

Object Lessons for the Media Home: From Storgewall to Invisible Design

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In 1991 Mark Weiser, famous for his vision of ubiquitous computing, published an article in *Scientific American* titled “The Computer for the 21st Century.” In what is by now his oft-cited opening lines, Weiser claimed: “The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.”¹

As director of the computer science laboratory at the Xerox Palo Alto Research Center (Xerox PARC), Weiser predicted that “ubicom” environments (with their wireless networks, infrared transmitters, and mobile devices he called “tabs” and “pads”) would one day restore the human world and social relations in it by eliminating the objects that get in our way.² PCs and mainframes are clumsy old dinosaurs that “demand focus of attention” and create obstacles to human interaction. Conversely, Weiser argued that ubicom would take people out of their private bubbles and away from their individual screens and place them in a world where technologies operated “invisibly,” much “like wires in the wall.”³ The world he had in mind was a humanist dream of people-friendly spaces promoted by technological advances that would enhance social relations among humans by reimagining the relations between humans and things. He envisioned this future most fully in his scenario starring Sal, a working mother, whose life was made better by ubicom technologies that allowed her to move between home, family, friends, and office with ease.

1. Mark Weiser, “The Computer for the 21st Century,” *Scientific American* 265, no. 3 (1991): 78–79. See also Mark Weiser and John Seely Brown, “Designing Calm Technology,” December 21, 1995, www.ubiq.com/hypertext/weiser/calmtech/calmtech.htm.

2. “Ubicomp” is the commonly used abbreviation for *ubiquitous computing*. Ubiquitous computing is often also referred to by terms such as *invisible computing* and *pervasive computing*.

3. Weiser, “The Computer for the 21st Century,” 80.

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Although in compromised forms, Weiser's ideas for ubicomp made their way into designs for smart environments including the one Sal lived in and the one I am currently most interested in—the media home. The dream of ubiquitous computing and invisible design formed a basis for many of the digital home projects of today that rely on Internet networks, intelligent agents, digital interfaces, robotics, and mobile technologies to create adaptive environments that respond to and even predict resident needs. These range from university experimental projects like the Massachusetts Institute of Technology's (MIT) House_n or the Georgia Institute of Technology's Aware Home to corporate designs at places like Panasonic, Microsoft, or Intel.⁴ Often created with pro-social goals in mind, smart homes include, for example, green architecture or embedded memory sensors for aging populations.

But smart home futures are expensive, and, not surprisingly in this sense, many designs rely on corporate schemes where wondrous gadgets prevail. Smart fridges talk to your stove and even tell you when the tuna runs low; smart toilets analyze your urine and e-mail the results to your doctor; closets don't just store clothes, they work as a personal wardrobe consultant and tell you what to wear. In more practical versions, ubicomp and the related concept of invisible design have infiltrated the consumer market for smart home technologies where the twin middle-class ideals of leisure and luxury, on the one hand, and privacy and safety, on the other, reign supreme. Gourmet kitchens with Wi-Fi-enabled appliances and home theaters with ambient entertainment allow objects to communicate without the need of human interlopers. Digital services (from digital video recorders [DVRs] to wireless security systems) encourage people to connect back to the home while away for work or travel. Although some of these things still seem “heavy” (carrying a laptop *and* an iPhone *and* an iPad is certainly less than an object-free load), the futuristic fantasy of “lightness” (as posed by terms like *cloud* or *air book*) is part and parcel of a design vision where objects disappear.

4. For histories and cultural analyses of smart homes and technologies, see Fiona Allon, “An Ontology of Everyday Control: Space, Media Flows, and ‘Smart’ Living in the Absolute Present,” in *MediaSpace: Place, Scale, and Culture in a Media Age*, ed. Nick Couldry and Anna McCarthy (London: Routledge, 2004), 253–74; Davin Heckman, *A Small World: Smart Houses and the Dream of the Perfect Day* (Durham, N.C.: Duke University Press, 2007); Terence Riley, *The Un-private House*, exhibition catalog (New York: Museum of Modern Art, 1999); Lynn Spigel, *Welcome to the Dreamhouse: Popular Media and Postwar Suburbs* (Durham, N.C.: Duke University Press, 2001), 379–408; Spigel, “Designing the Smart House: Posthuman Domesticity and Conspicuous Production,” *European Journal of Cultural Studies* 8, no. 4 (2005): 403–26; David Morley, *Media, Modernity, and Technology: The Geography of the New* (London: Routledge, 2007), chap. 7; and Mark Andrejevic, *I Spy: Surveillance and Power in the Interactive Age* (Lexington: University of Kentucky Press, 2007).

It's tempting to tell a story where Weiser's vision of disappearing objects predicts a future for the smart homes of today. But rather than see Weiser's plan for ubiquitous computing as an origin myth for a new conception of the home, I want to trace the history of the idea of the disappearing technological object back to architecture itself and, specifically, to midcentury modern design. My goal is to show how midcentury logics of the domestic interior formed a compatible ideological infrastructure for the media lifestyles now promoted by smart home enthusiasts. Here I focus on one key player in this history of the interior—American designer George Nelson. A leading figure in midcentury design for both home and office, Nelson is an uncanny double for Weiser. He too had a theory of disappearing objects, and, like Weiser, Nelson advocated for the disappearance of objects as a means of improving social life. Whereas Weiser imagined ubicomp as a way to eliminate the tyranny of things, Nelson was famous for his more material solution to the same problem, a solution that he called the “Storagewall.”⁵ Nelson's Storagewall was intended for the postwar consumer family overcome by the objects they possessed, but it especially served as means of hiding and organizing media machines (from radio to the phonograph to TV). Easy to produce in do-it-yourself makeshift forms, the Storagewall became a highly popular design for the average home. In other words, like ubicomp, in its own time the Storagewall was a profoundly influential means of shaping the environment through the practice of making things (especially media machines) disappear.

Although Nelson and Weiser are not joined in a straightforward intellectual history (Nelson did not directly influence Weiser), the Storagewall and ubicomp share an epistemology of space (based on the disappearance of material things), which has broad implications for the way media environments are experienced. In the following pages, I trace the history of Nelson's Storagewall and in particular its relation to media technologies like radio, TV, and hi-fi and even its more surprising links to the technology with which contemporary ubicomp environments are most engaged—the computer. In looking at Nelson in connection with Weiser, then, I want to provide a history of the idea of the disappearing object from its material form in residential building of the midcentury period to its digital form in smart home designs of the late twentieth and early twenty-first centuries. Most importantly, I want to explore the problematic underside to invisible design. Whether through storage walls or ubiquitous computing, the attempt to make objects disappear also often winds up hiding the social relations

5. *Storagewall* is often spelled as one word, although Nelson and others also spelled it as two words. Here I use two words only when it appears as such in an original citation or when I am referring to a generic design concept.

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and belief systems upon which environments are built and through which social power (in this case the uneven social relations of gender, class, and race) is organized and produced. Here I especially focus on the gendered forms of labor and leisure implicit in and orchestrated by Nelson's wall. In this respect, via historical example, I also offer some object lessons the Storgewall provides for anyone interested in smart environments today.

Bettors Homes and Media Storage

Nelson is best known today for his decorative objects and furniture designs, such as his bubble lamps, ball clock, and marshmallow sofa (figs. 1–2). In his own time he created a vast array of things for the home and office while also contributing to major international exhibitions and corporate campaigns. In 1946, largely on the basis of his Storgewall, Nelson became the head of design at the furniture company Herman Miller, which went on to become a major innovator of now canonical midcentury designs including the work of Nelson's close colleagues, Charles and Ray Eames. Nelson was also a prolific writer, who published over a dozen books and served, throughout his career, on the editorial teams of numerous journals, including *Architectural Forum* (where he was co-managing editor in 1943–44). Starting in the early 1940s, *Architectural Forum* initiated an intensive dialogue about the future of the postwar home, a concern also voiced by publications like *Arts and Architecture*, *Fortune*, and *Arts and Decoration*, as well as by museum exhibitions such as the Walker Art Center's *Idea House I* and *II* (1941 and 1947) and a variety of exhibitions at the Museum of Modern Art (MoMA).⁶ Nelson wrote for many of these publications and was engaged in a number of museum exhibitions.⁷ Throughout his career, he also produced a number of client-built homes and speculative designs such as his modular pre-

6. The future of the postwar home was often considered under the rubric of "House 194X," a term devised by *Architectural Forum* in 1942 when the editors asked thirty-three American architects to speculate on designs for the postwar house. Nelson often referred to "House 194X." The MoMA shows include, for example, *Tomorrow's Small House* (1945), *The House in the Museum Garden Exhibition* (initiated in 1949), and the *Good Design* shows (1950–51).

7. For example, the Storgewall was prominent in the Walker Art Center's *Idea House II*, which was widely popular and heavily promoted in popular magazines. For photographs, see Forgotten Minnesota, "Walker Art Center's Idea House," August 11, 2011, forgottenminnesota.com/2011/08/walker-art-centers-idea-house. At MoMA, Nelson served as an adviser for the housing exhibition curated by Eliot Noyes in 1943, and he also contributed to MoMA's *Good Design* shows. For more, see Stanley Abercrombie, *George Nelson: The Design of Modern Design* (Cambridge, Mass.: MIT Press, 1995), 67; Jochen Eisenbrand, "Planning with You: George Nelson as an Architect for the Home," in *George Nelson: Architect/Writer/Designer/Teacher*, exhibition catalog, ed. Jochen Eisenbrand (Weil am Rhein, Germany: Vitra Design Museum, 2008), 42–65.



Figure 1 George Nelson. Reprinted with permission of Corbis Images



Figure 2 George Nelson, Bubble Lamp. Reprinted with permission of Getty Images

fabricated “Experimental House” (unbuilt, 1957), which was inspired in part by Buckminster Fuller’s unconventional dome designs.⁸ But Nelson’s major innovations for postwar domestic architecture were offered in the spirit of practical design advice aimed at average homeowners with social aspirations to live what people came to call “the good life.”

In 1945 Nelson and his *Architectural Forum* colleague Henry Wright coauthored *Tomorrow’s House* (fig. 3).⁹ A huge popular success, *Tomorrow’s House*

8. Nelson’s Experimental House was essentially a series of reconfigurable cubes with translucent dome roofs. Nelson collaborated with Fuller on a climate-controlled dome house project for several months in 1952, when Fuller worked in the Nelson office. For more on that and on the Experimental House, see Eisenbrand, “Planning with You”; and Abercrombie, *George Nelson*, chap. 4. For Nelson’s speculative “Shell House” (unbuilt, 1952), a climate-controlled home with no permanent walls that was inspired by Fuller, see George Nelson, “After the Modern House?” *Interiors*, July 1952, 80–89. Such projects show that Nelson was interested in the potential of the fully automated home and in flexible design, which both prefigure the smart homes of today.

9. George Nelson and Henry Wright, *Tomorrow’s House* (New York: Simon and Schuster, 1945). Wright was the co-managing editor (with Nelson) of *Architectural Forum*.

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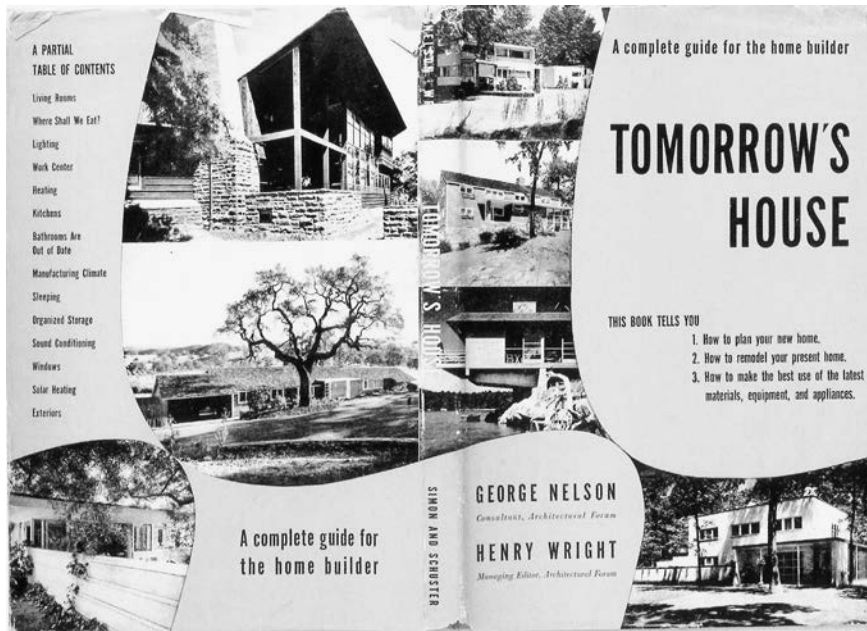


Figure 3 *Tomorrow's House*, cover, George Nelson and Henry Wright, Simon and Schuster, 1945

quickly soared to number nine on the *New York Times* best-seller list.¹⁰ The book was especially aimed at young couples eager to own their own homes and increasingly encouraged to do so by Federal Housing Administration (FHA) policies like the GI Bill, which allowed returning soldiers to acquire mortgages at low costs.¹¹ As *Architectural Forum* publisher Howard Myers stated in the book's foreword, "I hope this book will be read by all those who plan to build or buy a postwar house."¹² In line with their attempts to attract a wide public of middle-class home buyers, Nelson and Wright consulted consumer surveys, hoping to figure out the housewife's chief concerns (closet space ranked number one, making the Storage-wall, at least in Nelson's and Wright's minds, the housewife's dream come true).¹³ Although never stated explicitly, the implied reader was white and, regardless

10. Abercrombie, *George Nelson*, 68.

11. For more on the GI Bill, see Kenneth Jackson, *Crabgrass Frontier: The Suburbanization of the United States* (New York: Oxford University Press, 1985). In *Tomorrow's House's* final chapter (202–3), Nelson and Wright included advice on how to get an FHA-secured mortgage.

12. Howard Myers, foreword to Nelson and Wright, *Tomorrow's House*.

13. Nelson observed that storage was a number one concern in surveys of housewives conducted in the early 1940s. See George Nelson, ed., *Storage* (New York: Whitney Publications, 1954), 9, 141.

of actual income, a socially mobile consumer aspiring to aesthete tastes. Most stunning in this respect, even while the authors assumed that many of their actual readers were young families living in small houses, they nevertheless filled the book with more than two hundred photographs of client-built homes by modernist masters such as Richard Neutra, Marcel Breuer, Walter Gropius, Philip Johnson, and Nelson's major influence, Frank Lloyd Wright. Shot by major architectural photographers like Julius Shulman and Ezra Stoller, the homes variously display the hallmarks of midcentury modern design: open plans and expansive spaces, smooth unadorned surfaces, window walls with dramatic views, industrial materials offset by natural elements (such as stone fireplaces), indoor-outdoor living arrangements, and built-in shelving and cabinetry.

Although *Tomorrow's House* promoted the modern style, Nelson and Wright argued that architectural modernism was part of a "great tradition" of good "honest" design, not a futuristic gimmick.¹⁴ They especially took issue with previous "homes of tomorrow" that were displayed over the course of the early twentieth century at fairs, world exhibitions, and department stores and also featured in magazines and newsreels.¹⁵ Sponsored by companies like General Electric and Westinghouse, homes of tomorrow came chock-full of "electrical servants" promising science-fiction futures. Disenchanted with these futures, Nelson and Wright admitted that the title of their book "could be misleading." As opposed to so many designers of homes of tomorrow, they were not interested in "fancy electronic gadgetry" of the "crystal gazers."¹⁶ Rather than fill the home with automatic fridges or push-button stoves, Nelson and Wright proposed a counterintuitive plan for the family's future—the elimination of objects through the device they called the Storage wall.

According to Nelson (who devised the concept),¹⁷ he first imagined the Stor-

14. The first chapter of Nelson and Wright's *Tomorrow's House* is titled "The Great Tradition"; see especially 7–8.

15. For histories of homes of tomorrow, see Brian Horrigan, "The Home of Tomorrow, 1927–1945," in *Imagining Tomorrow: History, Technology, and the American Future*, ed. Joseph J. Corn (Cambridge, Mass.: MIT Press, 1986), 137–63; Robert Haddow, "House of the Future or House of the Past: Populist Visions from the USA," *Architecture and Ideas* 1, no. 1 (1999): 68–79; Gregory L. Demchak, "Towards a Post-industrial Architecture: Design and Construction of Houses for the Information Age" (master's thesis, Massachusetts Institute of Technology, 2000); Robert Boyce, *Keck and Keck* (Princeton, N.J.: Princeton Architectural Press, 1993); Inaki Abalos, *The Good Life: A Guided Visit to the Houses of Modernity* (Barcelona: Gustavo Gili, 2001); Beatriz Colomina, "The Media House," *Assemblage*, no. 27 (1995): 55–66; Colomina, *Domesticity at War* (Cambridge, Mass.: MIT Press, 2007); Spigel, "Designing the Smart House"; and Heckman, *A Small World*.

16. Nelson and Wright, *Tomorrow's House*, 8.

17. In his edited book *Storage*, Nelson did give Wright cocredit but nevertheless discusses the Storage wall as his conception (see 37). Abercrombie (*George Nelson*, 69–70) also relates Nelson's

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agewall as a solution to a number of interrelated forces at midcentury: (1) the shrinking size of modern homes and the elimination of basements and attics, (2) the decline of the servant labor force during the war, and (3) the impending consumer economy and especially the boom in leisure that would lead to the accumulation of more and more things with less and less space to put them in. Together, he reckoned, these factors would make clutter a central concern for postwar residents and particularly for the housewife who would (with fewer servants) have to clean up the mess herself. Nelson thought that he could solve the housewife's dilemma by using the air space inside walls to make objects disappear. His "theory of essential storage space in the home" envisioned Storgewalls as modular built-in units scattered across the house to "keep things out of sight."¹⁸

The Storgewall may at first seem to have nothing to do with media. In design history, storage is instead typically considered in relation to the problem of clutter and the emphasis early twentieth-century modern architects like Le Corbusier or Bauhaus director Gropius put on clean minimalist spaces and efficient rational designs modeled on industrial concepts. As Le Corbusier famously declared in 1923, "The home is a machine for living in," a phrase that became the slogan of the "International Style," which quickly made its way to US soil.¹⁹ In the early decades of the twentieth century, the modernist penchant for rational order and machinelike spaces dovetailed with domestic science movements that similarly imposed factory concepts of efficiency onto the home. In the United States, domestic science was orchestrated by a new breed of expert, epitomized by Lillian Gilbreth (a pioneer of time-motion studies who devised techniques for the modern kitchen) and Christine Frederick (who popularized ideas about domestic efficiency starting in the 1910s and became famous for her work as a consultant to advertisers and especially for her 1929 book *Selling Mrs. Consumer*).²⁰

recollection of the birth of the Storgewall in which Nelson takes credit for its conception. More generally, it is associated with the other storage cabinets and systems Nelson created throughout his life.

18. Nelson and Wright, *Tomorrow's House*, 139. Nelson and Wright discuss storage throughout the book and especially in their chapter "Organized Storage." Note that modernist designers created modular designs earlier in the century. See Abercrombie, *George Nelson*, 93.

19. Le Corbusier, *Towards a New Architecture*, trans. John Goodman (1923; repr., Los Angeles: Getty, 2007). Note, as well, that storage was a central feature of Bauhaus residential design.

20. Gilbreth was married to industrialist Frank Gilbreth, a leader in the scientific management movement for industry. By applying time-motion studies originally devised for factory labor to domestic work, she and other domestic scientists hoped to conserve labor time and human energy. Beginning in 1912, Frederick wrote articles in *Ladies' Home Journal* on the "new housekeeping," and they were subsequently published as a book, *The New Housekeeping: Efficiency Studies in Home Management* (1913; repr., London: Kessinger, 2010). For her later book, see Christine Frederick, *Selling Mrs. Consumer* (New York: Business Bourse, 1929).

While often popular with women, domestic science promoted modes of everyday life that resulted in worker alienation similar to that in factory labor.²¹ The focus on the private home (as opposed to collectivist lifestyles), the adherence to the linear mechanized time of the Fordist work clock, the new form of bodily regimentation entailed in the endless routines of cleaning, storage, and retrieval encouraged by time-motion studies, and the work involved in performing the role of “Mrs. Consumer” offered modes of everyday experience that were good for industry but not always good for women. So, too, the discourses of domestic science were often taken up in reform movements aimed at “cleaning up” and acculturating the working class, immigrants, African Americans, and other groups who did not typically own private homes but instead often cleaned up other people’s houses.²² Most important for my purposes here, both modern design and domestic science were based on the disappearance of objects, which had important implications for gender. As Penny Sparke argues, the penchant for clean minimalist spaces was not just an innocent decorating style. In their calls for object-free spaces, the mostly male modernists were in effect also advocating for the elimination of Victorian decor associated with women’s taste, which they redefined as clutter.²³ Clutter and storage, then, have ideological links to a whole history of gender, labor, class, taste, and whiteness.

Nelson’s *Storage* fits snugly into this framework. In *Tomorrow’s House*, Nelson and Wright raise the issue of taste by telling the story of a husband and

21. Feminist historians have critiqued the domestic science movement and the antifeminine bias of modernist designs. See, e.g., Dolores Hayden, *The Grand Domestic Revolution: A History of Feminist Designs for American Homes, Neighborhoods, and Cities* (Cambridge, Mass.: MIT Press, 1982); Janice Williams Rutherford, *Selling Mrs. Consumer: Christine Frederick and the Rise of Household Efficiency* (Athens: University of Georgia Press, 2003); Penny Sparke, *As Long as It’s Pink: The Sexual Politics of Taste* (London: Pandora, 1995); Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books, 1983); Gwendolyn Wright, *Building the Dream: A Social History of Housing in America* (Cambridge, Mass.: MIT Press, 1983); Kristin Ross, *Fast Cars, Clean Bodies: Decolonization and the Reordering of French Culture* (Cambridge, Mass.: MIT Press, 1996), chap. 2; and Erica Carter, *How German Is She? Postwar West German Reconstruction and the Consuming Woman* (Ann Arbor: University of Michigan Press, 1997). For an interesting essay about ideologies of storage and clutter, see Saulo B. Cwerner and Alan Metcalfe, “Storage and Clutter: Discourses and Practices of Order in the Domestic World,” *Journal of Design History* 16, no. 3 (2003): 229–39.

22. In the United States, this acculturating and often racist and class-based ideology of the domestic science ideal was most clearly envisioned in the 1920s by the “Better Homes Movement” promoted by then secretary of commerce Herbert Hoover and widely publicized in women’s magazines. The movement equated the efficient home with good citizenship via appeals to cleanliness and order. See Wright, *Building the Dream*, 196–97.

23. Sparke, *As Long as It’s Pink*.

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wife who live in a clutter-filled world. The husband wants a living room with a comfortable chair, a radio receiver, books, magazines, and ashtrays for smoking to maximize his daily pleasures. But his wife wants to clean up his mess by banishing the objects of leisure — the radio, cigars, books, magazines, and comfy chair all have to go. In their place she imagines a room that she can exhibit with pride to clubwomen and bridge players. Modeled on a plan she saw in *House Beautiful*, her dream room is filled with what Nelson and Wright call a “cluttered” assortment of women’s decorative tastes: “stunning eighteenth-century furniture andirons,” an “antique coffee table with a sofa on each side,” and “a high table with a pair of very handsome Chinese lamps on it.”²⁴ Nelson and Wright mediate this spousal dispute by declaring them both tasteless. In this regard, the modern home — either in its “man cave” or feminine “slave to style” versions — is a mess, and the media (in this case, radio, magazines, and even books) are part of the problem.

More generally, Nelson and Wright claimed that the Storage wall would replace the mess of media and, in particular, the poorly designed cabinets for radio sets. They ridiculed “ornate radio cabinets” and especially the “old Chippendale cabinets for radio.”²⁵ Notably, during this period, Chippendale was a euphemism for low-class taste in furniture design, ranking next to last on Russell Lynes’s famous “highbrow, lowbrow, middlebrow” chart that was published in *Life* in 1949.²⁶ To be sure, by the 1940s, in mainstream designs of the Chippendale sort, furniture camouflage was a long-standing practice. As radio manufacturers discovered in the early 1920s, hiding radios inside furniture made machines seem familiar and domestic, and marketers thought that this was especially important to women, who, they feared, would reject media machines and wires as blights to decor.²⁷ By

24. Nelson and Wright, *Tomorrow’s House*, 10–11.

25. Nelson and Wright, *Tomorrow’s House*, 13.

26. Russell Lynes, “Highbrow, Lowbrow, Middlebrow,” *Life*, April 11, 1949, 100–101. This article (without the illustrated chart) was originally published in *Harper’s Magazine*, February 1949.

27. Catherine L. Covert, “‘We May Hear Too Much’: American Sensibility and the Response to Radio, 1919–1924,” in *Mass Media between the Wars: Perceptions of Cultural Tension, 1918–1941*, ed. Catherine L. Covert and John D. Stevens (Syracuse, N.Y.: Syracuse University Press, 1984), 204–5; William Boddy, “The Rhetoric and Economic Roots of American Broadcasting,” *Cinetracts* 6, no. 2 (1979): 43. For more discussion of hiding machines, see Adrian Forty, *Objects of Desire: Design and Society from Wedgwood to IBM* (New York: Pantheon, 1986). Note that television camouflage, and especially the concealment of the screen, was also related to concerns about privacy and surveillance. See Lynn Spigel, *Make Room for TV: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992), 115–19. In line with this idea of concealment, Nelson spoke of the TV screen as a “glassy white eye” and suggested ways to hide it. See Nelson, *Storage*, 104.



ridiculing ornate radios, then, Nelson and Wright were also mocking a whole tradition of mass-produced design based on decorative motifs they associated with women's bad taste.

As a furniture maker, Nelson worked in relation to other modern designers who hoped to solve the problem not only of unsightly machines but also of the tasteless mass-produced furniture manufactured to hide them. For example, John Vassos's Music Room (displayed at the 1939–40 New York World's Fair in the "America at Home" exhibit) integrated a radio, 16 mm film projector, phonograph, and TV set in a modular streamlined furniture/storage unit with built-in seating, all of which wrapped around a room.²⁸ Nelson's freestanding storage wall, which he designed for Herman Miller in 1949, included a space for a radio that was concealed, but also designated on the surface, by a round shape (for the speaker) that offset the geometric modular design (fig. 4).²⁹ By the postwar period, high-end media cabinets became hallmarks of good taste. In 1949 MoMA included Nelson's storage unit and Vassos's Music Room in its *Modern Art in Your Life* exhibit, which fea-

Figure 4 George Nelson's freestanding storage wall unit for Herman Miller, 1949

28. Vassos made numerous radio and TV designs for RCA. At the fair, he also created the "Radio Living Room of Tomorrow," which showed how TV could be integrated into decor.

29. In the catalog photograph, the round radio also rhymed with a "modern primitive" African mask on the same cabinet. See Robert Goldwater and René d'Harnoncourt, "Modern Art in Your Life," *Bulletin of the Museum of Modern Art* 17, no. 1 (1949): 1–48.

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tured the influence of modernism on industrial design.³⁰ Yet despite this elevation of media cabinetry to the lofty status of “good design,” Nelson’s real dream was the elimination of media furniture altogether. In *Tomorrow’s House*, Nelson and Wright agreed, “The best radio cabinet was . . . no cabinet.” “We would therefore be inclined to take our radio out of its fancy imitation Chippendale cabinet and tuck the works into the storage wall.”³¹

Storagewalls, Media Walls, and Do-It-Yourself PCs

As Nelson and Wright’s sparring couple already suggests, the Storagewall was embedded in gender relations in the home. It both assumed and promoted women’s role as housekeeper, which included not only the welfare of her family but also the social life of things. A sequence of photographs in *Tomorrow’s House* tells the story: one photograph shows a young housewife overcome by objects. With a look of consternation, she stands among a sea of picnic baskets, board games, pool cues, tennis rackets, and other objects (mostly) pertaining to family leisure (fig. 5). A second photograph next to this shows how Nelson’s Storagewall solves the housewife’s dilemma (fig. 6). The items of everyday use, or what Nelson and Wright called “active storage,” all find their place in the wall, ready for instant retrieval.³² These items include a game closet; bookshelves and magazine racks; a space to store vases; a wet closet (for “highballs”); a foldout desk with cubbies for family records (meaning bills, receipts, and letters); a built-in radio; speakers; and a drawer unit for a record player.³³

As the photographs indicate, the Storagewall was not just a place to put things; it was also key to the imagination of the home as a media space. The wall contains media machines (a record player, speakers, and a radio), as well as older print media (magazines, books) and leisure activities like board games. In other incarnations (both in this book and elsewhere), the Storagewall also includes television sets, home movie projectors, slide projectors, and hi-fis. Most importantly, the Storagewall imposes an order on things. The wall is a means of disciplining the environment and giving shape to a new kind of postwar domesticity where leisure and media become the key centers of everyday life. As opposed to just a radio or TV cabinet, the Storagewall puts media objects into a discursive network

30. For the catalog, see Goldwater and d’Harnoncourt, “Modern Art in Your Life.”

31. Nelson and Wright, *Tomorrow’s House*, 140.

32. Nelson and Wright, *Tomorrow’s House*, 137.

33. While the sporting goods in the “before” photograph don’t appear in the “after” photograph, the authors do discuss the Storagewall’s utility for storing these items.



Figure 5 Housewife overcome by her things, *Tomorrow's House*, Geroge Nelson and Henry Wright, 1945



Figure 6 Storagewall, in *Tomorrow's House*, George Nelson and Henry Wright, 1945

with one another, as well as with other decorative objects in the house (vases, plants, knickknacks). So, too, the Storagewall includes a foldout desk with those primitive inscription machines known as pens and notepads. In this respect, the Storagewall operates as a media network that is a terminal of sorts where people can receive and store the data of culture and also transmit their own messages (via pens and paper—but also often typewriters). And fundamentally, the wall hides all of these things with doors and cubbies that fold in and out and allow all of the media to disappear. In all of these ways, the wall is a kind of makeshift do-it-yourself PC before the advent of the home computer, and it operates as an interface for the resident. The Storagewall contains a set of germinal ideas about people, things, and everyday environments that are central to the mediated spaces of home in postwar culture.

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Nelson's wall received immediate attention in the popular press, which promoted it not only as a design but also as a design for living. Just before the publication of *Tomorrow's House*, *Life* showcased Nelson's wall in an article simply titled "Storage Wall," the first in the magazine's series of "stories devoted to the [postwar] American home and how it could be improved."³⁴ To test the wall, *Life* built a full-size model that stored about one thousand typical household items, but the majority of things *Life* mentioned were either clothing or objects for leisure (including games, sporting equipment, card tables, and media). The article stated, "Into the living-room side were built a desk, shelves for books, magazines and bric-a-brac, a radio, a phonograph and place for records [of bills and receipts]."³⁵ The *Life* spread features a full-color version of the photograph that appeared in *Tomorrow's House* but also several more poses, including one that shows the housewife seated at a foldout desk apparently writing letters or paying bills (fig. 7). Much like Nelson himself, then, *Life* promoted the wall as a media space for both the reception and transmission of messages. Moreover, in all cases, the Storgewall is not only a means of organizing media; it is itself a medium that orchestrates household activities of work and leisure.

In years to come, Nelson's Storgewall quickly took off in popular home magazines and design manuals aimed at women, and here the Storgewall literally becomes a media wall. In 1956 the *Better Homes and Gardens Decorating Book* (with a picture of Nelson's bubble lamp on the cover) told housewives: "If you need extra storage space—and most of us do, don't overlook the biggest area in your room, the walls. . . . In a space 2 feet deep by 3 feet square you can fit a card table and eight folding chairs. Above it might go your television set, and above that, out-of-season items such as the picnic basket or the vacuum jug."³⁶ The following page features a media wall that looks like a makeshift version of Nelson's 1949 Herman Miller freestanding Storgewall. Like Nelson's, it includes the round design (indicating the radio) against geometric modular shapes. In addition to radio and TV, it houses books, knickknacks, a desk, a telephone, a clock, and stamped mail apparently waiting to be posted (fig. 8). Again, the media wall serves as a communications terminal by putting media and a range of objects into a spatial-discursive network that links the home to any number of unspecified outside destinations. The basic idea was repeated many times and became especially prominent during the 1960s as increasing numbers of media machines entered the

34. "Storage Wall," *Life*, January 22, 1945, 63–71. Note that *Architectural Forum* also ran a preview article. See "Storgewall," *Architectural Forum*, November 1944, 83–93.

35. "Storage Wall," *Life*, 65.

36. *Better Homes and Gardens Decorating Book* (Des Moines, Iowa: Meredith, 1956), 302–3.



Figure 7 Housewife at Storgewall foldout desk. The airmail envelopes and globe indicate the Storgewall's function as an interface for international communications. Photo by Walter Sanders, *Life*, January 22, 1945. Reprinted with permission of Getty Images

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Figure 8 Architect George Nelson. Photo by Gjon Mili. Originally published in *Better Homes and Gardens Decorating Book*, 1956

home.³⁷ By 1970–71, *The Practical Encyclopedia of Good Decorating and Home Improvement* (an eighteen-volume book on interior design) proposed numerous media walls featuring telephones, desks, books, stereos, game boards, reel-to-reel tape decks, typewriters, phones, plants, and decorative objects all placed together in modular designs in family rooms, guest rooms, bedrooms, and even (in modified forms) in kitchens (fig. 9).³⁸

In all of these examples, the fusion of wall and media creates a third term—“a media apparatus.” In 1954, in his edited collection titled *Storage*, Nelson makes the case crystal clear. The cover shows a graphic rendering of a television set built into a modular Storgewall of similar color wood-grain design so that every object

37. See, e.g., Phoebe De Syllas and Dorothy Meade, *Design to Fit the Family* (New York: Penguin, 1965); Elizabeth T. Halsey, *Ladies' Home Journal Book of Interior Decoration* (Philadelphia: Curtis, 1959), 200; Evelyn Enright and Anne Larsen, *Decorating Ideas for the Active Rooms* (New York: Armstrong Cork, 1967); and “Instant Office in a Closet,” *Popular Mechanics*, September 1965, 144.

38. *The Practical Encyclopedia of Good Decorating and Home Improvement*, 18 vols. (New York: Greystone, 1970–71).

Object Lessons for the
Media Home



Figure 9 Like the contemporary computer, this makeshift storage wall includes media for transmission and reception of messages and for work and play. Originally published in *The Practical Encyclopedia of Good Decorating and Home Improvement*, vol. 9, 1971

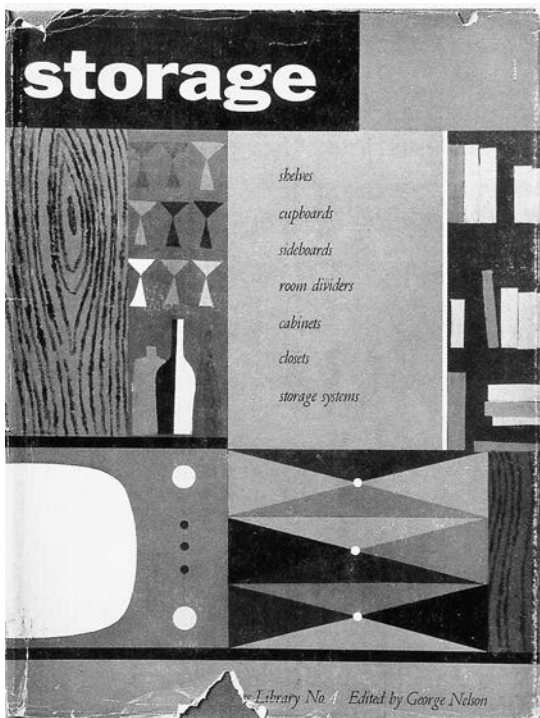


Figure 10 *Storage*, George Nelson, cover, Whitney Publications, 1954

blends into the other (fig. 10).³⁹ The Storgewall fuses architecture, furniture, and TV into a media device that fades from view in lived space even as TV brings virtual spaces into the home.⁴⁰ Given the fact that most homes did not have the resources for the high-end custom-built media storage, decorating manuals came up with makeshift solutions. As Mary and Russel Wright's *Guide to Easier Living* told housewives in 1950, "A factory-made storage unit . . . can look like a built-in."⁴¹ The knockoff version was essentially a freestanding (but mountable) replica of Nelson's wall, complete with wood finish, a wet bar, a foldout desk, a round space for the radio receiver, and now a square space (apparently for a TV set). For households even more strapped, the manual suggested do-it-yourself invisible designs. For example, it told readers to "draw a curtain" or "hang bamboo slats" over an "inexpensive Storgewall placed on bricks or cinder blocks." In this curious iteration of double invisibility, the manual promotes hiding a thing that hides other things.⁴²

While some of these specific designs may not have matched his aesthete tastes, Nelson nevertheless was an enthusiastic proponent of the post-war do-it-yourself movement and often promoted the idea that modular designs afforded flexibility and democratic choice. In 1955 he endorsed generic storage wall kits offered by the United States Plywood Corporation in its "Famous Designers Do-It-Yourself Plans" advertising initiative (fig. 11).⁴³ The hi-fi and

39. Nelson, *Storage*, cover.

40. From this point of view, as an apparatus for spectatorship, the media wall has helped strengthen the illusion of "liveness" for TV programs and hi-fi sound. The disappearance of the *material* object (the media machine) vanished so that the *immaterial* illusions emanating from it might take on a life of their own. By concealing a TV in a media wall, it was possible to minimize the viewer's relation to the machine itself as a frame of representation.

41. Mary Wright and Russel Wright, *Guide to Easier Living* (1950; repr., Salt Lake City, Utah: Gibbs Smith, 2003), 16–17.

42. Wright and Wright, *Guide to Easier Living*, 18–19.

43. Eisenbrand, "Planning with You," 44. Eisenbrand sees Nelson as a leader in the do-it-yourself movement. Note that storage wall kits continued to be popular in the next decade as the American Plywood Association offered plans for Storgewalls in ten-cent booklets. See *Popular Mechanics*, November 1967, A18.


radio are prominent features in the wall, which uses a modular design, foldout cubbies, and Mondrian-like alternating swatches of red, yellow, and blue to make media machines both “hide-able” and attractive. More generally, decorating manuals suggested hiding media through a combination of modular shelving, colorful paint, and/or pattern that would draw the eye away from machines and wires. *The Complete Basic Book of Home Decorating* in 1968 recommended a houndstooth backdrop for a modular entertainment wall with “stereo, radio, television, and what-you-have.”⁴⁴ A stereo unit and TV set recede into the houndstooth cloth that covers the surfaces on which they are placed, while hanging files in the same unit indicate the wall’s secretarial function for the administration of family finances and postal communication. On the adjacent wall, houndstooth curtains and ottomans blend in not so subtle harmony. In this way, the media wall creates a dizzying distraction from media machines. It ties together seemingly unrelated objects into a pattern that suggests planned organization, a network rather than a hodgepodge of things. Not to be outdone, in 1971 *The Practical Encyclopedia of Good Decorating and Home Improvement* offered a “combination conversation and music pit” that submerged the media in the floor. A “spacious sunken area” with a brown shag carpet and built-in Naugahyde seats, the pit housed a “stereo, reel-to-reel


44. William E. Hague, ed., *The Complete Basic Book of Home Decorating* (New York: Doubleday, 1968), 316.

SA-184
PRICE 25c

Famous Designers

DO-IT-YOURSELF PLANS





Called by *Collier's* “one of America’s leading architects,” George Nelson is equally well known for industrial design and home furnishings. He won the Rome Prize in Architecture and worked as an editor on *Fortune* and *Architectural Forum*. Turning to industrial de-

A STORAGE WALL

designed by
GEORGE NELSON

sign, he developed the Storage wall which *Life* featured. He then did the Herman Miller Furniture line. His office is now active in architecture, interiors, graphic design, industrial products, lighting, and furniture. One of the most important projects done recently was a plastic dinnerware line by Proton which has many new conceptions such as ultra-modern shapes, use of thin edges and vivid colors.

Figure 11 Nelson endorses the do-it-yourself storage wall for the United States Plywood Company, 1955. Vitra Design Museum, Archive



Figure 12 While the technology is on display, it is submerged in a Naugahyde-covered “music pit” and integrated into a geometric design around the organ. Originally published in *The Practical Encyclopedia of Good Decorating and Home Improvement*, vol. 9, 1971

tape deck, radio, television . . . and organ,” all of which are also covered in yellow Naugahyde to rhyme with the seats (fig. 12).⁴⁵ As it turns out, the pit was also a Nelson knockoff. In a model for his Experimental House, Nelson proposed a sunken living area with a green shag carpet and a Storgewall with a radio, books, and decorative objects (but no Naugahyde).⁴⁶ Most important, whatever their decorative schemes, these media walls share many common features with Nelson’s basic plan, especially his mission to make objects disappear.

So, too, foremost in these designs is Nelson’s taken-for-granted assumption that the housewife is the manager of family storage, the filer of everyday things, which in the postwar period increasingly meant objects for leisure and especially home media. In 1955 *Fortune* estimated that Americans were spending a phenomenal “\$30 billion for fun.” But when calculated in terms of disposable income, this figure actually represented about a 2 percent decline since 1947. The

45. *Encyclopedia of Good Decorating and Home Improvement*, 9:1603.

46. See Abercrombie, *George Nelson*, unpaginated photograph, located between pages 74 and 75.

greatest drop was in spectator amusements, especially movie attendance, but also theater, concerts, and sports events. *Fortune's* survey concluded that Americans had moved indoors where television and high-fidelity sound promised more and better entertainment than in the “golden age of the box office.”⁴⁷ In this respect, as a media device, the Storgewall negotiated this shifting terrain of private and public leisure. Even while sociological studies and articles in women’s magazines observed that women feared TV and other home amusements would cut them off from social life in public places, the Storgewall offered housewives a pleasing sense of mastery over the privatization of everyday life by putting them in charge of hi-fis and TV sets — the new objects of home entertainment.⁴⁸

Nelson in his own writing depicted the homebody culture of postwar leisure as a thrilling new adventure for socialites. In this respect, he argued that “the new prosperity and the new leisure” resulted in a world where objects took on a kind of viral dimension, or what he called a “chain reaction” that created not only the need for more things but also opportunities for social networking. Using golf as an example, Nelson observed that if a man purchased golf clubs, the clubs then set off a chain reaction of other needs including “joining a club of some sort,” which serves to “multiply social contacts,” which in turn creates a need for “new dresses for parties” and new things for entertaining like “glasses for highballs” and an “ice bucket,” which then meant buying a better refrigerator, and so forth.⁴⁹ As Nelson describes it, this world sounds a lot like those described today in actor-network theory where the social life of humans is intricately related to the social life of things. But for Nelson’s more immediate concerns as a designer, all of this meant the need for more storage and organization — the housewife’s domain. While Nelson claimed that the Storgewall would simplify women’s work, the actual labor of storage was likely harder than he imagined. In the context of the new leisure society with its home entertainments, women had to make complex decisions about what to buy, what to save, and what to toss.

Yet even if the Storgewall generated more work for mother, it also presented a design that made women feel as if they could express themselves through it — it was a communication medium for the housewife. Its modular form allowed women to rearrange it so that the standardized media of mechanical reproduction

47. *Fortune* editors, “\$30 Billion for Fun,” in *Mass Leisure*, ed. Eric Larrabee and Rolf Meyerson (1955; repr., Glencoe, Ill.: Free Press, 1958), 165.

48. For discussion of television’s relation to private and public spheres, sociological studies of women’s sense of domestic isolation, and related ads and popular discourses on the issue, see Spigel, *Make Room for TV*, chap. 4.

49. George Nelson, *Problems of Design* (New York: Whitney Publications, 1957), 122.

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became the symbols of personal choice.⁵⁰ Nelson and Wright saw the Storage wall precisely in these terms. They wrote: “What we have here is another instance of standardization functioning not as a straight-jacket but as a means for freeing the expression of family tastes. The Storage wall is just a framework. It becomes what one makes of it.”⁵¹ In this sense, the Storage wall was both a functional system of family management and a symbolic system that expressed one’s acquisition of cultural capital and the democratic freedom to choose one’s taste. From this point of view, it’s easy to see why decorative objects like souvenirs or vases shared a place on the wall. Rather than mere decor, these items (in the lingua franca of the day) were “conversation pieces” that expressed (in however mass-produced a form) a personal sense of taste. As conversation pieces, these items were not just random add-ons; they too were component parts of a communications network in the media wall.

Like other designers of the period, Nelson often talked about design in terms of communication. In his 1957 book *Problems of Design*, Nelson begins with a chapter called “Design as Communication,” which links his interest in disappearing objects to this concern. He states:

Every design is in some sense a social communication, and what matters is not so much the importance of the object . . . as the emotional intensity with which the essentials have been explored and expressed. . . . What I dislike very much is the visual evidence of the machine—I would greatly prefer having it out of sight, like a furnace. What I like and admire is that the designer did everything he could to reduce its visibility—its shape is the simplest possible and ornamental tricks are at a minimum. I get from this design a distinct sense of communication.⁵²

50. In *The System of Objects*, Jean Baudrillard argues that modular furnishing is the design par excellence of postwar France and claims that it is also the ultimate expression of a new focus on design as communication in the technical modern world. In the new postwar interior, “everything has to intercommunicate, everything has to be functional—no more secrets, no more mysteries, everything is organized, therefore everything is clear.” For Baudrillard, the organized home with its modular design is the habitat of “modern man, the cybernetician.” But unlike Nelson, Baudrillard does not think this world of modular intercommunicating things leads to progress or liberation. Rather than a democracy of choice, Baudrillard thinks that modular design and advertising slogans for it—“to your own taste” or “to your own measurements”—offer an illusion of choice (what he calls “the double-dealing of advertising”). Jean Baudrillard, *The System of Objects* (London: Verso, 2006), 28–29, 26.

51. Nelson and Wright, *Tomorrow’s House*, 141.

52. Nelson, *Problems of Design*, 6.

Replicating modernism's rejection of ornament, Nelson links the concealment of machines to good, clear, "unnoisy" communication. Nelson often used the term *honest* to praise designs that stripped themselves of symbolism in favor of clear, transparent expression. Paradoxically, in this respect, while Nelson thought invisible designs would avoid "ornamental tricks," media walls used a battery of perceptual pranks (from houndstooth to Naugahyde) to make technology disappear.

Beyond the case of the Storage wall, Nelson's focus on design as communication speaks to a growing relationship between architecture and media in the second half of the twentieth century.⁵³ This is made more convincing when we recognize that Nelson was himself intimately involved not only in home design but also in the design of media, including the midcentury development of the computer. In 1952 he created "Sample Lesson," a multimedia educational "visual lesson" he prepared with the Eameses (who went on to become IBM's celebrated design team). Presented at the University of California, Los Angeles, and the University of Georgia, "Sample Lesson" (subtitled "Subject: Communication") was projected on three screens and composed of a huge amount of slide and film materials, with images from photographs (many taken by Nelson), paintings, films, animation, and graphic designs assembled in montage sequences and interspersed with text (as well as music on the soundtrack and even incense filtered into the lecture hall). Sequences include images and discussions of computer "decision making," "transmitter-message-receiver" relations, and signal "noise."⁵⁴ In 1956 Nelson worked for IBM, coordinating an exhibition on computer design, and he also worked on a real-time management system called SABER, which was based

53. For more on the relation among design, architecture, media, and communication in the post-war period, see Colomina, *Domesticity at War*, especially chap. 7; Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, Mass.: MIT Press, 2003); Felicity Scott, *Architecture and Techno-Utopia: Politics after Modernism* (Cambridge, Mass.: MIT Press, 2007); Mark Wigley, "Network Fever," *Grey Room*, no. 4 (2001): 82–122; Pat Kirkham, *Charles and Ray Eames: Designers of the Twentieth Century* (Cambridge, Mass.: MIT Press, 1998), especially chap. 7; John Harwood, "The Wounded Man: George Nelson and the 'End of Architecture,'" *Grey Room*, no. 31 (2008): 90–115; Harwood, "The White Room: Eliot Noyes and the Logic of the Information Interior," *Grey Room*, no. 12 (2003): 5–31; Harwood, *The Interface: IBM and the Transformation of Corporate Design, 1945–1976* (Minneapolis: University of Minnesota Press, 2011); and Jochen Eisenbrand, "Visual Education and the Lessons in Networked Thinking," in Eisenbrand, *George Nelson*, 170–83.

54. Illustrating the communication model devised in 1949 by Claude Shannon and Warren Weaver, an offscreen narrator describes how messages can be received differently, depending on the educational and cultural background of the listener. See Nelson, *Problems of Design*, 22, 25–26. See also Eisenbrand, "Visual Education," 172; and Abercrombie, *George Nelson*, 141–49. For the communication model, see Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949).

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on software and hardware being developed for the US Air Force's SAGE air defense system.⁵⁵ In 1959 Nelson coproduced the *American National Exhibition* in Moscow for the United States Information Agency (USIA), working alongside Fuller (who created the dome pavilion) and the Eameses (who produced the multiscreen exhibition *Glimpses of the USA*). In addition to Nelson's "umbrella" pavilions, Nelson's office also produced an IBM computer installation and suspension system that allowed screens (projecting information about US life) to be hung inside Fuller's dome.⁵⁶ More generally, throughout his career, Nelson designed media machines from typewriters to phonographs to slide projectors to record players to computer designs, such as the Programma 101 computer stand for Olivetti-Underwood in 1967 and the Lexis console for Mead Data Central in 1978.

While Nelson's personal forays in the world of computer design predate the PC explosion, it is perhaps no coincidence that his 1945 Storgewall appeared in the same period as major advances in computer engineering. The first electronic, binary, partially programmable computer, Colossus, was created in 1944; the Von Neumann Architecture with stored programs was introduced in 1945; and the patent for the IBM Automatic Sequence Controlled Calculator (known as the Harvard Mark I) was registered in 1945. The significance of this historical conjuncture is not found in the emergence of the hardware alone. More important, the Storgewall and the computer share an epistemology of memory, organization, and rapid retrieval. Nelson made this point clear with his elaboration of the concept of "active storage," which defined things in relation to social use. In this configuration, the housewife had to assign use values to everyday things in order to figure out which objects to store. In return for her efforts, she would no longer spend hours searching for things because the Storgewall—with its superior patterns of organization—promised instant retrieval. Like push-button appliances and remote controls, which also proliferated in the postwar period, the Storgewall was a means of redefining the resident's relation to domestic time and space. But unlike the technological gizmos that added to domestic clutter ("the fancy electronic gadgetry" of the "crystal gazers"), Nelson's wall was a programmatic, built-in, mainframe, *invisible* solution.

In its function as a time-saving device, the Storgewall is a form of domestic architecture consistent with the new media architecture of postwar information

55. Harwood, "Wounded Man," 97–98. See also Eisenbrand, "Visual Education."

56. The screens were part of an information center that allowed visitors to retrieve data like the number of babies born every year in the United States. Abercrombie, *George Nelson*, 165–66.

society. The Storgewall and its media wall offspring were the domestic manifestations of the new communication techniques that eradicate space through “speed” (exemplified, as Paul Virilio first suggested, by intelligent defense systems, satellites, and guided missiles—that is, instruments of modern warfare).⁵⁷ Applied to the more repetitive tasks of the housewife’s day, the Storgewall makes the logic of information society into a household experience. Everything is there on demand—one for domestic convenience, the other for economic and national security. But the relation between the two is what matters because the epistemology of organization, storage, and rapid retrieval made the logic of information *familiar*, part of one’s everyday relation to media and technology at home.

Reassembling the Social Life of Home: Leisure, Labor, and Gender

As a media apparatus, the Storgewall (and the media walls that followed in its wake) expressed new links between the domestic interior and the world outside the home facilitated by technologies of communication. But these designs also responded to and perhaps helped instigate larger transitions in the kinds of material and immaterial labor taking place at home. In the modern home (over the course of the twentieth century, but especially after World War II) office work and housework were increasingly intertwined with the influx of office furniture (from desks to storage solutions) and machines (from telephones to typewriters to PCs). Domestic spaces increasingly included home offices, which in the 1950s and 1960s were often part of multipurpose spaces in guest rooms, kitchen/dining areas, or even bedrooms (fig. 13).

In this respect, Nelson’s designs for home management also resonated with the everyday world of corporate America and office management.⁵⁸ Throughout his career, Nelson was a prolific designer of office furniture, and, as with his home designs, he imagined modularity as a progressive, humane, even utopian form that would enhance everyday life. Intended to make labor more sociable and productive, his “Action Office” predates Weiser’s concerns with conviviality in the office through ubiquitous design. As Nelson declared, the Action Office “[is] not just desks and file cabinets. This is a way of life.”⁵⁹ Meanwhile, the things he

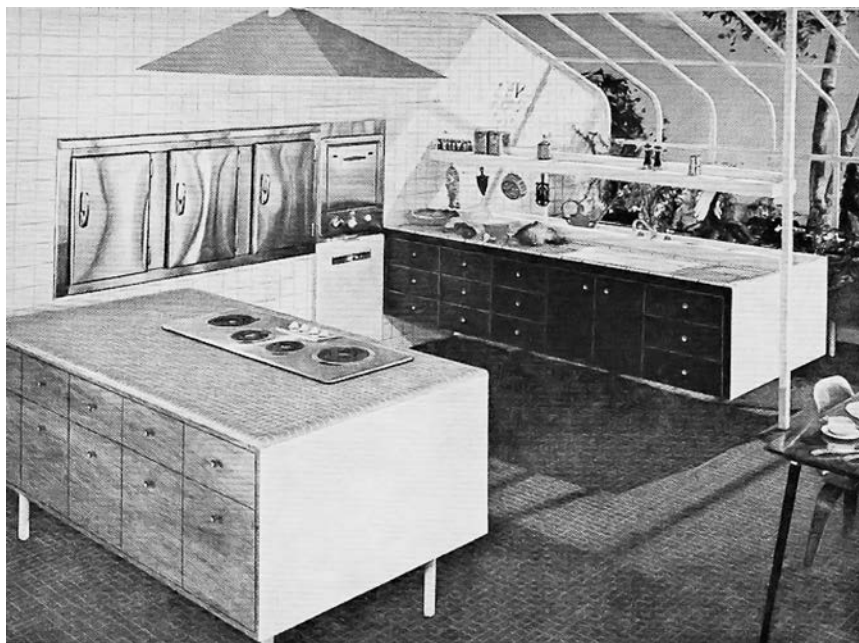
57. Paul Virilio, *Speed and Politics: An Essay on Dromology*, trans. Mark Polizzotti (New York: Semiotext(e), 1977).

58. Martin in *The Organizational Complex* (105–21) observes similar links between midcentury designs for home and office. Although he does not mention Nelson, Nelson’s designs are important to consider in this context.

59. Nelson discussed and presented photographs of this desk in “Styling, Organization, Design,” *Arts and Architecture*, September 1947, 24–27. See also Abercrombie, *George Nelson*, 213.



Figure 13 A “his and hers” home office/vanity in a bedroom. The woman’s desk doubles as a vanity. © *The Complete Book of Home Decorating*, Fawcett, 1972



Kitchen design by George Nelson, A. I. A.

**"CLAY TILE... PRACTICAL... CONVENIENT... BEAUTIFUL!
A STIMULUS TO DYNAMIC NEW DESIGN"**

George Nelson

Figure 14 The Nelson kitchen has cupboard units that resemble office storage and reduce the visibility of kitchen appliances and plumbing. Advertisement, ca. 1952

made for homes (such as his 1946 desk, storage unit, and filing cabinet system or his modular kitchen designs) could easily fit in the office (fig. 14).⁶⁰ His furniture company, Herman Miller, promoted this ambiguity between home and office as well. The 1952 Herman Miller catalog, for which Nelson wrote the preface, stated: "While the contemporary residential interior has been demonstrating a steady evolution towards a more 'workmanlike' kind of space—easier to furnish and take care of—the executive office has been going through an equally inter-

60. Nelson ventured into kitchen design in 1943. Some of the designs looked like his high-end storage cabinets and, in the tradition of disappearance, minimized the visual look of machines. In the 1950s, he created an unsuccessful "mechanized storage unit" (MSU) kitchen for General Electric. See Abercrombie, *George Nelson*, 72–73.

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esting development towards the warmth and informality of the well-appointed home living room.”⁶¹

Given the continuities between designs for home and work, it seems useful to consider the implications of these two forms of labor and their growing relations in the postwar context. *Tomorrow's House* already suggests that their relations were in flux. For example, Nelson and Wright did not have a chapter called “Kitchens” (a decision radically antithetical to the then reigning concept of the “kitchen of tomorrow” where women worked in a paradise of Technicolor push-button things). Rather, the chapter that discusses kitchens is called “The Work Center.” While the authors define this room as a woman’s space and discuss the usual assortment of appliances, the term *work center* is ambiguous enough to include all sorts of labor. Meanwhile, the work center would also open itself up (according to the logic of the open plan) to the social activities in other parts of the home, including family leisure (Nelson and Wright also call it a “work center–social center”).⁶² While the book’s only mention of a home office per se defines it as a father’s space,⁶³ the Storagewall included the housewife sitting at her foldout desk. Decorating manuals displayed configurations that suggested women’s ambiguous status as homemaker/secretary in bedroom, kitchen, or living room units that contained an incongruous mix of sewing machines, blenders, encyclopedias, letter and bill storage, TV sets, mixing bowls, desk supplies, and typewriters, and in bedrooms built-in desks sometimes doubled as vanities.⁶⁴ By the late 1960s, several iterations offered “his and hers” desk/media units in kitty-corner (as in fig. 13) or side-by-side arrangements (fig. 15).⁶⁵

Histories of domesticity tend to focus on the housewife’s cooking, cleaning, and child-rearing chores, but historians have paid less attention to the way office work was already part of domestic labor even before the advent of PCs. Erica Carter’s research on “civic housekeeping” in postwar Germany offers a useful window into this history of women’s managerial labor. According to Carter, as the postwar nation moved from a thrift economy to a surplus economy, women were increasingly expected to manage the proliferation of goods and related consumer

61. *The Herman Miller Collection* (Zeeland, Mich.: Herman Miller Furniture, 1952), 70.

62. Nelson and Wright, *Tomorrow's House*, 72.

63. Nelson and Wright, *Tomorrow's House*, 13.

64. See, e.g., Betty Pepis, *Interior Decorating A–Z* (Garden City, N.Y.: Doubleday, 1965), 101; *Encyclopedia of Good Decorating and Home Improvement*, 10:1872; *Better Homes and Gardens Decorating Ideas* (Des Moines, Iowa: Meredith, 1960), 149; and *Better Homes and Garden Decorating Book*, 306.

65. See, e.g., Frank Bowers, ed., *The Complete Book of Home Decorating* (New York: Grosset and Dunlap, 1972), 143; *Encyclopedia of Good Decorating and Home Entertainment*, 6:1102.



Figure 15 Woman as filer of family data at her “his and hers” storage wall in a den. Originally published in *The Practical Encyclopedia of Good Decorating and Home Improvement*, vol. 6, 1970

lifestyles. As she argues, “By the middle of the [1950s], market research into family consumption was highlighting the key managerial functions of housewives in the family economy; in financial planning, accounting, decision making, and long-term investment.”⁶⁶ While Carter focuses on the housewife’s new role of “citizen consumer” in relation to shopping and advertising, her work also suggests that women were expected to be family secretaries by keeping track of bills, filing receipts, and compiling family data. In the United States, these jobs similarly became part of women’s domestic career. Just as sociologist William H. Whyte’s *The Organization Man* described the conformist world of middle management and mundane masculinity in the office, the “organization woman” served as a kind of middle manager for family life and found her greatest expression in Nelson’s wall.⁶⁷

66. Carter, *How German Is She*, 56.

67. William H. Whyte, *The Organization Man* (1956; repr., Garden City, N.Y.: Doubleday, 1957).

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In this regard, however, the Storgewall was also an edifice for a complex history of domestic labor that involved not only the housewife (always rendered as white and at least modestly affluent) but also the domestic servant—the working-class woman, immigrant, or woman of color. The wall, as Nelson constantly suggested (both in *Tomorrow's House* and elsewhere), was predicated on the absence of servants in the middle-class home. In *Tomorrow's House*, for example, the spat between husband and wife includes a maid named Bessie who is repulsed by the mess that the father, kids, and mother (with her bad decorating sense) have made of the home. Bessie speaks in plantation dialect (calling the children “Master John” and “Miss Peggy”), thereby suggesting that she is likely assumed to be African American. But oddly—and I think symptomatically—when Bessie enters Nelson and Wright’s scenario, she appears as an apparition. She is a figure in the housewife’s nightmare. The text states:

Overwhelmed by [the objects needed in the house] and the requirements and the desires of the rest of her family, [the housewife] drifted presently into a dream of Bessie, the maid they had the longest time and family member they were most anxious to keep. “I quit!” Bessie was saying over and over again in the dream. “I can’t clean that living room! . . . I can hardly move around, because you’ve got three floor lamps now.” “I quit!” screamed Bessie, vanishing into a black void.⁶⁸

At the risk of overinterpretation, it does seem important that Nelson and Wright end this curious dream with the term *black void*. For whether or not they (unconsciously) intend this in a racial way, they consistently use the word *disappearing* when they talk about servants. For example, when discussing the work center, they claim, “Servants as a group are disappearing.”⁶⁹ When discussing the “design for tomorrow’s living,” they state, “Within our lifetime we have watched servants disappear and mechanical aids come in.”⁷⁰ And in a chapter titled “How to Plan a Living Room,” they describe home owners in a New York suburb who “originally . . . believed three servants would be needed to keep the house in

68. Nelson and Wright, *Tomorrow's House*, 12–13.

69. Nelson and Wright, *Tomorrow's House*, 72. In a 1946 study of domestic servants, the National Bureau of Economic Research stated: “When the number of servants is compared with the number of potential employers (i.e., private families) or with the total population, the popular lament over the disappearing servant becomes apparent. The ratio of servants to private families fell 36 percent [between 1900 and 1940].” George J. Stigler, ed., *Domestic Servants in the United States, 1900–1940* (Washington, D.C.: National Bureau of Economic Research, 1946). See UMI version on www.nber.org/books/stig46-1 (accessed June 15, 2012).

70. Nelson and Wright, *Tomorrow's House*, 208.

order. Then the war came [and] servants disappeared.” But the installation of “forty-five feet of storage cabinets” in the living room solved the “housewife’s problems.”⁷¹ In this sense, the Storgewall was the material manifestation of the changing social relations of domestic labor and the power dynamics between home owner and servant.

As is clear from Nelson and Wright’s scenario, despite the fact that Bessie is objectified (the family wants to “keep” her), she has newfound power in the postwar home. For as Nelson and Wright also point out, ever since World War I, working-class and “newly arrived” immigrant “girls” had increasingly found work in offices and factories.⁷² In another scenario, the authors speak of a Swedish girl, “Greta the maid,” who “found that she could make more money and live more pleasantly if she got a job in a store or office.”⁷³ In this sense, the middle-class family needs a Storgewall in order to retain their most precious object—the maid. By hiding the objects in her way (the three lamps and various other disorderly messes), the wall will make her labor conditions more tolerable and thereby serve as a bargaining chip in the fierce competition over “cleaning girls.” But for Nelson and Wright, who were promoting the Storgewall largely to middle-class home owners, the wall is not really designed for the maid; rather, the Storgewall is designed to make the middle-class woman feel like she is not one. In other words, rather than a cleaning girl, the “organization woman” is a purveyor of good taste who operates a complex network of things. It’s not so much that she turns on TV sets or works at a desk. It’s her function as the manager of a technical system that differentiates her from the scullery maid—the women of lower social rank who used to clean her house.

In the changing contexts of domestic work and leisure, the Storgewall served as a means of reassembling the social life of the home.⁷⁴ The Storgewall organized people in space, articulating clear distinctions and power relations. In addition to its redistribution of the relation between servants and residents, it also served as a major form of arranging family members themselves, especially with respect to the gendered dynamics of leisure and labor.

In this respect, the Storgewall was the companion piece to Nelson and

71. Nelson and Wright, *Tomorrow’s House*, 19.

72. Nelson and Wright, *Tomorrow’s House*, 39.

73. Nelson and Wright, *Tomorrow’s House*, 40.

74. I am borrowing from Bruno Latour, particularly with regard to ideas about how social worlds are in part assembled through the practices objects afford. See Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network Theory* (Oxford: Oxford University Press, 2005), especially 63–86.

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Wright's other influential invention in *Tomorrow's House*: the family room. Poised to satisfy the trend for what women's magazines called "casual living," and especially the disappearance of formal living rooms, the family room was a multipurpose space designed to accommodate a variety of activities associated with different gender and generational roles.⁷⁵ Divided up into activity zones (e.g., children's play spaces, father's study, or mother's sewing nook), the family room encouraged family unity through the seemingly contradictory idea of division. In home magazines and decorating books, the family room quickly became the space par excellence for the new medium of television.⁷⁶ While promoting family togetherness around the TV set, the family room also allowed for spatial divisions and distinct viewing protocols according to the gender- and age-related power dynamics of family members in the home. The Storgewall worked in a similar fashion. As Nelson claimed, "the Storgewall was basically a two-sided affair" that organized storage in two rooms at once.⁷⁷ But as a room divider, the Storgewall also organized social relations.

A perfect example of this logic appears in *Life's* 1945 article that introduced Nelson's wall to the public. *Life* presented the wall as a blueprint for family/object relations (fig. 16).⁷⁸ An architectural rendering shows a mother and daughter on separate sides of a Storgewall that divides the kitchen (where mother handles dishes) from the dining area (where daughter, apparently mimicking her mother's role, handles tableware stored in the wall). Mother and daughter are also featured organizing things in the Storgewall located in the entranceway hall. The master bedroom has a kitty-corner Storgewall that allows mother to work at a fold-out desk while father stands before his built-in closet, which also houses a radio receiver. The Storgewall in the boy's bedroom contains a space for clothes and books (presumably for his education). In other words, the Storgewall serves as a nuclear family apparatus. It solicits a range of performances from occupants according to age and gender, and it balances the seemingly contradictory ideals of personal privacy and family togetherness in a harmonious script for everyday life.

To test the wall, *Life* chose the Zecher family from Saddle River, New Jersey. The Zechers were clutter bugs whose small home could not keep pace with their consumer habits. Claiming "the storage wall did wonders for the Zecher family,"

75. More generally, Nelson and Wright conceptualized the house as a performance space for daily activities rather than as a preconceived set of rooms. They often spoke of multipurpose rooms like the living-dining room.

76. For more on TV in the family room, see Spigel, *Make Room for TV*, 39–40.

77. Nelson, *Storage*, 141.

78. "Storage Wall," *Life*, 66.

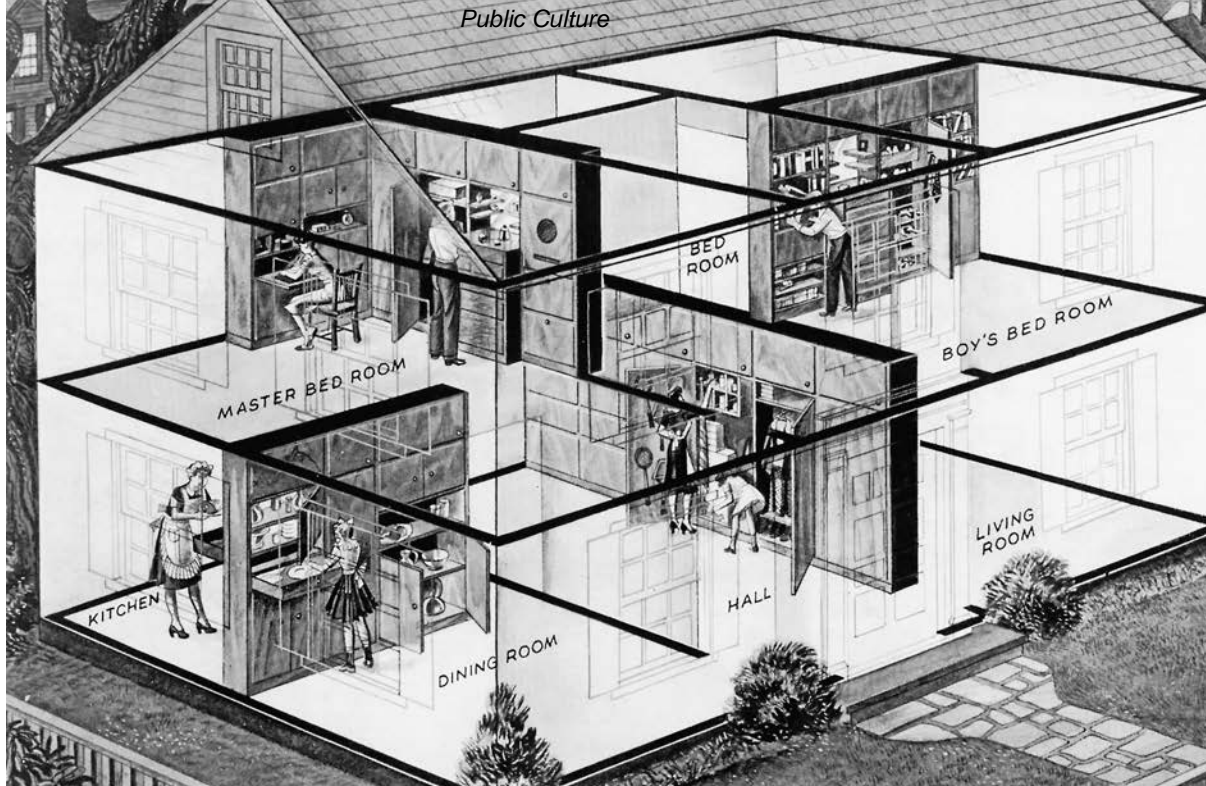


Figure 16 Storage wall as nuclear family apparatus. James Lewicki, illustrator. Originally published in *Life*, January 22, 1945.

Life offered a before and after story of their cleaned-up lives and listed objects of clutter that had benefited from the Storage Wall makeover.⁷⁹ The final “reveal” photograph shows the now blissful Zechers sharing the living space that allows them to play and work more efficiently (fig. 17). In other words, like the family room, the Storage Wall maintains family togetherness by demarcating space according to gender and generation. The older son stands at the Storage Wall tuning in the radio; Father types at the Storage Wall’s foldout desk; and younger children play games on the floor. Curiously, however, mother is not in this picture. In fact, in the logic of *Life*’s makeover story, the woman of the house herself becomes a disappearing object—exiled somewhere beyond the wall.

Disappearing Women: The Poetics of Media Spaces

While an idiosyncratic example, the *Life* photograph is nevertheless symptomatic of a more general issue concerning women and femininity in the media home.

79. “Storage Wall,” *Life*, 70.

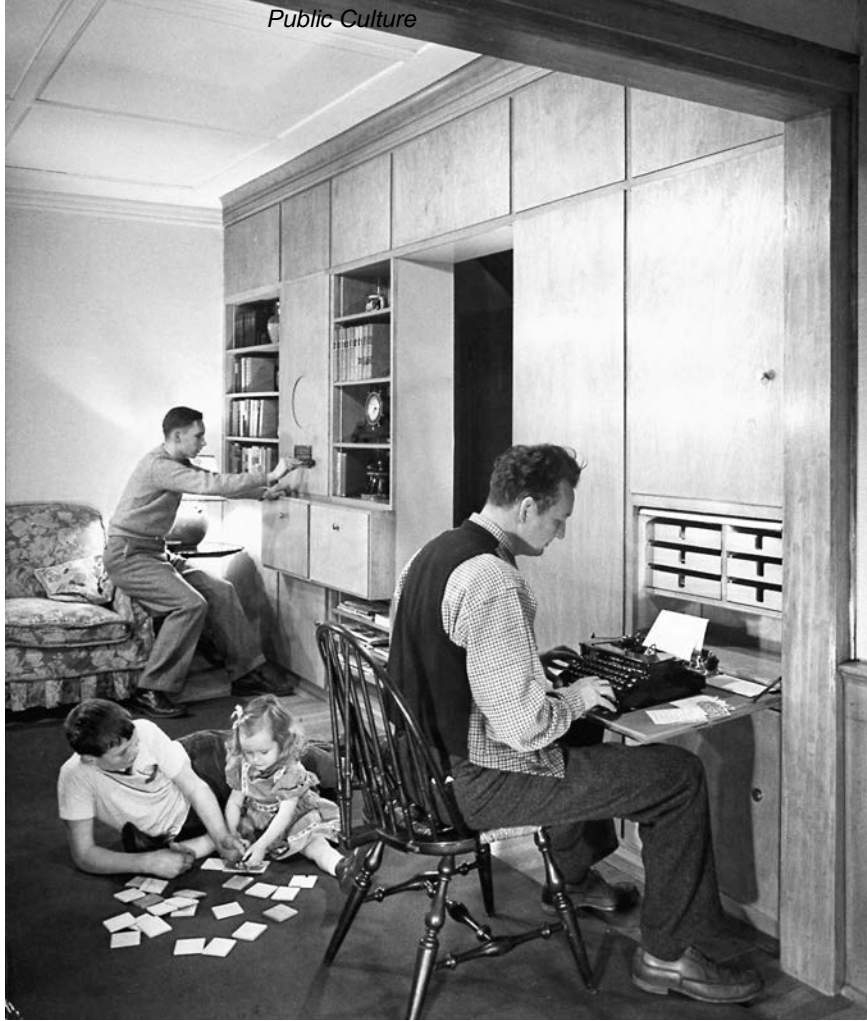


Figure 17 The Zechers Storagewall makeover. Where did mom go? Herbert Gher, *Life*, January 22, 1945. Reprinted with permission of Getty Images

At the most literal level, this visual rhetoric of the disappearing housewife has to do with larger cultural beliefs about women's relation to work and leisure. In the postwar period, when TV was first installed in American homes, there was a virtual taboo around showing women alone in a room watching TV, a taboo connected to widespread beliefs (especially among advertisers) that women could not work and watch TV at the same time. In fact, even in ads that showed families circled around the TV set, women were often productively engaged in housework or childcare while watching TV.⁸⁰ The Storagewall had its own relation to wom-

80. For more on these dynamics of women's work and TV, see Spigel, *Make Room for TV*, chap. 3.

en's work, both optimizing her efficient retrieval of household things and serving to make her work invisible. In other words, the most successful housewife makes it look as if housekeeping is easy, as if housework is not work at all. In this regard, the Storgewall doesn't only hide objects; it also hides the gendered relations of work and leisure at home.⁸¹

At another more speculative level, the disappearing woman in the *Life* photograph is a symptom of something profoundly metaphorical about the imagination of the home in media culture. For as the Storgewall suggests, in the post-war media home, domestic space is increasingly conceptualized as a space of bureaucratic storage rather than as a space of family memory. Given that Nelson predicated the Storgewall on the "gradual disappearance of both attics and basements," it's not surprising that he thought about how to get rid of objects that usually occupied these spaces.⁸² *Tomorrow's House* includes a sketch of an attic with exiled items including a baby's rocking horse and high chair, a piano, a rocking chair, a tire swing (presumably once used by children), and a china closet—items that evoke sentimental attachments to family heritage. These are strewn among useful items that have apparently lost their utilitarian value: a ladder with a flowerless flowerpot thrown on top, an empty barrel, and an old washtub.⁸³ The disorganization represented in this pile of incongruous things suggests that all of it is clutter, equally useless stuff. Later, the authors tell housewives, "If you cannot bear to throw out any . . . rarely looked at mementos, you would still be better off if they were stored behind a wall and out of sight."⁸⁴ In this scenario, family keepsakes are subject to the same invisibility regime as the media; however, the authors make it clear that rarely looked at keepsakes should ideally be tossed, and, unlike the media, they are never considered "active storage." Memory has a low priority.

In his book *The Poetics of Space*, Gaston Bachelard considers the spatial poetics of the home in relation to the unconscious processes of memory and dwelling. He writes, "If I were asked to name the chief benefit of the house, I should say: the house shelters daydreaming, the house protects the dreamer, the house allows

81. At a talk I gave at the Bard Graduate Center, in New York, on February 29, 2012, Amy Ogata suggested that the disappearing woman might also suggest a form of female pleasure in which the wall, and its many amusements, offer the housewife privacy from her family.

82. Nelson and Wright, *Tomorrow's House*, 135.

83. Nelson and Wright, *Tomorrow's House*, 137.

84. Nelson and Wright said that a family keepsake could be displayed, but if so they thought the object should be exhibited more as an object of beauty or curiosity than as an object of memory. More typically, keepsakes are recategorized as junk. Nelson and Wright, *Tomorrow's House*, 140.

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one to dream in peace.” He continues: “The house is one of the greatest powers of integration for the thoughts, memories and dreams of mankind. . . . It is the human being’s first world. . . . Life begins well, it begins enclosed, protected, all warm in the bosom of the house.”⁸⁵ As the bosom metaphor suggests, as a memory space the house is also the space of the mother. Bachelard is interested in what he calls the “maternal features of the house,” and its status as a womblike enclosure. “When we dream of the house we were born in . . . we participate in this original warmth, in this well-tempered matter of the material paradise.”⁸⁶ Then writing more specifically about cellars and attics, he says, “If the house . . . has a cellar and garret, nooks and corridors, our memories have refuges that are all the more clearly delineated.”⁸⁷ And considering cabinets, drawers, chests, and other instruments of storage, he sees these as places for secrets, daydreams, and intimacy.⁸⁸

While my point here is not to render the home essentially female, I’m interested in the way Bachelard’s understanding of the home as a “maternal” space is precisely an imagination of a home with no media. Indeed, for Bachelard, who often refers to images of home in nineteenth-century poetry and literature, the home doesn’t communicate with the outside world.⁸⁹ He imagines walls as enclosures for reverie—not as organization units that store golf clubs, coats, or media (i.e., things that gesture toward the world outside the home). Nor do his walls resemble the other major wall motif of postwar culture—the window wall—with its mission to blur the boundaries between inside and outside space and its oft-discussed relation to the new medium of television, which was promoted as a “window on the world.”⁹⁰ Instead of imagining sweeping views, Bachelard cites Edgar Allan Poe (the “great dreamer of curtains”) and Charles Baudelaire, whose “heavy draperies” help “protect the . . . house from cold.”⁹¹ In Bachelard’s domestic paradise, everything is enclosed; the only escape hatch is the virtual space projected in the mind’s imagination.⁹²

The Storagewall, in this respect, is the opposite of Bachelard’s poetic spaces. It turns the sentimental things of everyday life into frivolous clutter, into forms of

85. Gaston Bachelard, *The Poetics of Space*, trans. Maria Jolas (1958; repr., Boston: Beacon, 1994), 6–7.

86. Bachelard, *Poetics of Space*, 7.

87. Bachelard, *Poetics of Space*, 8.

88. Bachelard, *Poetics of Space*, chap. 3.

89. Bachelard is also concerned with notions of home in disciplines such as philosophy, psychology, and ornithology.

90. Spiegel, *Make Room for TV*, 100–109.

91. Bachelard, *Poetics of Space*, 39.

92. Bachelard, *Poetics of Space*, 39.

nonactive, “dead storage.” Meanwhile, active storage (cleaning supplies, clothes, media machines, etc.) is organized according to an information logic where things can be filed and retrieved on demand. The Storagewall inscribes this shift from memory to storage, from Victorian sentiment to rational modernism, from the home as a place for the protection of daydreams to the home as a place for media projectors and recording machines.

All of this seems ripe for a cyberfuture of memory implants where humans dwell in networks, in places no longer resembling anything like home. But it seems to me that the shift from sentimental memory to rational storage and organized data is never really complete. Instead, I would argue, the concept of home as a memory space coexists with a concept of home as a storage space. Memories, affect, and sentiment—all the unconscious processes that Bachelard attributes to the home—are still meaningful. The phrase “If these walls could speak” is still meaningful precisely because people still think of homes as haunted places—as spaces where secrets hide, no matter what logics of efficiency, storage, data, and rationality are applied.

It’s useful to note in this regard that Bachelard published *The Poetics of Space* in 1958, at the heyday of the midcentury modern design movement (which was well known in France). In other words, the modernist/efficiency view of home as a media space and the poetic view of home as a space of memory and daydreaming coexist historically, and each stakes its claim in the postwar world. These competing visions of home exist in dialectical tension and at the same time and, I would venture to guess, in many geographical locations.

As Bruno Latour argues, “We have never been modern,” or at least fully modern.⁹³ In a similar sense, I would argue, “We have never lived in a modern home.” Instead of the clean orderly worlds envisioned by the moderns, Latour draws attention to the monstrous hybrids of nature and culture, modern and unmodern, progress and entropy. So, too, despite Nelson’s dream of empty spaces, the Storagewall never really cleaned up the mess of modern life. So rather than mop up this mess, or offer a neat conclusion, I’ll end with a few object lessons by returning to Nelson and Weiser and their parallel dreams of invisible design.

Object Lessons

Both Nelson and Weiser hoped to improve the environment through architecture/furniture and ubiquitous computing, respectively. Each man saw objects—whether

93. Bruno Latour, *We Have Never Been Modern* (Cambridge, Mass.: Harvard University Press, 1993).

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clutter in the home or technology in the office—as obstacles to social relations, and each imagined a more humane world through the design of things that would make other things disappear. Despite their work for major corporations, they were both deeply critical of the problems caused by the proliferation of material things, and they envisioned their invisible designs as a solution.

Nelson left long treatises on this point. As Nelson's biographer Stanley Abercrombie notes, Nelson was a very strange designer who seemed at every turn to debunk his practice. He was a furniture designer who called for the elimination of furniture, and he often spoke out against planned obsolescence and consumer culture. By the end of his career, Nelson even called for the disappearance of architecture altogether.⁹⁴ He especially expressed this negative critique of both design and consumerism through his fascination with junk. In 1961, in a lecture on planned obsolescence at MoMA, Nelson presented his film *Elegy in a Junk Yard* (introduced on stage by a robot, a telling, if ironic, gesture about his disposition toward technology-human relations).⁹⁵ Three years later, at the 1964–65 New York World's Fair, Nelson created an exhibit for Chrysler Motors composed out of car parts; the guidebook called it a “zoo of metal monsters.”⁹⁶ In 1962 Nelson even made a television show for CBS called “How to Kill People” that discussed how designers made beautiful automated weapons that ravaged the world.⁹⁷

Returning to Weiser, on his original website Weiser listed his top research interest as “garbage collector,” a term used at the time by computer scientists concerned with storage management systems and theories of automatic memory reclamation, but it perhaps also signals the same ironic engagement with junk that Nelson professed (and, as this also suggests, like Nelson, Weiser was fundamentally concerned with storage and retrieval, albeit of a digital kind).⁹⁸ Moreover, at various turns, Weiser (like Nelson) worried about the dark consequences of his ubicomp future. He ends “The Computer for the 21st Century” by considering difficulties that ubicomp might engender, including “information overload” and

94. Abercrombie, *George Nelson*, 238.

95. Abercrombie, *George Nelson*, 188 and unpaginated photograph between pages 202 and 203; Harwood, “Wounded Man,” 96.

96. Editors of Time-Life Books, *Official Guide: New York World's Fair* (New York: Time, 1964), 200. See also Abercrombie, *George Nelson*, unpaginated photograph between pages 202 and 203.

97. The program was an episode of the CBS public affairs show *Camera Three*. Harwood, “Wounded Man,” 98–101; Eisenbrand, “Visual Education,” 174–75.

98. www.ubiq.com/weiser/ (created 1988; accessed January 20, 2011). As Weiser points out, “garbage” was essentially “inaccessible storage” that would eventually be reclaimed by users. See Hans-Juergen Boehm and Mark Weiser, “Garbage Collection in an Uncooperative Environment,” *Software Practice and Experience* 18, no. 9 (1988): 807–20.

problems of privacy and surveillance. “Hundreds of computers in every room, all capable of sensing people near them and linked by high-speed networks, have the potential to make totalitarianism up to now seem like sheerest anarchy. . . . A single rogue tab in a room could potentially record everything that happened there.”⁹⁹ While Weiser quickly assuaged these fears by showing how his vision could overcome these difficulties, the problems nevertheless remained key features of the discourse on ubiquitous computing in years to come.

Despite Nelson’s and Weiser’s mutual desire to make objects disappear, the futures they envisioned did not exactly pan out. Rendering artifacts invisible has a problematic underside that creates occult trajectories for technology that hide not only ugly forms but also the entire social and political apparatus that supports the technology. Both men seemed to recognize this problem but also somehow hoped to escape it. In their recent book on ubiquitous computing, Paul Dourish and Genevieve Bell suggest that we focus on the “mess” of the infrastructures for the technologies that developed out of Weiser’s vision for invisible computers—the jumbled wires, spotty connections, uneven social relations, and general noise of our less than ideal digital world.¹⁰⁰ In this regard, we should also consider the power dynamics of class, race, and geographical location in the infrastructures that support the digital world—the local repair person fixing the broken cable or the low-paid workers at call centers around the world. As Sara Ilstedt Hjelm (following Augustin Araya) argues, ubicomp and invisible design can “obscure ‘otherness’ in parts of the surrounding world in such a way that we are not even aware of it.”¹⁰¹

So, too, we should consider the gendered nature of work entailed in the “smart” way of life. Contemporary magazines like *Broadband House* or *Digital Home* are filled with working mothers who are shown trying to juggle home and digital labor, while men are more typically shown at play or else able to focus on their work in a secluded home office, far away from the kids. Sociological and ethnographic studies show that women are finding it hard to combine childcare and housework with digital labor and even feel guilty for the time they spend online.¹⁰² So unlike Weiser’s working mother Sal, who could move easily between

99. Weiser, “The Computer for the 21st Century,” 89.

100. Paul Dourish and Genevieve Bell, *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing* (Cambridge, Mass.: MIT Press, 2011).

101. Sara Ilstedt Hjelm, “Visualizing the Vague: Invisible Computers in Contemporary Design,” *Design Issues* 21, no. 2 (2005): 77.

102. For discussion of the magazine images, see Lynn Spigel, “Smart Homes: Practiced and Imagined,” in *Relocating Television: Television in the Digital Context*, ed. Jostein Gripsrud (London: Routledge, 2010), chap. 18. For ethnographic/sociological studies, see Elaine Lally, *At Home*

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home and office, for many people digital work is not necessarily as mobile or laborsaving as it first appears. Despite the dreams of disappearing objects, the legacy of Nelson's and Weiser's invisible designs is, paradoxically, a world with more and more things. Today's residential smart homes, at least those marketed in venues aimed at affluent consumers, are predicated on objects and (often invisible) women's work or service-sector (information technology [IT]) labor, even as they promise residents freedom through design. My point is not that technologies or objects are in themselves evil. Rather than take a Luddite view of the digital future, I think that the genealogy of media homes — and the case of the Storage-wall outlined here — should point us in other directions. For now, I will name just three.

First, as many design historians have argued, we should look to the way design practices (and design utopias) both promote and replicate social practices and reigning belief systems. Second, we should consider how design relates to larger policies of housing. In the United States and in many other areas across the globe, housing policies (or lack thereof) make it hard for people to access homes, no less the smart wireless homes dependent on high-speed broadband (which is itself unevenly distributed around the world).¹⁰³ Third, and most pertinent to my project here, media archeology should include a genealogy not just of media objects or even actor networks but also a broader archeology of the devices that make media disappear.

In his book *Stuff*, Daniel Miller argues that rather than focus on the symbolic meanings of objects, material culture studies should instead attend to the way objects form backdrops for the performance of social relations. Drawing on sociologist Erving Goffman and art historian E. H. Gombrich, Miller argues for a “frame” analysis that explores how objects recede from view to become social settings that create an “exterior environment that habituates and prompts us” to act in certain ways. Referring to his ethnographic case study of pots in an Indian village and their iconic use at a wedding, he notes that his informants told him that his desire to understand the meaning of the pots made him miss their

with *Computers* (Oxford, U.K.: Berg, 2002); Dourish and Bell, *Divining a Digital Future*; Catherine Burke, “Women, Guilt, and Home Computers,” in *The Wired Homestead: An MIT Sourcebook on the Internet and the Family*, ed. Joseph Turow and Andrea L. Kavanaugh (Cambridge, Mass.: MIT Press, 2003), 325–36; David M. Frohlich, Susan Dray, and Amy Silverman, “Breaking Up Is Hard to Do: Family Perspectives on the Future of the Home PC,” in Turow and Kavanaugh, *Wired Homestead*, 291–324; and Morley, *Media, Modernity, and Technology*.

103. For comparative statistics on global broadband distribution, see Internet World Stats, www.internetworldstats.com (accessed February 2012).

larger social import. “As the villagers were telling me, the pots are not the point, they are the frame. Material objects are a setting. They make us aware of what is appropriate and inappropriate. . . . But they work most effectively when we don’t actually look at them, we just accept them.” “The surprising conclusion,” he argues, “is that objects are important, not because they are evident and physically constrain or enable, but quite the opposite. It is often precisely because we do not *see* them. The less we are aware of them, the more powerfully they can determine our expectations, by setting the scene and ensuring proper behaviour.”¹⁰⁴ While I agree with Miller’s assessment of the way objects form “frames” for social behavior, Miller’s anthropological/sociological conceptions of social performance leave out the important historical question of exactly how those frames are constructed in the first place. In other words, how do objects move from visibility to invisibility? How do they recede from view to become frames for social life? How do they, to use Weiser’s words, “weave themselves into the fabric of everyday life until they are indistinguishable from it”?

The history of the Storgewall provides a clue to how things disappear and how social environments are formed in the process. The Storgewall was a concrete design practice through which invisibility was rendered. It demonstrates the literal material assemblage not just of a wall but also of a frame for social action in postwar media homes. It also reveals the complex histories of gender, taste, class, race, domestic science, and modernism and the utopian dreams for democratic design upon which this frame was built in the first place. And it shows how the logics of communication networks and postwar information society were embedded in its structure. Yes, the Storgewall was a frame for action that made objects disappear, but this did not happen magically or just by everyday habit. Frames have a history; they go in and out of use.

Today the nightmares of technological blight that both Nelson and Weiser feared reappear in a multitude of ways. Rather than a world of disappearing objects, people’s daily lives are increasingly cluttered with out-of-date plugs, useless adapters, cell phones, and the like—the products of planned obsolescence that wind up, along with old boxy TV sets, in the dust piles of digital culture commonly referred to as “e-waste.” The dreams of storage and disappearing objects reappear today as a global mess—both in the upper-class garbage piles of places like New York’s Upper West Side and en route to impoverished places around the globe. In 2007 the US Environmental Protection Agency (EPA) estimated that “US consumers and businesses discarded televisions, computers, cell phones, and

104. Daniel Miller, *Stuff* (Cambridge, U.K.: Polity, 2010), 50.

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hard copy peripherals . . . totaling 2.25 million tons.” Approximately 82 percent of these electronics were “disposed of primarily in landfills, where . . . hazardous substances can leak into the ground and contaminate soil and water.”¹⁰⁵ As Greenpeace elaborates, “E-waste is routinely exported by developed countries to developing ones,” and the trail goes to parts of Africa, South Asia, and China.¹⁰⁶ In a variety of places across the globe, people make a living stripping toxic computer parts and cathode-ray tubes for resale.

For reasons such as this, the history of the idea of the disappearing object (whether in interior design or in computer engineering) can help expose the social contradictions that continue to form the basis of everyday environments, at home, at work, and across the globe. As uncanny doubles, Weiser and Nelson were engaged in a disappearing act that is seductive to be sure. But even if made to disappear, objects contain material and affective histories that can’t easily be swept away. On closer look, the object-free spaces imagined by Nelson and Weiser turn out to be cluttered with the historical baggage of their times.

105. EPA, “Cleaning Up Electronic Waste (E-Waste),” www.epa.gov/international/toxics/ewaste/index.html (accessed May 11, 2011).

106. Greenpeace, “Where Does E-Waste End Up?” www.greenpeace.org/international/en/campaigns/toxics/electronics/the-e-waste-problem/where-does-e-waste-end-up (accessed May 11, 2011).