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A Selection of Sociologies: *The Sociology of work**

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This paper will examine the role of the social in design practice. In aid of understanding and enacting that role, it will examine the kinds of sociology that could be involved in design practice and education. Topics considered include the fundamentally social and cultural nature of design, and the of design to the sociologies of work, science and technology, organisations, education, and culture.

INTRODUCTION AND DISCLAIMERS

THE ORIGINS of this paper may be found for the most part within my years of teaching design students as a sociologist within design programs, initially architecture and later industrial design. Less often, design students would turn up in sociology courses, and it is to one of those students that I dedicate this document. He was enrolled in Industrial Sociology, and after a fairly conventional 'labour process' lecture emphasising the perils and evils of production-line work, he approached me and said, 'Is that what I am designing?' My answer at the time was not memorable, to him or to me; but I have not forgotten the question and it has led me to spend a lot of time casting a sociological eye on the nature of design. This conference is a wonderful chance to take the results on the road, as it were. There will be a lot of citations herein, but I must admit that there is much here that comes from my own observations and conversations. Along with thanking the organisers of this conference, I must thank that student, and many other students and colleagues for their patience with me over the years.

As well, I must acknowledge that I am presenting the tips of a number of intellectual icebergs, and there are undoubtedly dangers in their depths. As well, there are others that will not even have made it onto this chart. All suggestions for amendments will be gratefully received. The most obvious omission is a section on gender. My concern is that a section devoted to gender issues isolates those issues from the other concerns to which they are related. Even if I don't make it obvious, the gender implications of that of which I speak will, I hope, be easy to read.

THE SOCIAL NATURE OF DESIGN

A basic premise underlying these considerations is that design is a basic human process. That is because it is the way in which people relate to things, and the way in which they do that is crucial. As Sut Jhally [1] puts it:

> The relationship between people and their things should not be considered a superficial or optional feature of life. It is in fact a definitional component of human existence. All societies are based upon the use of nature by humans. Humans as a species are only able to survive by the 'appropriation' of the material elements that surround us.

Amos Rapoport [2] defines *design* as follows (emphasis in the original):

> In fact, 'design' as a process, needs to be seen much more broadly than is common: *design is any purposeful change to the physical environment*.

Such a definition resembles a Weberian definition of social behaviour as meaningful behaviour; indeed, one might argue that 'design' so defined is a category of social action. But design is also a process of providing meaning [3]:

> The etymology of *design* goes back to the Latin *de* + *signare* and means making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users, or gods. Based on this original meaning, one could say: design is making sense (of things).

Given these definitions of design, what then do we make of design as an activity? Firstly, it is an activity that is a constant part of everyday life. Indeed, it can be said that everyone is a designer. Jhallys's statement applies not only to some notion of a simple society; to get through a day (and night), one is constantly designing. Examples abound, from the way in which personal space is marked in informal settings to the personalisation of workspaces (as well as to the 'vernacular' planning of work by the worker); from the need to control small objects in a limited environment by seniors to the planning of safe routes (and safe clothing) for the trip home by women and children who have to traverse public spaces.

Secondly, like many other human endeavours, design has become a specialised professional

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activity. As such, it can be compared to other professions—not only to architecture, which is the most obvious, but to the health professions, law, and theology. As such, it involves a special language and body of knowledge; as with other professions, that knowledge monopoly is a matter of contest in the society as well as within the profession. But as it emerges as a professional activity, a specialist design becomes an exercise of power in relation to a number of kinds of people, clients and users in particular. The specific knowledge base of the profession thus reproduces the social forces at play. As Imrie [4] points out:

> . . . clearly, architects, and other design professionals, are implicated in the production of the built environment, of developing aesthetic values propagating specific conceptions of design, and engaging with wider social structures. In this sense, the socio-economic, political and, crucially, ideological relations of architectural theories and practices are of vital importance to explore in order to gain some understanding of how the uneven and unequal spaces of the built environment are developed and perpetuated.

I argue that engineering designers are among the 'other design professionals'. They have a particular significance in that they are often involved in what Dormer [5] calls 'below the line' design:

> 'Below the line' design is the design that the consumer does not see—either because the design is literally out of sight, as in the molecular engineering that produces new synthetic materials, or it refers to the components that make the object work but do not *visibly* add value to the product. 'Below the line' design is usually the most important because it determines how well the object functions . . .

That specialisation is part of a social context 'not only reflected but actively engaged by the qualities of the artefacts' [6, 7]. Brain, citing Latour, describes three senses in which technical artefacts are fundamentally social:

1. They are the products of human effort;
2. they substitute for human action in particular social settings; and
3. they 'shape human actions by imposing prescriptions back on the behaviour of humans engaged by the scenarios they describe' [7].

Thus professional design *inscribes* into the artefacts views and ideas as to what the social setting (including the artefact) is to be; and *prescribes* the behaviours of the people who form that social setting with the designed artefact. Thus, we are left with the question put by Philip Pacey [8]: 'If we are all designers, has the professionalisation of design deskilled or disempowered us?'

The professionalisation of design is part of the process of the separation of mental from manual labour that is part of the complex development of the division of labour and social structure. The design processes that Pacey [8] and Barley [9] describe involves a close relation between designing and making. But as Dym [10] points out, we are more often dealing with situations where designing and making are separate activities carried out by different people. Indeed, that is what separates design from craft. Professional designers design the ways in which things are made or used by other people, often of lesser status. Forty [11] describes Josiah Wedgewood as asking for the design of products to be made by the dumbest possible workers. Deskilling is in itself designed. Cheryl Buckley [12] argues that design activities done by women in the home are not considered to be design, because they are labelled as domestic activities and done by women. The same activities (textile design) done by men are labelled as design. I would argue as well that in the domestic setting, the design and the production are more closely integrated, which also negates the 'professional' label.

More generally, the impact of the division of labour in a complex society is to produce the following notion of design [13]:

1. The possibility of a separation of the maker from someone who is responsible for the 'blueprint' of the artefact.
2. The location of decisions about what is to be produced in the hands of the person who commissions the artefact, usually on the basis of a brief.
3. The possibility of multiple 'runs' of the object for which the designer provides models.
4. A tight relationship between the modelling and the economic function of the object in question.

Particularly, the separation in (1) creates the definition of engineering design cited in Dym [10]:

> Engineering design is the systematic, intelligent generation and evaluation of specifications for artefacts, whose form and function achieve stated objectives and satisfy specified constraints.

Each of these elements implies a set of relationships: (1) between different roles in the social processes of design, and (2) between the incumbents of those roles and the artefacts involved, including the artefacts that are part of the production of design as well as the artefacts that are the ultimate outcome of the design process.

It is the purpose of this paper to explore sociological perspectives that might illuminate these relationships. In so doing, we will look at relationships within the design process, as well as relationships between the design process and processes within the wider society. It is organised around traditional sub-disciplines within sociology. The division of labour and interests within sociology is itself a matter of controversy, but fortunately it is not a controversy that need concern us here.

THE SOCIOLOGY OF WORK

The design of production is part of the establishment of power over work. Latour's description of

the automatic door closer [6] outlines the nature of the 'non-human actor' as a surrogate for organisational control. Indeed, I use that description in teaching the labour process in Introductory and Industrial Sociology. At the level of production line work, the history of mass production is a history of the engineering design of work [11]. At the level of bureaucratic work, the design of offices reflects and reproduces organisational rationality, and constrains the people who work therein, in both physical and symbolic terms [14, 15]. The study of the Sociology of Work is certainly a place where my student's question might be answered. As well, the design of production is in essence a design of the worker as a user of the process. Ellis and Cuff [16] speak of 'architect's people'; I would argue that we need to speak of 'engineer's people' as well. The conceptions of those people, as workers and as users, is part of the professional knowledge base of the designer.

The traditional shop floor ethnographies that were the bases of the sociology of work, returned as the basis of the labour process studies and have now returned again in the place of 'workplace studies' [17]. Two characteristics of these studies are noteworthy in our context:

1. The workplaces involved need not involve a specific place—much of the work in question involves collaboration through computer networks.
2. Much of the work involved might well be termed 'design' in the light of the Dym definition mentioned above.

As Louridas [18] puts it: '. . . design is a distinct human activity, but not so distinct. Design is a more common activity than is usually thought.' Thus design as practised by professionals and within organisations is a form of work like other forms of work, and the same question of control, alienation and the like obtain. Mieksins and Smith [19] provide an examination of these questions in a comparative international perspective.

Design and the sociology of organisations

This section will examine design as a process that occurs within organisations, and as part of the relations between organisations. As well, it will examine organisation as the clients for, the users of, and the context for individual use of the products of design.

The designer's exercise of control over the product of his or her labours is constrained by processes analogous to those in other work situations. Becker [20] has described the situation in terms of the division of labour, and the effects thereof, on artistic production. And it seems clear in his account that the final form that is produced reflects the structure of that division as well as the simple fact of its existence. In the case of the design professions, that division of labour is reflected in technical specialisation within the profession, and to related professions in the design process (e.g. architect to structural or civil engineer [21, 22] as well as in the construction/production process. It is also manifest in a number of 'employment relations' which serve to structure the production of design, although they vary widely in organisational terms. Vaughn [23] describes the organisational process of knowledge generation and design, and the influence of organisational structure on that process.

What distinguishes complex organisations from other forms of social organisation is that they are purposive [24]. Given the purposive nature of design as an activity, the relation of organisational to individual purposes in design becomes an issue. This is true for design organisations, as well as for organisations as the context of use for what has been designed [25]. The use of designed artefacts is part of the organisational process. They are also used as part of the negotiation of individual and organisational purpose, functionally and symbolically [26].

Design and the sociology of science and technology

This section, perhaps more than any of the others will only scratch the surface of the concerns involved. I shall mention two lines of concern; there are many others that must be put aside for another time.

One line of concern is based on the designed artefact as, in Bruno Latour's phrase, as a 'non-human actor' [6]. Latour is concerned with the substitution of the designed artefact for the human actor(s). His particular example is an automatic door closer; it substitutes for both a doorman and for a normative agreement that anyone using the door will close it. With apologies, I would like to extend the notion, examining the way in which the artefact embodies design notions and makes them evident as constraints in the lives of those that use them. Elsewhere, I have written how something as commonplace as stairs embodies a history of design and regulation, and serves to teach persons now about status, ability and other social characteristics [27]. Indeed, I suggest that that the rich body of Henry Petroski's 'product histories' may be usefully interpreted in these terms [28]. Particularly, his history of the pencil is a clear example.

The second line of concern involves an understanding of technology as text along with a parallel understanding of the text as technology. I subscribe to Dym's [10] emphasis on the importance of representation in terms of both design processes and designed artefacts. That said, the technology of that representation has major implications in the workings of the design process. Henderson [29] describes engineering sketches and drawings as the building blocks of engineering design and as the 'social glue' that holds the relationships between individuals and groups. Ferguson [22] describes a similar process. I am particularly taken by Susan Turner's [30] account of the role that plans and maps played in the

negotiation of a site plan between designers and local government officials. In that negotiation the metrics of the plans became the language of the redesign, losing sight of the 'reality' of the site itself.

Cultural considerations

There are two lines of consideration in this section as well. The first involves the products of designs as embodying cultures of engineering, which in their turn embody broader national cultures. As Pffafenberger [31, p. 282] points out:

> The constraints of technique, resources and economics *underdetermine* design outcomes. To account fully for a technical design, one must examine the technical culture, social values, aesthetic ethos, and political agendas of the designers.

Differences in national 'cultures' of product design relate to differing trends in the organisation of design in various cultures. As Rosenberg [32] puts it (emphasis in the original):

> These [British] engineers were imbued with a professional tradition which often led to an obsession with technical perfection in a purely engineering sense, and they imposed their own tastes and idiosyncrasies upon product design. In America, by contrast, the engineer and engineering skills were more effectively subordinated to business discipline and commercial criteria and did not dominate them. The result was to perpetuate, in Great Britain, a preoccupation with purely technical aspects of the final *product* rather than with the productive *process*.

As well, engineers have been the carriers of culture in colonial processes [33].

The second line of cultural inquiry involves the place of the designed artefacts within consumer culture. The direction of this line involves tracing how these artefacts are involved in the processes of consumption. Arguably, going back to the Rapoport definition, consuming is itself constituted by acts of design, but under certain constraints. As Daniel Miller [34] describes, we seek to understand how:

> . . . to discover how people using goods that they did not produce and they experience only as consumers nevertheless struggle to create social and cultural identities.

In so doing, they are attempting to apply their own meanings to physical objects provided to them. Their efforts may be more or less successful, and more or less alienating. Engineering design is involved here in two senses: (1) in the specific processes of artefact and production design, and (2) in the 'below the line' design mentioned earlier. The second sense refers to the extent to which the design of the infrastructure that underlies daily life, forms that daily life. Schivelbusch's accounts of the cultural history of lighting and railroads are rich examples [35]. My own rich encounter comes from enduring the ice storm that devastated eastern Ontario and Quebec a few years ago.

Sociology of education

If one accepts the role of the designer in the processes of cultural reproduction, then one must examine the reproduction of the reproducers. For example, Lindy Biggs [36] notes that the introduction of scientific management was greatly enhanced by a new generation of university trained engineers. They took up the cause, in contrast to the resistance of their shop-floor-trained predecessors. There are a number of lines of inquiry into the education of the designer. They include:

- the particular educational processes in a particular design profession;
- the place of education within the division of labour within a profession;
- the role of the practitioner in education;
- the institutional location of the professional education process, involving the kind of institution involved and the place within the institution;
- the curricula, both explicit and hidden;
- the role of the educational process in the selection of individuals for professional careers.

CONCLUSION

The title of this section is a misnomer, because I regard these remarks as a beginning. The purpose is to begin to answer the question put by Philip Pacey [8] as to the effects of the professionalisation of design, and to suggest the kinds of sociology that might contribute to those answers. Any one of these sections might justify volumes, not to mention the problem of bringing these concerns together. I hope as well that such questions will illuminate the processes of design, and provide insights to the designers (even as they are free to adopt, adapt or resist those insights.) I admit as well to a hortatory purpose—to push for a place for sociological inquiry within the processes of design and design education.

REFERENCES

1. Sut Jhally, *The Codes of Advertising*. London: Routledge (1987).
2. Amos Rapoport, Culture and the urban order, in *The City in Cultural Context*, edited by John Agnew, John Mercer, and David Sopher, London: Allen and Unwin (1984).
3. Klaus Krippendorf, On the essential contexts of artefacts or on the proposition that 'design is making sense (of things)', *Design Issues*, **2** (Spring 1989).

4. Rob Imrie, *Disability and the City: International Perspectives*, New York: St. Martin's Press (1996).
5. Peter Dormer, *The Meanings of Modern Design*, London: Thames and Hudson (1990).
6. Bruno Latour, Mixing humans and nonhumans together: the sociology of the automatic door closer, *Social Problems*, **35**(3), (1988) pp. 298–310.
7. David Brain, Cultural production as 'society in the making': architecture as an exemplar of the social construction of artefacts, in Crane, Diana, ed., *The Sociology of Culture*, Oxford, UK: Blackwell (1994).
8. Philip Pacey, Anyone designing anything? Non-professional designers and the history of design, *Journal of Design History*, **5**(3), (1992) pp. 32–48.
9. Nigel Barley, Design in a tribal context, *Journal of Design History*, **5**(2), (1992) pp. 103–111.
10. C. L. Dym, *Engineering Design: A Synthesis of Views*. New York: Cambridge University Press (1994).
11. Adrian Forty, *Objects of Desire: Design and Society from Wedgwood to IBM*, New York: Pantheon (1986).
12. Cheryl Buckley, Made in patriarchy: toward a feminist analysis of women and design, in Victor Margolin, ed., *Design Discourse*, Chicago: University of Chicago Press (1989).
13. Jerry Palmer, Introduction to Part I, in Jerry Palmer and Mo Dodson, eds., *Design and Aesthetics*, London: Routledge (1996) .
14. Michael Rosen, Wanda J. Orlikowski, and Kim S. Schmahmann, Building buildings and living lives: a critique of bureaucracy, ideology and concrete artefacts, in Gagliardi, Pasquale, ed., *Symbols and Artefacts*, New York: Aldine de Gruyter (1992).
15. Per Olaf Berg, and Kristian Kreiner, Corporate architecture: turning physical settings into symbolic resources, in Gagliardi, Pasquale, ed., *Symbols and Artefacts*, New York: Aldine de Gruyter (1992).
16. Russell Ellis, and Dana Cuff, eds, *Architects' People*, Oxford, UK: Oxford University Press (1989).
17. Paul Luff, Jon Hindmarsh, and Christian Heath, *Workplace Studies: Recovering Work Practice and Informing System Design*, Cambridge: Cambridge University Press (2000).
18. Panigiotis Louridas, Design as Bricolage: anthropology meets design thinking, *Design Studies*, **20** (1999) pp. 517–535.
19. Peter Mieksins, and Chris Smith, *Engineering Labour*, London: Verso (1996).
20. Howard Becker, Art as collective action, *American Sociological Review*, **39**(6) (1974).
21. Dana Cuff, The social production of built form, *Society and Space*, **7** (1989) pp. 433–447.
22. Eugene Ferguson, *Engineering and the Mind's Eye*, Cambridge, MA: MIT Press (1992).
23. Diane Vaughan, The role of organisation in the production of techno-scientific knowledge, *Social Studies of Science*, **29**(6) (1999) pp. 913–43.
24. Charles C. Gordon, Complex organisations and bureaucracy, in Dennis Forcese and Stephen Richer, eds., *Social Issues*, Toronto: Prentice-Hall (1982).
25. Robert J. Thomas, *What Machines Can't Do: Politics and Technology in the Industrial Enterprise*, Berkeley: University of California Press (1994).
26. Antonio Strati, *Organisations and Aesthetics*, London: Sage (1999).
27. Charles C. Gordon, *Pedestrian Practices: built form and the non-human teacher*, Northeast Regional Meeting, Association of Colleges and Schools of Architecture, Buffalo, New York (1996).
28. Henry Petroski, *To Engineer is Human: The Role of Failure in Successful Design*, New York: St. Martin's Press; *The Pencil: A History of Design and Circumstance*, New York: Alfred A. Knopf; *The Evolution of Useful Things*, New York: Alfred A. Knopf; *Design Paradigms: Case Histories of Error and Judgement in Engineering*, Cambridge, UK: Cambridge University Press (1994); *Invention By Design: How Engineers Get From Thought to Things*, Cambridge, MA: Harvard University Press; *Remaking the World: Adventures in Engineering*, New York: Alfred A. Knopf.
29. Kathryn Henderson, Flexible sketches and inflexible data bases: visual communication, conscription devices, and boundary objects in engineering, *Science, Technology and Human Values*, **16**(4) (1991) pp. 448–473.
30. Susan M. Turner, Rendering the site developable: texts and local government decision making in land use planning, in Marie L. Campbell and Ann Manicom, eds., *Knowledge, Experience and Ruling Relations: Studies in the Social Organisation of Knowledge*, Toronto: University of Toronto Press (1995) pp. 234–248.
31. Bryan Pfaffenberger, Technological dramas, *Science, Technology and Human Values*, **17**(3) (1992) pp. 282–312.
32. Nathan Rosenberg, Economic development and the transfer of technology: some historical perspectives, *Technology and Culture*, **11**(4) (1970) pp. 550–575.
33. R. A. Buchanan, The diaspora of British engineering, *Technology and Culture*, **27**(3) (1986) pp. 501–524.
34. Daniel Miller, Consumption and commodities, *Annual Review of Anthropology*, **24** (1995) pp. 141–161.
35. Wolfgang Schivelbusch, *The Railway Journey*. Berkeley: University of California Press; (1988) *Disenchanted Night: The Industrialization of Light in the Nineteenth Century*, Berkeley: University of California Press (1986).
36. Lindy Biggs, The engineered factory, *Technology and Culture*, **36**(2) (1995) (Supplement) pp. S174–S188.

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