

The Way of Inquiring Systems

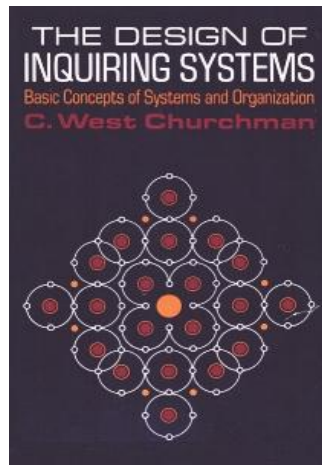
A Review of C.W. Churchman's *The Design of Inquiring Systems*, New York, Basic Books, 1971

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ABSTRACT. *The Design of Inquiring Systems* is perhaps one of the most original books by the former UC Berkeley management scientist, research philosopher and pioneer of the “systems approach” as well as of the field of “operations research,” C. West Churchman. Although it is not written in a conventional scholarly style, the book has been highly influential and remains today an inspiring text fundamental, but still full of difficulties and questions. Contemporary ideas such as information systems, artificial intelligence, and research-based practice. Look at these concepts from the perspectives of some major thinkers of the past: Leibniz, his teacher Edgar A. Poe, and William James). At the same time, the book can be read as a self-strengthening and limiting systems approach. This short review essay touches upon some of the core themes of Churchman's pioneering work on the systems approach and should thus be of interest to all readers interested in systems thinking.



on some of the most largely unresolved, difficult issues raised by key contemporary systems design, information intelligence, and Churchman's idea is to bring together the different perspectives of some major theorists of knowledge: Locke, Kant, Hegel, and Singer (a disciple of Kant). At the same time, the book can be read as a reflective essay on the evolution of Churchman's own systems approach.

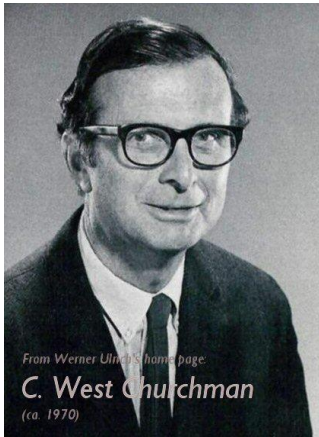
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Working at the Limits of the Systems Paradigm

The advancement of science has always depended on individuals thinking beyond and



ahead of prevailing paradigms. But the history of science also shows that the scientific community tends to “discipline” such thinkers by marginalizing them. Established disciplines often

enough seem to spend more effort for the purpose of defending their paradigm than for overcoming its limitations. Ironically, the more successful a discipline is in securing its own paradigm, the more its advancement will finally depend on the few thinkers who are working at the limits of this paradigm.

The Design of Inquiring Systems is an impressive example of a pioneer working at the limits of his own field’s paradigm. Significantly, the first section of the book (p. 3) is entitled “On the Limits of the Design of Systems.”

The Challenge of Improvement

For Churchman, the idea of systems design – “the effort to improve social systems through planning” (Churchman, 1982, p. 129) – entails a question of paradigmatic importance to applied science in general, and to operations research / management science in particular: “Is it possible to secure improvement in the human condition by means of the human intellect?” (1982, p. 19). Improvement implies learning; can systems design *secure* learning? And if it cannot, how can we secure at least a

critical understanding of the limits of design, i.e., of the sources of deception implied in our relying on design?

This is the fundamental question that Churchman, as I understand him, poses himself in *Inquiring Systems*. In an age threatened by global self-destruction, ecological crisis, hunger and many other complex problems brought forth by scientifically supported systems design, this is not merely an academic question. It is a question of immediate importance to the applied scientist; for what else is he trying to achieve but producing knowledge that might help secure improvement?

Can systems design secure learning?

The manner in which Churchman seeks to answer his fundamental question is no less characteristic of this deeply philosophical pioneer of the systems approach than the question itself. Far from presupposing that there is any such thing as one „best” epistemological starting point (theory of knowledge) for approaching his question – an early insight (see Churchman, 1948) on which today’s prevailing theories of knowledge have hardly advanced – he turns to some outstanding philosophical minds of the past: Leibniz, Locke, Kant, Hegel and finally, his own philosophical teacher, Edgar A. Singer, who was a disciple of the great American pragmatist William James. Churchman thus gains five alternative – or, as it turns out, complementary – epistemological viewpoints from which to elucidate some basic limitations of present-day Utopias of systems design (one might think of conceptions such as management information systems, artificial intelligence, expert systems,

social cybernetics, and other applications of systems science).

Inquiring Systems

Churchman's idea is to look at these different epistemologies as designs for *inquiring systems*, that is, systems that would be capable of securing knowledge about the real world – and of knowing how and why exactly they know: “We can regard the history of epistemology (theory of knowledge) not as a description of how men learn and justify their learning, but as a description of how learning can be designed and how the design can be justified.” (1971, p. 17) This idea opens up two complementary perspectives for reading the book.

Looking at classical theories of knowledge as designs for inquiring systems requires a translation from one philosophical aim to another.

Basically, the book can and should be read as a philosophical inquiry into the meaning and limitations of systems design. In addition, it can also be read as a refreshingly unconventional discussion of the meaning and limitations of traditional epistemologies from a systems point of view. Both ways of reading the book have their charm; both might also cause the readers some difficulties in translating the book's insight back into their accustomed ways of thinking (be it as a systems designer or as a philosopher). As Churchman explains, his way of looking at the older texts “requires a translation, not from language to another, but from one philosophical aim [i.e., the

justification of knowledge] to another [i.e., the justification of design].” (p. 17)

The philosophical reader might find the translation inaccurate, as there is little direct consultation of the original authors. Churchman does not belong to the majority of ivory-tower philosophers, for whom philosophy is largely the same thing as studying the *history* of philosophy (an observation that has lost nothing of its validity since Kant made it over 200 years ago). To Churchman, philosophy is meaningful and important as an *applied discipline*, as a stepping stone to improving actual social reality. Hence he is “less interested in what Leibniz, say, was trying to accomplish, than in what his attempts mean to the designer. Therefore, when we speak of a Leibnizian inquiring system, we do not mean that this system is an exact account of how Leibniz conceived the theory of knowledge; rather, it is a reconstruction of Leibnizian ideas in the language of the design of an inquiring system.” (p. 17f)

Can we teach a computer to conduct research?

As a basic translation of his underlying question, Churchman asks “whether it is possible to tell a computer how to design an inquiring system, or, in other terms, teach a computer to conduct research.” (p. 6) To be sure, his interest is not in actually developing computer software, for example, in the sense of artificial intelligence research; rather, the question serves as a conceptual boundary experiment to clarify the limitations of some alternative designs for inquiry.

The Guarantor Problem: Toward a Theory of Deception

In the first of the two parts of the book, entitled “A Classification of Systems” (pp. 1-205), Churchman examines the five chosen epistemologies in the light of his question. He shows that each of the thus-gained designs for an inquiring system is bound to remain incomplete (or open-ended) in regard to the validation of the information it produces. It cannot serve as its own *guarantor* (pp. 22f, 78, 204f). A design’s specific gap of guarantee signals its „lonely,” creative part, “the part that cannot be designed, at least relative to a standard computer.” (p. 6) In other words, it signals the limit beyond which “man cannot be bettered by his own designs.” (p. 3)

No design for an inquiring system can serve as its own guarantor of the information it produces.

If not adequately considered, a design’s specific gap of guarantee will become a source of hidden normative assumptions about how the world *ought* to be viewed or redesigned. In Churchman’s language: it will become a source of deception. Because each conceivable design of inquiry runs the risk of such built-in sources of deception, a self-reflective, purposeful human inquirer is called for to take on the responsibility for the lack of guarantee in a design’s premises and promises.

The Theme of Comprehensiveness and the Heroic Mood

As I understand Churchman, the fundamental limit common to all designs for an inquiring

system lies in the simultaneous indispensability and impossibility of a complete (or comprehensive) systems design. This implication leads Churchman to two of his favorite themes: the theme of comprehensiveness, which he already discussed in *Challenge to Reason* (1968a), and the „heroic mood“ required from a systems designer who really strives for a comprehensive rationality of his designs – a rationality to which its own built-in sources of deception would become transparent.

The ultimate meaning of the systems approach may lie in the creation of a theory of deception.

The theme of the „heroic mood” is expounded in the second part of the book, “Speculations on Systems Design” (pp. 207-277). It mainly discusses the inevitable role of „imagery“ or *Weltanschauung* (pp. 209-218) in inquiry and the problem of designing a guarantor for the choice of such imagery (pp. 237-246). Other aspects discussed are the implementation of systems design and the psychology of the inquiring system (pp. 219-236, 259-273).

This part of the book, though impressive, will probably leave most readers rather helpless. Churchman poses a lot of thoroughly puzzling questions, and he does not seek to create the impression that he or anybody else has the answers. “To me the essence of philosophy is to pose serious and meaningful questions that are too difficult for any of us to answer in our lifetimes.... Thought likes solutions, wisdom abhors them.” (1982, p. 20) The ultimate question with which the book concludes may convey the flavor of this second part: “What kind of a world must it be in which inquiry becomes possible?” (p. 277)

*What kind of a world
must it be in which
inquiry as understood in
this book is possible?*

Personal Appreciation

What have I learned from this book? Despite a few critical thoughts, I owe to *Inquiring Systems* some basic ideas and questions that have shaped my understanding of the systems approach. Along with Churchman's earlier books, *Challenge to Reason* (1968a) and *The Systems Approach* (1968b), *Inquiring Systems* is a main reason why I did not prematurely write off systems theory as a technocratic approach (as many of my fellow students did) but began to see in it a critical and emancipatory potential waiting to be uncovered – the aim of my subsequent step from Churchman's "heroic" systems approach to "critical systems heuristics" (Ulrich, 1983).

I think the key insight for me was the inevitability and critical significance of the systems idea for an adequate, self-reflective and *self-limiting* concept of rationality, which, as I began to realize, had to replace Churchman's heroic quest for comprehensiveness (cf. Ulrich 2004, p. 1128f).

Linked to this was the conclusion that the systems idea, if only we understand it in the Kantian sense of an „unavoidable“ critical idea of reason, can make a major contribution to dealing reasonably with the inevitable *lack* of comprehensiveness in all human knowledge and understanding (Churchman and Ulrich, 1980; Ulrich, 1981; Churchman et al., 1981; Ulrich, 1983).

As a third and last point, I was led to recognize the fact that not only modern systems science but also contemporary practical philosophy has failed to understand the significance of the systems idea for a critical *and practicable* approach to the problem of practical reason: How can we rationally identify and discuss the normative implications of our designs? Hence, my effort to redefine and unify practical philosophy and the systems approach in terms of critical systems heuristics (CSH).

Outlook to the „Enemies“

The Design of Inquiring Systems to me is one of the two books by West Churchman that best represent the critical program of research that he proposed at the end of *The Systems Approach*: "The ultimate meaning of the systems approach lies in the creation of a theory of deception and in fuller understanding of the ways in which the human being can be deceived about his world...." (1968b, p. 229f)

The other of these two books is *The Systems Approach and Its Enemies* (1979). Perhaps a short outlook to how this later book takes up the basic intent of *Inquiring Systems* will interest the reader. Basically, *Enemies* offers a dialectical framework for unfolding the meaning and limitations of concrete systems designs. Although Churchman does not say it in these terms, I believe that in this book the systems approach for the first time has become truly self-reflective with respect to the normative implications of its own quest for systems rationality. In Churchman's terms, the systems approach cannot realize its search for a comprehensive rationality of planning so long as it seeks to absorb the „enemies“ of such rationality, which to him are: politics, morality, religion, and aesthetics (some readers might want to replace morality with economics).

The somewhat provocative term „enemy“ is meant to connote the irreconcilable conflict between the whole-systems rationality of the systems approach and the private, subjective rationalities of these other standpoints, which are not willing to subject themselves to the planner's standards of systems rationality even though he may claim to plan for them. They are in this sense his „deadly enemies,“ that is, the dialectical negation, of the systems approach.

Rather than by seeking to absorb the standpoints of the enemies so as to render them innocuous, the systems approach can hope to claim comprehensive rationality inasmuch as it learns to reflect on its own limitations, namely, by listening to its „enemies“ and by understanding them dialectically as what they are: mirrors of its failure to be comprehensive (Ulrich, 1983, p. 34).

The ultimate lesson to which *Inquiring Systems* and the *Enemies* amount for me is this: only that concept of rationality (and hence, understanding of systems design) can help secure improvement which makes transparent to itself its own lack of comprehensiveness and which also comprehends this lack of comprehensiveness – its own self-limitation, that is – as a necessary condition of reasonable social practice. Only thus systems design can become an effective instrument for bringing reason into practice, and for rendering practice reasonable.

West Churchman has served the design profession and other applied disciplines by thinking beyond their current concepts of rationality; but he cannot save us the trouble of reading and re-thinking his books for ourselves. So many years after the publication of *Inquiring Systems* and *Enemies*, it is certainly not too late, but more urgent than ever, to come to terms with this great, difficult pioneer of the systems approach who, by a lifetime's hard

work at the limits of his own paradigm, has taught us so much more than we have as yet learned from him.

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