

# Communication Among All People, Everywhere: Paul Arthur and the Maturing of Design<sup>1</sup>

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In response to the social and technical dislocations of the second half of the twentieth century, the conceptualization of function in communications design has broadened from the formalist concerns of modernism.<sup>2</sup> The trend has been towards an integrated, user-centered approach, based on collaborative research within related scientific disciplines. Performance-based criteria, derived from the study of user perception and behavior, have been emerging, redefining assumptions about audience, function, and purpose.

The career of Paul Arthur, a Canadian designer who has worked extensively in Europe and the United States, spans the last fifty years and offers a useful paradigm for the growing sophistication and maturity of the discipline of communications design.<sup>3</sup> He has devoted much of his career to issues of wayfinding in three-dimensional space, including navigation, legibility, and readability, which have been highlighted in Web design in recent years, but play an important role in all media. Using taped interviews with the designer, I trace Arthur's development from his discovery of the international style to his reevaluation of its lessons as he tackled major environmental graphics projects, and his development of standards for graphic systems (figure 1).

## A Career Overview

Arthur's long and distinguished career has encompassed key developments in the growth of visual communications for identification and orientation from the 1950s to the 1990s.<sup>4</sup> With no formal design training, he moved from a devotion to Swiss typographic principles to a much broader definition of function, seeing design as improving the quality of our lives by making information easier to find, understand, and use. Although Arthur worked extensively on identity programs for corporations and governments, the topic here is his growing sense of design's social mission, so the discussion concentrates on his environmental communications design.<sup>5</sup>

Trying to meet the needs of a vast and varied audience grappling with the problems of an increasingly complex environment, Arthur was an early exponent of graphic design as part of an interdisciplinary system, integrated with other aspects of communication and spatial planning. He began with major airport projects in 1961, and subsequent programs include Montreal's *Expo 67*, univer-

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- 1 The title is taken from Margaret Mead and Rudolph Modley, "Communication Among All People, Everywhere," *Natural History* (August-September, 1968), in which they discuss and categorize graphic symbols. Modley is regarded by Arthur as a mentor, and a copy of the piece is in Arthur's papers, held in Archive of Advertising and Design at the Royal Ontario Museum, Toronto, Ontario.
  - 2 The growing interdisciplinarity of design, particularly its links with the social sciences, is well documented. For example, a close parallel with developments described here can be found in Jorge Frascara, "Graphic Design: Fine Art or Social Science," in Victor Margolin and Richard Buchanan, eds., *The Idea of Design: A Design Issues Reader* (Cambridge, MA: MIT Press, 1995), 44–55, and *User-Centered Graphic Design: Mass Communications and Social Change* (London: Taylor and Francis, 1997) by the same author.
  - 3 Interviews are referred to by date in the notes.
  - 4 Based on two biographical sketches by the author: "A Good Sign: Paul Arthur gets the Order of Canada" *Graphic Design Journal* 1:3 (The Society of Graphic Designers of Canada, Ottawa, 1995) and "Paul Arthur" in Sara Pendergast, ed. *Contemporary Designers* (Detroit: St. James Press, 1996, third edition).
  - 5 Arthur's major projects in the field include Stelco (1970), the Province of Saskatchewan (1974), and Canada Post (1989).

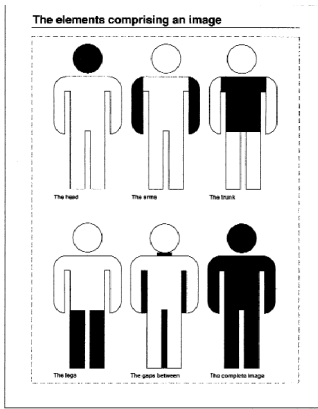


Figure 1  
Components of the standard male figure, from PictographicSystems©, a comprehensive system of pictographs for worldwide use under license (1998). Permission of Paul Arthur VisuCom, Ltd.

sity campuses, hospitals, the U.S. Postal Service, and Parks Canada. In 1973, Arthur became a founding member of the Society for Environmental Graphic Design (SEGD) in Cambridge, Massachusetts. Since then, he has written several reference texts for environmental graphics, including two standard manuals for Public Works Canada: *Orientation and Wayfinding in Public Buildings* (1988) and, with Romedi Passini, *1-2-3 Evaluation and Design Guide to Wayfinding* (1990).

The term “wayfinding,” defined as spatial problem solving, marks a realization that information design must be user-centered. Arthur’s 1992 book, *Wayfinding: People, Signs, and Architecture*, develops the theme by analyzing how people orient themselves, and emphasizes the need for graphic designers and spatial planners to work together.

The only way to approach wayfinding issues intelligently is for architects and designers to pay attention to how people perceive and understand the environment, how they situate themselves in space, and how they use information in the decision-making and decision-executing processes.<sup>6</sup>

His extensive contributions to the theory and practice of creating visual systems for orientation were recognized in 1995, when he became the first communications designer to receive the Order of Canada (presented to Canadians “whose contributions enrich the lives of their contemporaries”). The award cited his pioneering work in the development of pictographic systems and his coauthorship of Canada’s national standards for signs and symbols.

### Discovering Modernism

Arthur studied English language and literature at the University of Toronto, with a three-year interruption for war service in the navy. His family background and love of literature led to an interest in book design.<sup>7</sup> When he left the university in 1948, he felt there were no training opportunities in Canada and moved to England, where he worked in publishing and book production. He discovered modernism when he went to Switzerland to work for Walter Herdeg at *Graphis*, where he served as assistant editor from 1951–56. Arthur didn’t think of himself as a designer, and described design in Switzerland as “rather like a priesthood.”

That is where I learned everything, because across my desk came the best work of every designer in the entire world. I guess I’m an intuitive designer because I’ve never had any training of any kind. I told Walter Herdeg that I would like to do layouts. He laughed and laughed...and told me he had to study for seven years to learn how to do what he did. English language and literature wasn’t proper preparation.<sup>8</sup>

6 Arthur and Romedi Passini, *Wayfinding: People, Signs, and Architecture* (New York: McGraw-Hill, 1992), 5. Arthur has completed two related manuscripts, as yet unpublished, *Effective Environmental Communication Design* and *Pictographs and Graphic Symbolism*.

7 Arthur is the son of Eric Arthur, a prominent Toronto architect and author.

8 August 25, 1996.

Eventually, however, Arthur did most of the layouts for *Graphis* and for the *Graphis Annual*.

In 1956, Arthur decided to return to Canada, and set up an office in Ottawa (Paul Arthur + Associates) which he ran until 1974. Initially, the work of the office was print based, and Arthur was Director of Publications at the National Gallery and the editor of *Canadian Art*. He has described Ottawa as a backwater when he arrived, but there was a great deal of work and he employed many of the finest young designers in Canada. The company's approach was firmly in the Swiss modernist camp, a stance which he now abhors:

...we graphic designers were so blinkered by our desire to make type as illegible as we could make it, and to make patterns on paper that had nothing to do with legibility or anything else. ...For instance, in those days, we never allowed cross heads to interrupt the beautiful flow of grey matter on the page (this all came from *The New Typography*). We were very keen on this; we were a real fortress of Swiss typography in North America.<sup>9</sup>

### **From Print to Signage**

A decisive point in Arthur's change of vision came in 1961, when his office was given two major airport signage projects by the Canadian Department of Transportation, at Edmonton and Winnipeg. Arthur recalls that, to his knowledge, they were the first signage projects in North America that were actually designed by a design firm. He worked closely with industrial designers for the first time, and sees this as the beginning of environmental graphics.

Arthur brought back from Europe a strong belief in systems design, which he saw as the application of strategic planning to design problems, and very different from standard North American practice of the day:

It is not a cookie-cutter approach, nor was it inhibiting to a true designer.... The systems approach was used in the print work that I was doing prior to 1961–1962. The airports were, without question, done to a definite system. [North American designers] were brilliant and we got on, but I didn't like the way they worked. I didn't understand how you could just pull things out of your back pants pocket. To me, this was far too much like the artist, and I was scathing about it.<sup>10</sup>

Other aspects of late modernist design thinking were less useful, and Arthur began to see Swiss typography as a purely formalistic system, not based on human factors. In the transition from designing for publications to designing for signage, for example, scale, distance, and viewing angle forced designers to abandon the tight

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9 August 25, 1996.

10 June 13, 1997.



Figure 2  
Parking lot use of animal pictographs at  
*Expo 67*. Permission of Paul Arthur VisuCom,  
Ltd.

11 August 25, 1996.

12 The State University Construction Fund was responsible for building all of the SUNY campuses. Arthur worked on twelve of them, from 1969-1974.

13 For example, the *Standard Sign Manual* and the *Printing Guide* produced for the Canadian Corporation for the 1967 World Exhibition.

14 In signage, a legend is a verbal (text) or nonverbal (symbol) message. They were invented in 1965. Arthur recalled in 1997: "... the major change in the development of signs was the creation of pre-spaced legends for messages, which previously had been hand painted. We pioneered those at *Expo*. They were not done by computer, as they are today."

15 Graform Associates Limited was founded in Ottawa in 1964 as a joint venture of Paul Arthur + Associates and Girard, Bruce and Garabedian. The report was subtitled "A Draft Concept for Colour, Graphics, Industrial Design and Lighting."

16 Arthur has cited the work of Masaru Katsumie at the 1964 Tokyo Olympics as a precedent. For Krampen's views, see "Signs and Symbols in Graphic Communication," *Design Quarterly* 62 (1965): 3-30.

spacing of modernist print design; there was a chronic lack of reliable, objective data on which to base decisions.

The progression from books, to signs, to environments in Arthur's development ran parallel with his broadening conception of the designer's role in visual culture. In the 1950s and '60s, there was an emerging trend towards inclusiveness-vaulting the boundaries between different sections of the population, and attempting to include all cultures and different user needs. Arthur found the still-dominant assumptions about high and low culture frustrating. He was an early collector of folk art and, as the editor of *Canadian Art*, he challenged hierarchical views by producing issues on cars, photography, design, and television, which were controversial in the 1950s.

Pop art reeducated the establishment quite a bit, but that hadn't happened yet, as we were still in the throws of Barnett Newman and so on. It was to be taken very seriously, and the people who did it were the priesthood.<sup>11</sup>

In this view of visual culture, design was the "captive handmaiden" of a purist modernism dominated by fine art. Arthur began to move on from a concept of "good design," derived from a limited view of functionality, by working towards performance-based criteria rooted in how people perceive and process information.

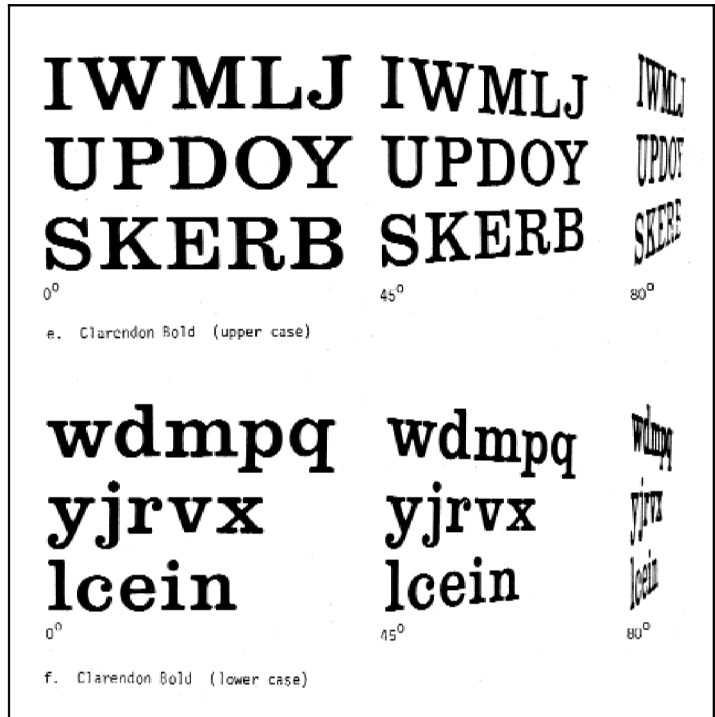
### The Need for Standards

In the late 1960s, Arthur was involved with two enormous projects, *Expo 67* (the Montreal world's fair of 1967) and the New York State University Construction Fund.<sup>12</sup> There are three key features in his approach to this work. One is systems design. As with the earlier airport signage, the scale and complexity of the projects demanded a rational overview, expounded in the guidelines Arthur produced for the many designers from different disciplines working on the projects.<sup>13</sup> Second is technological advance in sign fabrication, which now used pre-spaced legends.<sup>14</sup> Third, and most significant, is the growing importance of learning how people see and use information.

Arthur made a proposal to the organizers of *Expo* and in the *Graform Report*, argued that color, graphics and street furniture all should have an integrated design approach.<sup>15</sup> The project was a pioneering effort to produce a totally coordinated information system, with innovative results. At the suggestion of Martin Krampen, a consultant for *Expo 67* (and a well known professor at Michigan State University, the University of Waterloo, and the Hochschule für Gestaltung Ulm), Arthur's team used pictographs more extensively than ever before. One example is the use of animal symbols to help people remember where they had parked their cars (figure2).<sup>16</sup>

Figure 3

The effect of viewing angles, from *Campus Signage Interim Report. Criteria/State of the Art* (Albany, NY: State University Construction Fund, July 1970). Permission of Paul Arthur VisuCom, Ltd.



Extensive research was conducted for the industrial design aspect, but Arthur is critical of the lack of research for the graphics. Back then, we did not have a proper, mature approach to research, and the graphics at *Expo* were under-researched. I had done research on letter sizes at Guelph University...I was aware of letter size and contrast, but we weren't conscious of blind people or the rights of people with disabilities, or anything to do with cognitive and perceptual impairments.<sup>17</sup>

Arthur found it impossible to fund further research, and the lack of reliable data was apparent in his first meeting in Albany with the State University Construction Fund in 1968. He was asked to write the report, *Campus Signage Interim Report: Criteria/State of the Art*, as a result of the recognition that informative guidelines were needed.<sup>18</sup>

I was talking about performance standards because the people for whom this book was intended were people like Ivan Chermayeff and Tom Geismar. I didn't want to tell them how to design, but what I wanted to tell them was what performance was to be expected of their designs...If you talk about signage, you're just talking about a bunch of hardware. Wayfinding, however, has to do with a process. Accessibility and inclusive design are another step. In *Campus Signage*, I tried to establish a series of broad criteria based on data. I imagined that a lot of it wouldn't stand up

17 June 13, 1997.

18 *Campus Signage Interim Report: Criteria/State of the Art* (Albany, NY: State University Construction Fund, July 1970). *Campus Signage* was issued under the name of an interdisciplinary team called the Design Collective, founded in Knoxville, Tennessee in 1970 by Paul Arthur, architects Bill Lacey and Frank Kelly, engineer Arlyn Orr, and industrial designer Hugh Spencer. The report was widely used in the development of signage for many public buildings in New York State, including universities and jails, and some of the data appeared in the *Americans with Disabilities Act*

Figure 4

"20/20 Vision" from Paul Arthur and Robert Dewar, *Pictographs and Graphic Symbolism* (unpublished manuscripts, 1998–9). Permission of Paul Arthur VisuCom, Ltd.



to scrutiny in a laboratory. On the other hand, a lot of it has stood up empirically rather well, so there may be no evidence for it apart from the fact that it does work.<sup>19</sup>

*Campus Signage* contains tables and charts to cover topics such as letter spacing, typefaces and sizes, legibility from moving vehicles, the effects of angular distortion and color, and value relationships between text and background (figure 3). The report, in addition to guidelines for fabrication and maintenance, and design parameters for consistency in size and position of signs, tries to establish performance-based criteria for readability and legibility. Though it was a remarkable attempt at summarizing design parameters, technical data, and human factors, Arthur was aware of the limitations.

It was...called "State of the art," which meant that this is what the state of the art was in 1970.... I'm not at all sure that I was as aware as I should have been of the challenge to the designer of designing inclusively, of what we now call universal design. In the '80s, I was enraptured by it, but in the '70s I was insufficiently aware. I must take the blame for some of the things we did which did not take into account people with perceptual problems. We did take into account halation and good contrast, for example. This was done because I believed, and still believe, that we should do a good job for the able-bodied, what I call the temporarily abled. If we did a good job for us, we would immeasurably improve the ability of people with perceptual or cognitive problems to function in our built environment. But we're still doing a terrible job, really.<sup>20</sup>

### Pictographic Systems

Arthur cites his friend Rudolph Modley, with whom he had extensive discussions, as having the greatest impact on his pictographic systems.<sup>21</sup> Another significant influence was Henry Dreyfuss, who commissioned Arthur to produce a review of signage at the Dallas-Fort Worth airport. Arthur recalled a specific instance of Dreyfuss's thinking which greatly influenced his own:

When I said to him that the beauty of using a diamond instead of a triangle for warnings is that you don't have to reduce the pictograph by 15 per cent he replied by asking me if I was interested in graphic design or communication.... The two should be inseparable but, in practice they are often sadly out of joint. I promptly stopped using diamonds.<sup>22</sup>

The need for clear communication prompted Arthur's increasing concern with accessibility and performance-based criteria in the 1980s and '90s. It is reflected in his graphic systems for the Canadian Electrical Association (CEA) and Parks Canada, and his collab-

19 June 13, 1997.

20 June 13, 1997.

21 Modley included work by Arthur in his *Handbook of Pictorial Symbols: 3250 Examples from International Sources* (New York: Dover, 1976).

22 June 27, 1997.

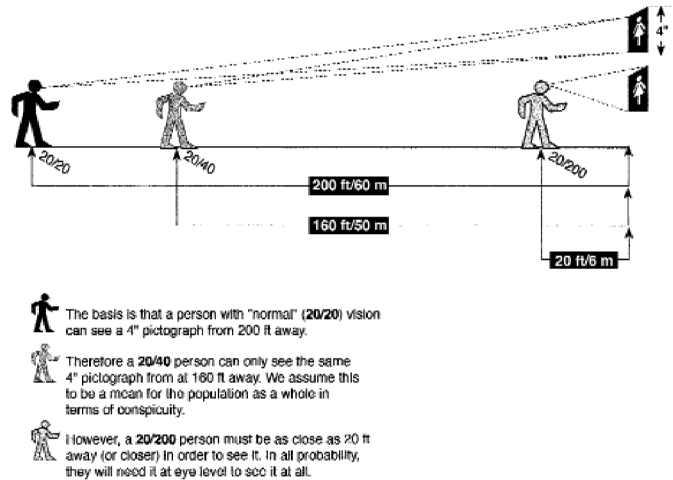
Figure 5

Standard figures for signage from the report prepared by Western Ergonomics Inc. in association with Paul Arthur VisuCom Limited, **Natural Hazard Safety Signs** (Canadian Parks Service, Western Region, March, 1996). Permission of Paul Arthur VisuCom, Ltd.



Figure 6

Example of hazard warnings from the report prepared by Western Ergonomics Inc. in association with Paul Arthur VisuCom Limited, **Natural Hazard Safety Signs** (Canadian Parks Service, Western Region, March, 1996). Permission of Paul Arthur VisuCom, Ltd.



operations on wayfinding with Romedi Passini (of the University of Montreal) and on testing with Robert Dewar of the University of Alberta (figure 4).<sup>23</sup> The work was conducted while Arthur made strenuous efforts to establish standards nationally (the Canadian National Standard, Z321) and internationally for the use of pictographs, reflecting the need for a standardized language in effective visual communication. Arthur's work eventually was not used by CEA, but has been implemented by Parks Canada in the western region, and also was sold to parks in the United States.

The development process for the Canadian Electrical Association (CEA) and Parks Canada was the same. Investigation was followed by development and testing; hazards were identified and image content descriptors created, then tested on sixteen-hundred people before publications, signs, and documentation were developed. Arthur has noted that many solutions to problems of representation came directly from the test groups. The third phase was prototyping, followed by a problem statement and discussions with fabricators, and finally a master plan for implementation.

The first step in the investigation phase was to find out what had been done with wilderness signs in other parts of the world,

23 Arthur, *Effective Environmental Communication Design*, and Arthur and Robert Dewar *Pictographs and Graphic Symbolism* (unpublished manuscripts, 1999).

which was very little. A range of approximately twenty key, hazardous situations occurring in different seasons were then identified, and designs created for testing (figures 5 and 6).

We then wanted an image content descriptor of each of those and where they will be, because I'm not only interested in the graphic content of symbols, prohibitions, and so on, but also the physical context, which is enormously important. We got this description, which was one page for each one, and discussed it with the client until we thoroughly understood it. I then took a little man and tore his arms and legs off and had him do all kinds of terrible things, a sort of catalogue, and put them in the context of a vocabulary of animals and landscape elements (rocks, rushing waters and so on). We combined those to create the pictographs... Are you testing for effectiveness, for glance legibility (which means if you see the thing for a thirtieth of a second, can you still see it and recognize it?). Or are you testing it for acceptability, like the presence of the toilet in the man/woman symbol, which was unacceptable for many years and now is acceptable?<sup>24</sup> (figure 7)

Extensive research then was conducted by Professor Robert Dewar.<sup>25</sup> All the pictographs were tested in the laboratory. Those comprehended by 67 percent of the audience (a requirement of the International Standards Organization) were then tested in situ. Testing included recognition, legibility, and acceptability, and respondents were drawn from a wide range of demographic groups. Various forms of pictographs, and different combinations of pictographs and words in a range of languages (English and French, or German and Japanese) were tested. The design team decided that the signs should be in comic strip form, showing the danger and what could happen. As with Arthur's work for the Canadian Standards Association (CSA) on the Z321 standard, it was impossible to create the convincing gender-neutral figure which he had wanted (this was a cultural issue he took seriously).

The symbols used by Parks Canada conformed to the Canadian National Standard (Z321) partly because it offered some legal safeguards. Z321 first appeared in 1977, was modified in 1994 with the addition of text, and published in 1996. The effectiveness of purely visual communication proved to be severely limited:

We found that the standard wasn't being used because those pictures weren't worth a thousand words... There are, in fact, very few pictographic images that can stand on their own and be recognized by 67-75 percent of people. The ones that can are toilets, telephones, and certain things to do with food. There are only about 20 to 25. We have text signs which are entirely text, signs with text and symbols, and a very few with no text at all. The "no smoking" sign

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24 June 26, 1997. The figures were designed by Terry Brown.

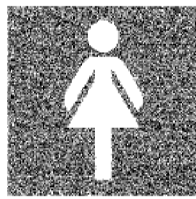
25 *Reevaluation of Selected Warning Signs at Hydro Electric Stations* by Western Ergonomics (June 1994). Dewar has worked extensively in the United States for the Highway Research Board and with designer Don Meeker.



Figure 7

Recommendations for toilet symbols produced for the Government of Ontario in 1990. The one preferred by Arthur is now the ISO 7001 standard. Permission of Paul Arthur VisuCom, Ltd.

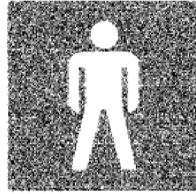
## The toilets (Take your pick)



~~Women~~



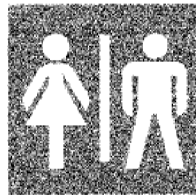
I find this preferable



~~Men~~



I find this preferable



~~Toilet(s)~~



I find this preferable



I find this preferable as we are most familiar with this style at home



Not advisable; there is no lid on these toilets; it might even be read, "Leave the lid up!"



Not advisable; without lid or tank, its meaning may not be clear

Paul Arthur VisuCom Limited / 99:Di

and the "no entry" sign need no words. The need for text does not mean that the whole idea of using pictographs to get around the idea of illiteracy is self-defeating. First the words must be simple, grade 6 level. Then the context will help you.<sup>26</sup>

### Summary

The development of Arthur's inclusive view of functionality demonstrates that transcending the barriers to communication is a broader and more complex project than many designers realized in mid-century. Recognizing the significance of context (cultural, technological, geographic, and graphic) for communications has contributed to a mature assessment of the role of designers, users, and design, increasingly integrated into the design process and educational programs.

Arthur's early insistence on user needs as the basis for design revealed to him how much designers did not know, and the necessity for collaboration with other disciplines for information and expertise. Multicultural trends have demolished any possibility of a single, dominant aesthetic view of design, while technology has democratized design by placing powerful tools in many hands, inducing a reexamination of purpose and professional education. The continuing legacy of models for design derived from fine art and science often results in arbitrary oppositions between expression and system, which should be replaced with a central core of information structuring to maximize participation:

There still is far too much emphasis on aesthetics, but that is changing, certainly in the United States, where the [Americans with Disabilities Act] mandate says absolutely that it's against the law to discriminate against people because they have perceptual or cognitive problems. I don't think we were conscious about that as a problem.... I was not terribly sensitive, and neither was anybody else, to the fact that there was a whole series of disenfranchised groups out there who could not make use of our facilities.<sup>27</sup>

### *Designing and Using Design Are Social Processes*

Not only are physiological, psychological, and cultural data needed in order to meet the needs of users, but users can actively contribute to the design process, as in Arthur's work for Parks Canada. In all communications design, but, perhaps, most evidently in environmental and interactive media, users always will bring unexpected resources and patterns to their use of tools provided by designers, as illustrated by Arthur's and Passini's conceptualization of way-finding as an active, decision-making process.

Arthur is well aware of the limitations imposed on designers by their traditional, narrow role:

I would like to think that of every dollar spent on a designer, eighty-five cents is spent on research, thinking, and problem solving. That would be wonderful but, unfortunately, it isn't like that—fifteen or twenty percent is spent on that, and the remainder is spent on getting the job, keeping the job, presenting the job, and making pretty pictures.<sup>28</sup>

In Arthur's assessment, designers must become mediators and moderators, more inclusive and more modest. He found that the process of developing standards through large committees was at times very frustrating, with the results often being compromised by the accommodation of different stakeholders, but for modernist dreams of international communication to be realized, design must be seen as a collective process in which many groups have to be involved..

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27 June 13, 1997.

28 August 25, 1996.

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