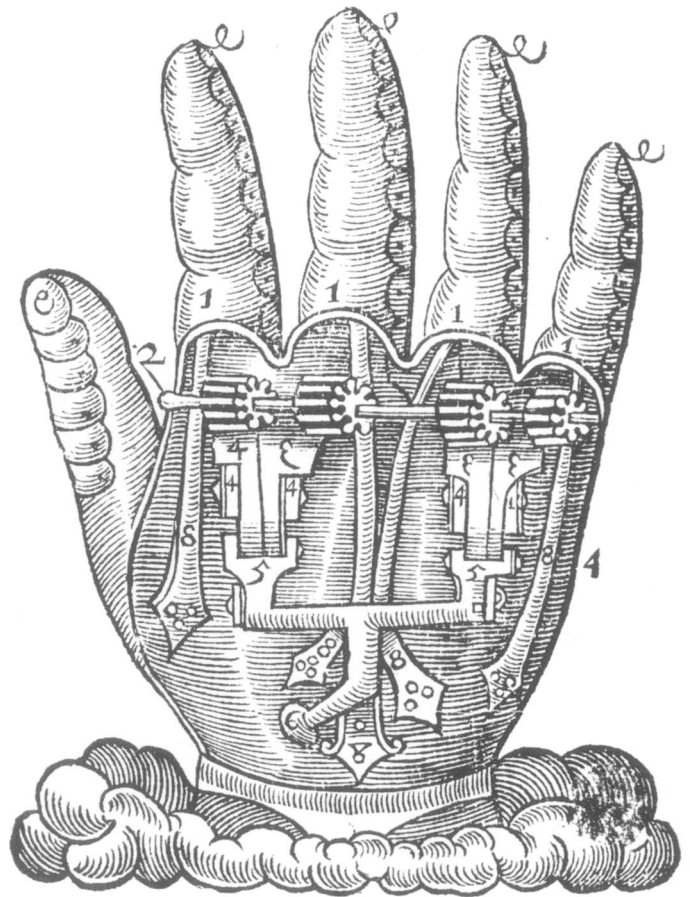
Architecture itself could only be admitted into the space of the university when the distinction between architectonic and technical broke down. Indeed, it could act as a privileged figure for this breakdown inasmuch as Ware had always argued that it was the unique character of architecture to straddle all such distinctions. Significantly, Ware was fired from Columbia for pushing the limits of the university even further. He had established the form of the modern architectural school by identifying education with publication, producing many of the standard architectural books that were used extensively both inside and outside all the universities. But he was dismissed in 1903 when he reported to the trustees of Columbia that he had published his lecture notes as textbooks for a correspondence school, a program intended to be a university “extension” course, through which students who could never enter the physical, let alone class-specific, space of the university could, nevertheless, eventually earn one of its regular degrees.⁵³ Ware was held to be subverting the distinctions between private and public, and between intellectual and commercial, with which the university had traditionally defined itself. In such a scheme, the elite space of the well-constructed argument could no longer be isolated even from domestic space. But, of course, such a transformation of the private house into a prosthetic attachment to the university was as inevitable as the original occupation of the university by the technologies of communication that would make this attachment possible, and Columbia soon launched its own correspondence course as the “Home Study” program.⁵⁴

But in thinking of how architecture participated in these transformations of the institution, it must be remembered that Heidegger identifies the ends of modern technology, and therefore the university, as fundamentally military. In these terms, it should be noted that prosthetic technology is military technology. The pioneering work on prosthetics of the sixteenth-century surgeon Ambroise Pare, for example, was a development of the precise mechanisms with

which the surrogate body that forms a suit of armor is constructed.⁵⁵ Prosthetic technology alternated between producing substitutes for the body parts that military weapons had destroyed and producing these very weapons. All weapons are prosthetic. Like all prostheses, they are always mechanisms of both defence and attack. As extensions of the body, they are called “arms.” One body gains control of another by being extended further. Theory became the agent of this control by redefining the possibility of extension. As the first American university to efface the distinction between the architectonic condition of theory and its technological application, MIT, whose original course of study included military training in the basic program,⁵⁶ would, of course, go on to become a major developer of military technology, and effectively a producer of weapons, through its increasingly close ties to a growing network of new intermediate institutions, known as the “military-industrial complex,” that has disrupted every one of the traditional limits of the university.

In entering the university by grafting itself onto the sciences, architecture, the art that was responsible for military technology before the rise of the sciences as independent disciplines (all the classical treatises on architecture having a section on both defensive structures and weapons of attack), is implicated in the operations of this complex. The effacement of the limits of the university, and its complicity with the military, does not occur in the applied sciences alone. Every field has its disciplinary technologies that sustain specific institutional practices with material and ideological effects that are strategically exempted from critique. The traditional space of the thesis is more and more the space of technical mastery.

Even though the modern displacement of the limits of the university follows from certain gaps in the architectonic theory of place itself, architecture did not enter the university as some kind of rethinking, or even first thought, of architecture. Precisely what it is to enter is to take this theory for granted, that is to say, to take it as an unquestionable truth that in some way precedes the university structure “based” on it, rather than as an ideological construction whose structure can, and should, be inspected. The university’s fundamental thesis, the architectural prin-



19. “The form of a hand made artificially of iron.” From Ambroise Pare, *A Supplement of the Defects in Man’s Body*, 1579.

ciple of grounding, remains undefended, undisputed. The university does not examine the foundation of its own foundation. Its architecture is unstable, necessarily erected over an abyss, inasmuch as its inaugural metaphor of architecture is exempted from its own interrogation.⁵⁷ The metaphor becomes so familiar that it is not seen, even in the moment of being applied to actual buildings.

It is this blindness that needs to be examined when addressing the development of modern architecture as a technological prosthesis. In a parallel and apparently unrelated history, the discipline of architecture developed itself as a prosthetic implant in the institutional mechanisms for the production of theory. Both histories turn on the evolution of new technologies of communication. As these technologies begin to breed, the body of the university becomes as dissimulated as the human body. The limits and functions of each are no longer clear. But these dissimulations are not independent of each other. With the continued erasure of the distinction between theory and technology, the two histories have become fundamentally entangled.

For Heidegger, the final collapse of the distinction between theory and technology is the technology of theory itself, thinking machines, information systems.⁵⁸ The networks of communication have become the new house of theory: "The philosophical requirement is today best represented by that information technology which, though it seems to escape the control of the university and thus, in Kantian terms, the control of philosophy, is nonetheless its true and most faithful representative."⁵⁹ The contemporary architecture of digital prosthetics is what remains of the once-solid body of the university. The critical gap between architecture and its metaphor has been erased. The uncanny home of both theorist and theory is electronic. The status of both the architectural object and architectural discourse has been displaced, such that the distinction between them can no longer be made. The way these technologies parasitically inhabit, infect, and become the body of architecture redefines the discourse. But this displacement cannot simply be theorized here, or anywhere, as theory is itself dependent on the very architecture being displaced by its own technological offspring. In the end, prosthetic architecture cannot be disciplined.

Notes

I would like to thank Elizabeth Perkins of the MIT Archives and Special Collections, Sally Beddow of the MIT Museum, and Janet Parks of the Avery Library at Columbia University for their assistance in the research for this paper. A shorter version of this paper was published in *Ottogono* 96 (1990): 19–26.

1. Le Corbusier, *The Decorative Art of Today*, trans. James I. Dunnett (Cambridge, Mass.: MIT Press, 1987), 72. On this passage and the whole argument about architecture as a form of clothing that organizes it, see Mark Wigley, "Architecture After Philosophy: Le Corbusier and the Emperor's New Paint," *Journal of Philosophy and the Visual Arts* 2 (1990): 84–95.

2. Sigfried Gideon, *Mechanization Takes Command* (New York: Oxford University Press, 1948), 390.

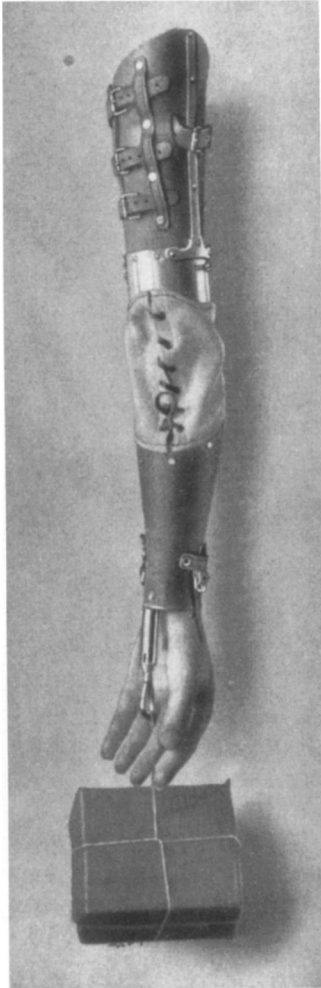
3. "Tools are the useful extensions of man's arms and legs. This definition can be stretched to cover certain products of human ingenuity which are also intended to second the person as such: the dwelling is a tool, and so are the road, the workshop, and so on" (Le Corbusier, *Looking at City Planning*, trans. Eleanor Levieux [New York: Grossman Publishers, 1971], 31).

4. "With every tool man is perfecting his own organs, whether motor or sensory, or is removing the limits to their functioning. Motor power places gigantic forces at his disposal, which, like his muscles, he can employ in any direction; thanks to ships and aircraft neither water nor air can hinder his movements; by means of spectacles he corrects defects in the lens of his own eye; by means of the telescope he sees into the far distance; and by means of the microscope he overcomes the limits of visibility set by the struc-

ture of his retina. In the photographic camera he has created an instrument which retains the fleeting visual impressions, just as a gramophone disc retains the equally fleeting auditory ones; both are at bottom materializations of the power he possesses of recollection, his memory. With the help of the telephone he can hear at distances which would be respected as unattainable even in a fairytale. Writing was in its origin the voice of an absent person; and the dwelling-house was a substitute for the mother's womb, the first lodging, for which in all likelihood man still longs, and in which he was safe and felt at ease. Man has, as it were, become a prosthetic god. When he puts on all his auxiliary organs he is truly magnificent; but those organs have not grown on to him and they still give him much trouble at times" (Sigmund Freud, *Civilization and its Discontents* [1930], trans. James Strachey [New York: W. W. Norton, 1961], 42).

5. Ernest Jones describes this implant, added after an operation in October 1923: "The huge prosthesis, a sort of magnified denture, or obturator, designed to shut off the mouth from the nasal cavity, was a horror; it was labelled 'the monster'" (Ernest Jones, *The Life and Work of Sigmund Freud* [New York: Basic Books, 1957], 3:96).

6. "I am writing to you from the deep contentment of a boundless inactivity, interspersed with the unpleasant sensations of a small-scale war waged with a refractory piece of equipment. Reflecting on the fine but yet not entirely acceptable sentences in which you discuss the relationship of man to his body, I ask myself what you would say to the analogous relationship to a substitute such as this which tries to be and yet cannot be the self. This is a



20. Prosthetic arm and package. From *Orthopadische Behandlung Kriegsuerwundeter*, 1915.

problem which arises even in the case of spectacles, false teeth and wigs, but not so insistently as in the case of a prosthesis" (Letter of 11 August 1924, in Ernest Pfeiffer, ed., *Sigmund Freud and Lou Andreas-Salome Letters* [London: Hogarth Press, 1972], 137).

7. Letter of 3 September 1924, in *ibid.*, 138.

8. "We are not accustomed to expend much thought on the fact that every night human beings lay aside the garments they pull over their skin, and even also other objects which they use to supplement their bodily organs (so far as they have succeeded in making good their deficiencies by substitutes) — for instance, their spectacles, false hair or teeth, and so on. In addition to this, when they go to sleep they perform a perfectly analogous dismantling of their minds — they lay aside most of their mental acquisitions; thus both physically and mentally approaching remarkably close to the situation in which they began life" (Sigmund Freud, "Metapsychological Supplement to the Theory of Dreams" [1916], in *General Psychological Theory* [New York: Macmillan, 1963], 151).

9. "During the mechanical ages we had extended our bodies in space. Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing space and time" (Marshall McLuhan, *Understanding Media: Extensions of Man* [London: Routledge and Kegan Paul, 1964], 3). This identification of the technology of the media with extension is written into modernist theory. For example, "Painterly methods of representation suggestive merely of past ideologies shall disappear and their place be taken by *mechanical means of representation* and their as yet

unpredicted *possibilities of extension*," and "the photographic camera can *either complete or supplement* our optical instrument, the eye" (Laszlo Moholy-Nagy, *Painting, Photography, Film* [1925; Cambridge, Mass.: MIT Press, 1987], 15, 28).

10. For a development of Heidegger's account of the architectural metaphor that organizes theory, see Mark Wigley, "The Translation of Architecture: The Production of Babel," *Assemblage* 8 (1989): 7–22.

11. Martin Heidegger, *Der Satz vom Grund* (Neске: Pfullingen, 1957). Cf. Jacques Derrida, "The Principle of Reason: The University in the Eyes of Its Pupils," *Graduate Faculty Philosophy Journal* 10, no. 1 (1984): 12.

12. "Each of the faculties that constitute the university had some church or convent which was usually borrowed for its meetings; but the place of the meeting was not invariable, and neither the university nor its constitutional bodies assembled in a building of its own. . . . Wherever there were rooms to be hired for schools, and churches and convents to be borrowed for congregations, a university could make itself at home" (H. Rashall, *The University of Europe in the Middle Ages* [New York: Oxford University Press, 1936], 1:406).

13. Cited in Stephen C. Ferruolo, *The Origins of the University: The Schools of Paris and their Critics, 1100–1215* (Stanford: Stanford University Press, 1985), 275.

14. For an analysis of the "fragility" of the relationship between the early universities and the cities they occupied, see Thomas Bender, ed., *The University and the City* (New York: Oxford University Press, 1988), in particular, Stephen C. Ferruolo, "Parisius-Paradisus: The

City, Its Schools, and the Origins of the University of Paris," 23–25, on the essential "placelessness" of the institution.

15. For examples of the close relationship between legal documents for buildings and professorships, see the documents assembled in John Willis Clark, ed., *Endowments of the University of Cambridge* (Cambridge: Cambridge University Press, 1904).

16. The first such dedicated building constructed for the first university (the university "in" but, significantly, not yet "of" Paris), that is to say, arguably the first university building proper, was built in 1322 to lure back the masters that had migrated to Siena the year before. See Ferruolo, "Parisius-Paradisus," 23.

17. Aristotle, *Metaphysics*, 981b. Cf. Derrida, "The Principal of Reason," 23.

18. Despite their radically different operative agendas (beaux arts, modern, postmodern, etc.), all the different historical constructions of the architecture of mid-nineteenth-century America share the figure of the "abyss" (sometimes referring to it as a "chasm" or "schism").

19. See, for example, Minard Lafever, *The Architectural Instructor* (1856).

20. "Architecture, A School Study," *The Architectural Review and American Builder's Journal* (December 1869): 308.

21. *Ibid.* 309. "Education must be liberal and comprehensive as well as universal and cheap, or the result will remain incomplete. To secure anything permanently satisfactory in the matter of architecture, professors of ability, workmen of ability, and an appreciative public are necessary. . . . With reference to the

appreciative and able public, the press is the improving power that is mainly to be looked to" (Calvert Vaux, *Villas and Cottages* [New York: Harper and Brothers, 1857]).

22. On the constitutional relationship between architecture and publication, see Beatriz Colomina, ed., *Architectureproduction* (New York: Princeton Architectural Press, 1988). "Until the advent of photography, and earlier of lithography, the audience of architecture was the user. With photography, the illustrated magazine, and tourism, architecture's reception began to occur also through an additional social form: consumption. With the enormous amplification of the audience, the relation to the object changed radically. The audience (the tourist in front of a building, the reader of a journal, the viewer of an exhibition or a newspaper advertisement, and even the client who often is also all of the above) increasingly became the user, the one who gave meaning to the work. In turn the work itself changed" (Beatriz Colomina, "Introduction: On Architecture, Production and Reproduction," in *ibid.*, 9).

23. S. E. Morison, *The Founding of Harvard College* (Cambridge, Mass.: Harvard University Press, 1935), 337.

24. Peter Slee, "The Oxford Idea of a Liberal Education, 1800–1860: The Invention of Tradition and the Manufacture of Practice," *Histories of the Universities* 7 (1988): 61–68.

25. John Henry Newman, *The Idea of a University* (1852), xxxix. Reason is "exercised, unfolded and confirmed" but not extended. Instead, the university seeks to establish "principles laid down within them as a foundation for the intellect to build on" following the traditional method of "making his

ground good as he goes." The "stable" core of the university is always described as building: "He is accustomed to a chain of deduction in which each link hangs from the preceding, yet without any insecurity in the whole; to an ascent beginning from solid ground, in which each step, as soon as it is made, is a foundation for a further ascent, no less solid than the first self-evident truths" (William Whewell, *Of a Liberal Education in General* [London: John W. Parker, 1845]).

26. See Newman, *The Idea of the University*, 61.

27. *Ibid.* 62. The expressions "place," "firmness," and "laying down" come from the very architectural domain they are used to exclude. The architectural metaphor is always employed politically as a conservative agent. For example, the inaugural address by Charles Eliot on becoming president of Harvard University in 1869: "A university is not built in the air, but on social and literary foundations. If the whole structure needs rebuilding, it must be rebuilt from the foundation. Hence, sudden reconstruction is impossible in our high places of education" (S. E. Morison, ed., *The Development of Harvard University 1869–1929* [Cambridge, Mass.: Harvard University Press, 1930], lxi).

28. Before then, there had only been supplementary courses on architecture in the university, starting in 1852 at New York University, Yale, Michigan, and Harvard. Likewise, in England, supplementary courses were started in 1840 at King's College in the University of London and a year later at University College. But it was not until 1894 that the first university school of architecture was founded at the University College of Liverpool.

29. The lantern slide was beginning to play a crucial role in the emerging institution of the modern university lecture. In 1875 MIT offered a course of eighteen public lectures, called "Lantern Projections," on "the use of lantern slides as a means of illustration in teaching" (*President's Report for the Year Ending September 30, 1875* [Boston: A. A. Kingsman, 1876], 97). And in 1876 a regular course on lantern projections began within the Physics Department (*President's Report for the Year Ending September 30, 1876* [Boston: A. A. Kingsman, 1877]). For a brief account of the passage of the lantern slide from entertainment to education, see Elizabeth Shepard, "The Magic Lantern Slide in Entertainment and Education, 1860–1920," *Journal of the History of Photography* 11, no. 2 (April–June 1987): 91–108.

30. William Ware, *An Outline of a Course in Architectural Instruction* (Boston, 1865), 9.

31. William Rogers, *Objects and Scope of an Institute of Technology; Including a Society of Arts, a Museum of Arts, and a School of Industrial Science* (Boston: John Wilson and Son, 1861), 13. "In organizing and conducting the Museum of the Institute, reference should be had rather to the extent of practical instruction to be derived from it rather than to the multitude of objects which it might embrace. Its several departments therefore, should aim, in the first phase, at forming a collection of objects of prominent importance. . . . As specimens of materials, workmanship, and machinery accumulate, care should be taken to preserve this method of arrangement, wherever practicable; and to accord a prominent place to what might be called the *typical objects* in each depart-

ment, however large the general mass of its collection" (*ibid.*).

32. Rogers proposed a department of "Building and Architecture" that would begin with engineering and only in the fourth year would offer "lectures on Architecture as a Fine Art" (William Rogers, *Scope and Plan of the School of Industrial Science of Massachusetts Institute of Technology* [Boston: John Wilson and Son, 1864]).

33. "There is not now in the country any adequate instruction in Construction and in Design none whatsoever, while the demand for skilled draughtsmen and competent architects is rapidly increasing in every part of the country. To meet this want would require a comparatively slight extension of your programme" (William Ware, letter to John Runkle [secretary of the Institute], 27 April 1865, p. 1, Massachusetts Institute of Technology Archives and Special Collections).

34. *Ibid.*

35. Ware identifies "the history of architecture, the theory of architectural ornamentation, the laws of proportion, of harmony and of geometrical and naturalistic decoration," on the fine art side, and "mechanic arts employed in building, supervising, specifications, contracts, lighting, ventilation, heating, etc.," on the scientific side (*ibid.*, 2).

36. *Ibid.*, 6.

37. In his first annual report to the president in 1872, Ware argues that "it has been necessary to give a good deal of information, *viva voce*, that might better have been obtained from text-books, if proper text-books were to be had. Indeed a chief part of my own labor has consisted in collecting and putting into shape the common-places of archi-

textural information, things which every architect knows, but which are not as yet accessible to students" (*President's Report for the Year Ending September 30, 1872* [Boston: A. A. Kingsway, 1873], 41).

38. Ware, *An Outline of a Course in Architectural Instruction*, 15. On the library, and photography in particular, as a surveillance device, the disciplinary apparatus responsible for the emergence of art history as a science, see Donald Preziosi, *Rethinking Art History: Meditations on a Coy Science* (New Haven: Yale University Press, 1989).

39. "Where so much is to be done in the collecting of information it would of course be profitable to the whole class and stimulating to each member of it to put them upon the search, making them contribute the result of their reading or of their conversation with mechanics and experts to the common stock. I have practiced this method with my own pupils" (Ware, letter to Runkle, 16).

40. Ware's report on the school of architecture, in *President's Report for the Year Ending September 30, 1872*, 36. More than just collecting material that would then be classified in the library, Ware prepared detailed lists of thousands of objects in Europe, and their prices, that could be ordered from the United States as the school developed. When Ware wrote to William Rogers, then president of the university, asking for permission to travel to Europe, he argued that he needed to prepare such a catalogue in addition to studying different systems of architectural education and collecting the "necessary equipment": "The collection of drawings, models, photographs, casts and other necessary equipment of an architectural school could be made at the same time with this study of

existing schools, and time spent in learning what can be had and in making judicious selections, would be well spent. . . . I should also propose to prepare accurate lists of the collections and apparatus needed for my classes" (William Ware, letter to William Rogers, 24 April 1866, MIT Archives and Special Collections).

41. See Caroline Shillaber, *Massachusetts Institute of Technology School of Architecture and Planning 1861–1961* (Cambridge, Mass.: MIT Press, 1963).

42. I am indebted to discussions and correspondence on the question of the roof design with Joan Follett of the John Nicholas Brown Center for the Study of American Civilization. For details of the argument over the roof, see Joan E. Follett, "The Business of Architecture: William Gibbons Preston and Architectural Professionalism in Boston During the Second Half of the Nineteenth Century," Ph.D. diss., Boston University, 1986, 65–71.

43. The beginning of this trend can be seen in the official description of its first move: "Opening directly from the main drawing-room is the department library comprising six hundred and fifty volumes, and some three thousand photographs bound in books. The library and photographs are entirely free to the students, who are encouraged to use the collections very freely. There is, also, quite a collection of casts and models of architectural fragments, and a very fine lot of French school drawings, including some of the *envois de Rome*, which were secured by Professor Ware, some years since, in Paris. In addition to the special library, several thousand photographs, prints, drawings, and casts have been collected to form a nucleus for an architectural

21. Man with seven legs. From *Orthopadische Behandlung Kriegsuverwundeter*, 1915.



museum. Models and illustrations of architectural detail and materials are arranged in the rooms of the department, but the chief part of the collection of casts of architectural sculpture and detail belonging to the department has been, for want of space in the Institute Buildings, deposited in the Museum of Fine Arts. . . . The students of the department have free access to them at all times; and as the Museum building is close at hand, no inconvenience results from the change" ("Architectural Education in the United States," pt. 1, "The Massachusetts Institute of Technology," *The American Architect and Building News* 24, no. 658 [4 August 1888]: 48).

44. Rogers first specified that to obtain a degree the student must "prepare a dissertation" in *Scope and Plan of the School of Industrial Science of Massachusetts Institute of Technology*, 18.

45. The first description of the thesis project in architecture appeared in an 1868 supplement to the third annual catalogue of the university: "The Diploma of the Institute, declaring its possessor competent to practice his profession as an Architect, is given only to those students who, having passed a satisfactory examination in the studies prescribed for the Regular Students, presents Original Designs, upon a prescribed subject, satisfactory to the judges appointed to examine them" (*A Supplement to the Third Annual Catalogue of the Massachusetts Institute of Technology: The Programme of the Course of Instruction in the Department of Architecture* [Boston: Alfred Mudge and Sons, 1868], 6). But the first mention of the word "thesis" in the school of architecture came only after the completion of the first thesis in the catalogue of 1874, which

refers to it as a successful "graduating thesis" (*Tenth Annual Catalogue of the Officers and Students with a Statement of the Courses of Instruction 1874/75* [Boston: A. A. Kingsman, 1874], 51). The requirement for "thesis work" was first added to the list of courses in the catalogue of 1876, at the same time as it was added to the list of courses in all the other schools. But not until the catalogue of 1880 did the university spell out what a thesis entailed. For the student to be entitled to a degree, "he must, moreover, prepare a dissertation on some subject included in his course of study; or an account of some research made by himself; or an original report upon some machine, work of engineering, industrial works, mine, or mineral survey; or an original architectural design accompanied by an explanatory memoir. This thesis or design must be approved by the Faculty" (*Fifteenth Annual Catalogue of the Officers and Students with a Statement of the Courses of Instruction 1879/1880* [Boston: A. A. Kingsman, 1880], 51).

46. Ware, *An Outline of a Course in Architectural Instruction*, 3. On Ware's repeated insistence that architectural education should be, first and foremost, founded in a general liberal education, see John Andrew Chawning, "William Robert Ware and the Beginnings of Architectural Education in the United States, 1861–1881," Ph.D. diss., Massachusetts Institute of Technology, 1986.

47. "The question is raised whether, architecture being counted among the fine arts, it does not belong in a school of science. But if a thorough and comprehensive course of study is to be established, a school of science seems the most convenient place for it. Two out of

its three branches are certainly more germane to scientific pursuits than to painting and sculpture, and it is easier and cheaper to *add the apparatus* needed for the study of elementary design to a school of science than to bring the work-rooms and laboratories of a school of science into a school of art. Still, it needs to be distinctly recognized that the atmosphere of exact science is unfavorable to the growth of the artistic sentiment; and that in temper and methods a school of architecture must always be, so far as relates to design, at least, not quite one with the purely practical schools with which it is associated. It must accordingly require special pains to create for it an atmosphere of its own, favorable to the harmonious development of its own students" (William Ware, "Memorandum as to the Proposed Course of Architecture in the School of Mines," *School of Mines Quarterly* 3 [November 1881]: 4, emphasis mine). In a letter to President Barnard, Ware discussed extensively the foundation and use of the collection: "In establishing a School of Architecture it was obvious that the first thing to do was to form a sufficient collection of books and photographs, prints and drawings, so that ample illustrations of the subject matter might be at hand. But it was not so obvious how such collections could best be utilized in the daily routine of instruction." He described his "revision of the material collected so as to make sure that it was in presentable form" and the way the students systematically went through the content of the library in a succession of studies called a "tour" (William Ware, letter to President Barnard, 1887, MIT Archives and Special Collections).

48. "All the Architectural Schools

in this Country have been established in connection with schools of Engineering. This connection though a great advantage in starting is soon felt to be a hindrance, but our school is the first that has undertaken to put this work on an independent and purely professional basis" (William Ware, letter to President Low of Columbia University, 12 September 1892, MIT Archives and Special Collections). On the period in which the school of architecture had no designated place, see Stephen M. Bedford and Susan M. Strauss, "History II: 1881–1912," in Richard Oliver, ed., *The Making of an Architect, 1881–1981* (New York: Rizzoli, 1981), 23–48.

49. In 1902 Ware described this process in a letter: "Abroad, Schools of Architecture are associated with Schools of Painting and Sculpture, or of Decorative Art, and it was only in the lack of a more congenial field that some of those in this country were planted in Scientific Schools. . . . Architectural schools were needed, and the simplest way to start them was to take advantage of the courses in Physics, Chemistry, Geology, Mathematics, and Civil Engineering already established. A single instructor in Architecture was all that was required to set the new branch of study on its feet. But all these schools have found, what we were ourselves quick to discover, that the conditions were unfavorable to its growth and development. Schools of Architecture are first of all Schools of Art, and in the somewhat sandy soil suitable to Schools of Applied Science, they were in danger, like the seed sown among the rocks, of springing up quickly indeed, but of presently withering away because they had no richness of earth. All these schools accordingly, have from their inception endeavored to

differentiate their work from that of the scientific departments. . . . In this endeavor some of these schools have indeed met but indifferent success" (William Ware, letter to Mr. Mitchell, 11 January 1902, MIT Archives and Special Collections).

50. "The truth is that owing to this condition of misfit, schools of architecture, while located at the university, can seldom be said to be in and of the university" (Henry N. Cobb, *Architecture and the University* [Harvard University, 1986]). "From the administrative point of view architecture is often thought of as a 'black sheep' of university courses" (F. H. Bosworth and Roy Childs Jones, *A Study of Architecture Schools* [New York, 1932], 129). The specific needs of architecture schools "and the academic points of view of the American University were points of view that could not be completely harmonized in the American University" (Arthur Clason Weatherhead, *The History of Collegiate Education in Architecture in the United States* [Los Angeles, 1941], 71).

51. In architecture, reason is "influential" yet its control is not "absolute": "but even here [architecture as fine art] intelligence and sound reason exert a controlling influence, and elsewhere they rule with absolute authority" (Ware, *An Outline of a Course in Architectural Instruction*, 17).

52. "The perfection of technology is only the echo of the claim to the *perfectio*, that is, to the completeness of the foundation" (Martin Heidegger, "The Principle of Ground," trans. Keith Hoeller, *Man and World* 7 [1974]: 213).

53. In his unpublished reminiscences of Ware, William Partridge described the event: "For many

years he was interested in education by means of the correspondence system, diffusing in the widest possible way some knowledge of the principles of architecture. I assisted him in getting up a text-book on the architectural orders. . . . This year Professor Ware reported [to the board of trustees of Columbia University] the success he had with the text-book he had prepared for the International [Correspondence School of Scranton, Pennsylvania] and outlined a scheme of credits to beginners for entrance to the School of Architecture for students taking the correspondence course. They listened without comment, and said they they would adjourn for luncheon. Mr. Ware ate his lunch and upon going to his office before rejoining the Trustees, found there a letter delivered by hand, stating that he was therewith retired from head of the Architectural School" (William Thomas Partridge, *A Few Reminiscences of Prof. W. R. Ware*, ms., Papers of William Thomas Partridge, William Ware Collection, Avery Library, Columbia University).

54. "Some time afterward I asked one of the trustees the reason for their action. He said they were panic stricken at the thought that he, as head of a Columbia School, had committed them too far with a purely commercial project. . . . Within a few years afterward Columbia University embarked on a huge 'Home Study' program — by correspondence, of course!" (ibid.).

55. See Ambroise Pare, "A Supplement of the Defects in Man's Body," in *The Collected Works of Ambroise Pare* (Paris, 1579).

56. "The regular students of the School will be taught the use of small-arms, and the simpler parts of

tactics; and, for this purpose, will be organized into companies, to meet on stated days for military instruction and exercise" (*The First Annual Catalogue of the Officers and Students and Programme of the Course of Instruction of the School of the Massachusetts Institute of Technology, 1865/66* [Boston: John Wilson and Sons, 1865], 25).

57. See Derrida, "The Principle of Reason," 10.

58. Heidegger, "The Principle of Ground," 216.

59. Jacques Derrida, "Mochlos, ou le conflit des faculties," *Philosophie* 2 (1984): 21–53.

Figure Credits

1, 20, 21. *Orthopadische Behandlung Kriegsuerwundeter* (Berlin, 1915).

2. Sigfried Gideon, *Mechanization Takes Command* (New York: Oxford University Press, 1948).

3. Walter Gropius, *Scope of Total Architecture* (New York: Collier, 1943).

4. Gregorius Reisch, *Margarita Philosophica* (Basel, 1583).

5. Harvard University Archives.

6. *The Magic Lantern and Its Applications* (New York, 1886).

7–18. Collection of the MIT Museum.

19. Ambroise Pare, "A Supplement of the Defects in Man's Body," in *The Collected Works of Ambroise Pare* (Paris, 1579).