Chapter 9

Getting a Handle on It

Thomas Lamb, Mass Production, and Touch in Design History

Grace Lees-Maffei

Introduction: Handles, Theory and Design Practice

A hundred years ago, sociologist and philosopher Georg Simmel published an aesthetic study of handles. Industrialization and capitalism have produced a material world of applied arts objects, such as handles, serving functional needs for many people, Simmel contended, and that "each one is only the random example of a universal."1 For Simmel, the relationship between handle and bowl, utility and beauty, is a microcosm of the relationship between the individual and society. An uncomfortable handle is symptomatic of an unjust society, while an aesthetically appealing and ergonomically successful handle can be socially beneficial. This chapter responds to Simmel's proposition that a handle can represent a society by examining the work of designer Thomas Lamb (1896–1988) as a rich example of the value of studying capitalism in ways attentive to the senses. Lamb was known as "the handle man" for his focused work designing handles. He is best known for the Wedge-Lock handle which followed his Lim-Rest Crutch.

Design is a creative and pragmatic process which engages the senses. The history of design can provide a focus for understanding the sensory experiences of people within capitalist societies. Yet historians have yet to address adequately the role of the senses in design and have tended to focus on the outcomes of the design process more than the process itself. While the field of sensory studies has begun to engage with design,2 a disjuncture exists between the literatures of design history, on the one hand, and business and capitalism, on the other. This chapter extends the influential, but now rather neglected work of Eugene S. Ferguson. Ferguson (1916–2004) was an engineer, historian of technology, history professor at the University of Delaware, and curator of technology at the Hagley Museum and Library. His ideas about nonverbal knowledge in engineering inform the analysis here of the relationship between the theory and practice of design and the importance of touch and embodied research in the history of design and design history respectively. Bringing a range of literatures together, this chapter seeks to understand Lamb's outputs as evidence of his practice—a sensory, tactile process of embodied research.

Embodied research in the form of direct handling is used here as a way of engaging with the design of the past that illuminates the design process and showcases the role of touch in design practice. This account of Lamb's work also interrogates "Universal Design" and considers how it may be understood differently through object handling. The research raises provocative questions about a normative pattern in which male designers create objects for mass production, which are sold around the world for mass consumption by female as well as male consumers.

In Theory: Capitalism, Hands, Machines, and Tools

Capitalism is theorized both as an economic model, underpinning globalization, practiced at scale by big business and the state, and as a world view. The mass production, exchange, and mass consumption of designed goods and services rely on migration and population increases to create concentrated labor in industrial towns and cities. This occurred initially in the West, where large numbers of workers operated capital-intensive machines to produce the commercial goods exchanged in modern economies. Hands and machines are commonly used as metonymic symbols for polarized positions in debates about the economics, politics, and ethics of mass production. In practice, mass production combines hand and machine techniques, and very few production tasks are wholly mechanized. Yet, the individual phenomenology of people operating within capitalism and their sensory experiences have not been overlooked: Charles Fourier and Karl Marx each attended to the sensory engagement of laborers within capitalism, with Fourier believing that "societies could be judged according to how well they gratified and developed the senses of their members" and Marx laying "the blame for the alienation of the senses in capitalist society on the dehumanizing regime of private property."3

An 1899 United States government report on *Hand and Machine Labor* proceeded from the premise that while "hand methods are going out of use," there is much evidence of "obsolescent processes."[4] The purpose of the report was to inform managerial decisions about capital investment in machinery based on the time saved in specific manufacturing tasks and the relative cost of wages in hand and machine processes.[5] It was "designed to bring into comparison the operations necessary in producing an article by the old-fashioned hand process and by the most modern machine methods, showing the time consumed by the workmen and the cost of their labor for each operation under the two systems." The author notes, "The words 'hand' and 'machine' have not been used in the strict sense of their meaning, but have been adopted, for

want of better terms, to express the two methods of production."[6] The main body of the report comprises quantitative data on the time taken to fulfil tasks in a variety of trades, from glove making and baking to pitchfork manufacturing, all of which used both hand and machine methods. Over more than 120 years since the report was published, few areas of production remained untouched by mass production. Even in the luxury trades, such as bespoke tailoring and haute couture, manufacturing can incorporate elements of machine sewing.[7] At the same time, most apparently mechanized or automated processes rely on some level of handiwork.

Not all researchers have drawn the same conclusion. Curator and writer Glenn Adamson has contended that "industrial weaving," for instance, has left "the domain of direct craftsmanship behind" before nuancing his position: "This doesn't mean the material intelligence is any less important, however—as you might well reflect if you were about to hit the start button on a machine that can produce miles of cloth without stopping."8 The hands which operated the machinery of capitalism were not merely units of power; rather, they were sentient and individuated and, as such, worthy of historical attention.

As a leading twentieth-century theorist of relationships between people and technology, Lewis Mumford conceptualized the latter as just one part of a large matrix of technics. His *Technics and Civilization* (1934) is a history of the machine as a "technological complex" over one thousand years.[9] Mumford distinguishes between machines and tools on the basis of their autonomy. Tools are manipulated by their operators, while machines have the capacity for automatic action. People using tools are like machines: "using the tool, the human hand and eye perform complicated actions which are the equivalent, in function, of a well developed machine." Most important, "the skilled tool-user becomes more accurate and more automatic, in short, more mechanical, as his originally voluntary motions settle down into reflexes." And "even in the most completely automatic machine," Mumford argues, humans consciously participate "in the original design" and intervene with refinements and repairs. While tools are relatively flexible, the machine emphasizes specialization, and by speeding up production, it services an acquisitive capitalism. Mumford critiqued technics using the philosophical yardstick of what he later termed "organic humanism."[10] Nevertheless, he remained optimistic about the potential of machines as subordinated to humanity: "We can now see plainly that power, work,

regularity, are adequate principles of action only when they cooperate with a humane scheme of living: that any mechanical order we can project must fit into the larger order of life itself."[11]

While Mumford's project was to write a thousand-year history of the machine, his contemporary, Siegfried Giedion, aimed in *Mechanization Takes Command* (1948) to provide what his publishers billed as "a study of the evolution of mechanization in the last century and a half." Both Mumford and Giedion examine the social effects of the machine and mechanization, but Giedion's book is sufficiently distinctive—with its focus on "anonymous history," its detailed empirical case studies, and its typological approach[12]—for Mumford to praise it as novel: "Even in the realm of technics itself, far more attention has been paid to machines, particularly to those that converted energy into motion, than to the utensils, the apparatus, and the utilities that have modified the character of building."[13] Giedion's only omissions, as Mumford saw it, were the Morris chair, the so-called Craftsman handicraft movement in the United States, the importance of personality, and the origins of mechanization.

In promoting anonymous history, Giedion intended to explore the ways in which "mechanization penetrates the intimate spheres of life"[14] to reveal the impacts and influences of overlooked things such as abattoirs, Yale locks, and breadmaking techniques on human perception and cognition. In writing about the movement of the hand, Giedion notes that "vital to all this integrated work is the mind that governs and the feelings that lend it life." The hand was both a marvel and a mystery, both an adjunct to mechanization and an unwitting agent of resistance: "For all the complicated tasks to which this organic tool may rise, to one thing it is poorly suited: automatization. In its very way of performing movement, the hand is ill-fitted to work with mathematical precision and without pause. . . . It wholly contradicts the organic, based on growth and change, to suffer automatization."[15] Mumford and Giedion each argued that technology should be kept in check through subordination to nature and the human: "Being less easily controlled than natural forces," Giedion wrote, "mechanization reacts on the senses and on the mind of its creator."[16] He wished for the "time that we become human again and let the human scale rule over all our ventures."[17]

Mumford's and Giedion's calls for the march of technology to be circumscribed by the human differed from the vision of a technological future popularized by another contemporary leading theorist of technology, Marshall McLuhan. McLuhan was strongly influenced by Giedion's conceptualization of technological modes of cognition and by his interdisciplinarity,[18]

and like Mumford, he wrote a glowing review of *Mechanization Takes Command*.[19] For our purposes of exploring Simmel's contention that a handle is a microcosm of the society in which it was produced, McLuhan's theory of tools is his most salient contribution. He elaborated in *Understanding Media*: "The tool extends the fist, the nails, the teeth, the arm. The wheel extends the feet in rotation or sequential movement. Printing, the first complete mechanization of a handicraft, breaks up the movement of the hand into a series of discrete steps that are as repeatable as the wheel is rotary. From this analytical sequence came the assembly-line principle."[20] Notwithstanding his critique that "technology needs not people or minds, but hands,"[21] rather than seeing technology as something which threatens humankind, as needing to be circumscribed or held in check by the human, McLuhan presents technology as enabling people's interactions with the world.

Mumford, Giedion, and McLuhan each theorize the ways in which people, tools, and machines interact in ways that change human cognition. Their writings illuminate the symbolic and communicative dimension of modes of production. Because tools are utilitarian first and foremost, their symbolic dimensions are often overlooked. In tracing *A History of the World in 100 Objects*, the British art historian Neil MacGregor begins with a stone chopping tool from Olduvai Gorge, Tanzania. This ancient object, which is 1.8 to two million years old, is a basic tool such as "other animals might use." MacGregor contrasts it with a representational bird-shaped pestle from Papua, New Guinea, dating from 6,000 B.C. to 2,000 B.C. He identifies the second object as art and associates it with an expression of meaning, perhaps spiritual.[22] MacGregor's discussion recalls Ferguson's description of a disregarded dimension of technological design: "Technologists, converting their nonverbal knowledge into objects directly (as when an artisan fashioned an American ax) or into drawings that have enabled others to build what was in their minds, have chosen the shape and many of the qualities of our man-made surroundings. This intellectual component of technology, which is nonliterary and nonscientific, has been generally unnoticed because its origins lie in art and not in science."[23] Handles share with Ferguson's axes their utilitarian affordances; they assist human hands in carrying and holding objects from suitcases to knives. They rarely take on representational qualities such as those of a carved or painted bird. However, that does not mean that the appearance or aesthetic qualities of a handle lack meaning. MacGregor's distinction between utilitarian artifacts and fancifully decorated utilitarian artifacts, and Ferguson's call for attention to nonverbal

knowledge as demonstrated in the work of technologists or engineers, are both applicable to the work of product designers such as Thomas Lamb. When Lamb's Wedge-Lock handle was exhibited at the Museum of Modern Art in New York in 1948, the press release admitted that "at first glance" Lamb's handle "resembles a piece of abstract sculpture" before going on to enumerate its ergonomic and utilitarian qualities.[24]

This brief survey of some key twentieth-century ideas about technology, craft, and design process contextualizes the histories of technology, engineering, and design practice, among other fields of endeavor at the time Lamb was active. The chapter will now move to consider hands in practice.

In Practice: Touch and Hands in Design and Making

With few exceptions, existing theoretical discussions of the relative roles of hand and machine have not adequately recognized the experiences of makers. One exception is found in craft practice. The potter Julian Stair has participated in a multidisciplinary Victoria and Albert Museum research project, "Encounters on the Shop Floor." Stair was filmed at his wheel demonstrating and describing how he creates a firm triangular form with his left elbow on his left thigh, and his right elbow on his right thigh, leaning forward to brace for steadiness, supporting his hands.[25] Sharing techniques with ceramic artists, ceramic modelers create prototypes for plates, cups, and teapots in mass production contexts but the intellectual, material, or bodily processes involved in their work remain largely undescribed in the relevant literatures. Automotive designers, too, have traditionally created models in clay, although this practice is now either wholly replaced by, or combined with, Computer-Aided Design (CAD). Images of the design staff at General Motors modelling automobile prototypes under the auspices of Harley Earl in the 1950s have been obscured in historical accounts in favor of an emphasis on design management and the resultant vehicles.[26] This chapter responds to this relative absence by examining the work of another designer who used clay modelling, Thomas Lamb.

Thomas Lamb represents an unusual example of a successful designer who focused the majority of his working life on creating one type of object (or, rather, one component part of lots of different objects): handles. His apparently diverse formative experiences converged in this activity. From early childhood, Lamb wanted to become a doctor. He was studying anatomy informally by the age of eight and, at eleven, according to a 1948 press release, he "assisted in an

emergency operation for the removal of the fifth finger" of a patient.[27] Later, Lamb's medical aspirations were curtailed by financial circumstances, so he began to design patterns for household textiles and took night classes in drawing, painting, and anatomy. He established his own textile design studio serving New York City's department stores in 1919,[28] and then worked in children's illustration from 1924 onward, with his Kiddyland serial cartoon being published in *Good Housekeeping*, a popular American women's magazine, and through spin-off merchandise lines.[29] When Lamb's attention was caught by the problem of improving handle design to increase the stability of crutches used by veterans, he changed direction.[30] Along the way, Lamb developed a philosophy that he called "manuskinetics," informed by, but irreducible to, "art, engineering, anatomy or physics." Manuskinetics was promoted in grand terms as the first time "design has created a new science."[31] He did not pursue mass production of one promising design, the Lim-Rest crutch, partly because, as a 1954 profile put it, Lamb "always felt kind of funny about going into crutches to make money."[32] But, its handle formed the basis of his commercially successful Wedge-Lock handles, which he spent the rest of his career refining across many applications. Lamb began working on the Wedge-Lock in 1941. It was made public in 1946 and was featured the following year in *Home Furnishings Review*. Edgar Kauffman, Jr. invited Lamb to stage an exhibition at the Museum of Modern Art in New York City which took place in 1948. Contracts with Wear-Ever Aluminum (a division of the Pittsburgh-based Aluminum Company of America, or ALCOA) and its upstate New York knife-making unit, Cutco (short for the Cooking Utensil Company) followed.[33]

<Figure 9.1>

One way to understand Lamb's contribution is to focus on his working methods. Because he wanted his products to feel good in the hand, to have "feel appeal" as the advertisements for his Cutco handles put it, Lamb made touch and handling crucial parts of his research and design methodology.[34] (Figure 9.1) He built up an extensive study collection of handles from other products. Through handling the samples, Lamb sought to understand user experiences of grasping, carrying, and using handles. He created hundreds of prototype handles which, like the complete objects in his study collection, he evaluated using his hands and modified accordingly.[35] In 1954, design journalist Deborah Allen visited Lamb in his workshop and

witnessed his working processes. In her profile in the inaugural issue of *Industrial Design* magazine, Allen described watching Lamb, "pink-cheeked, besmocked, and exuberant, filing away at his latest handle. . . . His work is timeless, he explains as he whittles." Lamb attributed his practical concern for tactile experience to his mother's New England roots, quoting an imagined Yankee as commenting on his work, "'That's nice, Mr. Lamb; how do she feel in the hand?'" Lamb was more than a rosy-cheeked whittler, however. He pursued the need for objects that feel good in the hand by combining his training in drawing, painting, and anatomy with measurement, "manuskinetics," hand making, and machine making. One academic researcher, Rachel Elizabeth Delphia, summarizes Lamb's methods: "He cut profiles of handles on the band saw, turned them on the lathe, and carved elements without radial symmetry by hand. Throughout the process he used calipers and dividers to check his dimensions and to maintain bilateral symmetry. Carefully transcribed contour lines, which often matched the ones on his scale drawings, helped him visualize the high and low points of complex, intersecting curves as he carved."[36] Delphia notes that Lamb worked diligently with a careful eye for detail: "If he accidentally removed too much material, he would add Chavant clay, a hard, oil-based clay capable of being sanded and painted. Once he had refined a design, he often made a plaster mold so that he could easily cast duplicates in plaster, lead, plastic, or aluminum."[37]

<Figure 9.2>

In addition to the "volumes of notes and meticulous sketches comprising the three hundred and sixty studies of handles he has already made toward some 15,000 or so potential applications for the Lamb Wedge-lock Handle," Allen encountered "tray upon tray of oddly curved and twisted sculptures in glass, plastic, aluminum, steel, clay, wood and plastic wood. They look like the bones and shards of a civilization; in fact, they are the record of Mr. Lamb's extraordinary life work designing handles to 'make full use of the forces of the hand for better and safer manipulation of objects.'"[38] (Figure 9.2) This example of hand-whittled objects serving as models for mass-produced handles provides a telling instance of the role of the hand in machine production. Lamb licensed his handle designs to selected manufacturers in a range of product categories. The resulting products were touted as having Lamb's Wedge-Lock handle, and Lamb received a royalty for each one sold (or compensatory payments if sales fell short of

expectations). Each of his handles, Allen continued, was "protected under his patents describing a scientific mechanism for exploiting the hand," and manufacturers were required to "accept his Lamb Handles without modification, which means using Mr. Lamb's hand-sculptured models to make the molds without intervention of engineering drawings."[39] Lamb's motives in protecting the form and application of his handles were not purely altruistic, in preserving their superior functioning for users. The brand value of the Wedge-Lock handle, and Lamb's own branded persona, were enhanced when they were prominently applied to products.

Lamb's working practices exemplify Ferguson's "nonverbal thought."[40] Ferguson's now-classic defense of nonverbal learning in design is based on his insight that a good deal "of the creative thought of the designers of our technological world is . . . not easily reducible to words; its language is an object or a picture or a visual image in the mind." Ferguson elaborates: "As the designer draws lines on paper, he translates a picture held in his mind into a drawing that will produce a similar picture in another mind and will eventually become a three-dimensional engine in metal. Some decisions, such as wall thickness, pin diameter, and passage area may depend upon scientific calculations, but the non-scientific component of design remains primary."[41] One of Ferguson's many examples is Peter Cooper Hewitt, the early twentieth-century inventor of the mercury-vapor lamp. Quoting Hewitt's friend Michael Pupin, Ferguson writes, "'Those who knew him . . . watching him at work, felt that a part, at least, of Hewitt's thinking apparatus was in his hands.'"[42] Lamb asserted something similar: a "man's hand is a supreme evolutionary achievement, almost another brain."[43] Lamb did preliminary research by touching objects and making drawings of what he saw in front of him and in his mind's eye. He drew handles, and hands using them, and modelled his prototypes in clay. Lamb's hand-crafted handles were passed to manufacturers as patterns for molds, rather than being translated into technical drawings in the way Ferguson describes. Ferguson's concept of nonverbal thought is, therefore, arguably even more applicable to Lamb's way of working.

Ferguson's focus is the role of images in learning about technology and design. He says little in his 1977 article about what engineers learned through engagement with objects, other than making brief references to the failure of Norman A. Calkins's *Object Lessons* (1861) to gain long-term traction in education and to Rudolph Arnheim's complaint that "beyond kindergarten . . . the senses lose educational status" in favor of a verbal emphasis in the schoolroom.[44] Ferguson complains that "in engineering curricula analytical courses have proliferated at the expense of

courses attempting to teach design," and when the latter are cut, "we can expect to witness an increasing number of silly but costly errors that occur in advanced engineering systems today."[45] In his follow-up book, *Engineering and the Mind's Eye* (originally published in 1992), Ferguson distinguishes between learning visually, for instance by copying a drawing, and learning through the "laying on of knowing hands."[46] He distinguishes between design expressed through neat drawings made on large sheets of paper which "exude an air of great authority and definitive completeness," the engineer's way, and, as he puts in in his chapter title "Designing Without Drawings: The Artisan's Way," wherein working with materials informs the design and post-hoc modifications can more easily be made.[47] He argues for the importance of the latter: "The tacit knowledge and the skills of workers may not have been the determining factors in Britain's leading role in the Industrial Revolution, but they were essential components of it. Today, similarly, the knowledge and skills of workers—sensual non-verbal knowledge and subtle acts of judgement—are crucial to successful industrial production."[48] This chapter adds to Ferguson's call for attention to nonverbal learning and practice in design an analysis of embodied research as both a design practice and a historical research method for understanding design. Ferguson claims that the "opportunities for a designer to impress his particular way of nonverbal thinking upon a machine or a structure are literally innumerable."[49] And yet, impressing "his particular way of nonverbal thinking" into his designs can lead to unanticipated consequences that are, in fact, contrary to the design philosophy and aims of that very designer, as we shall see.

Embodied Research: Handling the Handles

Designer John Christopher Jones wrote about the Lamb handle for the United Kingdom's *Design* magazine in 1954, the same year that Allen's *Industrial Design* article appeared. Unlike Allen, Jones could not travel to meet with Lamb, visit his workshop, or even handle his handles. However, just the sight of the Wedge-Lock assured Jones of its use and function. "It can . . . be seen that the curved shapes have the visual purpose of indicating the manner of gripping and the direction of movement," Jones writes, "and this is a truly ergonomic virtue."[50] More recently, Rachel Elizabeth Delphia has used this as evidence that the "value of Lamb's work, both during the time period that he created it, and from a historical perspective, is that he made the invisible apparent. We can both see and feel the ergonomic impulse at work in his handles; the Wedge-lock exposes what more nuanced designers integrated seamlessly into their designs."[51] The

implication here is that the very appearance of the Wedge-Lock handle communicates the experience of using it.[52] (Figure 9.3) If this were true, then direct object handling and embodied research methods would have no value for research on objects that are seen, by some, to communicate their tactile experience visually. But is it true? What do we learn from handling Lamb's handles?

<Figure 9.3>

Because Lamb's design process incorporated embodied research, it is appropriate and instructive for researchers to use embodied research to understand his work. Like Jones, albeit for different reasons, today's researchers are unable to follow in Deborah Allen's footsteps and visit Lamb's workshop to watch him work. However, unlike Jones and Allen, we have access to the comprehensive Thomas Lamb design archive at the Hagley Museum and Library in Wilmington, Delaware, which preserves Lamb's working methods in both artifacts and documents. At Hagley, researchers can touch and examine both the handle specimens Lamb collected for reference and the prototype handles that he made. Researching Lamb's work using the Hagley collection therefore becomes necessarily embodied, whether or not that is the researcher's intention. Embodied research is a method, or group of methods, that acknowledges and employs the researcher's own physical experiences in relation to the research material as well as those of the research subject(s).[53] It can recover information lost to a history focused on documentary evidence; for instance, just as culinary historians recreate historical recipes, so historians of sciences can participate in historical making workshops.[54] Embodied research is suitable for a study which seeks to better understand the role of the senses in the history of capitalism, and the sense of touch in particular.

Handling is a well-established method in education—learning through doing, experiential learning—and in museology, where it is an effective tool of audience engagement. However, embodied research is not much used as a method by historians. Innumerable historical objects and images survive, yet the fact that some historians need encouragement and training in how to engage directly with them is exemplified by the steady stream of books which promote the use of material culture for historical research.[55] Even design historians, whom we might suppose to be in the vanguard of object-centered research methodology, do not typically handle the objects

they study. While object analysis entails "close first-hand examination of individual objects and groups of objects, and the placement of the object as the central focus through examination of its design, manufacture and use," a researcher's firsthand examination is more likely to be visual than tactile.[56] In practice, it is not always possible for researchers to touch artifacts held in archives and museums, and even when it is possible, it is usually forbidden to handle objects in the way that they were intended to be used, for instance, by placing a ring on a finger.

Jeffrey L. Meikle has reflected on the shortcomings of document-driven research, which informs his classic work, *Twentieth Century Limited*. "I rarely saw, touched, used or otherwise physically interacted with the material objects and environments I purported to describe, analyze and interpret," he recalled. Working from photographs, Meikle approached his research "as a literary historian" rather than "with the object-oriented expertise of an art historian or curator" grounded in visual and material evidence.[57] Meikle's call for direct handling in design historical research is part of an effort to address the marginalization of nonverbal knowledge, discussed above. Tracing his account back to the Renaissance, Ferguson lamented the fact that for designers and engineers, "as the scientific component of knowledge in technology has increased markedly in the 19th and 20th centuries, the tendency has been to lose sight of the crucial part played by nonverbal knowledge in making the 'big' decisions of form, arrangement, and texture that determine the parameters within which a system will operate."[58] Design historians, designers, and engineers alike have much to gain from direct manual engagement with materials, models, prototypes, and objects.

As noted, researchers undertaking archival research in the Thomas Lamb archive at Hagley are, in some ways, engaging in a research process similar to that of Allen during her visit to Lamb's workshop in the early 1950s. Allen's interest in Lamb's handles opened her series, in the early issues of *Industrial Design*, "on what Americans then called 'human engineering' (only the British called it 'ergonomics')" as design consultant Ralph Caplan put it.[59] Lamb described the Wedge-Lock as fitting "the average hand."[60] But whose hand served as the prototype for average? Embodied research in the archive helps to answer this question. As a researcher opens box after box of handles made by Lamb, the difference in size between his hand and her hand becomes readily apparent.[61] Lamb asserts that his handle fits all hands, and this universality is an important principle of his design practice. Yet when handling Lamb's handles, this researcher felt that while an attempt had been made to shape the handles to suit the grip of many sized

fingers, unless the grooves were the same size and distance apart as her own fingers, they would become irksome ridges that would exacerbate the discomfort of a heavy tool or load. Delphia recorded a similarly mixed response to the Lamb handles in the archive at Hagley: "hands-on experience with extant models suggests that the handle worked better in some applications and orientations than in others."[62] Delphia concludes that a "Wedge-lock handle that fits the hand feels amazing, but if the scale is too large or small or the angle of a groove does not quite match the hand, it feels incredibly awkward."[63] Lamb's universalizing aspirations are countered by other designers who have recognized that "certain users will prefer certain handles," as one study of handle shapes in the specific context of train drivers pointed out. "This matters for comfort in everyday life just as it matters for optimal performance in professional contexts."[64]

While direct handling of the handles Lamb collected for reference purposes and the handles he fabricated as part of his design process engages a researcher's sense of touch, it cannot replicate Lamb's own tactile experience. Clues to his experience exist in his notes and the choices we see preserved in the archives, but despite the proliferation of objects and documents, the record is sometimes silent. Delphia laments the shortcomings of the archives: "Parts of Lamb's process are more transparent to a researcher than others. Some of his notebooks and sketches are dated and easy to interpret, but others lack labels and render parts of the process a mystery."[65] The information gleaned through direct object handling offers a more direct mode of accessing Lamb's working processes, albeit a suggestive rather than complete one.

Universal(izing) Design?

Lamb made great claims for his work. The foreword of Lamb's draft memoir claims that his "handle will transcend and cross all barriers between peoples of every race, creed and color, and all levels of intelligence, for all of mankind has the sense of touch, and all human beings seek personal comforts, a sense of cooperation, and aid is transferred to the hand that touches a Lamb handle."[66] In a handwritten editorial plan for the memoir, dating from 1948, he notes, "You have got to learn to sell a principle not <u>a Handle</u>."[67] The principle Lamb was selling is indicated in another document from his archive: "The objective of the designer was not only to create beauty in form, but to make the handle forms render human service" and to "create for the manufacturer merchandise which would not be measured in dollar value alone, but would also be measured in terms of service and safety, greater use of human facility, better and more precise work."[68]

Lamb's determination that his designs be evaluated by yardsticks other than that of profitability should not be taken as evidence that he was a poor businessman. On the contrary, Lamb excelled at promoting his handles under his own name and the Wedge-Lock brand in ways which made clear their universal utility. His inclusivity is seen in marketing materials published by some of Lamb's clients such as the Cutco Division of Wear-Ever Aluminum, which claimed in the March 1960 issue of its newsletter that the Wedge-Lock handle is "not just another handle but actually A WAY OF LIFE. Many people who are crippled by paralyzing arthritis or rheumatism and people with only one hand have praised Lamb handle Cutco because it distributes the tension in their hand evenly and gives them a safe grip."[69]

Delphia has described Lamb as "an evangelical crusader, hoping to save the world one handle at a time. His pioneering use of anthropometric design methods provided a model for other designers and foreshadowed a significant shift in twentieth-century design practice" toward ergonomic design.[70] Hagley's online exhibit on Universal Design explained that Lamb "wanted his handles to be used comfortably by as many people as possible. His attention to anatomy, people's varying body sizes and abilities, and universal functionality formed the foundation of the Universal Design movement."[71] Recognizing that "the vast majority of consumer products are not designed with disability in mind, meaning that handles are too delicate, buttons too stiff, and graphics too small for certain users," the historian Bess Williamson has cautiously welcomed Universal Design as a "deliberate effort on the part of designers to address the ways things can go wrong for hand, eye, and body."[72]

Universal Design is certainly well-intentioned, but achieving universal applicability is extremely difficult. Williamson and Aimi Hamraie, another historian, have critiqued Universal Design for failing to accommodate disabled people. Williamson points out that Lamb's design for war veterans with leg injuries, the Lim-Rest crutch, was not successfully mass produced, unlike his ubiquitous Wedge-Lock handle which drew on the innovations of the Lim-Rest. The Lim-Rest remained a benevolent failure. In Henry Dreyfuss's *The Measure of Man*, an influential resource for designers, "people with disabilities were literally off the charts" and confined to special side projects, Williamson observes.[73] Williamson shows as evidence Dreyfuss's "Hand Positions—Average Man," in which maximum reach, finger grip, and hand grasp are illustrated with a "semi-statistical approach to design."[74] While Dreyfuss's Humanscale did recognize disability, it demonstrated the difficulty of achieving truly Universal Design.

Hamraie concludes that Universal Design must be combined with disability justice in order to function more equitably.[75]

<Figure 9.4>

Williamson notes that Lamb's handles are not formed merely by Lamb clasping pieces of clay in his hand, rather they are based on his study of anatomy and on many measurements, and their finger grooves have cutaways to help them accommodate different sized fingers and grips.[76] But the experiences of female and nonbinary researchers handling the Wedge-Lock handle suggest that it is only partly successful in accommodating difference, a reality that has implications for Lamb's bold ambitions for universality and for Universal Design more broadly. (Figure 9.4) The British feminist and activist Caroline Criado-Perez exposes two injustices in the design of the contemporary world. Firstly, a gender data gap—a basic lack of information about women's bodies, expectations, customs, and activities—results in, secondly, the still-patriarchal West that ignores female physiognomy and experience so products and services are designed for a male norm, which Criado-Perez calls "reference male." This echoes Aimi Hamraie's critique of the "normate template."[77] These twin injustices affect every area of life from medical diagnoses and treatments to safety equipment.

Criado-Perez refers to data showing that "women have, on average, smaller hands than men, and yet we continue to design equipment around the average male. . . . This one-size-fits-men approach to supposedly gender-neutral products is disadvantaging women."[78] For instance, increasingly large smartphone screens become difficult for women to hold and to tap single-handedly, which negatively affects women's hand and arm health as well as our safety.[79] In United States agriculture, where there were nearly a million female farm operators in 2007, almost all equipment and tools "have been designed either for men or for some average user whose size, weight, strength, etc. were heavily influenced by the average man" even though "women's hands are on average 0.8 inches shorter than men's."[80] Hand tools such as wrenches "tend to be too large for women's hands to grip tightly."[81] Women have about half of the grip strength of men throughout their lives. Even an older male will have a stronger handgrip than a young woman.[82] Female athletes have only half the manual strength of untrained males, and in general, 90 percent of women have a weaker grip than 95 percent of men.[83] So the fact that tools

are designed with reference to male bodies limits the competence of women using those tools, which ultimately has a negative impact on women's health, safety, and well-being. Research is needed to fill the gender data gap and to develop standards and measurements sensitive not only to relative size and strength but also to diverse ways of making.[84]

The technological advances that underpin mass production and globalization have enabled manufacturers to drive down costs and offer consumers more goods at more accessible prices. The right tool combined with manual skill enhances dexterity. Historically, dexterity has been gendered, with textile processes such as crocheting, needleworking, and lacemaking all associated with women while activities such as watchmaking, model making, and whittling have been associated with men, whether professional or hobbyist. These persistent stereotypes underpin contemporary globalization. For instance, clothing production and electronics manufacture both rely on a cheap off-shore labor force of female workers. Among the apparent benefits resulting from economies of scale and efficiencies of distribution and logistics is a broad product range. But rather than offering consumers a wider choice, mass production relies not only on labor inequities, but also on industry standards centered on a normative male end-user. The majority of consumers, who are not best represented by reference male, pay other costs in addition to those on price tags, including reduced suitability and utility.

Conclusion

This chapter began with Georg Simmel's assertion that a handle could be read as a microcosm of the society in which it was produced. It has contributed to an understanding of capitalism through attention to the senses, using an archival study of Thomas Lamb, the twentieth-century's self-appointed, preeminent designer of handles to analyze both the role of design as a building block for the material world of capitalism and of the role of touch in the design process. In so doing, it has shown that making things by hand is not insurance against normativity. This chapter extends Eugene Ferguson's work on "knowing hands" as crucial carriers of tacit, nonverbal knowledge in engineering into a novel discussion of embodied knowledge in design practice and design historical research. By placing handcrafting at the center of his embodied design practice, Lamb attempted to universalize his own experiences at the expense of the needs of consumers with differently sized or shaped hands or different tactile propensities. Embodied research in the Lamb collection has demonstrated that while Lamb's Wedge-Lock handle may have been

designed to serve as many users as possible, the *average* user he designed for resembled himself more than anyone else. When the designer's own hands, and their sense of touch, are key determinants of their designs, the suitability of the resultant products for a variety of consumers should be assured via complementary methods. Overarching philosophies of design can be understood differently through embodied archival research. For instance, even in the case of Universal Design, the pattern of male design and female use, and male production and female consumption, serves women poorly. Embodied research as a method for design history, as exemplified by the author's tactile work in the Thomas Lamb archive, has highlighted both the shortcomings of embodied research as a tool for design practice and the need to avoid these pitfalls through blended research methods using a wider data set which overcomes the gender data gap.

Skilled manual work has not yet been mechanized out of manufacturing. Twenty-first century manufacturing processes make extensive use of the dexterity of hired hands to operate and maintain digitized, robotic, and mechanized processes, to assemble miniaturized electronic goods, to complete finishing and packaging, and to ensure quality control, among a variety of tasks. As long as hands are used in the manufacturing which drives capitalism, embodied research using direct handling will be important for understanding design and the role of the senses within the capitalist system.

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[1] Georg Simmel, "Das Problem des Stiles," *Dekorative Kunst. Illustrierte Zeitschrift für Angewandte Kunst* 11, no. 7 (1908): 307–16, 309, quoted in Siegfried Gronert, "Simmel's Handle: A Historical and Theoretical Design Study," *Design and Culture* 4, no. 1 (2012): 55–71, 62.

[2] See, for example, *Senses and Sensation: Critical and Primary Sources* ed., David Howes, vol. 4, *Art and Design* (London: Bloomsbury, 2018); Ian Heywood, ed., *Sensory Arts and Design* (Abingdon, UK: Routledge, 2018).

[3] David Howes, "HYPERESTHESIA, or, The Sensual Logic of Late Capitalism" in *Empire of the Senses: The Sensual Culture Reader*, ed. David Howes (Abingdon, UK: Routledge, 2005), 281–303. Quotations at 282, 283.

[4] Carroll D. Wright, "Preface', *13th Annual Report of the Commissioner of Labor 1898: Hand and Machine Labor*, vol. 1, *Introduction and Analysis* (Washington, D.C.: Government Printing Office, 1899), 6. This study was based on fieldwork begun in November 1894. The author of the preface was the U.S. Commissioner of Labor.

[5] Wright, *13th Annual Report*, 1:5.

[6] Wright, *13th Annual Report*, 1:11.

[7] Roger Kneebone, *Expert: Understanding the Path to Mastery* (London: Viking, 2020). See, for example, the work of Lee McQueen, for his own label Alexander McQueen and for the Givenchy couture house.

[8] Glenn Adamson, *Fewer, Better Things: The Hidden Wisdom of Objects* (London: Bloomsbury, 2018).

[9] Lewis Mumford, *Technics and Civilization* (New York: Harcourt, Brace & World, 1963), 12. For a broader definition of technics which includes "blood and sinew" see Lewis Mumford, "An Appraisal of Lewis Mumford's *Technics and Civilization* (1934)," *Daedalus* 88, no. 3 (1959): 527–36.

[10] Lewis Mumford, *The Condition of Man* (New York: Harcourt, Brace and Company, 1944).

[11] Mumford, *Technics and Civilization*, 372.

[12] Siegfried Giedion, *Mechanization Takes Command* (New York: Norton, 1948), back cover, 2–3, 10–11.

[13] Lewis Mumford, "Man Takes Command: Notes on Siegfried Giedion's Comprehensive Study of Mechanization," *Progressive Architecture* 39 (July 1948): 48, 108, 110, 112. On p. 10, Mumford's phrase "the realm of technics" may refer to his own work. His comments point to one explanation for why Giedion did not reference Mumford's earlier text, even though he had moved from Switzerland to the United States to research and write his book at that time.

[14] Giedion, *Mechanization Takes Command*, 41.

[15] Giedion, *Mechanization Takes Command*, 46.

[16] Giedion, *Mechanization Takes Command*, 714.

[17] Giedion, *Mechanization Takes Command*, 723. "Humanscale" is the name of a design resource developed from Henry Dreyfuss's *Measure of Man*. See Niels Diffrient, Alvin R. Tilley, and Joan C. Bardagjy, *Humanscale 1/2/3: A Portfolio of Information* (Cambridge, MA: The MIT Press, 1974); Niels Diffrient, Alvin R. Tilley, and Joan C. Bardagjy, *Humanscale 4/5/6: A*

Portfolio of Information (Cambridge, MA: The MIT Press, 1981). It also the name of a design studio for which Diffrient has designed ergonomic seating.

[18] Douglas Tallack, "Siegfried Giedion, Modernism and American Material Culture," *Journal of American Studies* 28, no. 2 (1994): 149–67, esp. 151, 157. See also Marshall McLuhan, *The Mechanical Bride: Folklore of Industrial Man* (London: Routledge, 1967).

[19] H. Marshall McLuhan, "Encyclopedic Unities," *Hudson Review* 1 (1948): 599–602.

[20] Marshall McLuhan, *Understanding Media: The Extensions of Man* (London: Routledge Classics, 2001), 165. This text was originally published in 1964.

[21] Marshall McLuhan, *The Mechanical Bride: The Folklore of Industrial Man* (New York: Vanguard Press, 1951), 53.

[22] Neil MacGregor, *A History of the World in 100 Objects* (London: Penguin, 2010), 30.

[23] Eugene S. Ferguson, "The Mind's Eye: Nonverbal Thought in Technology," *Science*, n.s., 197, no. 4306 (August 26, 1977), 827–36. Quotation at 835.

[24] "Museum of Modern Art Exhibits Revolutionary Type of Handle Designed to Fit the Hand," New York: Museum of Modern Art, press release for exhibition March 2–May 16, 1948, https://www.moma.org/calendar/exhibitions/3232 [hereafter cited as MoMA press release].

[25] Julian Stair filmed by Paul Craddock for the V&A Research Institute, "International Symposium—Encounters on the Shop Floor: Embodiment and the Knowledge of the Maker," Victoria and Albert Museum, London, June 26–28, 2019.

[26] For instance, "Where Today Meets Tomorrow: General Motors Technical Center," Public Relations Staff (Detroit, MI: General Motors, 1956).

[27] MoMA press release.

[28] Henry Hagert, "Biographical Sketches of 1953 I.D.I. Honors," Industrial Designers' Institute, May 26, 1953, in accession 2181: Thomas Lamb Papers, Manuscripts and Archives Department, Hagley Museum and Library, Wilmington, DE.

[29] Hagley Museum and Library, "Universal Design: Thomas Lamb–The Handle Man," accessed March 11, 2022, https://www.hagley.org/research/digital-exhibits/thomas-lamb-handle-man.

[30] On the Lim-Rest and similar solutions, see Cara Kiernan Fallon, "Walking Cane Style and Medicalized Mobility," in *Making Disability Modern: Design Histories*, ed. Bess Williamson and Elizabeth Guffey (London: Bloomsbury, 2020), 45–60, esp. 52–53.

[31] Allen, "Tom Lamb: The Handle Man," *Industrial Design* 1, no. 1 (1954): n.p.

[32] Allen “Tom Lamb.”

[33] Hagley Museum and Library, accession 2181: Thomas Lamb Papers [hereafter cited as Lamb Papers], finding aid.

[34] Advertisement, “The Exclusive Handle with the ‘Feel Appeal,’” in *Blade* [Cutco newsletter] undated clipping, ca. 1950–1959, Series 1, Subseries B, Box 4, Lamb Papers. For visual evidence of Lamb’s work environment, see Lamb Box 4 Tom Lamb Photographs, undated, Thomas Lamb Papers, 1916–1988 (Accession 2181), Hagley Museum and Library, Wilmington, DE 19807.

[35] E. J. Kahn Jr., “Profiles: Come Let Me Clutch Thee,” *New Yorker*, May 29, 1954, 33.

[36] Rachel Elizabeth Delphia, “Design to Enable the Body: Thomas Lamb’s ‘Wedge-Lock’ Handle, 1941–1962” (master’s thesis, University of Delaware, 2005), 52–53.

[37] Delphia, “Design to Enable the Body,” 52–53.

[38] Allen, “Tom Lamb.” Prototype handles. Thomas Lamb Papers, 1916–1988, Accession 2181, Hagley Museum and Library, Wilmington, DE 19807.

[39] Allen, “Tom Lamb.”

[40] Ferguson, “The Mind’s Eye,” 828.

[41] Ferguson, “The Mind’s Eye,” 828.

[42] Ferguson, “The Mind’s Eye,” 834 cites *Dictionary of American Biography* (New York: Scribner, 1928–36).

[43] Kahn “Profiles,” 33.

[44] Rudolf Arnheim, *Visual Thinking* (Berkeley: University of California Press, 1969), 3, cited by Ferguson, “The Mind’s Eye,” 831.

[45] Ferguson, “The Mind’s Eye,” 834.

[46] Eugene S. Ferguson, *Engineering and the Mind’s Eye* (Cambridge, MA: The MIT Press, 1994), 58.

[47] Ferguson, *Engineering and the Mind’s Eye*, 3–4.

[48] Ferguson, *Engineering and the Mind’s Eye*, 59.

[49] Ferguson, “The Mind’s Eye,” 827.

[50] J. Christopher Jones, “Handles: The Ergonomic Approach,” *Design* 72 (December 1954): 34–38, 36.

[51] Delphia, “Design to Enable,” 67.

[52] See, for instance, 'Lamb Wedge-Lock Handle,' Standard Handle Co. promotional leaflet, cover. Undated. Thomas Lamb Papers, 1916–1988, Accession 2181, Hagley Museum and Library, Wilmington, DE 19807.

[53] Jennifer Frank Tantia, ed., *The Art and Science of Embodied Research Design: Concepts, Methods and Cases* (Abingdon, UK: Routledge, 2021).

[54] Pamela H. Smith, Amy R. W. Meyers, and Harold J. Cook, eds., *Ways of Making and Knowing: The Material Culture of Empirical Knowledge* (Chicago: University of Chicago Press and Bard Graduate Center, 2018).

[55] For example, Sarah Barber and Corinna Peniston-Bird, eds., *History Beyond the Text: A Student's Guide to Approaching Alternative Sources* (London: Routledge, 2009).

[56] Grace Lees-Maffei, "The Production-Consumption-Mediation Paradigm," *Journal of Design History* 22, no. 4 (2009): 351–76, esp. 366–67.

[57] Jeffrey L. Meikle, "Writing About Stuff: The Peril and Promise of Design History and Criticism," in *Writing Design: Words and Objects*, ed. Grace Lees-Maffei (London: Berg, 2012), 23–32. Quotations at 23.

[58] Ferguson, "The Mind's Eye," 835.

[59] Ralph Caplan, "I.D. Magazine, 1954–2009," AIGA, January 5, 2010, https://web.archive.org/web/20210205104618/https://www.aiga.org/i-d-magazine-1954–2009.

[60] Thomas Lamb, "The Story of the Lamb Lim-Rest," 10–12, Lamb papers.

[61] Business Papers, 1916–1996, Box 2; Wedge-lock Handle, Box 4; Crutch—Technical article and correspondence with the New York State Department of Health, March 9–April 13, 1950; Handle sketches—pots and pans, April 1, 1945-December 16, 1947, Box OS 5; Hands and Handles, June 4, 1945–June 23, 1963, Box OS 7; Baggage, Luggage, and Carrier Handles, Box 17; Series II: Artifacts—Baggage, etc., Box 17A, Lamb papers.

[62] Delphia, "Design to Enable," 57–58. It is not clear whether Delphia is reporting on her own "hands-on experience" and whether she is "the user" mentioned. Arguably, embodied research necessitates a first-person register, because otherwise the researcher risks normatively extrapolating from her own experiences the generalized potential experiences of others. Critics of Lamb's approach might claim that he did this in design, too. Nevertheless, the editors of this volume have requested that this chapter report on archival research in the third person.

[63] Delphia, "Design to Enable," 99.

[64] Beiyuan Guo, Linzhi Tian, and Weining Fang, "Effects of Operation Type and Handle Shape of the Driver Controllers of High-speed Train on the Drivers' Comfort," *International Journal of Industrial Ergonomics* 58 (2017): 1–11.

[65] Delphia, "Design to Enable," 29.

[66] "Foreword" in "The Story of the Lamb Handle," September 8, 1954, 9, Lamb Papers, Series 1, Subseries A, Box 4.

[67] "Editorial Plan," December 12, 1948, Lamb Papers, Series 1, Subseries A, Box 4. Underlining in original.

[68] "Facts Concerning Lamb Handle Cutlery," January 1953, Lamb Papers, Series 1, Subseries A, Box 4.

[69] "The Lamb Handle: A Perfect Mate for Every Hand," in Wear-Ever Aluminium, Inc., Cutco Division, *Blade* 12, no. 12 (March 21, 1960): 2, in Lamb Papers, Series 1, Subseries B, Box 4. Capitalization in the original.

[70] Delphia, "Design to Enable," xii. Delphia's comment echoes that of Kahn, "Profiles," 33. Delphia does not mention that "Come Let Me Clutch Thee" is a quotation from Macbeth's dagger soliloquy in the eponymous play by William Shakespeare (1603–1606).

[71] Hagley Museum and Library, "Universal Design."

[72] Bess Williamson, "Getting a Grip: Disability in American Industrial Design of the Late Twentieth Century," *Winterthur Portfolio* 46, no. 4 (2012): 213–36. Quotation at 214.

[73] Williamson, "Getting a Grip," 217.

[74] Bess Williamson, *Accessible America: A History of Disability and Design* (New York: New York University Press, 2019), 156.

[75] Aimi Hamraie, *Building Access: Universal Design and the Politics of Disability* (Minneapolis: University of Minnesota Press, 2017), 255–61.

[76] Williamson, "Getting a Grip," 218.

[77] Hamraie, *Building Access*, 19–39.

[78] Caroline Criado-Perez, *Invisible Women: Exposing Data Bias in a World Designed for Men* (London: Chatto & Windus, 2019), 157.

[79] Criado-Perez, *Invisible Women*, 161.

[80] Aaron M. Yoder, Ann M. Adams, and Elizabeth A. Brensinger, "Designing Agricultural Tools and Equipment for Women," poster for the Women in Agriculture Educators National

Conference, Indianapolis, IN, April 3–4, 2014, https://agrisk.umn.edu/Conferences/Presentation/designing_agricultural_tools_and_equipment_f o cited in Criado-Perez, *Invisible Women*, 121.

[81] Criado-Perez, *Invisible Women*, 121–22, cites Wendy Davis, ex-director of the U.K. organization, the Women's Design Service (1987–2012), and the New York Committee for Occupational Safety and Health (NYCOSH), "Risks Facing Women in Construction," September 2014, https://nycosh.org/wp-content/uploads/2014/09/Women-in-Construction-final-11-8-13-2.pdf.

[82] Urška Puh, "Age-Related and Sex-Related Differences in Hand and Pinch Grip Strength in Adults," *International Journal of Rehabilitation Research* 33, no. 1 (2010): 4–11; Kerith K. Zellers and M. Susan Hallbeck, "The Effects of Gender, Wrist and Forearm Position on Maximum Isometric Power Grasp Force, Wrist Force, and Their Interactions," *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 39, no. 10 (1995): 543–47.

[83] D. Leyk, W. Gorges, D. Ridder, et al., "Hand-grip Strength of Young Men, Women and Highly Trained Female Athletes," *European Journal of Applied Physiology* 99 (2007): 415–21.

[84] For instance, on the craftwork of leisured upper-class Englishwomen as what she calls "ladies' work" see Constance Classen, "Feminine Tactics: Crafting an Alternative Aesthetics in the Eighteenth and Nineteenth Centuries" in *The Book of Touch*, ed. Constance Classen (Abingdon, UK: Routledge, 2005), 228–39.