

Material Culture and Mass Consumption

The Meaning of Things;

Domestic Symbols and the Self

Mechanization Takes Command

Design Discourse;

History, Theory, Criticism

General Evolution Theory

The Idea of Design;

A Design Issues Reader;

Communication, Action and Meaning;

The Creation of Social Realities

Conjectures and Refutations;

The Growth of Scientific Knowledge

Critique of Judgment

Abductive Inference — Computation, Philosophy, Technology

Autopoiesis and Cognition: The Realization of the Living

Understanding Media - the Extensions of Man

Utility, Reassessment

The Role of Ethics in the Practice of Design

Understanding Computers and Cognition

A New Foundation for Design

Understanding Even

Affect and the Construction of Social Action

The Symbol System

The Tact Dimension;

Technology and the Lifeworld;

From Garden to Earth

Representation and Reality

Return to Reality

The Sciences of the Artificial

Philosophical Tools for Technological Culture — Putting Pragmatism to Work

Philosophy in the Flesh

Of Problematology, Philosophy,

Science and Language

Practical Reason, On the Theory of Action

Mind, Language and Society —

Philosophy in the Real World

On the Pragmatics of Communication

Personal Knowledge

Phenomenology of Communicative

Knowledge in Communication and Semiology

Knowledge As Design

Material Culture and Mass Consumption

The Meaning of Things;

Domestic Symbols and the Self

Mechanization Takes Command

Design Discourse;

History, Theory, Criticism

General Evolution Theory

The Idea of Design;

A Design Issues Reader;

Communication, Action and Meaning;

The Creation of Social Realities

Conjectures and Refutations;

The Growth of Scientific Knowledge

Critique of Judgment

Abductive Inference — Computation, Philosophy, Technology

Autopoiesis and Cognition: The Realization of the Living

Understanding Media - the Extensions of Man

Utility, Reassessment

The Role of Ethics in the Practice of Design

Understanding Computers and Cognition

A New Foundation for Design

Understanding Even

Affect and the Construction of Social Action

The Symbol System

The Tact Dimension;

Technology and the Lifeworld;

From Garden to Earth

Representation and Reality

Return to Reality

The Sciences of the Artificial

Philosophical Tools for Technological Culture — Putting Pragmatism to Work

Philosophy in the Flesh

Of Problematology, Philosophy,

Science and Language

Practical Reason, On the Theory of Action

Mind, Language and Society —

Philosophy in the Real World

On the Pragmatics of Communication

Personal Knowledge

Phenomenology of Communicative

Knowledge in Communication and Semiology

Knowledge As Design

Material Culture and Mass Consumption

The Meaning of Things;

Domestic Symbols and the Self

Mechanization Takes Command

Design Discourse;

History, Theory, Criticism

General Evolution Theory

The Idea of Design;

A Design Issues Reader;

Communication, Action and Meaning;

The Creation of Social Realities

Conjectures and Refutations;

The Growth of scientific knowledge

Critique of Judgment

Abductive Inference — Computation, Philosophy, Technology

Building a Philosophy of Design is one of the three sections of the Annotated Design Research Bibliography. Design suffers from the ambiguity of its philosophical context. Although design communities attempted to solve this problem a decade ago, there is no agreement concerning what a philosophy of design might be. The study addresses the differences of philosophy in design and science. This is followed by an analysis of the most read books as determined by community ranking. Field-keyword analysis is then used to analyze interdisciplinary books and expert recommendation of books. The results from community ranking demonstrate that books related to philosophy of design still require substantial development since there is a limited literature that directly points to a philosophical context for design. Most current books tend to be design history and criticism of design. From the field-keyword analysis, the majority of books recommended fall within the social science field. From the results it is evident that design requires progressive action to establish a foundation in this area.

Philosophy
of Design

**Perspectives on Building
a Philosophy of Design**

Sakol Teeravarunyou and Carlos Teixeira

**& Annotated Philosophy and
Theory of Design List**

Perspectives on Building a Philosophy of Design

INTRODUCTION TO PHILOSOPHY OF DESIGN

Definitions, perspective and roles of philosophy of design

'Philosophy' has a long history and ambiguous meaning. The Merriam-Webster dictionary defines philosophy with different levels of meaning: as the most general beliefs, such as concepts of love, moral self-discipline, knowledge, justification and as the attitudes of an individual or group in pursuit of wisdom. The content of philosophy comprises cognition, logic, ethics, aesthetics, metaphysics, body and mind relations, epistemology and theology. These different philosophical subcategories call into question which of them have importance to design.

Philosophy's method is both critical and constructive. Its critical function calls into question assumptions and ideas in order to clarify and understand them. Theories of knowledge and value, examined analytically, are the focus of these critical approaches. Its constructive function attempts to take into account and organize all the facts in developing a view of the world as a whole. Metaphysics and theories of reality are the focus of this approach.

The need for a philosophy of design occurs when designers seek to define their own discipline, beliefs and knowledge. In the last thirty years, design has evolved and been influenced by scientific thinking. Many designers who teach in graduate programs nurture the hope of defining design's own body of knowledge. Nevertheless, the nature of most design problems, with their ill-defined structure, is in conflict with scientific inquiry.

Design methodologists as well as philosophers attempt to solve this problem, but there is no agreement regarding a solution. If this problem remains, the judgment of design cannot be accomplished. Design, as well as other disciplines, needs reasonable judgment and belief structures to guide its development as a discipline. Without judgment, it is impossible to take an appropriate direction to establish belief. The more we understand design judgment, the more we are able to develop new knowledge and encourage its growth.

Design appears to not belong in a single discipline; the study of subcategories of philosophy in the arts and sciences should be examined to find the knowledge that fits to design. However such an examination is beyond the scope of this brief introductory essay. Philosophy in design should stand for design knowledge, judgment, justification and new attitudes toward design.

Differences

Differences of philosophy in design and other disciplines

- There is no apparent common understanding and definition concerning a philosophy of design. In contrast to the philosophy of science, which is a metalanguage that refers to an object-language (science) and is grounded in theoretical constructs, design lacks a philosophical structure. For example, the philosopher of science asks whether it is possible that a term occurring in a definition refers to physical objects and their properties. Klemke (1998) explains: "Philosophy of science is the attempt to understand the method, foundations, and logical structure of science and to examine the relations and interfaces of science and other human concerns, institutions, and quests, by means of a logical and methodological analysis of both the aims, methods, and criteria of science and of the aims, methods, and concerns of various cultural phenomena in their relations to science."

One of the distinguishing characteristics between the philosophy of design and others is described in terms of the logics of design by March (1984). He explains that the model of explanation in natural science mostly uses deductive inference while social science uses inductive inference. A scientific hypothesis is not the same thing as a design hypothesis. "Abduction, or as we have it production, 'is the only logical operation which introduces any new ideas; for induction does nothing but determine a value; and deduction merely evolves the necessary consequences of a pure hypothesis. Thus, production creates; deduction predicts; induction evaluates." March's explanation of logic is another viewpoint design should examine. Yet another supporting idea is the concept of 'Design Science.' It is a potentially new subcategory of science. Herbert A. Simon suggests in his book *The Sciences of the Artificial* (1981) that a science of this sort is concerned with the organization of natural and artificial things, and characterizes such things by the functions they perform and the goals they achieve.

According to Owen (2000), design is a unique discipline. "Design as a broadly-based discipline suffers mightily from philosophical ambiguity. Design is not science, and it is not art – or a branch of any other discipline." Design has its own theories such as "Form follows Function." Design also has its own methodologies such as *Notes on the Synthesis of Form* (Alexander, 1964), *Design Methods* (Jones, 1997) and others. Friedman (2001) defines the design knowledge domain that shapes philosophy of design. He identifies four domains: 1) Skill for Learning and Leading, 2) the Human World, 3) the Artifact and 4) the Environment. Nevertheless, design knowledge does not have a clear position in one particular domain. For example, problem solving in the learning domain is useful for psychology and education but might not necessarily contribute to design. Problem solving in design relates

to the artifact (second domain) and design process (third domain). This presents a unique domain from the field combination. Cross (2000) describes design as an interdisciplinary discipline. He positions design as a discipline rather than as a science. Design as a discipline seeks to develop domain-independent approaches to theory and research. The underlying axiom of this discipline is that there are forms of knowledge peculiar to the awareness and ability of a designer, independent of the different professional domains of design practice (such as architectural, industrial, communication design, etc.).

Popper (1963) explains the nature of philosophical problems. Rather than ask "What is philosophy?" which requires a definition, he suggests instead a description, "What is the character of philosophical problems?" He admits that many problems involve many disciplines, thus it is difficult to tell whether the problem belongs to one or another of the traditional disciplines. As a consequence, philosophy does not contain any theories, but is an activity or a process of thinking. The argument continues that philosophy of design should not refer to theories but rather to disciplines.

From observing and analyzing the books we collected for the philosophy section, it is interesting to see a variety of perspectives and opinions regarding design. Books written by philosophers, such as Kant, Popper, Polanyi do not speak directly to design disciplines, but their ideas contribute to design with regard to aesthetics, conjecture and refutation and tacit knowledge respectively. They identify an ambiguity in scientific inquiry and the intuition that leads to judgment. This shares the same problems faced by a philosophy of design. Design judgment can begin with these philosophers. Books, like those of Simon (1969) and Perkins (1997), take an explanatory approach to design through artifacts, processes and structures. These provide another entry into the philosophy of design.

Although it is impossible to identify which ideas belong specifically to a philosophy of design, it is a significant idea to perceive the connections between philosophy and design. In conclusion, the books in the philosophy of design section are based on both domain specific and interdisciplinary domains. A discipline stands for a point of view, it puts a fence around its domain. But today disciplinary boundaries are increasingly insubstantial and design has historically been a synthetic and pragmatic discipline. This complicates the criteria for book selection and makes the field-keyword analysis essential.

Roles

Roles for philosophy in design

Unlike theorists, methodologists and practitioners, philosophers are theory critics, disciplinary builders and belief missionaries.



The role of philosophy in design has a clear mission and purpose.

- Philosophy of design like other philosophies is composed of concepts, meaning, reference, knowledge, truth, reason and value.
- Similar to the philosophy of science, philosophers in design are responsible to define the terminology for design, accumulate design knowledge and justify design theory.
- If design is a broad-based discipline, the new terminology and knowledge from a field combination should be defined. For example, the proposition of user-centered design is a combination of four human factors – social, cultural, physical and cognitive human factors. The question for philosophers is can such terminology and technique as is used for those disciplines, be transferred

to design and can they be the source of knowledge useful to design. Such knowledge and its transference should be carefully selected and used for design.

• Philosophy of design can be generated from field combinations or a specific field. The combination of different fields generates a uniqueness and contribution to design philosophy. For example, the concept of the Simon's book *The Sciences of the Artificial* is a field combination of economics, sociology, humanities and computer science.

Focus

Focus and scope of this research in the philosophy of design section

Certainly, an argument of which books belong to philosophy and non-philosophy happened when we first collected the books. For example, some books related to history might not be philosophy books. The history of design is a valuable pursuit for both designers and non-designers. But it must not be confused with the philosophy of design. In reality, it is difficult to find philosophy of design on bookshelves of design or philosophy; therefore the tolerance for error in selecting as philosophy books of criticism and design history, must be excused. Those books might not be philosophy in the first place, but they might have an influence on design philosophy and its development in the future.

The project does not attempt to verify or judge the books in relation to philosophy of design, but does so through the consensus of the participants who ranked the books and contributed new titles. The collection of books represents a basic idea of philosophical study. Since philosophy of design relates to the disciplinary approach rather than as an identification as science or art, comparison of contributory disciplines among the books that participants rank and the books that participants add to the list are a further criteria of selection.

RESULT AND DISCUSSION

The results from community ranking demonstrate that the philosophy of design books drew the second greatest response from the design community (after the theory-practice section). The results of book ranking and field-keyword analysis are discussed next. Specific issues and observations regarding the methods and emphasis among disciplines in the field-keyword analysis are explored.

Results from ranking

Forty books appeared under the philosophy of design for ranking. Books that are high ranking are most read, most recommended and written by well known authors. Eight books from the ranking are selected as seen in table 2 (see p. 134-135). This list is a selected ranking that is modified from the original ranking of books. Some books are not included, for example, *The Reflective Practitioner* was shifted to another section of this bibliography. This points up the fact that some books crossover among these three lists and so the editors needed to make a judgment with regard to which list most strongly represented their contribution to design thinking.

The books that participants read most in Philosophy of Design are:

1. *Design Discourse* (1995) and *The Idea of Design* (1996)
2. *The Sciences of the Artificial* (1996)
3. *Discovering Design* (1995), *The Reflective Practitioner* (1984)

Design Discourse and *Idea of Design* are the most read. As can be seen from table 2, these books are based on the history and criticism of design. Both of them present the design field clearly with regard to product design and graphic design. *The Sciences of the Artificial* is second. This book explores an idea of a science of design and its relation to cognitive psychology. The author makes a significant contribution to the design field, but not directly in relation to design practice. Third is *Discovering Design* and *The Reflective Practitioner*. Both of them mention design practice and the social role of design.

The books that participants recommend to read are:

1. *The Sciences of the Artificial*
2. *Discovering Design*
3. *Design Discourse*

The books whose authors the participants know are:

1. *Design Discourse* (1995)
2. *The Sciences of the Artificial* (1996)
3. *The Idea of Design* (1996) and *Discovering Design* (1995)

In the philosophy section, the high ranking group deals with history and criticism of design.

Result

Field-keyword analysis

Keywords are categorized in eight fields as shown in table 1 (see p. 128). According to field-keyword analysis in table 1, the original books in first row (40 books) have a high percentage in social science, technical science and education fields respectively. None of the books fall under visual communication which is a branch of design. The original books ranked by participants in the second row (8 books) vary from the original books especially in social science; no book falls under the category of natural science, architecture and visual communication. Similar to the original book ranking, books added (34 books) by participants have a high score in social science, education, natural science and technical science.

For the added-selected list (6 books), the field-keyword analysis is used to select the book (as can be seen in the fourth row). Based on the method of selecting books, two ways of using the keyword analysis is proposed. The first is a selection of specific fields from a design point of view. Annotations from individuals in the design field facilitates this selection since they perceive and review those books from that perspective. The annotation should reflect why the books relate to design and its relevance. This criterion is a qualitative justification for the books. The second direction is a field combination. If the combination of fields have not been found in any books, that might suggest a lack of study among those combinations or that those fields do not fit together. The number of combinations is also another indicator that suggests the repetition or pervasiveness of the content. By using these criteria, the added-selected list has only six books. The books with a high percentage are social science and education.

Analysis

	Natural science	Social science	Technology science	Business	Education	Architecture	Industrial design	Visual design
Original list	7.46	40.29	16.41	8.95	13.43	2.98	10.44	0
On-line ranking	0	37.5	18.75	12.5	12.5	0	18.75	0
Recommended books	10.41	27.69	8.33	2.08	22.91	0	4.16	4.16
Added-recommended	0	42.86	0	0	28.57	14.29	0	14.29
Added by experts	20	56	12	0	0	0	0	12
Final list	10.42	47.91	12.50	4.17	8.30	4.17	4.17	8.33

Table 1 Field-keyword Analysis

Since the number of books selected from the ranking and added list is not sufficient for the final selection, experts also recommended books (17 books). From the analysis in table 1 (see p. 128), the books from experts are in social science, natural science, technical science and visual communication. The final list (30 books) in row six represents all fields. Social science has a high percentage followed by technical science, natural science and education, followed by the three design fields and business.

Observation on the methods

From the ranking result, many low ranking books fall into creativity and psychology categories. Examples of such of books are: *Creativity in Invention and Design* (Dasgupta, 1994), *The Nature of Creativity - Contemporary Psychological Perspective* (Sternberg, 1998) and *Why We feel: the Science of Human Emotions* (Johnson, 1999). From observing the participant results in community ranking, it may be that they do not select books not related directly to design, since those books might not apply to design, or conversely, the books that are not well known represent new emerging fields.

The high-ranking books present a concept of philosophy different from traditional philosophy books, since most philosophy books are written in the style of theory justification. This observation reminds us of the character of philosophy books. There are many books in the added list that are serious philosophy but they are not selected in the final list. Some refer to the pre-history of philosophy such as in the Greek period; they are not selected because modern philosophy tends to have a closer connection to the design context than those based on historical foundations.

From the field-keyword analysis, the total percentage of design including architecture, industrial design and visual communication are equal to other fields, but each field in itself has a low number. As a result, most of the philosophy books have little emphasis on building a philosophy in design, since deep knowledge involving design still depends on other disciplines such as cognitive science, social science and scientific theories of explanation.

Selection

Final book selection

Many philosophy books fall under the social sciences which are comprised of psychology, anthropology and sociology. These have a different approach from the natural sciences. They are based on social activity, human judgment and cognition. High ranking scores relate to books presenting criticism of design rather than theory justification as might be found in more mature disciplines. The number of philosophy entries under the design category is small. This signals a need for improvement in the design field.

From the community participatory book ranking operation, we collected books from medium to high ranking. Eight from forty books were selected. Five books were selected from the added list of thirty-four books using the field-keyword analysis for appropriate discipline distribution. Seventeen books from expert recommendation were added to the final list. The total number of books is thirty for the final list.

Obtaining a good list for the Philosophy and Theory of Design section was not predictable or easy. There are many possible reasons that might explain this. First, the books on this list are not commonly read within the design community, since few books relate specifically to a philosophy in design. Many of the books listed are pure science or pure social science. Second, many books are out-of-print and it is difficult to find participants who have read them. Third, there are a large number of added books from participants in our database that do not pass the qualification to be a contributor to philosophy of design. Some books are conjecture rather than philosophy such as *Future Shock* (Toffler, 1999). As a result, we cannot depend only on the consensus from the ranking process and the added books from participants.

CONCLUSION

The field specific and field combination analyses related to design functions well as an indicator to identify design philosophy books. Nevertheless, many books relate to the philosophy of design only by virtue of serious investigation and interpretation. They do not present the justification of design theory that we mentioned as our goal. With regard to this point, a pattern of design justification can be observed from existing philosophy books in the list that bridge the gap between science and social science, such as *General Evolution Theory* (Laszlo, 1996) or *Return to Reason* (Toulmin, 2001).

Philosophical development in the design discipline is nascent. Since design is a young discipline, the number of philosophers in this field is tiny. Supporting design philosophers is a crucial step to accumulating design knowledge. Design philosophers require a substantial understanding of theory and analytical thinking to prove existing work. If a theory is rejected based on testing or falls short in an examination of its logic, a search for new theory should be launched from knowledge gained from the refuted theory.

Conclusion

This process will create knowledge growth. Although design considers action and result rather than theory verification as its proof, the development of a philosophy remains a requirement to identify the truth of design knowledge. Justified inference and standard validation of design should be established to prove design theory and to confront the problem of ill-defined problem structures mentioned earlier. The list of philosophy books presented here provides many philosophers from other fields that can serve as guides to open new opportunities for thinking about design. Design philosophers can use the existing fundamental framework of philosophy to understand what a philosophy of design might be.

The finding from this research demonstrates that design extends over many disciplines. In conclusion, design as a discipline is a powerful concept, but it should not be a trap to limit design to its own standard of performance that is unique and out of synchronization with other disciplines. This would assure the isolation of Design. Given its synthetic and cross disciplinary nature, design can use existing philosophical ideas to establish its mission to connect and use other disciplinary knowledge as well as generate its own knowledge to effect change in the manmade world.

REFERENCES

- Friedman, Ken. 2000. "Design Knowledge: Context, Content and Continuity." *Proceedings of Foundations for the Future: Doctoral Education in Design*. Staffordshire, UK: Staffordshire University Press, 5- p16.
- Klemke, E.D., Robert Hollinger, David Rudgeand David A. Kline. 1998. *Introductory Readings in the Philosophy of Science*. New York: Prometheus Books.
- March, Lionel. 1984. "The Logic of Design." In Cross, Nigel. *Developments in Design Methodology*. New York: John Wiley & Sons, 265.
- Owen, Charles L. 2000. "A Philosophical Home for Design." In Buchanan, Richard et al, editors. *Proceedings of Foundations for the Future: Doctoral Education in Design*. Staffordshire, UK: Staffordshire University Press, 43.
- Perkins, David N. 1997. *Knowledge As Design*. Mahwah, NJ: Lawrence Erlbaun.
- Popper, Karl. 1963. *Conjectures and Refutations: The Growth of Scientific Knowledge*. London: Routledge.
- Simon, Herbert A. 1969. *The Sciences of the Artificial*. Cambridge: MIT Press.

	Title: The final list	Author
1	Abductive Inference — Computation, Philosophy, Technology	Josephson, John R.; Josephson, Susan G.
2	Autopoiesis and Cognition: The Realization of the Living	Maturana, Humberto R.; Varela, Francisco J.
3	Communication, Action and Meaning: The Creation of Social Realities	Pearce, W. Barnett
4	Conjectures and Refutations: The Growth of Scientific Knowledge	Popper, Karl B.
5	Critique of Judgment	Kant, Immanuel
6	Design Discourse: History, Theory, Criticism	Margolin, Victor, editor
7	General Evolution Theory	Laszlo, Ervin
8	The Idea of Design: A Design Issues Reader	Margolin, Victor; Buchanan, Richard, editors
9	Knowledge As Design	Perkins, David N.
10	Material Culture and Mass Consumption	Miller, Daniel
11	The Meaning of Things: Domestic Symbols and the Self	Csikszentmihalyi, Mihalyi, et al
12	Mechanization takes Command	Giedion, Sigfried
13	Mind, Language and Society — Philosophy in the Real World	Searle, John R.
14	On the Pragmatics of Communication	Habermas, Jürgen
15	Personal Knowledge	Polanyi, Michael
16	Phenomenology of Communication: Merleau-Ponty's Thematics in Communicology..	Lanigan, Richard L.
17	Philosophical Tools for Technological Culture — Putting Pragmatism to Work	Hichman, Larry A.
18	Philosophy in the Flesh	Lakoff, George; Johnson, Mark
19	Of Problematology, Philosophy, Science and Language	Meyer, Michael
20	Practical Reason, On the Theory of Action	Bourdieu, Pierre
21	Representation and Reality	Putnam, Hilary
22	Return to Reason	Toulmin, Stephen
23	The Sciences of the Artificial	Simon, Herbert A.
24	The Symbol System	Elias, Norbert
25	The Tacit Dimension	Polanyi, Michael
26	Technology and the Lifeworld: From Garden to Earth	Ihde, Don
27	Understanding Computers and Cognition: A New Foundation for Design	Winograd, Terry; Flores, Fernando
28	Understanding Events: Affect and the Construction of Social Action	Heise, David R.
29	Understanding Media - the Extensions of Man	McLuhan, Marshall
30	Utility Reassessed: The Role of Ethics in the Practice of Design	Attfield, Judy, editor

Table 2 Philosophy of Design Book List

Bibliography

Annotated Philosophy and Theory of Design List

1 **Abductive Inference — Computation, Philosophy, Technology**

Josephson, John R. and Josephson, Susan G.

Cambridge: MIT Press, 1996

Based on the work of the logician Charles Sanders Peirce (1839-1914), the authors develop abductive inference. In informal terms, abductive reasoning involves inferring the best or most plausible explanation from a given set of facts or data. The authors argue that knowledge arises from experience by processes of abductive inference in contrast to the view that it arises non-inferentially or that deduction and inductive generalization are enough to account for knowledge. Confidence in an abductive conclusion depends on how decisively the best explanation surpasses the alternatives. Abductive inference is a procedure: collect knowledge from data, match hypothesis, classify and assemble hypothesis. The authors discriminate qualitatively among hypotheses as: belief, guess, potential explanation, explanatorily useless and unbelievable.

A common occurrence in everyday life, it is present in such diverse areas as medical diagnosis, scientific theory formation, accident investigation, language understanding and jury deliberation. The artificial intelligence community has found abduction to be a fruitful research topic. Much AI research is hypothetical so part of the importance of this book is that it reports key discoveries about abduction that have been made as a result of designing, building, testing and analyzing actual working knowledge-based systems for medical diagnosis and other abductive tasks. The book tells the story of six generations of increasingly sophisticated generic abduction machines. The final chapter argues that perception is logically abductive and presents a layered-abduction computational model of perceptual information processing. This book will be of great interest to researchers in AI, cognitive science and philosophy of science.

Sakol Teeravarunyou

2 **Autopoiesis and Cognition: The Realization of the Living**

*Maturana, Humberto R. and Varela, Francisco J.
Dordrecht, Holland: D. Reidel Publishing, 1980*

Autopoiesis and Cognition is the most fundamental, clear and direct explication of constructivism available. It follows Piaget's psychology. The thesis is that organism's cognitive systems construct the world around them according to their sensory systems. Such organisms operate by actively seeking homeostasis or equilibrium, and alter their internal structure (adapt) according to internal disturbances. Those disturbances are the basis of perception, projection of an outside world, and of self-reorganization, cognitive change, learning and development.

Autopoiesis develops a general theory of ontology and epistemology for individuals and for social systems. It seeks to radically solve problems of truth and knowledge in terms of evolutionary elaboration and pragmatism. For example, meaning is not problematic among participants. It becomes problematic for observers, those who do not share the common context.

The theory is of development and discovery as creative processes. Knowledge is always synthetic — it is constructed by the organism. Thus, knowledge is a historic product. But, because it is based on common neural and physiologic structures, it is not merely culturally relative, but embedded in cognitive structure. This view is called 'critical constructivism.' It underlies Piaget, Vygotsky, and Michael Mahoney, among others. It links cognitivism, Peircian semiotics, symbolic interactionism and ethnomethodology.

Peter Storkerson

3 **Communication, Action and Meaning: The Creation of Social Realities**

Pearce, W. Barnett

New York: Praeger, 1980

Pearce starts from: 1) the paradox of recursion that results from stepwise thought and its unintended consequences, e.g., "All cretans are liars and I am a cretan. Therefore, I am a liar," and, 2) from Suzanne Langer's formulation of Cassirer's philosophy of symbolic forms. According to Langer, in the twentieth century, "the triumph of empiricism is jeopardized by the surprising truth that our sense data are primarily symbols. Thus with respect to themselves and the things they purport to represent they are recursive.

According to Pearce, "If the structure [of current thought] is recursive, its content is communication... defined as the process by which persons collectively create and manage social reality." Pearce argues that the twentieth century notion of communication is new: a method of construction and of action (e.g., language games), rather than description. The information society is a result of the discovery of communication: no previous society ever considered communication as important.

Pearce studies communication as a mode of social organization — a play without a director — based on 1) empirical actions as worthy of study; 2) actor's meanings are relevant; actions construct social reality, and; 3) development is the creation of order out of disorder. Thus, awareness of communicative construction presents postmodernism as the dilemma of recursiveness. Pearce builds anatomies of communication as action, communicative competence both in individual and interactive systems and in ritualistic systems. Empirical studies of communicative competence and the social management of meaning are presented demonstrating the operationalization and measurability of the theory.

Peter Storkerson

4 **Conjectures and Refutations: The Growth of Scientific Knowledge**

Popper, Karl B.

London: Routledge, 1989

A collection of lectures and essays, this book illustrates a theory of knowledge formation that is preceded by conjectures and refutations (a theory of trial and error). Through testing our conjectures on theories, we are able to identify mistakes and so better understand the problem that we are investigating. Popper believes that our discoveries are guided by theory rather than that theories are the result of discoveries due to observation. Thus science starts from problems and not from observation; though observations may give rise to a problem. If a theory withstands severe attempts to refute it, the conjecture becomes more credible. A successful refutation of a conjecture is a breakthrough. Popper uses many examples from well-known scientists and philosophers to critique his studies. He applies his thesis to many topics, ranging from philosophy and the history of the physical to historical and political problems. His concepts can be applied to theory building and validation in design.

Sakol Teeravarunyou

5 **Critique of Judgment**

Kant, Immanuel

New York: Oxford University Press, 1952

Aesthetics are always a significant issue in design and how designers make aesthetic judgment is critical. This book is an important work in modern philosophical aesthetics as it draws a bridge between pure and practical reason. Kant, an eighteenth century German philosopher, reflected on aesthetic judgment in terms of the conditions for using judgment and through emphasis in a deep experience of beauty. He illustrates his theory of aesthetics in two parts: Analysis of the Beautiful and Analysis of the Sublime. Beauty is linked to cognition in terms of sensibility, understanding, condition of disinterest and universal validity. Sublime lies beyond the boundaries of sense experience, directing us to form concepts of pure reason. In part two, Critique of Teleological Judgment, he makes a case that the principle underlining all of our judgments relate to our inclination to see purpose and order in nature.

Not an easy read, Kant nevertheless provides excellent explanations of terms in aesthetic and teleological judgment.

Chujit Jeamsinkul

6 Design Discourse: History, Theory, Criticism

Margolin, Victor, editor

Chicago: The University of Chicago Press, 1989

As an anthology of carefully selected writings in the emerging field of design studies, *Design Discourse* brings together the discussion of design thinking regarding its social and cultural significance to understand what design is and how it functions in society. The essays in this anthology represent design thinking from various fields and disciplines. They are all collected from the first six *Design Issues*, published between 1984 and 1987. These essays are organized into three sections. In the first section, *After the Modernists*, writings are drawn from a postmodernist point of view, a departure from modernist conceptions of design. The second section, *The Interpretation of Design*, focuses on how we give meaning to design. In the last section, *Writing Design History*, the authors provide a new approach by linking design to the issues of economics, power relations and social ideology, instead of traditionally focusing on great designers or designs that have great influence. The essays included in this book provide a diversity of design thinking, yet share a common contribution to a discourse about what design is and how we can interpret it.

Napawan Sawasdichai

7

General Evolution Theory

Laszlo, Ervin

Cresskill, NJ: Hampton, 1996

This book has its origins in the twentieth century sciences of complexity rather than the reductionist views of traditional science. It was developed to better understand the behavior of whole complex adaptive systems rather than their elemental parts and, as such, provides helpful insights into the broader sociocultural role of design. Laszlo applies his theory at a high level of abstraction to physical, biological, social and cognitive dynamic systems. It is thus proposed as a 'unifying' theory and accommodates more specific theories like that of Darwin for biological systems. The general principles of Laszlo's work help us to better understand the many complex adaptive systems that increasingly define design practice and its broader sociocultural context.

Laszlo's thinking is useful both to interpret the transitions in design education during the Industrial Age and to predict those most likely as we embrace the Information Age. It is, by nature, an inexact science, but it does provide a theoretical basis for approaching sociocultural change proactively rather than reactively. This latter point is well understood by parts of the systems community, who view design as a sociocultural evolutionary guidance system — an interpretation with truly profound implications.

John Broadbent

8

The Idea of Design: A Design Issues Reader

Margolin, Victor and

Buchanan, Richard, editors

Cambridge: MIT Press, 1995

The Idea of Design is an anthology of writings collected from the international journal *Design Issues* as an effort to demonstrate the important shift of focus on how the idea of design is explored in contemporary discourse. It offers a broadening view of design that includes issues and problems that were seldom developed in depth in earlier practices to expand the scope of design thinking. The essays included in this book are examples of design criticism, theory and the exploration of philosophical issues. These essays are assembled into three sections. The first section, *Reflecting on Design*, addresses several themes such as the discipline of design and its relationships with other disciplines, the connections between contemporary and historic ideas and practices and the direction of new practices and research. The second section, *The Meaning of Products*, focuses on how meaning is socially constructed through interactions between users and the manmade world. The last section, *Design and Culture*, addresses the broad relations between design and culture in which designers and communities of users function.

Napawan Sawasdichai

9 Knowledge As Design

Perkins, David N.

Mahwah, NJ: Lawrence Erlbaum, 1997

Knowledge As Design is a general design ideology for multidisciplinary thinking in education, physics, mathematics and other disciplines. The book illustrates a simple concept of design that is not particularly based on science or art. Four design questions — purpose, structure, model or case and argument — are the main themes of the book. The author distinguishes between knowledge as information and knowledge as design and the book develops many analogies for the four parts. Purpose includes the significance of design and its goal. Structure can be an abstract form (i.e., theory), structure of procedure (i.e., supermarket shopping) or algorithms of arithmetic. Model can be represented as a physical model (i.e., drawing, map or mental model like cognitive processing). Argument is a justification in philosophy of science and informal reasoning (i.e., heuristic and justification). From a design point of view, *Knowledge As Design* assembles a crucial part of these four design elements. A deeper study of this topic will make a tremendous contribution to the philosophy of design.

Sakol Teeravarunyou

10 Material Culture and Mass Consumption

Miller, Daniel

Oxford, UK: Blackwell, 1987

Miller investigates the relationship between society and material culture. He proposes a theory of mass consumption as the context through which we relate to goods. The discussion starts with the subject-object relationship at its most abstract philosophical level. From Hegel, Marx and Simmel, the concept of objectification is derived. Objectification is a process of externalization and reabsorption, which is a necessary part of becoming. Continuous objectification makes mass goods an internal part of the process by which we create ourselves, our identities, affiliations and everyday practices. Goods become one of the languages with which we communicate with each other. Their consumption is defined as a “continual struggle to appropriate goods and services made in alienating circumstances and transform them into inalienable culture.” Goods are therefore representations and part of the process of building culture. In the process of establishing a theory of material culture and consumption, the author builds strong links to the work of Veblen, Bourdieu, Baudrillard and Douglas who also recognize goods as objects to be examined in terms of their expressive and symbolic functions. Design and design history is criticized for ignoring these functions of goods and their transformation in the process of consumption.

Suzan Boztepe

11

The Meaning of Things: Domestic Symbols and the Self

*Csikszentmihalyi, Mihalyi and
Rochberg-Halton, Eugenie
Cambridge: Cambridge University Press, 1981*

The Meaning of Things is an extraordinary study of the cultural meanings between artifacts and people. The authors use theories from semiotics, cultural theory and philosophy to develop research findings from questionnaires, interviews and statistics on domestic objects such as furniture, television and home characteristics. They use history, case studies and theory to support their interpretations. Although the authors mainly work in the context of social science and psychology, the study provides another viewpoint for the meaning of design. The meaning in this book is not usability or fashion, but is the broad meaning of objects in people's minds. This meaning can be cultivated and it requires time and transactions between people and things. The authors clearly distinguish among sign and symbol; object values by action; object values by contemplation; and terminal material value and instrumental materialism. It is interesting to see how design can be involved in the creation and redirection of meaning in a pragmatic sense, guided by moral standards oriented toward the good life for the wider community.

Sakol Teeravarunyou

12

Mechanization Takes Command

*Giedion, Sigfried
New York: Norton, 1948*

When it first appeared, Giedion's book rapidly became, and remains, a classic. He contrasts what he terms 'the ruling taste,' fashionable forms of social display, with 'vernacular' forms, very firmly emphasizing the validity of everyday products against the elite forms of the so-called Fine Arts. The book demonstrates how processes of mechanization have transformed objects in such fields as work, the home and transportation. Yet although an enthusiast for modernity, Giedion was an early member of the modernist movement in Europe, he depicts the results as being mixed. Steam baking transformed bread from being 'the staff of life' into a floppy white substance of dubious nutritional value. On the other hand, domestic improvements in such areas as cooking, heating and sanitation have decidedly brought great benefit. Although inevitably dated in some respects, the illustrations still fascinate and many of Giedion's ideas are highly relevant.

John Heskett

13

**Mind, Language and Society —
Philosophy in the Real World***Searle, John R.**New York: Basic Books, 1998*

John Searle, a contemporary philosopher, has three objectives in this brief book: 1) to advance a series of theoretical claims about the nature of mind, language and society; 2) to demonstrate a style of philosophical analysis; and 3) to make observations about the nature of philosophical puzzlement and problems. Going after dualism, his argument takes a biological approach to mind in which subjectivity is inescapable and consciousness is integral to mind and intension. Of particular interest is his distinction between 'observer-independent' and 'observer-dependent' features of the world in a chapter titled *The Structure of the Social Universe*. Throughout the book he gives excellent practical examples of abstract philosophical distinctions. Not an empiricist, he demonstrates a form of logical or conceptual analysis.

Sharon Poggenpohl

14

On the Pragmatics of Communication*Habermas, Jürgen**Cambridge: MIT Press, 1998*

Jürgen Habermas, a German philosopher, examines the pragmatics of communication and theories of meaning and action in particular. In contrast to other formal linguistic approaches to communication theory, he anchors communication in a social setting by focusing on dialogue. "The structure of language maintains and renews itself solely through the linguistic community's practices of reaching understanding." Such linguistic agreement allows the participants to coordinate their actions.

This collection of ten articles requires careful reading and study. Familiarity with other philosophical positions such as those of Wittgenstein, Frege, Derrida, Rorty, Searle and others is essential. The bibliography at the conclusion is extensive.

Sharon Poggenpohl

15

Personal Knowledge*Polanyi, Michael**Chicago: University of Chicago Press, 1962*

Written in a critical style, the author attempts to bridge the gap between fact and value, science and humanity. Many examples are drawn from the natural sciences, law, psychology and religion. The theory of knowledge presented here points to the fact that the human condition always shapes knowledge. The author, a distinguished physical chemist and philosopher, demonstrates that the scientist's personal participation in his knowledge in both its discovery and its validation is an indispensable part of science itself. As such the process of discovery and confirmation ultimately rely on one's own accrediting vision of reality or beliefs. Some of man's most important knowledge is tacit, such as the knowledge of how to swim or judge a work of art. The discovery of knowledge is the 'heuristic' function of science. This viewpoint can be applied to design as a means to discover design knowledge and to create a stable framework within which various kinds of knowledge can be justified.

Sakol Teeravarunyou

16

Phenomenology of Communication:**Merleau-Ponty's Thematics in Communicology and Semiology***Lanigan, Richard L.**Pittsburgh, PA: Duquesne University Press, 1988*

Lanigan's treatment seeks to free communication from the lenses of linguistics and other disciplines, and place it in the realm of experience through Husserlian phenomenology, as passed through Merleau-Ponty, whose phenomenology is based on perception as the primary or first mode, thus ground, of meaning. By this method, Lanigan poses a semiotic view, that all knowing or perceiving of things is not grasping the things in themselves, but grasping them in terms of determinate forms or signs, i.e., knowing or perceiving 'as.' Unlike semiologists such as Saussure and Kristeva, Lanigan's 'knowing as' is not linguistic. Rather it is in terms of an immanent perceived cognitive object. Rhetorical invention, for example, creates cognitive objects that are shared by speakers and receivers.

Lanigan gives a general and historical introduction to his approach including descriptions of theories of Jaspers, Heidegger, Husserl, Schutz, Habermas and Merleau-Ponty.

Peter Storkerson

17

Philosophical Tools for Technological Culture — Putting Pragmatism to Work*Hichman, Larry A.**Bloomington: Indiana University Press, 2001*

Technology is parsed into: techniques, tools and artifacts; systems; applications of science; and techniques of inquiry. This very broad and inclusive understanding of technology based on human physical and intellectual extensions anchors its meaning in human activities. Within this viewpoint, philosophy has a unique role in reconstructing and tuning up technology. The role of the philosopher is to challenge technological determinism and provide fresh ideas to help technical specialists determine whether their cherished ideas and values are in fact appropriate to changing life circumstances. Strong reference is made to Peirce, James and Dewey. Philosophies of action (praxis philosophies) and philosophies of production (productive pragmatism and pragmatic instrumentalism) are examined as tools for cultural renewal. While the text is accessible, Hickman cites many contemporary philosophers. This is either a source of frustration for the reader or an impetus to further exploration using the bibliography at the end.

Sharon Poggenpohl

18

Philosophy in the Flesh*Lakoff, George and Johnson, Mark**New York: Basic Books, 1999*

This is an attempt to heal centuries of mind-body dualism in Western philosophy. Lakoff, a linguist, and Johnson, a philosopher, team up in this sizeable book (600 pages) to explore the philosophical past and the cognitive and neuroscience present to effect an understanding and readjustment in thinking. Taking on the classic philosophical problem of 'what is real,' the authors establish knowledge of the world through our existence as embodied creatures with sensorimotor contact with the world as well as mental reflection in relation to it. Metaphor figures prominently in the analysis, as physical relationships are mapped to more subtle and abstract ones, linking bodily experience to mind. The last section of the book clearly compares and contrasts previous philosophical approaches to a more cognitive and biological science approach: disembodied reason is compared to embodied reason; literal reason to metaphoric reason; radical freedom to limited freedom; and objective morality to embodied morality.

The extensive reference list at the end divides into five sections: Cognitive Science and Cognitive Linguistics; Neuroscience and Neural Modeling; Philosophy; Other Linguistics; and Miscellaneous. Some sections are more finely divided.

Sharon Poggenpohl

19 **Of Problematology, Philosophy, Science and Language**

Meyer, Michael

Chicago: University of Chicago Press, 1995

Questions are fundamental to philosophical pursuits according to this author. Reason is identified with the question-answer process. The author argues that after Socrates, Western philosophy became mistakenly engaged with answers. The author critiques Socrates, Plato, Aristotle, Heidegger, Wittgenstein and Foucault in the process of making of his argument. "...recent work in rhetoric points toward a theory of radical questioning and claims that the methods of rhetoric and argumentation must be turned back on philosophy itself in order to recover the original significance of metaphysics as the science of ultimate questions." Written from a strong philosophical perspective, the chapters on What is a Philosophical Problem, Dialectic and Questioning and From Propositional Rationality to Interrogative Rationality are a useful foundation for those formulating design research questions.

Sharon Poggenpohl

20 **Practical Reason, On the Theory of Action**

Bourdieu, Pierre

Palo Alto, CA: Stanford University Press, 1998

Based on three fundamental concepts:

1) habitus, the global social space characterized by forces and struggles in which agents confront each other with various means and ends; 2) field, a space of dispositions in which groups are relationally located; and 3) capital, various kinds of investment concentration as in economic, cultural, symbolic, political, public, etc.; Bourdieu is interested in a science of social relations. His approach to sociology is to challenge naive realist readings of social life and instead to examine each practice as an instance in a pattern of substitutable practices.

He is concerned with patterns of consumption and lifestyle and uses his ethnological fieldwork in many countries to establish pattern. The overall goal is a philosophy of action that reveals often hidden patterns of social relationship from the institution down to the individual. He is at his best when revealing tacit agreements between institutions and individuals or among individuals.

The book consists of seven essays based on lectures and addresses given between 1988 and 1994. Chapters of considerable interest to design and particularly those engaged in planning are: chapter 1, Social Space and Symbolic Space; chapter 2, The New Capital; and chapter 5, The Economy of Symbolic Goods.

Sharon Poggenpohl

21 Representation and Reality

Putnam, Hilary

Cambridge: MIT Press, 1988

This book starts from Putnam's rejection of the computational model of human cognition proposed by Chomsky and others. Putnam wishes to establish the connection between meaning and the fixation of belief as a holistic and social process and to demonstrate that meanings cannot be isolated from each other. Meaning is a general judgment relying on our domain beliefs, and is a series of negotiations including equivocations, benefit of the doubt, and 'charity' by which we negotiate between concepts as paradigms or frames for the perception of particular events or entities as ostensions.

Putnam asserts and refutes three major assumptions of representation theory: 1) Every word one uses is associated in the mind of the speaker with a certain mental representation; 2) Two words are synonymous (have the same meaning) just in case they are associated with the same mental representation by the speakers who use those words; 3) The mental representation determines what the word refers to, if anything.

Putnam proposes a pragmatic realism: "The important thing, it seems to me, is to find a picture that enables us to make sense of the phenomena from within our world and our practice, rather than to seek a god's-Eye-View." He calls this 'internal realism.' Internal realism is an epistemic relation between conceptualization and ostension which can be at any time stable, but which can also be subject to stepwise transformation as either can change and force adaptations in the other. It is historical, dependent upon behavior and context.

Peter Storkerson

22

Return to Reason

Toulmin, Stephen

Cambridge: Harvard University Press, 2001

From the perspective that rhetoric and logic represent an inseparable practice in which the former is situational and the latter is intellectual, Toulmin argues that the current dominance of rationality needs to be counterbalanced with reasonableness. Rationality is based on scientific method, mathematics and abstraction, while reasonableness is based on humane judgments relating to personal experience and practice. The argument is set in an historical context that explores the invention of disciplines, developments in philosophy and science, ideas of ethical theory and moral practice and the quest for certainty. There are strong ties to John Dewey and Donald Schön and to the foundation of user-centered design running through this book.

Sharon Poggenpohl

23

The Sciences of the Artificial

Simon, Herbert A.

Cambridge: MIT Press, 1969

Herbert Simon pioneered the study of the artificial. Natural sciences describe 'natural' objects and phenomena. The sciences of the artificial describe artifacts that result from human intervention in the natural world. According to Simon, artifacts are not exempt from natural law but are adapted to the environments in which they operate. Artifacts are aimed at satisfying human purposes and they are conceived in the human activity called design. Simon defines design as the human capacity concerned with envisioning how things ought to be and devising artifacts to attain goals. Based on this definition, everyone who devises courses of action aimed at changing existing situations into preferred ones is practicing design. This understanding not only challenges traditional definitions of design as a technical activity, but also puts design at the core of all professional training. Simon suggests that schools of engineering, as well as schools of architecture, business, education, law and medicine, are all centrally concerned with the process of design.

Carlos Teixeira

24 The Symbol System

Elias, Norbert

Newbury Park, CA: Sage Publications, 1991

Elias builds a constructive, historical and evolutionary sociology of knowledge based on social systems and social organization. Human beings are at all times, sensory, behavioral, symbol using, social and cultural. The analysis of behavior and the design of artifacts must encompass all of these domains.

There are three major themes: language, knowledge and thought. Communication is viewed as embedded in behavior, especially social behavior as a non-coercive method for coordinating action. The separation of the symbolic and behavioral worlds, and the social and natural worlds is denied through a historical, evolutionary bio-sociology. Elias' view is embodied — language is sounds and gestures and emerges out of earlier forms of behavior. This is demonstrated by the importance of sound and gesture in early childhood language acquisition and the relative difficulty of learning languages in later life. Language extends perception to the experiences of others. The integration of behavior, language and thought builds an historical sociology of knowledge as a social artifact. He sees his role as following Comte and Hegel, to "break away from the stationary character of the philosophical view of knowledge."

Peter Storkerson

25 The Tacit Dimension

Polanyi, Michael

Gloucester, MA.: Peter Smith, 1983

In recent years, a reaction against the dominant emphasis on quantitative methodology in some disciplines has been reflected in growing awareness of the value of tacit knowledge. Michael Polanyi's book is generally acknowledged as the major source of this awareness. In its opening pages, he writes: "... we know more than we can tell. ... So most of this knowledge cannot be put into words." Polanyi juxtaposes tacit with coded knowledge, the kind that can be written down and communicated, that is also valuable, but not the whole story. Tacit knowledge is embodied in skills acquired through learning by doing, which cannot be explained adequately or replaced by theory. For example, we know how to ride a bicycle but have difficulty in describing how to do it for someone else. It is difficult to underestimate the importance of this book for understanding the nature and value of much design knowledge. It is much more than a tract for designers, however, for Polanyi writes profoundly of a vision of how knowledge can lead to personal fulfillment in the context of social commitment. Read it, and return to it, often!

John Heskett

26 **Technology and the Lifeworld: From Garden to Earth**

Ihde, Don

Bloomington: Indiana University Press, 1990

The purpose of this book is to make visible the ways in which technologies create new experiences which shape human beings as sentient and cognitive creatures. This view is in opposition to the product design notion of artifacts as tools employed by humans, or even as mere cultural artifacts or expressions.

There are three programs: 1) phenomenology of technology as a mode of individual experience; 2) cultural embedding of technology relations; 3) postmodern multicultural topography as a techno-cultural byproduct. Technology is the man-built universe in which we live, and in which all experience becomes enmeshed. From this standpoint non-technological experiences are transformed as, for example, in nature 'museums' or parks. But, technology has always been integral to human existence. While Ihde does not accept the natural-artificial distinction, he accepts that technology changes the nature of the human being by producing new modes of thinking. The technological mediation is experiential – behavioral - pragmatic and hermeneutic - semiotic. Experience is always of something. Technologies create and organize perceptions as experiences and in semiotic terms function as mediators between human beings and the world.

Peter Storkerson

27

**Understanding Computers and Cognition:
A New Foundation for Design**

*Winograd, Terry and Flores, Fernando
Norwood, NJ: Addison Wesley, 1987*

This book provides a new environment for understanding not only what computers do, but also how they function in the context of human language, thought and action. The authors present three important parts: 1) the theoretical background dealing with fundamental questions in relation to essential understanding of computers and cognition from philosophical and biological standpoints; 2) an understanding about computation, thought and language through illustrating what is currently being done and in anticipation of future developments in terms of what computers do; and 3) the orientation to design based on the theoretical background they develop. The authors view designing as ontological. Interventions take place through designing and changing existent ways of being in the world. Through the collaboration of two authors with totally different backgrounds, one is in computer science and artificial intelligence research while the other is in social and political organization, this book goes beyond the specific issues of what computers can or can't do. It offers an extended viewpoint from the traditional engineering-based foundations that have provided a fertile background for developing new technology to an adequate understanding of what computer devices do in the human context.

Youn-kyung Lim

Affect and the Construction of Social Action*Heise, David R.**Cambridge: Cambridge University Press, 1979*

Human behavior, including communication and human computer interaction, is determined by institutional contexts: activities, roles, projects and outcomes, as interpreted and carried out by participants according to their understandings, as cognitively processed by them as individuals.

Interpretive sociology — ethnomethodology, symbolic interactionism, etc. — operationalize situational conduct into events and actions by individuals, often according to 'turn taking' patterns of interaction by which participants collaborate to construct the activities they perceive as transcendental. One major issue is the integration of affect with non-affective process, i.e., logic. According to Affect Control Theory, affect appears in the context of turn-taking behavior as the method for steering interaction according to institutional context or activity.

Heise's goal is "development of an interpretive sociology formulated with mathematical rigor, grounded in empirical procedures, and permitting complex and subtle analysis of social relationships." Analysis includes cognitive psychology focusing on situational definitions, mechanisms controlling interaction and the role of affect in constructing reactions. A mathematical model is proposed for quantitatively operationalizing affect control theory as an observational and experimental framework for objectively analyzing roles and role oriented behavior within specific contexts.

Peter Storkerson

29

Understanding Media - the Extensions of Man*McLuhan, Marshall**Cambridge: MIT Press, 2001*

Originally published in 1964, the author was widely regarded as a visionary. Now many editions later, the media McLuhan so enthusiastically discussed, print, photography, games, telegraph, typewriter, telephone, phonograph and television to mention a few, seem quaint. However his thesis about media being extensions of human sensory systems remains important. Also important is his observation that "In the electric age we wear all mankind as our skin." The discussion of cultural transformations from tribal to civilized and the effect media has on our nervous system and intellectual life remain provocative. Perhaps Negroponte is to the digital age what McLuhan was to the electronic. For the media now are quite different, but the effects remain formidable. This book is best read with a view to history as the author's pseudoevent can be seen to foreshadow the postmodern spectacle; mass media can be seen to yield to interactivity; and an early form for the information society can be glimpsed. It is entertaining to consider what McLuhan would make of cellular phones, email, video games, the web, media convergence and star wars.

Sharon Poggenpohl

30

Utility Reassessed:

**The Role of Ethics in the Practice of Design
(Studies in Design and Material Culture)**

Attfield, Judy, editor

Manchester: Manchester University Press, 2001

This collection of essays defines and reassesses the concept of Utility. Using it as a touchstone for consideration of the place of ethics in the recent history of design, the collection offers an entrance into the issues that concern design decision-makers today. It reveals a fresh perspective on the philosophy behind the concept of Utility, and as a design theory, it offers a critique of the dangers of 'good design.' Rather than arguing about the inadequacies of modern functional design, it approaches the subject as a continuing history that has attempted to improve the human condition, through a process of rational thought in the construction of the material world. Using the history of utility as a design theory, the book suggests ways in which the past can teach us something of the present, and reveals why, on the cusp of the new millenium, utility is so relevant. The contributors are distinguished design historians and specialist researchers from some of the leading centers of design studies in Britain, Scandinavia and the United States, including Jonathan Bell, Julian Holden, Pat Kirkham, Paddy McGuire, Graham McLaren, David Crowley and Jonathan Woodham.

Carlos Teixeira