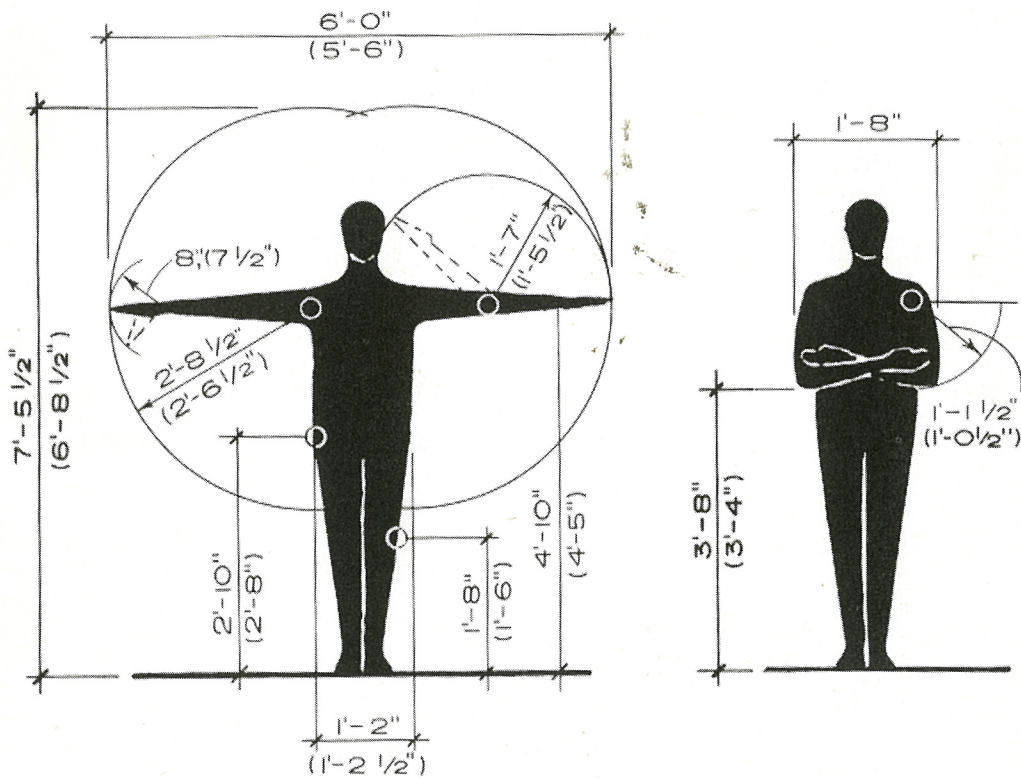


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KEY TO DIMENSIONS



Hidden Lines: Gender, Race, and the Body in *Graphic Standards*

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For most of its history, the anthropometric diagrams of *Graphic Standards* have presented an image of the human body that is sex- and race-specific. These illustrations reveal at once the selection of certain demographic segments as representative of the population as a whole, as well as the restrictive conception of a preferred or model inhabitant of buildings. The various methods used to represent the body reveal “the human figure” to be male and white. Given the role of *Graphic Standards* as a principal guide to architectural practice, these diagrams become emblematic of the sexual and racial composition of that practice.

Introduction

Next year marks the seventieth anniversary of *Architectural Graphic Standards*. Since 1932, it has become the most common single reference source for design professionals. In 1951, Ralph Walker proclaimed in the foreword to the fourth edition that “every architect—embryonic and established—should have a copy, and should have it close at hand.”¹ Philip Johnson reiterates this thought in the most recent edition, published in 2000: “No architect can be without *Graphic Standards*, and with it every architect is empowered and equipped to practice architecture.”² The book is ubiquitous in American architectural offices, and its widespread use arguably makes it one of the clearest reflections of conventional methodology.

Over the decades, *Graphic Standards* has become a self-professed “chronicle of 20th-century architectural practice.”³ Its ten editions trace the developments and preoccupations of the profession and, moreover, indicate the cultural changes responsible: the decline of classical and craft-oriented detailing, the simultaneous rise of mass-produced systems and prefabricated parts, the birth of historic preservation, the growth of energy conservation techniques, and so on.⁴ The book, then, is not simply a technical document: the selection, content, and presentation of the material all suggest discernible values. But the publishers deflect responsibility for the material to the industry at large.⁵ This is justifiable, for any work that shapes its subject according to popular habits implicates the culture that produces it. Such a book does not necessarily recommend how to do things; it simply records how they are done. As Robert Ivy writes in the preface to the 2000 edition, *Graphic Standards* serves as “social history.”⁶

Graphic Standards reflects the implicit beliefs of architecture and the larger community. Nowhere in the book is this more evident than in the first section, originally titled “Dimensions of the Human Figure.” For most of its history, the portrayal of the body in *Graphic Standards* has revealed at once the selection of certain

demographic segments as representative of the entire population, as well as the restrictive conception of a preferred or model inhabitant of buildings. The different methods used to represent the body reveal the “human figure” to be gender- and race-specific: male and white. This article examines these different methods, first by reviewing pertinent historical representations of and cultural attitudes toward the body, and second by analyzing the unique representational techniques of *Graphic Standards*.

Setting Standards

Visual and verbal representations of the body are persistent mechanisms for sustaining the sociopolitical relationships between men and women, and such representations have been integral to architectural discourse. The use of the male body as a model for buildings occurs in various canons of architecture, and the influence of two of these, classicism and modernism, may be seen in *Graphic Standards*.

The table entitled “Dimensions of the Human Figure” (Figure 1) first appeared in the third edition (1941), although the drawings themselves, attributed to Ernest Irving Freese, had been published elsewhere in 1934.⁷ The table recurred in subsequent editions, virtually unchanged, for forty years. The illustrations dimension the body in a variety of positions, but only one body type is shown. Historically, when a single body is proposed to represent all people, the body is male, and comparison with certain traditions confirms that this is the case here. The figures are abstract silhouettes with few apparent anatomical features, and, as such, they signify the body through the simplest pictorial means, profiling human proportions and symmetry, not physiology. This emblematic quality resembles many Renaissance drawings that glorify the body as a mandala or icon. Some of these, particularly sketches by Leonardo and Dürer, have become so prevalent and universally appropriated that they are signatures of Western culture. These renderings illustrate the Neo-Platonic belief that the natural perfection of man could be seen through the body’s relationship to primary geometry. The depiction in *Graphic Standards* of arms tracing arcs in the air is especially reminiscent of this pictorial tradition.

The similarities are not coincidental. In their original publication, the drawings were titled “The Geometry of the Human Figure,” so clearly Freese was preoccupied with the body’s aesthetic proportions and not just its statistical dimensions.⁸ Furthermore, Dürer’s book on human proportions was a precursor to the modern field of anthropometry and would have influenced any subse-

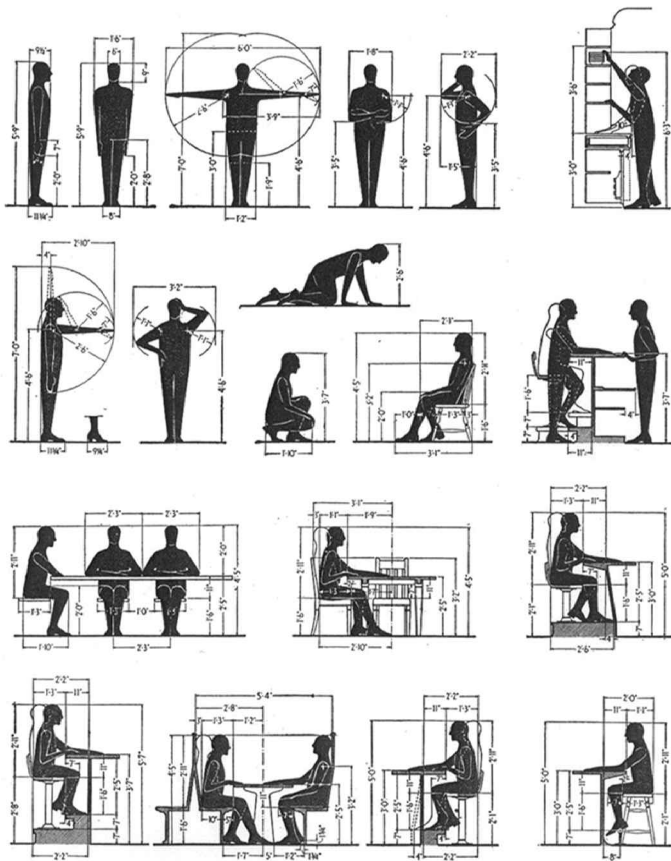


Figure 1. "Dimensions of the Human Figure," drawings by Ernest Irving Freese, *Architectural Graphic Standards*, 3rd ed. (1941). (John Wiley and Sons.)

quent pictorial study of the body. But, in architectural history, the body itself is not the primary concern of this tradition. The Renaissance sketches elaborated on the Vitruvian proposition of the "well shaped man" as a model of architectural harmony: "since nature has designed the human body so that its members are duly proportioned to the frame as a whole . . . in perfect buildings the different members must be in exact symmetrical relations to the whole general scheme."⁹ The indivisibility of part and whole, observed in the body, is a fundamental tenet of classical aesthetics.

The table of human dimensions first appeared in *Graphic Standards* during a time when historians such as Rudolf Wittkower and Erwin Panofsky were writing extensively of Vitruvius' impact on Renaissance thought, so the body metaphor was pervasive. *Graphic Standards* relates to this tradition in more ways than one. Robert Ivy recognizes harmonic unity in the book's conception and structure, although he mistakenly identifies the origins of the idea: "*Graphic Standards* presupposes the interrelationship of parts to whole projects, a nineteenth-century notion articulated by Wright when he said, 'The part is to the whole as the whole is to the part.'¹⁰ Hence, the organic structure of the book itself relates it to the body paradigm. The introduction displays the dimensions of an actual human body, and what follows is a dissection of the body of a building, its various systems laid out in seemingly anatomical order.¹¹

The social prejudice of the Vitruvian model is blatant, the equation of "perfect buildings" with the "well shaped man" being inherently sexist. Men are offered as the image of perfection, which suggests the imperfection of women. Diana Agrest writes that this gendered construct "remains at the very base of Western architectural thought": "This system is defined not only by what it includes, but also by what it excludes, inclusion and exclusion being parts of the same construct. Yet that which is excluded, left out, is not really excluded but rather repressed. . . . The repressed, the interior representation in the system of architecture that determines an outside (of repression) is woman and woman's body." Traditionally in architecture, Agrest states, "the human figure is synonymous with the male figure."¹² "The Human Figure" of *Graphic Standards* echoes this statement in its allusion to the classical paradigm.

The presentation of the body in *Graphic Standards* relates to a larger cultural context that includes not only the classical precedent, but also modern architecture and, more generally, modernity's attempts to standardize the body. Alexander Tzonis and Liane Lefaivre recount that a revision to the classical conception of the body occurred during the French Enlightenment. The shifts in thought from nature to science and faith to reason were represented by a shift in metaphor from the "divine body," an abstract, sacred vessel, to the "mechanical body," a real organism operating in an environment. Scale, a preoccupation with number and proportion in order to maximize aesthetic pleasure, was replaced by size, a concern for exact dimensions in order to increase efficiency. One is a model of form, the other of function.¹³

Quatremère de Quincy refers to a "mechanical analogy" in his discussion of typology, explaining that the body should fit a building the way it fits a chair: "Who does not believe that the form of a man's back ought to be the type of the back of a chair?" Quatremère cites the Greek word *typos*, meaning "to impress" or "to mark," so there is the suggestion of the body inscribing itself on the building for an optimal fit.¹⁴ The *Graphic Standards* diagrams illustrate this functionalist model, picturing the body molded to its environment through the immediate scale of furniture.¹⁵ Nearly half of the chart depicts bodies in actual chairs, a literal realization of Quatremère's model. Like Vitruvius' metaphor of "a well shaped man," Quatremère's description substitutes the specific designation "a man" for the more general "man," so the sex of his model user cannot be mistaken. The rhetoric used to construct the standards of the body is characteristically sexist, and the canonical texts of modern architectural theory are rife with such language.¹⁶

Graphic Standards appeared at a time when systematic documentation of the body was critical in many disciplines, particularly

industry.¹⁷ The science of anthropometry had developed in the late-nineteenth century in order to address the growing desire for a precise understanding of human mechanics. From the start, however, this effort favored men, partly because for many years most studies were conducted by the military.¹⁸ The lack of statistics for women also related to the perceived impropriety of viewing and measuring the female body, as physical examinations were often thought to violate women's natural modesty and "delicacy."¹⁹ Moreover, many scientists did not view women as an important subject for study. Ales Hrdlicka, an eminent Smithsonian anthropologist, pronounced in 1918, "The paramount objective of physical anthropology is the gradual completion...of the study of the normal white man under ordinary circumstances."²⁰ The modern practice of measuring bodies began in large part to reinforce existing social strata by supporting stereotypes about sex, race, and class. Physiological difference reflected political difference, and supposedly empirical data made "nature herself an accomplice in the crime of political inequality."²¹ When *Graphic Standards* was published, any compilation of the body's dimensions would have inherited incomplete and biased data.

The distinction between archaic and modern conceptions of the body provides a convenient contrast, but it is not an absolute split, for much of the canonical discourse of modernism reveals an emphasis on both sacred harmony and mechanical efficiency. In *The International Style*, which appeared the same year as the first edition of *Graphic Standards* (1932), Henry Russell-Hitchcock and Philip Johnson declare that the best modern design rejects extreme functionalism in favor of aesthetic harmony, stating that "a scheme of proportions integrates and informs a thoroughly designed modern building, [which] composes the diverse parts and harmonizes the various elements in to a single whole."²² This passage simply inserts the word *modern* into a distinctly Vitruvian argument, and similar sentiments have been expressed by Sullivan, Wright, Le Corbusier, and Kahn. As Tzonis and Lefaivre write, "sacred harmony" and the body paradigm are inextricably bound in architectural theory. To invoke one is to invoke the other, as well as the underlying conceptual principles and implications.²³

The most obvious modernist heir to the classical body paradigm is the *Modulor*, which Le Corbusier proposed to aid both aesthetics and efficiency, referring to the human figure as "divine proportion" and as a "machine."²⁴ *Graphic Standards*, which first offered its body charts during the period when Le Corbusier was developing and publishing the *Modulor*, similarly combines the two conceptions of the body. The table of figures is divided evenly between images of repose and images of activity, the body in isolation and the body applied to tasks—sitting, reaching, kneeling, and

crawling—and Freese acknowledges this balance of aesthetics and mechanics as intended.²⁵ Pictorial references to classical geometry combine with modernist functionalism in the detailed dimensioning.

Sexism is apparent in both paradigms. Le Corbusier writes, "Architecture . . . must be a thing of the body."²⁶ But whose body? Vitruvius and Le Corbusier both extol the ancient practice of using the body for units of measurement—the foot, the cubit, the inch, and so on—but historically this habit has been sexually exclusive, whether the source of measurement is the body of the builder, typically male, or, in the imperial system, that of the king. Le Corbusier's choice of bodies is explicit. He refers to "man as measure" and proposes a singular "human figure," as does *Graphic Standards*.²⁷ With characteristically gender-specific language, he writes that man through his body imposes order "on his own scale, to his own proportion, comfortable for him, to his measure. It is on the human scale. It is in harmony with him: that is the main point."²⁸ In this passage, the similarities to the classical paradigm are clear: man as the standard of measure, man as the universal human, the harmony of bodies and buildings, and so forth.

Here, Le Corbusier sounds much like Geoffrey Scott, the early twentieth-century champion of classicism, who defines architecture as "the transcription of the body's states into forms of building," a process that humanizes the world through the "universal metaphor of the body, a language profoundly felt and universally understood."²⁹ But the supposed universality of the body (or of experience in general) is a prejudiced myth. In their study of cultural views of the body, Jennifer Terry and Jacqueline Urla write that humanism "relied upon ideas of a single, generic human body to generate hypocritical fictions of unity, identity, truth and authenticity. . . . [T]he ideal human body has been cast implicitly in the image of the robust, European, heterosexual gentleman. . . ."³⁰ The humanist projection of a universal individual may be found in both ancient and modern symbols. Modern attempts to systematize the body are similar to previous idealizations to the extent that bodies are constructed as abstractions; idiosyncrasies are ignored in favor of generalizations. *Graphic Standards*, like these exemplars, proposes a solitary "human figure" as the definitive image of the body and, in doing so, succumbs to prevailing patriarchal habits.

Reading Graphics

To implicate *Graphic Standards* in this way is to view its portrayal of the body as a product of its historical and cultural context, which includes the visual and verbal languages of classicism and modern-

ism, as well as the political agendas and procedural methods of anthropometry. However, a restrictive portrayal of the body may be read more directly in the charts, separately from other precedents.

In the 1941 chart, the body is described graphically and numerically, and both methods are problematic. Just as there is only one type of graphic figure, there is only one set of dimensions. Body sizes and shapes vary according to physical and cultural differences, including sex, race, age, nationality, occupation, and socioeconomic conditions, and the use of a single dimensional set ignores human diversity. The caption note reads, "These dimensions are based on the average or normal adult," and the ambiguity of this phrase is telling. Anthropometrists have long agreed that an average is a misleading shorthand that causes dangerous errors.³¹ The designation "average" is less common in science than it is in popular language as an expression of social and cultural judgment.

Similarly, the description "normal" is questionable. The word may be quantitative, referring to a statistical distribution, and the above conclusions hold. Alternatively, it may be qualitative, implying a politically charged standard of evaluation.³² In general, "normal" necessarily posits the existence of its opposite, and dictionary definitions reinforce this conclusion: "free from physical or emotional disorder."³³ If one type is presented as "normal," any deviation must be taken as abnormal. Extensive critical theory over the last few decades has exposed the idea of normalcy as an elitist fiction. Norms and ideals are routinely confused, and identifying one type as "normal" constructs a distinction between Self and Other, between the privileged subject and the marginalized object.³⁴ By positioning one type of body to stand for all, *Graphic Standards* supports this dichotomy.

The gender bias of *Graphic Standards* is most overt in its visual representations of the body. In the original Freese drawings, the abstract silhouette might suggest that the "human figure" of the table's title is intended as a generic, genderless state of the body. However, the figure conforms to generalized descriptions of the male body. Frontally, the figure's torso and hips are of a continuous width, as are the chest and stomach in profile. Although the differences in appearance between male and female may not always be self-evident, textbooks list the following among the physiological distinctions: "The male shoulders are much broader, thicker and heavier than those of the female, a difference exaggerated by the females' wider hips. The typical male body shape tapers inwards as it descends, while the typical female shape broadens out."³⁵

Speculation is not necessary, because further scrutiny reveals the figure's sex. A diagram primarily demonstrating arm radius and shoulder height also lists the length of the foot or shoe as 11 $\frac{3}{4}$ ". Adjacent to this is another leg, strangely disembodied, with a sole

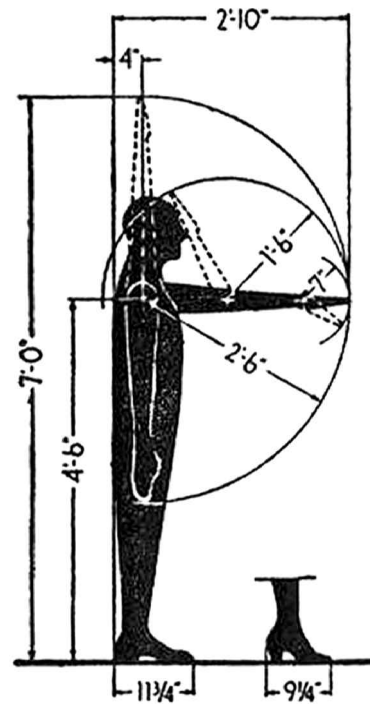
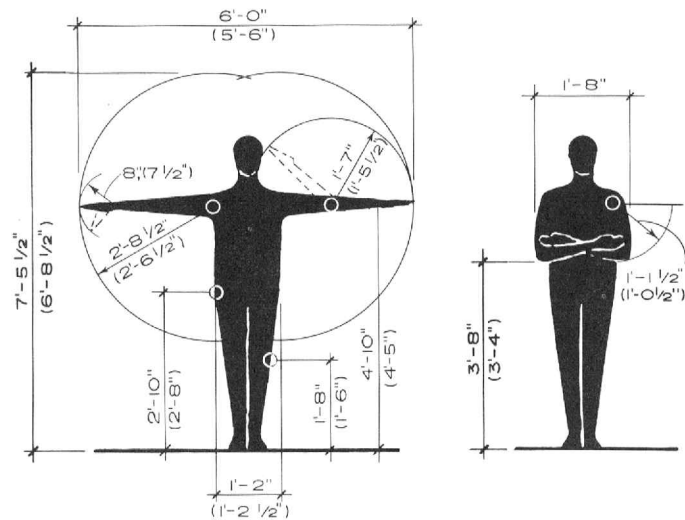


Figure 2. "Dimensions of the Human Figure" (detail), drawing by Ernest Irving Freese, *Architectural Graphic Standards*, 3rd ed. (1941). (John Wiley and Sons.)

measuring 9 $\frac{1}{4}$ ". (See Figure 2.) Although the image is not labeled, the high-heel shoe and the slight curve of the calf announce this to be a feminine foot. In the entire chart, this fragment by itself is to signify women. If the identity of the primary figure was previously uncertain, the introduction of the second draws unmistakable lines of gender. The male body is pictured in its entirety in two dozen poses, whereas the female body is only hinted at in one partial detail. The diagram of the dismembered foot literally objectifies women by reducing the female body to the leg alone, apparently intended as a highly iconographic aspect of the feminine profile.

Many feminist critics maintain that disfiguring images of the body is a form of control that sublimates more violent acts.³⁶ More generally, the fragmented body is often used in the construction of ideal images that reaffirm the cultural emphasis on women's appearance. Advertisements display isolated eyes, hands, and legs in the commercial production of standards of beauty that are often unnatural and unattainable. The fashion designer Donna Karan has remarked that women "are vulnerable when it comes to their legs. We feel they're never long enough, never thin enough, never toned enough."³⁷ Unlike the ideal male body, which typically is perceived as natural, the ideal female body is often attained only through deformation. The high-heel shoe has been compared to foot-binding and neck- or lip-stretching.³⁸ Ironically, while the purpose of the *Graphic Standards* chart is to illustrate body sizes, it shows the partial woman in footwear that alters bodily dimensions and proportions.

Architecturally, the dismemberment of the body violates established principles of composition. Using the leg to signify the fe-



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 2'-3" MEN
 (2'-1") WOMEN

Figure 3. "Dimensions of the Human Figure" (detail), *Architectural Graphic Standards*, 6th ed. (1970). (John Wiley and Sons.)

male body separates the part from the whole and disrupts Vitruvian harmony. Man is complete; woman is not. If the human body provides the basic grammar of architecture, the severed leg breaks syntax. The implication is that men are the creators and subjects of architectural discourse, and women lie outside its established language. "Perfect buildings" follow the perfect male body, and the disintegration of the female body suggests its unsuitability as a model, its irrelevance to the canonical standards of building.

The female body is not altogether excluded from the tenets of Vitruvius, who notes that the Corinthian Order originated through mimicry of the female body. However, whereas the Doric Order had been based on "manly beauty, naked and unadorned," the Corinthian emulated feminine "delicacy" and "adornment." The base was added to suggest shoes, the ornamental volutes to imply curly ringlets of hair, and the fluting to imitate the folds of a robe.³⁹ Again, the distinction between the ideal image of man as natural and that for women as artificial or clothed is a prevalent subject in feminist criticism. The objectification of women commonly occurs in the realm of fashion, as a woman's style of dress often is thought to affect her intrinsic value.⁴⁰ Clothing both conceals and augments the body, adding to the perception of women as objects of display, particularly sexual. The high-heel shoe image repeats the cultural tendency to see the female body not as a natural organism but as a cultural construct. While "men's clothes have no erotic value whatsoever,"⁴¹ women's attire and particularly the high heel are incessantly fetishized, independently of the body itself.

The suppression of the female from *Graphic Standards* occurs with more subtlety in the sixth edition (1970). Here, the "Dimensions of the Human Figure" table has been revised and rearranged with new numerical dimensions, but the drawings are almost exactly the same, with one significant exception. The female leg has disappeared, replaced by a new and novel form of communicating female statistics. According to the chart's key, the dimensions shown are twofold: above the stringer, a first dimension applies to men, and underneath this, contained in parentheses, a second number represents women. (See Figure 3.) Information regarding women is provided as an aside, literally a parenthetical gesture, as if these statistics are subordinate to the numbers for men. The graphic device of the parenthesis suggests that women are a parallel yet secondary construction. Defined as a qualifying remark, an interruption of continuity, or a digression, the parenthesis in this case renders women not as subjects in their own right but as background information. The feminine is only tentatively present, both there and not there. In the struggle to include women in its representation of the body, *Graphic Standards* reveals a reluctance to disturb the iconic solitary male. Women appear only numerically.⁴²

The sixth edition introduces a second table, titled "Human Dimensions at Varying Ages." (See Figure 4.) The silhouette from the older tables is transferred here as a line drawing, but the shape is the same, so its sexual identity remains intact. The figure appears next to graphs measuring height and width from childhood to adulthood. The age chart consists of two separate groups of information, which according to the chart's legend pertain to male versus female. On the graphs, a solid, continuous line traces the growth of the male body. Alongside, a dashed or "hidden" line tracks the corresponding female measurements. This graphic convention aptly portrays the position of women being described here. Next to the figure of the male body, the material for women is only dimly, faintly suggested. A solid line is a demarcation, a declaratory gesture. A hidden line is transparent, used to indicate what is behind a surface, or something out of view. It is a graphic of invisibility. These different techniques recall Quatremère's understanding of the Greek *typos*, the body imprinting itself on buildings. The distinction here suggests that the male body properly shapes and sizes buildings, whereas the female body does not fully mark space.

Paul Emmons has shown that the dashed line is not an insignificant technical convention; its long history of use in architectural drawings reveals particular symbolic meanings. Sebastiano Serlio first defined dashed lines (*linee occulte*) during the Renaissance, using them to refer to the "hidden" or "secret" portions of geometric solids. As Emmons explains, the process of making a dashed line, in which the pen alternates between touching and not touching the surface of the paper, suggests the simultaneous occupation of two separate planes, both on and off the field of representation. Similarly, in grammatical punctuation, a dash is "an unvocalized physical presence indicating an omission or break in thought. Its denotative presence connotes an absence." The architectural dashed line indicates an

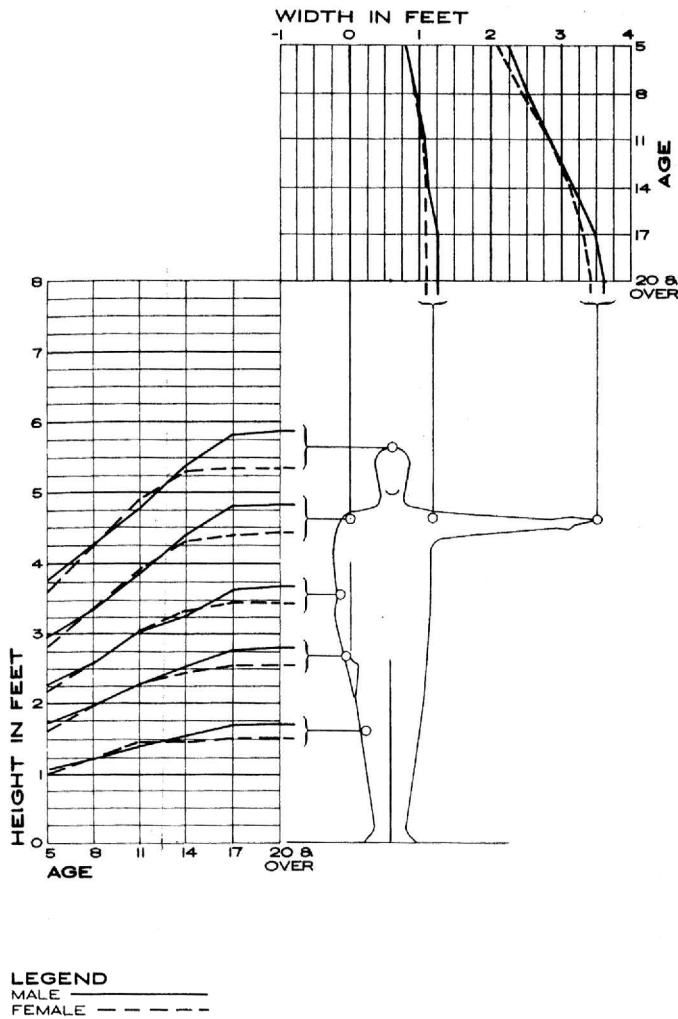


Figure 4. "Human Dimensions at Varying Ages" (detail), *Architectural Graphic Standards*, 6th ed. (1970). (John Wiley and Sons.)

in-between state, "something invisible but present."⁴³ This interpretation applies to the use of the line type in *Graphic Standards*. As Agrest writes of architecture in general, the female body is not fully excluded but repressed, defining the mode of representation through its absence. The repressed female body is an invisible presence in the sense Emmons uses to describe the dashed line.

The distinction between the solid line (*linea evidenta*) and the dashed line (*linea occulta*) here is not arbitrary, for the contrast between the exposed exterior and the concealed interior is consistent with common historical and popular representations of the masculine and the feminine.⁴⁴ Architectural discourse follows this tendency. Serlio identified the perpendicular line, or *cathetus*, as the essence of architecture, defined by the builder's tools of the set square, the plumb line, and the rod, all obvious phallic images.⁴⁵ Le Corbusier echoed this sentiment, calling the perpendicular line and the set square the bases for "strong objectivity of forms . . . male architecture."⁴⁶ The significance of this idea for the conception of architecture is apparent in the word *normal*, the roots of which mean "carpenter's square."⁴⁷

Similarly, a dashed line graphically approximates a braid, a chain, or a ladder, all of which are archaic symbols of women.⁴⁸ According to Emmons, in Renaissance theory, the *linea occulta* was a trope for sewing, in which a needle and thread puncture a fabric to produce the image of a dashed line.⁴⁹ Freud saw plaiting or weaving as a metaphor for the female genitalia. Weaving is the one tool of civilization he credited to women, claiming the "unconscious motivation" for this invention to have been matted female pubic hair, which provides "concealment of genital deficiency" (lack of a penis) and therefore the bodily expression of shame, the defining feminine characteristic.⁵⁰ Through the trope of weaving, the connection between the dashed line, concealment, and women reappears. The various associations of the two line types support the sociopolitical construction of gender.

Emmons recounts that, in some Renaissance paintings, the dashed line is used as a key symbol, appearing oddly diagrammatic in otherwise realistically representational pictures. In Fra Filippo Lippi's *Annunciation*, for instance, the *linea occulta* signifies a spiritual in-between, the line from the angel Gabriel to Mary.⁵¹ This single example has myriad sexual and political implications. As drawn, the symbol indicates in part a line of sight, and the use of the dashed line to represent vision is prevalent in many contexts. In innumerable drawings and diagrams, Renaissance perspectivists employed the *linea occulta* to trace paths from the eye through the viewing field. Robin Evans has described perspective science's "hegemony over vision," the construction of the world centered on a privileged viewer, as a form of sociopolitical control. Lacan, according to Evans, "extended the accusation beyond perspective, beyond geometry, to vision as a whole, which for most of us, most of the time, must remain irredeemably bound up with the process of domination."⁵²

That the privileged viewer in this system of domination is male is evident from many rhetorical and diagrammatic instructions on perspective drawing. Dürer's famous woodcut, "Man Drawing a Reclining Woman," illustrates the use of a perspective machine. A nude woman lies in repose on one end of a tabletop, while the fully clothed male artist sits upright at the other, viewing her body through a gridded transparent screen, the picture plane. For the drawing process to work, the viewer's eye must remain fixed at a particular point, which here is marked by an obelisk-shaped stiletto presumably rising from the table but obscured by the man's arm so as to appear to rise from his lap. Hubert Damisch has remarked that this mechanism reduces the viewer to "a kind of cyclops."⁵³ In similar machines illustrated by Dürer, the viewed object is traced by a series of puncture points in a sheet of vellum, an act which itself is sexually suggestive. Emmons points out that some translations of

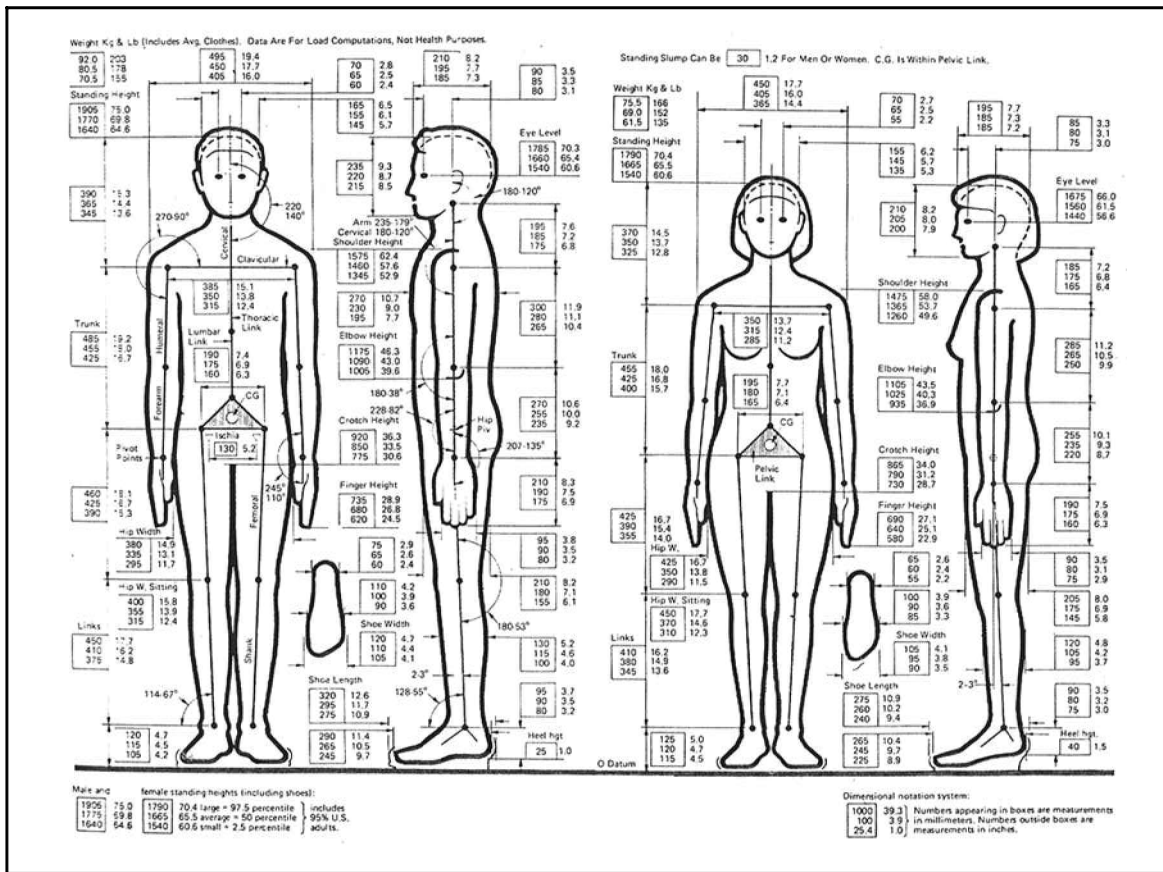


Figure 5. "Anthropometric Data," *Architectural Graphic Standards*, 7th ed. (1981). (John Wiley and Sons.)

Serlio define the geometric point as "a *pricke* made with a Pen or Compass," and the Spanish *puntos* ("point") is also *puntada* ("sewing" or "stitching"), so the association with weaving recurs.⁵⁴ In Dürer's construction, the dotted tracings, or *punte occulte*, mark the male act of controlling the female body through vision. The hidden line reproduces the sexual gaze.

The specific example of visual rays relates to a more general use of the line type in philosophy, theology, astronomy, and other sciences to represent other kinds of emanations. Emmons cites Descartes' use to illustrate "materialistic spirits as bits of matter flowing through the body." The sexual connotations of this description are clearer when applied to Lippi's depiction of the Annunciation, which Emmons calls "a miraculous penetration of the virgin's body without any physical evidence."⁵⁵ Here the dotted line, a stream of "bits of matter," depicts insemination, in this case divine. To apply Quatremère's theory of the *typos*, the male body may be understood here to mark not only architectural space, but also the female body, in an act of territorial control. The sexual connotation of the dashed line is also conveyed by the word *dash*, which can imply a violent thrust or splash.⁵⁶ Returning to *Graphic Standards*, this simple technique portrays the female body not as independent but as dominated by the male body, through both the sexual gaze and the sexual act itself.

As shown, in successive editions of *Graphic Standards*, various techniques allude to but never fully unveil the female body. In the earlier charts, statistics for women seem irrelevant, with the exception of shoe size. By 1970, the sixth edition's methods imply that statistics for women are relevant enough to include, although secondary to the statistics for men. In the seventh edition (1981), the previous tables have been replaced by charts taken from the ergonomics research of Henry Dreyfuss Associates. (See Figure 5.) The new charts, which remain in the most recent editions, divide the information for men, women, and children into separate, anatomically explicit figures, so the abstracted Everyman is gone. The dimensions given are extremely detailed, listed in both millimeters and inches, and subdivided according to three percentile ranges of statistics, which are noted to be accurate for "95% U.S. adults." The information is documented in a lucid, thorough manner, and the limits of the statistical range are clear.

In the Dreyfuss charts, the attempt to be comprehensive is evident to a degree, but one aspect of the former charts' exclusivity remains. Although sex has been treated more equitably in the later editions, race has not been treated at all and still continues as a problem. In *Humanscale*, the original document from which the Dreyfuss charts are taken, the first illustration is titled, "Proportional Differences in Races." (See Figure 6.) This diagram shows

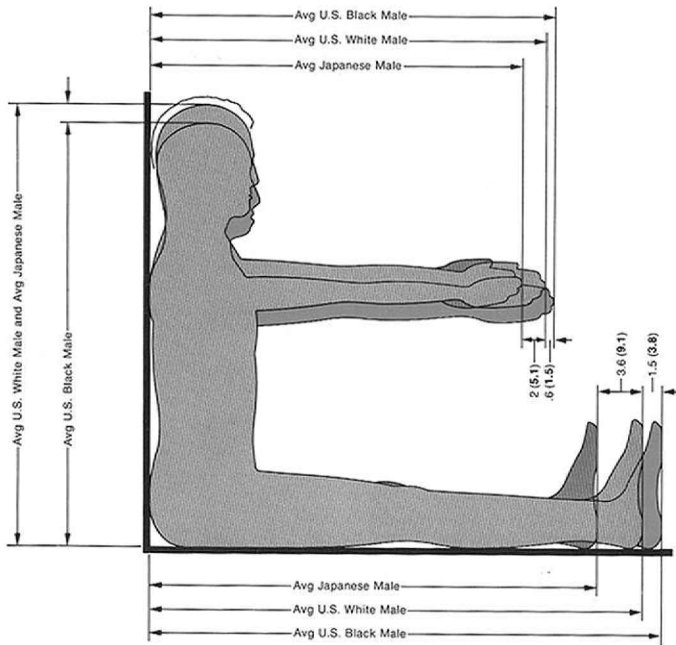


Figure 6. "Proportional Differences in Races," Niels Diffrient, Alvin R. Tilley, and Joan C. Bardagjy, *Humanscale 1/2/3* (1974). (Henry Dreyfuss Associates and MIT Press.)

three superimposed figures representing the "Average U.S. Black male," the "Average U.S. White Male," and the "Average Japanese Male."⁵⁷ Distinctions between these three numbers are listed for lengths of the leg, the torso, and the arm, and are graphically and dimensionally obvious. The difference between the leg length of the Japanese male and the black male, for instance, is more than five inches. This chart, however, is not reproduced in *Graphic Standards*. A decision has been made that race is not an important factor in the documentation of body sizes. Every edition classifies all people according to only sex and age.

Race is never in any way alluded to in the *Graphic Standards* charts, but, again, the system of representation is defined as much by what it excludes as what it includes. If the text may be seen as sympathetic to classical paradigms, the attitude regarding race is implicit. The "human figure" is specifically the Western white male, and the restrictions of the classical model may be extended not only to women, but to all minorities. *Graphic Standards*, as the bible of modern architectural practice, carried this legacy into the twentieth century. If Robert Ivy's introductory comments are correct, and *Graphic Standards* may be read as social history, the repression implied by its representation of the body is perfectly in keeping with society's slow progress in the treatment of gender and race.

Conclusion

Graphic Standards demonstrates the repression of women through its historical predecessors, through the biased procedures of statistics, and through its unique graphic methods. The culturally ingrained conception of the human body as a singular entity, an emblem of

unity, seems to have weighed heavily on these diagrams for decades. The desire to picture the body as solitary inevitably forces problems of representation. How may diversity be expressed in a single image? If human bodies are to be used as paradigms, the Dreyfuss diagram of superimposed racial types suggests a possible alternative.

The *Graphic Standards* diagrams are restrictive whether they are interpreted as aesthetic exemplars or as dimensions to accommodate the anticipated occupants of buildings. The implicit sexism of architecture's standards of practice should not be surprising, given that the profession has always been male dominated. At the beginning of the twentieth century, only a handful of women in the United States were architects.⁵⁸ In 1934, the same issue of *American Architect and Architecture* in which the Freese drawings originally appeared includes an editorial titled, "Architect: Professional or Business Man?" The presumed sex of architects was understood.⁵⁹ In 1970, when *Graphic Standards* began to include separate statistics for women, approximately 3 percent of architects in this country were female, compared to 40 percent of other professionals and of all workers.⁶⁰

The numbers are still very low. The AIA estimated its female membership in 1999 to be below ten percent.⁶¹ In the same year, women comprised 15 percent of all licensed and nonlicensed architects, although they comprised approximately half of the general workforce.⁶² Minorities fare much worse. The number of licensed African-American architects, for instance, is thought to be between 1 and 2 percent.⁶³ Because architecture traditionally has been a restricted profession, its standards of practice have been written by and for a narrow demographic. The authors, advocates, and audience of *Graphic Standards* typically have been white and male. And, because anthropometric statistics historically have been limited to men, it becomes clear that both the presumed designers and users of buildings have been male. In this sense, *Graphic Standards* may be read as a guide for white men to create buildings for themselves in their own image.

Notes

1. Foreword, *Architectural Graphic Standards*, 4th ed. (New York: John Wiley and Sons, 1951), p. vii.

2. "A Tribute to Architectural Graphic Standards," 10th ed., (2000), p. xv.

3. Preface, 8th ed., 1988. See also "Timeline," 10th ed., (2000), p. xiv. *Graphic Standards* "has mirrored the extraordinary accomplishments of architecture in the 20th century."

4. For example, the second edition (1936) notes that the repeal of Prohibition required the inclusion of data pertaining to the design of bars.

5. In 1964, the American Institute of Architects took on the editorial duties of *Graphic Standards* and has collected royalties from all subsequent editions.

However, it and all institutions involved in the publication disclaim responsibility: “The drawings, tables, data, and other information in this book have been obtained from many sources, including government organizations, trade associations, suppliers of building materials, and professional architects or architectural firms. The American Institute of Architects (AIA), the Architectural Graphic Standards Task Force of the AIA, and the publisher have made every reasonable effort to make this reference work accurate and authoritative, but do not warrant, and assume no liability for, the accuracy or completeness of the text *or its fitness for any particular purpose*” (emphasis mine). Verso, 8th ed. (1988).

6. “A View of Architectural Graphic Standards at the Beginning of the Twenty-First Century,” 10th ed. (2000), p. xiii.

7. Freese originally published his drawings in an article titled, “The Geometry of the Human Figure,” from *American Architect and Architecture* (July 1934): pp. 57–60. This magazine was absorbed by *Architectural Record* in March 1938.

8. An architect of Freese’s generation was likely to have received classical training, and his other published articles confirm his interest. He wrote several articles in the 1930s that betray a fascination with classical geometry. In one publication, for instance, he applies the ancient geometric theory of Apollonius to the dimensioning of modern stairs. See “Correct Proportioning of Stair Treads and Risers,” *American Architect and Architecture* (July 1933): p. 47; also “A Word on the Involute Arch,” *Pencil Points* (March 1935): p. 141. Furthermore, Freese’s training is evident from the traditional moldings and profiles in the cabinetry and furniture of the *Graphic Standards* drawings. In the 1970 edition, these details have been edited out.

9. Vitruvius, *The Ten Books on Architecture*, Morris Hicky Morgan, trans. (New York: Dover, 1960), III, I: 3, 4, pp. 72–73. The rule of compositional unity actually began with Aristotle’s theory of drama: “. . . the various incidents must be so constructed that, if any part is displaced or deleted, the whole plot is disturbed and dislocated.” See *The Poetics*, VII–VIII. From *Aristotle On Poetry and Style*, G.M.A. Grube, trans. (Indianapolis: Bobbs-Merrill, 1958), p. 17.

10. The connection to Vitruvius in particular is clear when Ivy ascribes “firmness, commodity and delight” to the book’s organization (“A View of Architectural Graphic Standards at the Beginning of the Twenty-First Century”). Eero Saarinen made a similar comparison, noting that *Graphic Standards* offers a vocabulary for the future, just as Vitruvius had spelled out the classical language for Renaissance architects. Foreword, 5th ed. (1956).

11. The table of human dimensions originally appeared in the back of *Graphic Standards*, under the heading “Miscellaneous Data.” With the sixth edition (1970), the table became the first section of the book. The chapters that follow it are organized according to the Uniform System for Construction Specifications.

12. Diana Agrest, “Architecture from Without: Body, Logic, and Sex,” *Assemblage* 7 (1988): pp. 29, 33.

13. Alexander Tzonis and Liane Lefaivre, “The Mechanical Body Versus the Divine Body: The Rise of Modern Design Theory,” *Journal of Architectural Education*, 29/1 (1975): pp. 4–5. Tzonis and Lefaivre recount that the revision of the body paradigm coincided with a transition from the guild system to the academy, which sought new objective rules to replace archaic standards. The standardization of practice that *Graphic Standards* is meant to aid began in this period’s restructuring of architectural training with new methods of instruction. The purpose of *Graphic Standards*, with its emphasis on classification systems, assembly methods, and fabrication techniques, belongs to the heritage of Quatremère, Durand, and Diderot. The analytical layout of the body in figure/ground poses even resembles the plates from Durand’s *Précis* (1809) illustrating generic plan types in their various permutations. The normative views of the body in *Graphic Standards* relate to

early modern ideas about normative building types. Buildings are conceived as universal forms, much as the male body is conceived as universal. For discussions of eighteenth-century French theory and typology, see Anthony Vidler, *The Writing of the Walls: Architectural Theory in the Late Enlightenment* (Princeton: Princeton Architectural Press, 1987), and Rafael Moneo, “On Typology,” *Oppositions* 13 (Summer 1978): pp. 22–45.

14. Anthony Vidler, *The Writing of the Walls*, pp. 153–155.

15. In the original publication of the drawings, Freese notes that the diagrams are “particularly to be consulted” for the use of furniture (“The Geometry of the Human Figure,” p. 57). The chair, of course, was a particular fascination of modern architects, and some of the most important modernist chairs, including Mies’ Barcelona chair (1929), Le Corbusier’s Armchair (1929), and Breuer’s Wassily Chair (1925), were designed around the time that the Freese drawings appeared.

16. David Cabianca points out similar language in Le Corbusier, who in the *Modulor* describes architecture as “a symphony of volumes and space meant for men.” Cabianca explains, “Although the statement can be made that Le Corbusier was using a variation of a term which only recently has come under attack for its hidden gender bias, his choice of the plural ‘men’ precludes any such interpretation that includes women. ‘Men’ is specific in its plurality—although the French ‘hommes’ would be only slightly more ambiguous in this context and ultimately forms its own mode of silence.” See “Notes on James Stirling’s Hysterics: Ronchamp, Le Corbusier’s Chapel and the Crisis of Modernism,” *openspace: Journal of Architecture and Criticism*, on-line journal of the University of Cincinnati, 1997.

17. As industrialization rose through the turn of the century, the mechanical conception of the body evolved to an extreme. F.W. Taylor’s theory of scientific management, which employed time and motion studies to increase efficiency, conceived of bodies literally as machines, dictating workers’ every move with detailed precision. This theory became increasingly popular between the wars, and with the unparalleled production of World War II, the *Graphic Standards* charts would have appealed to the demand for thorough documentation of human mechanics. Feminist critiques of scientific management highlight not just its dehumanizing effects but its tendency to strengthen sexual boundaries in the workplace. Taylorism gave greater control to managers, mostly men, and tended to increase the division of labor based on generalizations about sex, further limiting women to certain roles. Furthermore, because anthropometric statistics were predominantly male, the “standard” of body mechanics was inevitably gender biased. This often created unequal working conditions that affected women’s performance and therefore seemed to give further evidence to the argument that women did not belong in the workforce. See Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley: Univ. of California Press, 1990), 238 ff.; and Alice Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States* (New York: Oxford Univ. Press, 1982), pp. 145–147.

18. See, for instance, Niels Diffrient, Alvin R. Tilley, and Joan C. Bardagjy, *Humanscale 1/2/3* (Cambridge, MA: MIT Press, 1974), p. 4: “Large samplings are taken by the armed forces to make the man-machine relationship successful in a fighting environment, but although these measurements are accurate and comprehensive they are limited to select groups. Civilian surveys have not been extensive in terms of samples and measurements. . . .”

19. See, for example, the *American Medical Association Code of Ethics* (Philadelphia: TK and PG Collins, Printers, 1848), pp. 11–12.

20. Quoted in Jacqueline Urla and Alan C. Swedlund, “The Anthropometry of Barbie,” in Jennifer Terry and Jacqueline Urla, eds., *Deviant Bodies: Critical Perspectives on Difference in Science and Popular Culture* (Bloomington: Indiana University Press, 1995), p. 286. Gustave Le Bon, a founder of social psychology,

felt that women “represent the most inferior forms of human evolution and that they are closer to children and savages than to an adult, civilized man.” Of course, minorities were seen in the same light. See Stephen Jay Gould’s classic study of scientific racism, *The Mismeasure of Man* (New York: W. W. Norton and Company, 1981), pp. 104–105.

21. Marquis de Condorcet, quoted in Gould. *Ibid.*, p. 21.

22. Henry Russell-Hitchcock and Philip Johnson, *The International Style* (New York: W. W. Norton and Company, 1966), pp. 59–62.

23. Tzonis and Lefaivre identify the human body as the most common “epiphoric object” of design theory. An epiphore (literally, from the Greek, that which “bears upon”) is an everyday object that presents in a “steno-graphic” way the conceptual framework in use. It condenses the complex set of logical rules in a simple form, and to use the form is to embrace the logic it represents. “By accepting an epiphoric object in an argumentation, one accepts a conceptual framework in its entirety, which means not only an idea of the work as it is, but also as it can be and should be. . . . References to the human body relate simultaneously to all levels of the framework of archaic design. The building *is* a human body: to accept such a concept is to commit oneself to the overall framework of archaic methodology, i.e. sacred harmony as an ultimate warrant. . . .” “The Mechanical Body Versus the Divine Body,” pp. 4–5.

24. Le Corbusier, *The Modulor*, p. 5; *Modulor 2*, p. 296. Both Peter de Francia and Anna Bostock, trans. (Basel, Switzerland: Birkhäuser, 2000). Le Corbusier acknowledges a connection to Renaissance exemplars, listing the work of Dürer, Leonardo, and Francesco di Giorgio, among others, as precursors.

25. Freese notes that he has divided the diagrams into two categories: those illustrating the geometry of the body, which he calls “working drawings” of the human figure,” and those explaining common “applications.” (“The Geometry of the Human Figure,” p. 57.) The combination of aesthetics and mechanics parallels the state of American architecture in the early 1930s, for the few major examples of American modernism at the time still showed a distinct affinity for classical principles. Although in 1951 the second edition of *The International Style* would declare that “traditional architecture, which bulked so large in 1932, is all but dead by now” (p. 255), the original edition features only seven projects in the United States, some of which were designed by Europeans and all of which were built circa 1930. Of these, most were obscure houses, and only two—Raymond Hood’s McGraw-Hill Building and George Howe’s PSFS—were of a large urban scale. Both Hood and Howe were Beaux Arts trained architects, and these two buildings have been shown to blend modern and Beaux Arts sensibilities. See William H. Jordy, *American Buildings and Their Architects: The Impact of European Modernism in the Mid-Twentieth Century* (New York: Oxford University Press, 1972), pp. 87–117; and Robert A. M. Stern, “PSFS: Beaux-Arts Theory and Rational Expressionism,” *JSAH* (May 1962):84–95. The concurrence of the classical and the modern in American architecture of the 1930s is also illustrated by the issue of *American Architect and Architecture* in which Freese’s drawings are printed (July 1934). It features articles on the Acropolis (referred to as “masterpieces of perfect building”) and Cass Gilbert, as well as on Rockefeller Center and Albert Kahn.

26. *The Modulor*, pp. 60–61.

27. *Ibid.*, pp. 56, 63. Interestingly, Le Corbusier cites Gustave Le Bon, whose misogynistic attitude toward female anatomy is mentioned above. The *Modulor* includes two drawings (Plates 77 and 90) reproduced from Le Bon’s *The First Civilizations* that illustrate a sculptural relief from the Egyptian temple of Seti I, in which the pharaoh is depicted with attendant women, and the mathematical proportions of the sovereign figure are delineated. Le Corbusier intends the drawings to convey the universality of the proportioning system, but the images also

overtly illustrate patriarchal privilege and the male-centered practice of body measurement. This attitude is prevalent in the *Modulor*. While working in the United States, Le Corbusier devised a second version of the system, in which the original height of 1.75 meters (approximately 5 feet, 8 inches) became six feet. The height seemed to have epic connotations: “Have you never noticed that in English detective novels, the good-looking men, such as the policemen, are always six feet tall?” Hence, the American standard is the heroic male, the “good-looking” man being the modern equivalent of Vitruvius’ “well shaped” man. Elsewhere, Le Corbusier recoils at his colleagues’ attempt to include women in the *Modulor*. Plate 15 of *Modulor 2* superimposes the male body and the female body, and Le Corbusier merely scoffs at his colleagues who drew the image: “Here is the drawing prepared by Serralta and Maisonnier: you take the square of the ‘Modulor Man’ of 1.83 m. (but, since Serralta has a soft spot for the ladies, his man is a woman 1.83 metres tall: brrrh!).” *Modulor 2*, pp. 52–53.

28. Le Corbusier, *Towards a New Architecture*, Frederick Etchells, trans. (New York: Holt, Rinehart and Winston, 1984), pp. 67–68.

29. Geoffrey Scott, *The Architecture of Humanism* (New York: W. W. Norton and Company, 1974), p. 161.

30. See Jennifer Terry and Jacqueline Urla, introduction to *Deviant Bodies*, p. 4.

31. “Average” presumably refers to an arithmetical mean, a mathematical figure resulting from the sum of all dimensions compiled divided by the number of people measured, but this approach has many problems. Even if an average were agreed to be useful, the pools of people measured have tended to be relatively small and concentrated within certain demographic groups, so the results are exclusive. Scientists believe that, if all the available data were assembled in one place, it would not constitute a representative sample of humanity. As seen, studies of the body historically have excluded women through the small samples taken, the large percentages of men sampled, the various rationales behind the methods of sampling, and politically motivated interpretations of statistics. Whatever the explanation, it is clear that the idea of a dimensional “average” is restrictive. John Crony writes, “Very few persons in a population are average in a large number of definitive measurements of bodily dimensions or capacities that could be examined in an anthropometric study. . . . If we pursue the average in terms of more and more definitive characteristics we find that as the total number of definitive characteristics increases as the percentage of the ‘average’ person who can represent them all decreases.” John Crony, *Anthropometrics for Designers* (New York: Van Nostrand Reinhold Company, 1971), p. 81. See also Frederick J. Gravetter and Larry B. Wallnau, *Statistics for the Behavioral Sciences* (New York: West Publishing Company, 1992), p. 87.

32. The Americans with Disabilities Act includes *normal* in its list of so-called “No-No Words,” “socially incorrect phrases and words associated with . . . minorities.” According to the A.D.A., *normal* refers to “people without disabilities but suggests that anybody who has a disability is sub-normal or abnormal.” See Evan Terry Associates, *Americans with Disabilities Act Facilities Compliance Workbook* (New York: John Wiley and Sons Inc., 1992), pp. 9–10.

33. *The American Heritage Dictionary of the English Language*, 3rd ed. (New York: Houghton Mifflin Company, 1996).

34. For summaries of theories on the body as the site of difference, see the introductions to Jennifer Terry and Jacqueline Urla, *Deviant Bodies*; and Mike Featherstone, Mike Hepworth, Bryan S. Turner, eds., *The Body: Social Process and Cultural Theory* (London: Sage Publications, 1995); and Londa Schiebinger, ed., *Feminism and the Body* (New York: Oxford University Press, 2000). Also, for a discussion of the designation “normal,” see Georges Canguilhem, *The Normal and the Pathological* (New York: Zone Books, 1989).

35. Desmond Morris, *Bodywatching: A Field Guide to the Human Species* (New York: Crown Publishers, Inc., 1985), p. 129.

36. Tammy Shefer, "Feminist Theories of the Role of the Body Within Women's Oppression," *Critical Arts* 5/2 (1990); and Andrea Dworkin, *Pornography: Men Possessing Women* (New York: Dutton, 1989).

37. Donna Karan, foreword to Donna Karan, Diana Edkins, and Betsy Jablow, eds., *Leg* (Los Angeles: General Publishing Group, 1997), p. 3.

38. See Shefer, "Feminist Theories," and Rosemarie Garland Thomson, introduction to *Freakeery: Cultural Spectacles of the Extraordinary Body* (New York: New York University Press, 1996), pp. 1–19. A feminist poster from 1970, the year *Graphic Standards* eliminated its image of the high-heel-clad foot, features a virtually identical image, with the captions, "AMERICAN FOOT BINDING" and "STAMP OUT HIGH HEELS." See Christine Stansell, "Girlie, Interrupted," *New Republic* (Jan. 15, 2001): pp. 23–30.

39. *The Ten Books on Architecture*, IV, I: 6, 7; pp. 103–104.

40. This line of thinking began with Simone de Beauvoir. See Shefer, "Feminist Theories," and Naomi Wolf, *The Beauty Myth: How Images of Beauty Are Used Against Women* (New York: Anchor Books, 1992).

41. Dr. Robert Stoller, quoted in Marjorie Garber, *Vested Interests: Cross-Dressing and Cultural Anxiety* (New York: Routledge, 1997), p. 45.

42. Differences between the measurements given in 1944 and 1970 may be attributed both to the rising level of accuracy in survey methods and to physiological variations over the course of thirty years. For example, the difference between the respective male heights of the two editions is one inch, and the rate of growth of the average height is about three-tenths of an inch per decade. See *Humanscale 1/2/3*, p. 4.

43. Paul Emmons, "The Means and Meanings of Dashed Lines," unpublished manuscript presented at the ACSA Conference, "The Paradoxes of Progress" (March 2001), Baltimore, Maryland. George Hersey also discusses the *linee occulte* as "graphic metaphors for invisible affinities," especially hierarchical relationships. See *Pythagorean Palaces: Magic and Architecture in the Italian Renaissance* (Ithaca: Cornell University Press, 1976), pp. 64–87.

44. Phallic forms, such as the obelisk or the totem, are commonly interpreted as masculine, and womb-like or vulval forms, such as the cave or the shell, are often seen as feminine. As crude sexual symbols, the continuous line suggests a rigid boundary, and the dashed line implies penetrability (as with the solid versus broken stripe in the middle of a road). The linguistic representation of anatomy coincides with the sexual associations of the *linee evidente* and the *linee occulte* here. For example, the word *testis* (the singular of *testes*) comes from the Latin for "witness," hence the word *testify*, "to give evidence," and the term *clitoris* contains roots suggesting concealment (*The American Heritage Dictionary*). Thomas Laqueur has shown that, until circa 1800, Western society perceived women as "interiorized" versions of men; the female sexual organs were seen as identical to the male but internal. See *Making Sex: Body and Gender from the Greeks to Freud* (Cambridge: Harvard University Press, 1990).

45. Sebastiano Serlio, *On Architecture*, Vaughan Hart and Peter Hicks, trans. (New Haven: Yale University Press, 1996), pp. 7, 430 (note 15).

46. *The Modulor*, p. 223.

47. From the Latin *norma* or Greek *gnomon*; carpenter's square, rule. *The American Heritage Dictionary*.

48. George Hersey notes the similarity between the *linee occulte* and ladders or *scalae* (*Pythagorean Palaces*, p. 87). Both the chain and the ladder have been symbols of the Virgin Mary, and the braid is associated with many pagan goddesses. See Hans Biedermann, *Dictionary of Symbolism* (Hertfordshire: Wordsworth Reference, 1992). Furthermore, there is a linguistic connection between *clitoris* and *ladder*, which share the Indo-European root *klei*. *The American Heritage Dictionary*.

49. "The Means and Meanings of Dashed Lines."

50. In his essay "Femininity," Freud argues that feminine identity evolves around the lack of a penis. Shame, the "feminine characteristic *par excellence*," arose from the need to conceal the genitalia, and pubic hair, the inspiration for plaiting or weaving, provides this function. Anatomy is used to justify the subordination of women. Cited in Ann Bergren, "Female Fetish Urban Form," in Diana Agrest, Patricia Conway, Leslie Kanes Weisman, eds., *The Sex of Architecture* (New York: Abrams, 1996), p. 94 (note 16). Bergren also points out the connections between Freud's remarks on textiles, Gottfried Semper's theory of the screen wall enclosures in early dwellings, and feminine-defined images of domesticity. (There is a linguistic relationship between TEXTiles, archiTECT, TECtonic, TECHnology, and TEXT, all from the root *teks*, which can mean "weaving." *The American Heritage Dictionary*.) These ideas also relate to clothing, which in this context may be understood as another woven symbol of the feminine persona. (See above comments on fashion and attire.) Although the Freudian argument may be simplistic and sexist in its own right, it is consistent with other cultural constructions of the feminine discussed here. All of this suggests a feminine influence on the conception of architecture (and, more generally, the making of things) that has been suppressed or supplanted by the assertion of the male body and other masculine images.

51. "The Means and Meanings of Dashed Lines." Of course, in Christian theology, the Annunciation is the paramount moment of representation—through sight, language, creation, and so on.

52. Evans also cites Foucault's account of panopticism, in which "the gathering of lines of sight into a point, like the gathering of reins by a charioteer, is a symbol of control." Architecture expresses social tyranny by conforming to the sight lines of a single man, in this case the governor or watchman. See Robin Evans, *The Projective Cast: Architecture and Its Three Geometries* (Cambridge, MA: The MIT Press, 1995), pp. 123–125.

53. Hubert Damisch, *The Origin of Perspective*, John Goodman, trans. (Cambridge, MA: The MIT Press, 1994), pp. 35–36. The cyclops, a mythological one-eyed cannibalistic giant, seems an overt phallic symbol. On the psychosexual implications of vision, Ann Bergren has studied the mythological character of Baubo, who exposes herself, as a representation of the male fear of the female genitalia, the "irreparable wound." Exposed feminine sexuality, which explodes the normal concealment of women, shocks and threatens the male viewer's control. See "Female Fetish Urban Form," as well as "Baubo and Helen: Gender in the Irreparable Wound," in Andrea Kahn, ed., *Drawing Building Text* (Princeton: Princeton Architectural Press, 1991), pp. 107–126.

54. "The Means and Meanings of Dashed Lines."

55. *Ibid.* Emmons never offers any feminist interpretations of his topic, but they seem abundant. To suggest the *linea occulta* as both a symbol of insemination and an invisible axis (as Emmons does) is to provide a means of resolving long-standing arguments about the Vitruvian man's dual centers. The circle, a symbol of perfection, centers on the navel, whereas the square, a symbol for the earth, centers on the penis, and this misalignment has been much debated. (See, for instance, Giancarlo Maiorino, "The Vitruvian Man: At the Navel of Life's Compass," chap. 8 of his *Leonardo da Vinci: The Daedalian Mythmaker* (University Park, PA: Pennsylvania State University Press, 1992), pp. 177–201). If the dashed line may be understood as a third-dimension axis emanating from the penis to penetrate the female body, it returns to the male body as an umbilicus to the navel. The hidden line is the invisible in-between connecting the sexual center to the birth center via the concealed female body. Again, although the female body is integral to this representation, it is removed from view. In a separate analogy, Serlio compares the difference between the *linee evidente* and the *linee occulte* to that between the living human

body and the skeleton of a dead body: “the flesh covers the skeleton, but the skeleton is nevertheless there, hidden inside” (*On Architecture*, p. 48). An important difference between the skeletal and the fleshed body is the absence of genitalia. The *linee occulte* compare to the sexless body, the body stripped of difference and power.

56. *Dash*: to strike of thrust violently; to splash, bespatter. *The American Heritage Dictionary*.

57. In this diagram, the averages are used to illustrate an argument rather than a range of applicability. See *Humanscale 1/2/3*, p. 5.

58. Sarah Turner, the current AIA Archivist and Records Manager, recounts that there were six female American architects in 1900. Interview with author, Dec. 12, 2000.

59. “As It Looks to the Editors,” *American Architect and Architecture* (July 1934): p. 36.

60. “Employed persons by detailed occupation, sex, and race, 1972–1981,” Bureau of Labor Statistics.

61. Sarah Turner, interview with author, Dec. 12, 2000.

62. “Employed persons by detailed occupation and sex, 1983–99 annual averages,” Bureau of Labor Statistics.

63. Dennis Alan Mann, Professor of Architecture, University of Cincinnati, interview with author, Dec. 11, 2000.