De-scribing Design: Appropriating Script Analysis to Design History
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The designer of the gun had clearly not been instructed to beat about the bush. "Make it evil," he'd been told. "Make it totally clear that this gun has a right end and a wrong end. Make it totally clear to anyone standing at the wrong end that things are going badly for them. If that means sticking all sorts of spikes and prongs and blackened bits all over it then so be it. This is not a gun for hanging over the fireplace or sticking in the umbrella stand, it is a gun for going out and making people miserable with." [1]

Staring down the barrel of the Kill-O-Zap gun, Douglas Adams's galactic hitchhiker offers an excellent introduction to understanding what a product's "script" is—as well as why it should interest design historians.

Introduction

Over the last decade or so, there has been considerable interest in design studies within the theoretical framework and methodological concepts developed in the field of science and technology studies (STS). The dispersion and influence that STS theory enjoys in a wide range of disciplines and fields of study recently led Steve Woolgar to ask: "Has STS… settled down and moved out to the suburbs?" [2] His answer is that popularity *may* come at a high price, but that the spread of STS also is a potential source for reaffirming and even renovating its integrity and ability to provoke. So not only can STS invigorate design studies, but design studies—as one of the "new audiences" Woolgar requests—might even return the favor by supplying new testing grounds for STS's further development.

For some time now, design scholars have begun this work by exploring some of the major theoretical contributions from STS, such as the social construction of technology (SCOT), actor-network theory (ANT), and script analysis. However, while STS theory is making its mark on design *studies,* [3] it is little discussed within design *history*—with the partial exception of SCOT, which has inspired some very interesting design historical research. [4] The lack of discussion of the STS concepts' application to history is important because direct

methodology transfer between the social sciences and the humanities can be rather problematic. Historians and sociologists have long since had a rather ambivalent relationship, and the former have often, and with good reason, been sceptical of the latter's ever new social theories and their value to historical research. Nevertheless, many historians have overcome their reluctance and written excellent histories, heavily influenced by social science, and the two domains might seem to adjoin each other more and more.[5]

This article will explore one of STS's most powerful and invigorating methodological concepts, script analysis, focusing particularly on how it can be appropriated from the sociology of technology to the history of design. While there have been some more or less sporadic references to script analysis in design studies in recent years, the concept rarely has been explored at length by design scholars. Furthermore, the opportunities and challenges script analysis might pose more specifically to historical studies of design seem to be largely uncharted waters.

Writing Scripts: Script Analysis and Design History
Although its "parent" concept actor-network theory probably would be best considered a conceptual framework if introduced to design history, the affiliated notion of a product script could be more of a methodological tool. ANT is concerned with how artifacts, or nonhumans (as well as human actors), act as mediators, transforming meaning as they form and move through networks. Some of the most articulate and provocative formulations of ANT can be found in the work of Bruno Latour.[6] Within this framework, the idea of product script has been developed as an effort to facilitate closer analysis of how products transport and transform meaning. The concept was coined by Madeleine Akrich, and much of its allure stems from the term's metaphoric character and etymological versatility.[7]

Akrich uses the term "script" as a metaphor for the "instruction manual" she claims is inscribed in an artifact. Any artifact contains a "message" (the script) from the producer/designer to the user describing the product's intended use and meaning. Product scripts thus seem to resemble the "affordances" developed by the psychologist James Gibson in his work on perception,[8] which were appropriated by Donald Norman,[9] but the script concept is more comprehensive. Douglas Adams's vivid science fiction account of the Kill-O-Zap gun is an exemplary case in point, but the principle applies to more mundane products as well. As Akrich explains in her own, somewhat less sanguine, idiom:

> Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science and economy will evolve in particular ways. A large part

> of the work of innovators is that of "*inscribing*" this vision of (or prediction about) the world in the technical content of the new object. I will call the end product of this work a "script" or a "scenario." [10]

However, the inscription of meaning in an artifact is not limited to its "technical content"—which is Akrich's main interest—but is equally the case regarding its design in general.

Introducing script analysis to design history can be seen as formalizing an already existing mode of thought. Philippa Goodall observed back in 1983 that "design *for* use is design *of* use"—which is a more general way of expressing one of the central tenets of the script concept.[11] Script analysis thus can be a highly valuable tool in the quest for better understanding of how a product's utilitarian functions, aesthetic expressions, social meanings, and cultural identities are constructed.

The materialization of the designer's more or less informed presumptions/visions/predictions about the relations between the artifact and the human actors surrounding it becomes an effort at ordaining the users' understanding of the product's use and meaning.[12] However, there always is the chance that the actors decide not to play the role ascribed to them by the designers, and also that the users misunderstand, ignore, discard, or reject the "instruction manual" and define their roles and the product's use and meaning at odds with the producer's/designer's intentions as conveyed through the script. The script thus is a key to understanding how producers/ designers, products, and users negotiate and construct a sphere of action and meaning.

It is precisely this attention to what goes on between the sphere of production and the sphere of consumption and use that is so intriguing and promising about script analysis. The tendency to focus either on the sphere of production or the sphere of consumption has been criticized both in the history of technology and design history, and requests have been made for approaches that can bridge the two.[13] We should seek to constantly move between designer and user, between the designer's imagined user and the real user (as well as represented users),[14] between intention and interpretation, and between what is written into an artifact (inscription) and how it is read (subscription/de-inscription).[15] In short, mediation and translation should be core concerns; and script analysis can be an appropriate methodological tool in such an approach.

The concept is based on a series of metaphoric, analogical, and etymological modifications of the script theme. The relations to semiotics soon become clear, and because semiotics, due to its embedment in linguistics, has been accused of reducing everything to text and thus being ill-equipped to deal with materiality,[16] Akrich and Latour declare that "semiotics is not limited to signs: the key aspect of the semiotics of machines is its ability to move from signs to

things and back." [17] Providing a guide to understanding this system, Akrich and Latour have come up with a vocabulary that explains various connoted terms and how they fit in a script analysis. Some of its most central terms merit a closer look:

> **Script, description, inscription, or transcription:** The aim of the academic written analysis of a setting is to put on paper the text of what the various actors in the settings are doing to one another. The de-scription, usually by the analyst, is the opposite movement of the in-scription by the engineer, inventor, manufacturer, or designer.
> **Prescription; proscription; affordances, allowances:** What a device allows or forbids from the actors—human and nonhuman—that it anticipates.
> **Subscription or the opposite, de-inscription:** The reaction of the anticipated actors—human and nonhuman—to what is prescribed or proscribed to them. According to their own anti-programs, they either underwrite it or try to extract themselves out of it or they adjust their behavior or the setting through some negotiations.
> **Re-inscription:** The same thing as inscription, but seen as a movement; as a feedback mechanism.[18]

By thinking along the lines suggested here, we are given a tool that connects some of the many and disparate aspects of the complex field of study that comprises design history. Introducing this methodological vocabulary also might make it easier to locate and analyze the intricate relations that make up "the seamless web of sociodesign." [19]

Analyzing Scripts: De-scribing Design

A feature of the script concept that is not discussed in Akrich and Latour's vocabulary, but that may clarify it, is the suggested distinction between a "physical script" and a "socio-technical script." [20] The physical script is embedded in the artifact's physical form, and consists of those properties of the product's physical form and interface that (or at least try to) tell the user about its intended use. It is this (not always particularly successful) phenomenon, understood as intrinsic constraints and affordances that Donald Norman discusses in his 1988 book *The Psychology of Everyday Things*.[21] Although Norman, in a more recent book, takes on the emotional aspects of design,[22] here he is concerned almost exclusively with products' utilitarian functions. He thus can be said to be in line with the notion of a physical script, but does not relate to the idea of a socio-technical script. To a large extent, the same also can be said about Ian Hutchby, who has discussed the concept of affordances as a "remedy" for the relativism he finds in a radical social constitutionalist view of the nature of technology and artifacts. And like Norman, Hutchby has

borrowed the concept of affordances from Gibson.[23] In addition to Norman, Tom Fisher has explored the potential of Gibsonian affordances to design studies. Seen in light of Akrich's idea of the script, Fisher makes the important observation that "affordances cannot simply be 'built into' or 'read out of' artifacts, but are discovered by users through interaction with them."[24] Still, although he claims that "[o]ur exploration of the affordances of the material world resolves the objective and cultural aspects of our relationship to materials,"[25] Fisher's take on affordances is profoundly linked to the physical object and its (perceived) material properties; and thus is less dynamic and versatile than Akrich's notion of the (physical and socio-technical) script.

The socio-technical script has more to do with the transportation and transformation of a product's symbolic, emotional, social, and cultural meanings. This also is partly related to the artifact's physical, formal, aesthetic qualities, but the socio-technical script includes much more than the artifact itself. It involves all kinds of communication that surrounds and accompanies the product, such as the manufacturer's image, brand identity, market position, product reputation, user feedback, subcultural appropriation of the product, and—probably the most explicit expression of the socio-technical script—marketing, advertising, and general media coverage.

It is important, however, that this specification, or distinction between the two aspects of the script is not misread as a simplistic dualism. That would make the concept fall prey to the same kind of criticism Barry Katz has waged against Peter-Paul Verbeek's discernment between a product's "material utility" and its "social-cultural utility." Katz discredits this as "the old dichotomy between *engineered function* and *designed meaning*" reminding us that "[t]echnology, too, is laden with referential signification, just as it is unwise to presume that aesthetic categories have no function."[26] This clarification recalls the observation by Mihaly Csikszentmihalyi and Eugene Rochberg-Halton that "it is extremely difficult to disentangle the use-related function from the symbolic meanings in even the most practical objects."[27] This entanglement of the symbolic and the utilitarian is surely reciprocal, making their assertion equally valid vice versa. Akrich is acutely aware of the problems caused by the momentum of etymological and ontological conventions, and stresses that "the links that concern us are necessarily *both* technical and social."[28] Thus the distinction between physical script and socio-technical script should not be understood as a conceptual dichotomy, but as one possible—and often rewarding—way of nuancing our conception of how things act, communicate, and transform meaning. In real life—and hence in empirical case studies—the physical script and the socio-technical script will be entangled and reciprocal.[29]

Marit Hubak has made use of script analysis in her study of how the identities of certain car makes and models were sought, constructed, and conveyed through newspaper advertisements.

She defines the socio-technical script as: "*ideas* about or views of users and attitudes and values connected to cars and motoring. Thus marketing is part of the socio-technical script, which is built on the physical script." [30] According to Hubak, marketing contains both types of communication, of which one is direct and one indirect. The physical script is seeking to exercise direct influence over users, since it is promoting the product's physical properties and utilitarian function. The socio-technical script, on the other hand, is seeking to exercise influence by way of indirect attraction. This attraction can be more or less related to utilitarian, symbolic, and emotional arguments.[31]

Although advertising and marketing are important components of an artifact's socio-technical script, it should be stressed that these aspects do not equal the socio-technical script. The world abounds with products that are no longer manufactured or marketed. Of course, no one knows this better than design historians, since normally it is among this inexhaustible, motley crew of material culture that we find the artifacts making up our subject matter and sources. These products nevertheless have socio-technical scripts, although they are likely to have changed since first inscribed by manufacturers, designers, and marketers. Sticking to cars, a case in point might be the Citroën 2CV launched in 1948. Designed by Pierre Boulanger, Henri Lefèvre, Flaminio Bertoni, and Jean Muraret from the late-1930s, this highly unconventional and very popular little car remained in production until 1990. The 2CV was intended as a people's car, with the notorious design specifications demanding it be "capable of transporting four people, or two farmers with … a bag of potatoes… across a ploughed field, without breaking the eggs they carried with them in a basket." [32] Looking at advertisements from the 1960s and 1970s, the farmer is absent, but the script is still geared towards the conventional car consumer, represented for example by the happy nuclear family on a camping trip. In stark contrast to these inscriptions by manufacturers, designers and marketers, the 2CV became, as we all know, a paramount icon of just about everything opposed to mainstream car culture.

This effectively demonstrates the many elements of uncertainty pertaining to the process of inscription, as well as the power of the users. In the case of the 2CV, it was the users and their constellations of subcultures who transformed the script over time. Manufacturers, designers, and marketers can react to such subcultural transformation of meaning in different ways. Peter Stanfield has shown how Harley-Davidson has appropriated the historic use—real, represented and fictitious—of its motorcycles in its product development: "Harley-Davidson… has literally *inscribed* the past within the design of its machines." [my italics] [33]

An owner, user or consumer participates in the formation and transformation of an artifact's meaning and identity. It follows that a product should not be regarded as finished when it leaves the factory

and is introduced into the market. As Latour put it: "The fate of facts and machines is in later users' hands." [34] This is where script analysis can help bridge the gap between the sphere of production and the sphere of consumption: by moving from studying how scripts are constructed and promoted by manufacturers, designers and marketers (inscribed) to how they are read and interpreted by users. Those reading a script can choose to—completely or partially—accept (subscribe) or reject (de-inscribe) it. Or, in cases of "illiteracy" (or poorly written scripts), the script might be misunderstood or not even detected. As described in the opening quote by Douglas Adams, Ford Prefect most decidedly both understood and subscribed to the menace inscribed in the Kill-O-Zap gun by its designer.

Users thus form their own interpretations of scripts. But as long as the ways in and circumstances under which the product is used, and the meanings formed by/around/ through it do not differ too much from those envisioned by the manufacturer/designer/ marketer, script analysis will be an important instrument in understanding the interaction between product and user. [35] The concept is particularly enticing because it brings the artifacts we study alive, and does so irrespective of whether we approach them from the sphere of production or the sphere of consumption/use. By allowing us to trace the transformations through the object as it moves between different actors and arenas, it also can help to undermine the "Great Wall" that seems to have been erected between the two spheres. [36]

Reading and Re-writing Scripts: Domesticating Design

Both ANT and script analysis aim at moving back and forth between the sphere of production and the sphere of consumption/use in order to understand the coproduction of meaning. Still, at least in historical studies, much due to pragmatic limitations in resources and research methods as well as the availability of empirical evidence, users often remain "projected" users or "represented" users. The social sciences have been at the forefront of consumption studies, and might be a valuable source of inspiration. To historians, however, studying use and consumption poses many methodological challenges rendering direct methodology transfer difficult.

Traditionally, consumption has been regarded as a passive function in which the consumer conforms and adapts to directives issued by the producer. Newer research attributes both greater competencies as well as responsibilities to the consumer/user. [37] Consumer/users play active roles in forming their lives through the adaptation to and creative manipulation of objects, meanings, and social systems according to their needs, desires, and abilities. This reciprocal relationship between people and things is what Roger Silverstone et al. characterize as a process of "domestication." [38] The metaphoric term "domestication" is used to describe how we "tame"

technology and artifacts. An essential point is that the taming process is characterized by *mutual* change and adaptation. As Knut Sørensen puts it: "Domestication … has wider implications than a socialization of technology: it is a coproduction of the social and the technical."[39] Explaining the metaphor, Silverstone asks: "Wild animals then, wild technologies now: what's the difference?" The point is that "[d]omestication … leaves nothing as it is."[40] Even common animal domestication processes, such as housetraining a puppy, is a question of give and take. Yes, the dog is coaxed or scared into adapting to the owner's rules of conduct, but the owner also has to adapt to the dog's requirements for exercise and nutrition. Much the same can be said of the relation between products/technologies and their users. Users modify their artifacts so that they suit their needs and desires in the best possible way but, at the same time, they and their behavior, feelings, and attitudes are transformed by the products. Artifacts are adapted to patterns of use, but they also create new patterns of use. Such transformations take place in the emotional and symbolic domains as well. Symbolic codes of various kinds are converted into something personal, and associated with questions of identity, emotions, and social relations. Domestication is the utilitarian and emotional adaptation to, and appropriation of, artifacts.[41]

The concept of domestication can be seen as complementing Akrich's script metaphor. This combination could have great potential for design history in analyzing the relation between intention and understanding in the design and use of products.[42] This is precisely in line with Sørensen's recommendation "to study domestication as a negotiated space of designers' views and users' needs and interests."[43] Is the artifact being understood and used as intended and inscribed? What is it about the script that ensures this? And what happens if the domestication process takes an unforeseen direction—in other words, when users do not subscribe? Normally, though, some kind of intermediate position arises, in which parts of the script are subscribed to and other parts rejected or misunderstood (de-inscribed), and a process of negotiation commences during which both product and user are adapted and transformed until a satisfactory degree of domestication is achieved.

An intriguing illustration of a most mundane example of this phenomenon can be found in a passage from Nicholson Baker's little novel *The Mezzanine*—a tribute to the hoards of unsung innovations in commonplace design and technology that tend to elude everyday consciousness, but nonetheless profoundly affect people's lives. Howie, the book's protagonist ponders why the toilet seats in his office bathroom are horseshoe-shaped as opposed to the complete ovals of those found in his and most other home bathrooms:

> I suppose the gap lessens the problems of low-energy drops
> of urine falling on the seat when some scofflaw thought-
> lessly goes standing up without first lifting the seat. There

may be several other reasons for the horseshoe shape, having to do with accessibility, I'm not sure. But I am pleased that someone gave this subject thought, adopting what his company manufactured to deal with the realities of human behavior.[44]

What Howie in fact is suggesting here is how the horseshoe-shaped toilet seats in corporate bathrooms are the result of a redesign informed by the non-compliance (de-inscription) with some of the basic properties of the original, complete oval design by its users. And like Baker's protagonist, I take pleasure in the fact that someone has at least made an effort to respond to this most unpleasant instance of users' domestication of an artifact by redesigning it by factoring in undesired as well as desired use. Whether or not is has solved the problem or even can be considered a good attempt at doing so, is another question.

In keeping with the Citroën 2CV example above, the domestication of three other highly popular "people's cars" of the post-war era neatly illustrate how use and users matter; and how the domestication of a product can be fed back into design and product development. The archetype of the "people's car" is of course the Volkswagen Beetle (1938/1946), designed by Ferdinand Porsche and Erwin Komenda. The huge success of this product led other car manufacturers to develop equivalent concepts. Among the more successful were the 1957 Fiat 500, designed by Dante Giacosa, and the 1959 BMC Mini, designed by Alec Issigonis. All originally were developed as quintessential economic and pragmatic "people's cars." These scripts were, at least initially, largely subscribed to, but the cars underwent quite drastic domestication processes later in their long production lives during which the products took on new meanings and identities (e.g., Beetle, the hippie car; and Mini, the rally car).[45] Various aspects of these negotiated understandings that differed quite radically from the original scripts were then fed back as re-inscriptions into the design of the 1998 VW New Beetle, designed by J. Mays and Freeman Thomas, the 2001 BMW New Mini, and the 2007 Fiat Nuova 500—both designed by Frank Stephenson. Of course, these new cars have little or nothing in common with the originals, except for stylistic resemblances. They aspire to be trend icons, not "people's cars." [46] In short, the varying subscriptions and de-inscriptions of product scripts—their domestication—can result in re-inscription in new designs.

Like with script analysis, traces of the basic principles of domestication can be found in earlier design history literature. This is not to say that domestication brings nothing new to the table: only that design historians have long been aware of the fact that the meanings and forms of products are transformed through use. An early example, albeit from architectural history, is Philippe Boudon's

1972 study of how the inhabitants of Le Corbusier's row houses at Pessac near Bordeaux built in the 1920s radically transformed their homes.[47] As John Walker later wrote, citing Boudon's book; "[T]he issue is not only what design does to people, but what people do with design."[48]

Another good example can be found in a 1981 article by Tony Fry:

> [V]arious sub-cultures have appropriated the motorbike in order to convert it to an icon of antagonism towards the dominant culture. In technical and visual modification they have redesigned the appearance of the machines to alter their meaning in order to construct significations of opposition amongst an ensemble of such significations.[49]

Fry's example involves a very particular kind of user and a very physical transformation of the products in question—but there is nothing to indicate that the principle should not also apply to mainstream users of more mundane products and transformation less dependent on mechanical knowledge and tool equipment. Admittedly, he does not use the term "domestication," but writes about a process of appropriation involving conversion, modification, alteration, and construction. As it happens, "appropriation" and "conversion" are the first and last—enclosing "objectification" and "incorporation"—of the four stages Silverstone et al. identified in the process of domestication.[50]

Although the ideas behind the concept of domestication thus clearly should appeal to design historians, I have only come across one explicit reference in the design history literature to the article in which Silverstone et al. coined the term. In an article on the cultural transformations of the iconic "super-elliptical table" designed by Piet Hein and Bruno Mathsson, and manufactured by Fritz Hansen from 1968, Gertrud Øllgaard stated that:

> Processes of appropriation have been studied in recent analyses of practices of consumption which stress how consumers re-contextualize commodities by integrating them in their own worlds. These processes leave neither the significance of the object nor the social life and cultural identity of the consumer unaffected…. Processes of appropriation can include elements of objectification, incorporation, and finally conversion of the created into new regimes of value and new processes of objectification.[51]

Why she insists on omitting the term "domestication" altogether, and seems to replace it with "appropriation"—a term Silverstone et al. use as one of four stages in the process of domestication—is somewhat bewildering,[52] but her very introduction of the concept in a design history context is interesting.[53]

Conclusion

As script analysis stems from STS, it originally operates with a rather engineering-like notion of design as something pertaining to an artifact's "technical content." But to those more interested in sociodesign than in sociotechnology, this understanding seems unnecessarily narrow. In fact, as I hope to have shown in this article, the inscription of meaning in an artifact is by no means limited to its "technical content," but is equally the case regarding its design in general. Script analysis can be a highly valuable tool in the quest for a better understanding of how a product's utilitarian functions, aesthetic expressions, social meanings, and cultural identities are constructed. Thus, I would argue that, by appropriating script analysis, design history does not only gain methodological strength, but also may contribute to the improvement of the concept itself by expanding the conception of design that goes into the theoretical basis of script analysis.

As most methodological concepts, script analysis has its limitations. Here, the most apparent restriction pertains to the level of analysis. An extensive use of detailed script analysis seems to be best suited to rather neatly delimited case studies and micro histories. Nevertheless, it may be of value in studies of a broader scope as well, by informing our thinking in general of how products transport and transform meaning.

On a more general level, script analysis calls attention to what goes on between the sphere of production and the sphere of consumption and use. Such a perspective fits well with the increased focus on mediation and translation in recent design history. One great advantage of script analysis to design history in this respect is that it brings the artifacts we study alive and highlights their roles in the processes of mediation and translation— irrespective of whether we approach them from the sphere of production / design or the sphere of consumption / use.

The affiliated concept of domestication is a methodological tool devised to analyze how users turn commodities into functional things, meaningful objects, and expressive symbols. One of its most attractive qualities is that it follows the artifacts way past the purchase phase, and thus facilitates studies not only of consumption but also of use. This feature alone should reveal its potential value to design history. It is, however, a sociological concept, and as such not necessarily easy to apply to historical studies. Like most concepts from the social sciences, both script analysis and domestication were developed from studying contemporary situations, where use can be analyzed *in situ* and in real time. Historians are not that fortunate. In a critique of the recent vogue of consumption studies and its influence on design history, Jeffrey Meikle claimed that "We have no way of knowing with certainty how and why consumers at a given

historical moment responded to particular products." [54] Paul Betts likewise observed that studying "how [consumers] understand and use [products] … effectively represents a sobering epistemological limit for all historians of material culture." [55]

I believe Meikle and Betts are mostly right, but I still think it is possible to achieve some understanding of how users matter in design history. Getting at the real users *in situ,* (e.g., by means of ethnomethodology), rarely will be the solution. Rather, empirical studies of historical use and consumption probably are better conducted by going after the imagined users or the represented users.[56] One way of doing this is by focusing on the arenas and actors of mediation, translation, and transformation discussed in this article.

1   Douglas Adams, *The Restaurant at the End of the Universe: The Hitchhiker's Guide to the Galaxy 2* (London: Pan Books, 1980), 134.

2   Steve Woolgar, "What Happened to Provocation in Science and Technology Studies?" *History and Technology* 20:4 (2004): 340.

3   For instance, a group of STS scholars put together a 2004 special issue of *Design Issues* on STS and design studies that contains valuable perspectives on the social complexity of the design process: Edward Woodhouse and Jason W. Patton, "Design by Society: Science and Technology Studies and the Social Shaping of Design," *Design Issues* 20:3 (2004): 1–12. See also, for example, Jack Ingram, Elizabeth Shove, and Matthew Watson, "Products and Practices: Selected Concepts from Science and Technology Studies and from Social Theories of Consumption and Practice," *Design Issues* 23:2 (2007): 3–16.

4   See Louise Purbrick, "The Dream Machine: Charles Babbage and His Imaginary Computers," *Journal of Design History* 6:1 (1991): 9–23; O. A. van Nierop, A. C. M. Blankendaal, and C. J. Overbeeke, "The Evolution of the Bicycle: A Dynamic Systems Approach," *Journal of Design History* 10:3 (1997): 253–267; Paul Atkinson, "The (In) Difference Engine—Explaining the Disappearance of Diversity in the Design of the Personal Computer," *Journal of Design History* 13:1 (2000): 59–72; Arwen P. Mohun, "Designed for Thrills and Safety: Amusement Parks and the Commodification of Risk, 1880–1929," *Journal of Design History* 14:4 (2001): 291–306; Douglas N. Lantry, "Dress for Egress: The Smithsonian National Air and Space Museum's Apollo Spacesuit Collection," *Journal of Design History* 14:4 (2001): 343–359; Paul Atkinson, "Man in a Briefcase: The Social Construction of the Laptop Computer and the Emergence of a Type Form," *Journal of Design History* 18:2 (2005): 191–205; and Paul Atkinson, "The Best Laid Plans of Mice and Men: The Computer Mouse in the History of Computing," *Design Issues* 23:3 (2007): 46–61. The potential of SCOT to design history also is mentioned in Raimonda Riccini, "Innovation as a Field of Historical Knowledge for Industrial Design," *Design Issues* 17:4 (2001): 30 and Raimonda Riccini, "History from Things: Notes on the History of Industrial Design," *Design Issues* 14:3 (1998): 54.

5   For a good example of this mutual influence of history and sociology, see: *Beyond the Cultural Turn—New Directions in the Study of Society and Culture,* Victoria E. Bonnell and Lynn Hunt, eds. (Berkeley: University of California Press, 1999).

6   His take on ANT was first laid out in Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987). He reassessed the concept in Bruno Latour, "On recalling ANT" in *Actor Network Theory and After,* John Law and John Hassard, eds. (Oxford: Blackwell, 1999), 15–25; and recently revised it in Bruno Latour, *Reassembling the Social—An Introduction to Actor-Network Theory* (Oxford: Oxford University Press, 2005).

7   Madeleine Akrich, "The De-scription of Technological Objects" in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* Wiebe E. Bijker and John Law, eds. (Cambridge, MA: MIT Press, 1992), 205–224.

8   James. J. Gibson, "The Theory of Affordances" in *Perceiving, Acting, and Knowing,* Robert E. Shaw and John Bransford, eds. (Hillsdale, NJ: Erlbaum, 1977), 67–82; and James J. Gibson, *The Ecological Approach to Visual Perception* (Boston: Houghton Mifflin).

9   Donald A. Norman, *The Psychology of Everyday Things* (New York: Basic Books, 1988).

10 Madeleine Akrich, "The De-scription of Technological Objects" in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* 208. It is interesting to note that another contributor to this publication, W. Bernard Carlson, made a somewhat similar point—although perhaps with a less terse conjunction between artifact and meaning than Akrich's script metaphor allows for—when he argued that "inventors invent both artifacts and frames of meanings that guide how they manufacture and market their creations … [I]ndividuals must make assumptions about who will use a technology and the meanings users might assign to it. These assumptions constitute a frame of meaning inventors and entrepreneurs use to guide their efforts at designing, manufacturing, and marketing their technological artifacts." W. Bernard Carlson, "Artifacts and Frames of Meaning: Thomas A. Edison, His Managers, and the Cultural Construction of Motion Pictures" in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* Wiebe E. Bijker and John Law, eds. (Cambridge, MA: MIT Press, 1992), 176–177.

11 Philippa Goodall, "Design and Gender," *Block* 9 (1983): 58.

12 Steve Woolgar, "Configuring the User—The Case of Usability Trials in *A Sociology of Monsters—Essays on Power, Technology and Domination*, John Law, ed. (London: Routledge, 1991), 58–99.

13 Bruno Latour has provided a nice image of the insufficiency of studying only one sphere: "Looking at the mechanism alone is like watching half the court during a tennis game; it appears as so many meaningless moves." Bruno Latour, "Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts" in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* Wiebe E. Bijker and John Law, eds. (Cambridge, MA: MIT Press, 1992), 247.

14 Johan Schot and Adri Albert de la Bruheze, "The Mediated Design of Products, Consumption, and Consumers in the Twentieth Century" in *How Users Matter—The Co-Construction of Users and Technology,* Nelly Oudshoorn and Trevor Pinch, eds. (Cambridge, MA: MIT Press, 2003), 235; and Madeleine Akrich, "User Representations: Practices, Methods and Sociology" in *Managing Technology in Society: The Approach of Constructive Technology Assessment*, Arie Rip, Thomas J. Misa, and Johan Schot, eds. (London: Pinter Publishers, 1995), 167–184.

15 Madeleine Akrich, "The De-scription of Technological Objects" in *Shaping Technology/Building Society: Studies in Sociotechnical Change*, 208.

16 For instance, Mihaly Csikszentmihalyi and Eugene Rochberg-Halton have asserted that "Most accounts of how things signify tend to ignore the active contribution of the thing itself to the meaning process." Mihaly Csikszentmihalyi and Eugene Rochberg-Halton, *The Meaning of Things—Domestic Symbols and the Self* (Cambridge: Cambridge University Press, 1981), 43.

17 Madeleine Akrich and Bruno Latour, "A Summary of a Convenient Vocabulary for the Semiotics of Human and Nonhuman Assemblies" in *Shaping Technology/ Building Society: Studies in Sociotechnical Change,* Wiebe E. Bijker and John Law, eds. (Cambridge, MA: MIT Press, 1992), 259.

18 Ibid., 259–262.

19 Wiebe E. Bijker and John Law, "What Next? Technology, Theory, and Method" in *Shaping Technology/Building Society: Studies in Sociotechnical Change,* 202. Admittedly, Bijker and Law write about "The seamless web of sociotechnology"—a metaphoric phrase by now well-established in the history of technology and STS; coined in the moving away from the traditional distinctions between technical, social, economic, and political aspects of technological development. But this outlook, in my opinion, is equally true of design; hence my paraphrase "The seamless web of sociodesign." The phrase "The seamless web of sociotechnology" often is attributed to Thomas P. Hughes and his seminal work on sociotechnical systems, but to my knowledge he has never used this exact wording. He has, however, written that "the web is seamless," and that he believes "encompassing systems should be labeled sociotechnical systems rather than technological systems.": Thomas P. Hughes, "Edison and Electric Light" in *The Social Shaping of Technology,* Donald MacKenzie and Judy Wajcman, eds. (Maidenhead, Berkshire, UK: Open University Press, 2nd ed.—first published in 1985, 1999), 58; and Thomas P. Hughes, *Networks of Power: Electrification in Western Society, 1880–1930* (Baltimore, MD: Johns Hopkins University Press, 1983), 465. His notion of the seamless web is most explicitly theoretically expressed in Thomas P. Hughes, "The Seamless Web: Technology, Science, Etcetera, Etcetera," *Social Studies of Science* 16:2 (1986), 281–292.

20 Marit Hubak, "The Car as a Cultural Statement" in *Making Technology Our Own?—Domesticating Technology into Everyday Life,* Merete Lie and Knut H. Sørensen, eds. (Oslo: Scandinavian University Press, 1996), 175.

21 Donald A. Norman, *The Psychology of Everyday Things* (New York: Basic Books, 1988). See especially 81–104.

22 Donald A. Norman, *Emotional Design— Why We Love (or Hate) Everyday Things* (New York: Basic Books, 2004).

23 Ian Hutchby, "Technologies, Texts and Affordances," *Sociology* 35:2 (2001): 441–456.

24 Tom H. Fisher, "What We Touch, Touches Us: Materials, Affects, and Affordances," *Design Issues* 20:4 (2004): 26.

25 Ibid., 31.

26 Barry M. Katz, "Intelligent Design," *Technology and Culture* 47:2 (2006): 388. His reference is to Peter-Paul Verbeek, *What Things Do—Philosophical Reflections on Technology, Agency, and Design* (University Park: Pennsylvania State University Press, 2005).

27 Mihaly Csikszentmihalyi and Eugene Rochberg-Halton, *The Meaning of Things—Domestic Symbols and the Self,* 20–21.

28 Madeleine Akrich, "The De-scription of Technological Objects" in *Shaping Technology/Building Society—Studies in Sociotechnical Change,* 206.

29 A classical example is Langdon Winner's study of how the bridges across the Long Island Expressway in the late-1930s allegedly were designed too low for busses to pass underneath them, thus effectively preventing poor people and blacks—who normally used public transport—to reach recreational areas popular among the white middle class. Langdon Winner, "Do Artifacts Have Politics?" in *Daeddalus* 109:1 (1980): 121–136. Both the factual adequacy of Winner's study and his arguments were later criticized, but that is another story. For a discussion, see Steve Woolgar and Geoff Cooper, "Do Artefacts Have Ambivalence? Moses' Bridges, Winner's Bridges and Other Urban Legends in ST&S," *Social Studies of Science* 29:3 (1999): 433–449.

30 Marit Hubak, "The Car as a Cultural Statement" in *Making Technology Our Own?—Domesticating Technology into Everyday Life,* 175.

31 Ibid., 175–176.

32 Penny Sparke, *A Century of Car Design* (London: Mitchell Beazley, 2002), 102–105.

33 Peter Stanfield, "Heritage Design: The Harley-Davidson Motor Company," *Journal of Design History* 5:2 (1992): 154. Despite the wording, and because Stanfield's article was published about the same time as Akrich's first publications on the script concept, he make no reference to her work. However, he is clearly thinking along the same lines.

34 Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987), 259.

35 Madeleine Akrich, "The De-scription of Technological Objects" in *Shaping Technology/Building Society—Studies in Sociotechnical Change,* 216.

36 A useful and inspiring survey of more general strategies for historians aiming to tear down the wall or bridging the gap between the spheres of production and consumption can be found in Sally Clarke, "Consumer Negotiations," *Business and Economic History* 26:1 (1997): 101–122.

37 See Pierre Bourdieu, *Distinction: A Social Critique of the Judgement of Taste* [original published in French, 1979] (London: Routledge & Kegan Paul, 1984); Jean Baudrillard, *The System of Objects* [original published in French, 1968] (London and New York: Verso, 1996); Jean Baudrillard, *The Consumer Society* [original published in French, 1970] (London: Sage, 1998); Jean Baudrillard, *For a Critique of the Political Economy of the Sign* [original published in French,1972] (Townsend, MT: Telos, 1981); Zygmunt Bauman, "Broken Lives—Broken Strategies" in Zygmunt Bauman, *Life in Fragments: Essays in Postmodern Morality* (Oxford, UK and Cambridge, MA: Blackwell, 1995), 72–104; Daniel Miller, *Material Culture and Mass Consumption* (Oxford: Blackwell, 1987); and Daniel Miller, "The Myths of Consumption" in *Acknowledging Consumption,* Daniel Miller, ed. (London: Routledge, 1995), 20–35.

38 Roger Silverstone, Eric Hirch, and David Morley, "Information and Communication Technologies and the Moral Economy of the Household" in *Consuming Technologies. Media and Information in Domestic Spaces,* Roger Silverstone and Eric Hirsch, eds. (London: Routledge, 1992), 15–31. For a survey and critical discussion of the concept, see *Domestication of Media and Technology*, Thomas Berker, Maren Hartmann, Yves Punie, and Katie J. Ward, eds. (Maidenhead, Berkshire, UK: Open University Press, 2006).

39 Knut H. Sørensen, "Domestication: The Enactment of Technology" in *Domestication of Media and Technology,* 46.

40 Roger Silverstone, "Domesticating Domestication: Reflections on the Life of a Concept" in *Domestication of Media and Technology,* 231.

41 Merete Lie and Knut H. Sørensen, "Making Technology Our Own?" in *Making Technology Our Own?—Domesticating Technology into Everyday Life,* Merete Lie and Knut H. Sørensen, eds. (Oslo: Scandinavian University Press, 1996), 8–17.

42 A good example is Ronald Kline and Trevor Pinch's study of how users through their interpretations, modifications, and feedback, influenced early car design: Ronald Kline and Trevor Pinch, "Users as Agents of Technological Change: The Social Construction of the Automobile in the Rural United States," *Technology and Culture* 37:4 (1996): 763–795. Another illustrating example is Christina Lindsay's study of the co-production of an early personal computer in which "[T]he users … begin as somewhat stereotypically gendered representations constructed by the designers of the computer and end by becoming designers, producers, and retailers providing technical support for the technology and taking responsibility for its further development." Christina Lindsay, "From the Shadows: Users as Designers, Producers, Marketers, Distributors, and Technical Support" in *How Users Matter—The Co-Construction of Users and Technology,* Nelly Oudshoorn and Trevor Pinch, eds. (Cambridge, MA: MIT Press, 2003), 30.

43 Knut H. Sørensen, "Domestication: The Enactment of Technology" in *Domestication of Media and Technology,* 46.

44 Nicholson Baker, *The Mezzanine* [1988] (London: Granta, 1998), 74. For a brief account of how this particular work of fiction might stimulate design historians, see Jeffrey L. Meikle, "Material Virtues: On the Ideal and the Real in Design History," *Journal of Design History* 11:3 (1998): 197–199.

45 For an account of the multifaceted domestications or cultural appropriations of the VW Beetle, see Phil Patton, *Bug: The Strange Mutations of the World's Most Famous Automobile* (New York: Simon & Schuster, 2003).

46 J. Mays is now vice president of design for the Ford Motor Company, and is responsible for other "re-launched" cars in addition to the VW New Beetle, such as the 2002 Ford Thunderbird and the 2005 Ford Mustang—both of which draw heavily on the design of their 1950s and 1960s namesakes. This design trend was dubbed "Retrofuturism" and linked explicitly to Mays's name on the occasion of an exhibition of his work at the Geffen Contemporary of the Museum of Contemporary Art in Los Angeles in November 2002: Brooke Hodge and C. Edson Armi, *Retrofuturism— The Car Design of J. Mays* (New York: Universe, 2002). However catchy this label might be, though, Mays have been involved in many car designs that do not fit the bill, such as the 1983 Audi 100, the 1983 VW Golf, and the 1989 BMW 8 series.

47 Philippe Boudon, *Lived-In Architecture—Le Corbusier's Pessac Revisited* (London: Lund Humphries, 1972). Daniel Miller has made a similar point in showing how occupants of British council housing through interior decoration do their best to transform and domesticate a modernist architecture that "never reflected the people who had to live in [the estates]"—most of whom "had an entirely different aesthetic that positively valued ornament": Daniel Miller, "Possessions" in *Home Possessions—Material Culture behind Closed Doors,* Daniel Miller, ed. (Oxford: Berg, 2001), 117.

48 John A. Walker, *Design History and the History of Design* (London: Pluto, 1989), 183.

49 Tony Fry, "Design History: A Debate?" *Block* 5 (1981): 17.

50 Roger Silverstone, Eric Hirch, and David Morley, "Information and Communication Technologies and the Moral Economy of the Household" in *Consuming Technologies. Media and Information in Domestic Spaces,* Roger Silverstone and Eric Hirsch, eds. (London: Routledge, 1992), 15–31.

51 Gertrud Øllgaard, "A Super-Elliptical Moment in the Cultural Form of the Table: A Case Study of a Danish Table," *Journal of Design History* 12:2 (1999): 144. (See notes 4 and 5, 155 for references to Silverstone et al.)

52 It should be mentioned that Silverstone et al. themselves admit that from the "perspective [of anthropology] appropriation stands for the whole process of consumption as well as for that moment at which an object crosses the threshold between the formal and the moral economies.": Roger Silverstone, Eric Hirch, and David Morley, "Information and Communication Technologies and the Moral Economy of the Household" in *Consuming Technologies: Media and Information in Domestic Spaces,* 22.

53 Penny Sparke, in a study of how aluminium kitchen utensils were domesticated in early twentieth century USA, has used the term "domestication" to signify a dynamic process of reciprocal transformation in a manner very close to that indicated by the *concept* domestication as developed by Silverstone et al. However, she makes no mention of the concept and does not refer to any of its literature, and her use of the term thus must be said to be of a more generic kind. Penny Sparke, "Cookware to Cocktail Shakers: The Domestication of Aluminum in the United States, 1900–1939" in *Aluminum by Design,* Sarah Nicols, ed. (Pittsburgh/New York: Carnegie Museum of Art/Abrams, 2000), 112–139.

54 He continues: "How can we know how and why people responded to the products … that surrounded them? How do we know what the results of design mean to the people who negotiate them, often unselfconsciously, in their daily lives?" And, moreover: "These questions are all the more important now that most of us have abandoned a straightforward Frankfurt School-inspired assumption of passive consumers completely at the mercy of manipulative capitalists." Jeffrey L. Meikle, "Material Virtues: On the Ideal and the Real in Design History," *Journal of Design History* 11:3 (1998): 194–195.

55 Paul Betts, *The Authority of Everyday Objects: A Cultural History of West German Industrial Design* (Berkeley: University of California Press, 2004), 19.

56 A good example can be found in a recent cultural history of the Piaggio Vespa scooter in which the users are eminently present (e.g., through the owner's clubs). From a design and domestication perspective, it is particularly interesting the way in which the intricate relationship and communication between the users/clubs and the manufacturer is analyzed. Thomas Brandt, *Frie hjerter og små motorer: Kulturell produksjon, formidling og bruk av den italienske Vespa-scooteren, 1946–1969* (Doctoral dissertation, Trondheim: Norwegian University of Science and Technology, 2006).