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In memory of C. West Churchman (1913–2004)
Reminiscences, retrospectives, and reflections

Werner Ulrich *University of Fribourg, Switzerland*

Abstract

C. West Churchman, the grand old man of the 'systems approach', is dead. Born on 29 August 1913 in Philadelphia, Pennsylvania, he was 90 years of age. After a rich and significant life of scholarship, he died on 21 March 2004 in Bolinas, California. A former student and collaborator of Professor Churchman offers this commemorative essay. He looks back on his years with West (as everybody called him) at the University of California, Berkeley, and reflects on the way this changed his understanding of the systems approach. The paper also offers a sketch of some of the core concerns and concepts of Churchman's philosophy of social systems design; a short summary of his professional career; an overview of his major publications; and a list of recommended readings.

Keywords

C.W. Churchman - biography
C.W. Churchman - appreciation
ethics
management
organizational transformation
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Introduction

We are mourning the loss of one of the founding fathers of the fields of operations research and management science and, at the same time, one of the outstanding pioneers of a 'systems approach' to the solution of societal problems. To West Churchman, a systems approach meant much more than merely a unifying approach in the sense of general systems theory; it implied a deeply ethical stance regarding the ways we manage (and mismanage) our human affairs. His ambition was not only to increase our capabilities of handling complex problems but also to increase our understanding of the ways our 'scientific' solutions may fail to be appropriate, that is, to bring about desirable change. If there is any single quotation from his writings that may capture the hopes he associated with the systems approach, it must be this: 'Thought likes solutions, wisdom abhors them' (Churchman 1982b: 20).

Another way to capture what made West Churchman so special is this. He was a true pioneer, but he resisted the temptation of becoming a 'true believer' of the fields he had helped to establish. He did not fall into the trap into which so many academics tend to fall; of taking the basic assumptions and conventions of their fields of expertise for granted. Such independence from the mainstream did not make academic life easier for

him. He felt at times lonely and misunderstood by his academic environment, despite the recognition and fame he won himself and the many distinctions he received. Among them were several prestigious editorships, two 'Best Book of the Year' awards, the 'Berkeley Citation' (one of the University of California Berkeley's highest awards), three honorary doctorates and a nomination for the Nobel prize. Those who studied and worked with him know that his fame did not blow up his ego. He remained the man he was - always searching, doubting, unpretentious, and at times deeply disillusioned, if not despairing, about the failure of Academe - along with governmental and commercial organizations - to face major contemporary problems such as worldwide malnutrition and poverty, violence and war, environmental degradation, lack of education, and many others.

As a third and last initial characterization, West was a powerful teacher. He made students feel different. He knew how to move them and to awake their intellectual curiosity. He raised their ethical awareness in ways that made them reflect on the meaning of their academic education and set themselves new goals. He attracted students from all fields and from many parts of the world. His weekly 'informal seminar' sessions were proverbial. In the late 1970s, when I was his student, he used these Wednesday afternoon seminars to present newly drafted or revised chapters of his book in progress, *The Systems Approach and Its Enemies* (Churchman 1979). Patiently he listened to the comments of everyone who wished to comment and accepted what they had to say. In other sessions, he left the topics entirely to the participants and was mainly listening. With his head bent over a piece of knitting to which he seemed to dedicate all his attention, he would only now and then throw in a short question or comment. These seminars may have meant different things to different people, but I suspect West's small office in Barrows Hall where they took place was for many a place of worship; so much they adored their teacher. He radiated something that few could define clearly, but clearly they had been missing it in their studies before!

As these initial remarks should suggest, this essay does not aim to provide a scholarly exegesis of West Churchman's intellectual contribution, although I will try to survey some of his ideas and offer short biographic and bibliographic overviews. Rather than presenting a dry analysis, I would like to convey to the reader some of the radiating quality of his thinking as I experienced it as his student. But then, I find it nearly impossible to capture this special quality of which I am talking, except in the subjective terms of how I reacted to his ideas and how they influenced me. Honouring my former teacher in this manner risks looking egocentric, but it is not thus intended. Shortly after receiving the news of his death, it is simply the way in which I can best express my appreciation and gratitude.

For readers who would like to see different appreciations of Churchman's work by other authors, I have listed a number of these at the end of this essay. In no way should my account replace the reader's individual effort to meet and appreciate Churchman for himself, by reading him in the original. For those who would like to do so, I have elsewhere

(Ulrich 2002c) compiled a rather complete bibliography of some 300 titles, not counting multiple publications.

Figure 1: C.W. Churchman, around 1970. Photograph originally published on the jacket flap of The Design of Inquiring Systems *(Churchman 1971); the present, edited version is taken from the author's homepage (Ulrich 2002a).*

Meeting West Churchman *Through his writings and in person*

My first encounter with West's ideas was not exactly a revelation. That was in 1970, when *The Systems Approach* (Churchman 1968b) had just been published in a German translation. I could make little of the book. More accurately, I rather quickly stowed it away in the lowest shelf, where it subsequently suffered a lonely and neglected life until that lowest shelf was one day inundated by water (I got another copy later on).

The year after, I had a try at reading *The Design of Inquiring Systems* (Churchman 1971), this time in English. This changed my perception of Churchman. I would not claim that I understood the book, yet I felt attracted by it in a powerful way. It was so different from everything I had read before about the systems approach! I sensed that it represented a huge opportunity for learning. I sensed some deep personal affinity to West's way of thinking, as well.

In the following year, Churchman came to an international conference on systems thinking and management in St. Gallen, Switzerland. The conference program announced that he would talk about 'Perspectives of the systems approach'. His paper (Churchman 1973) had been circulated in advance. However, when West came to the podium, he announced that he felt so dissatisfied with it that he would not give the talk. Instead, he was going to talk about an idea that he had sketched out during the past night, in response to some discussion he had had the previous day of the conference. Hardly aware of what an important moment it was, perhaps for West as much as for me, I heard him talk about the 'enemies' of the systems approach (Churchman 1972a)!

Before the conference was over I had decided that I wanted to move to Berkeley as soon as possible and to work with West Churchman. I was now sufficiently motivated to familiarize myself more thoroughly with this somewhat exotic American philosopher and management scientist, so I began reading *Challenge to Reason* (Churchman 1968a). In the first chapter I soon run into a puzzling question: 'How can we design improve-

ment in large systems without understanding the whole system, and if the answer is that we cannot, how is it possible to understand the whole system?' (Churchman 1968a: 2)

My puzzlement quickly gave way to one of those rare 'aha experiences' when you feel the scales fall from your eyes. I sensed that for the first time, I was beginning to capture what Churchman was driving at. With the wisdom of hindsight, I should perhaps more accurately say, I began to grasp what pursuing a 'systems approach' in the spirit of Churchman was going to mean *to me*.

Epistemologically[1] speaking, Churchman's question made it clear to me that the search for a rational approach to improvement implied a continuous search for comprehensiveness, through a never-ending process of learning more and more about the world. This is why 'science' (rational inquiry) for him was so important in the quest for a better management of human affairs; without it, we had no chance of understanding what improvement meant and how we could achieve it. Science was an indispensable tool for 'sweeping in' ever more knowledge about the system in question, and thus for understanding the meaning of improvement.

West's question, as I would discover later on, was his preferred way of formulating the 'sweep-in' principle (as he liked to call it) of his academic teacher and mentor Edgar A. Singer (1959). In my understanding, the principle embodies nothing less than a pragmatic[2] criterion of truth:[3] true knowledge and understanding of a problem are the result of a process of inquiry that in principle is endless and must remain open to considering ever more aspects of a problem's environment.[4] If science was to do justice to the world of social problems, it had to be practised as a 'systems approach'.

Methodologically[5] speaking, however, West's question suggested something quite different to me. It suggested that in practice, not even the most comprehensive effort of inquiry can make sure we understand the 'whole system' relevant for achieving improvement. Thus understood, no amount of science could secure improvement. 'Understanding the whole system', then, had to mean something else than what we can achieve through science. A crucial point for me was the Kantian difference between 'knowing' and 'understanding': while the former is limited to what we can investigate empirically, the latter is not, its only limits are those of human cognition in general. It follows that critical reflection can and needs to go beyond what we can know empirically. Forecasting is one obvious example, ethical judgement another.

The implication for me was not that Singer and Churchman had got it wrong. I accepted that from an epistemological point of view, 'science' (if it meant the search for relevant and reliable knowledge) required a quest for comprehensiveness. The implication for me was that from a methodological perspective, the call for a systems approach was a question rather than an answer: How could we learn to practise a systems approach that would live up to the quest for comprehensiveness yet remain feasible and justifiable?

Thus I first discovered the intellectual power of Churchman's prefer-

1 Epistemology refers to the theory of knowledge. An epistemological analysis thus examines how we know what we believe we know, and how we know that we know, that is, can justify our claims to knowledge.

2 Throughout this essay, the word 'pragmatic' is to be read as referring to philosophical pragmatism rather than in its everyday sense of being useful. See the explanation of American philosophical pragmatism in the later section of this paper on some of Churchman's core concerns and concepts.

3 Compare the pragmatic criterion of truth of Charles S. Peirce (1969, par. 407): 'The opinion which is fated to be ultimately agreed to by all who investigate, is what we mean by truth, and the object represented in this opinion is the real. That is the way I would explain reality.' What Peirce's and Singer's concepts of truth share and what makes them both look so surprisingly up-to-date today is their process-oriented and consensus-dependent character. Likewise, both concepts imply that the real (what we take 'true' assertions to represent) is really an ideal; true knowledge is a state that we can never completely obtain but only approximate more or less. What distinguishes the two concepts from one another is the more explicitly discursive character of Peirce's concept; insofar his

ence for puzzling questions over solid answers. *Challenge to Reason* had definitely challenged my views on the systems approach. I was not going to be a true believer, thanks to West Churchman's question.

Some readers, particularly those who got to know Churchman in an earlier period of his career, might suspect that this way of reading him did not do justice to his intent; that the 'sweep-in' process - 'the heart of Singer's philosophy of inquiry' (Churchman 1982: 125) was indeed one of the core ideas that he sought to implant in our notion of scientific inquiry; and that he never lost faith in the power of science as a tool for securing improvement. They would be right. Indeed, West's efforts to contribute to the development of operations research and management science would hardly have made sense otherwise. After all, these two new professional fields were intended to extend the application of science to the domain of social systems design, that is, to issues of organizational transformation and social change. They should make science more relevant to the most important issues of humanity, in the best tradition of American pragmatism.

But even if we follow Singer and Churchman's intent, I do not think 'sweeping in' exhausts the lessons to be learned from their work. I would argue that it is by no means the most important lesson we actually may and should learn. Once my 'aha experience' had woken me up from my pre-critical slumbers, the most important lesson for me became a sort of Copernican turn in my understanding of the systems idea: its essential message to me was no longer that sound research and professional practice depend on comprehensive knowledge and understanding. Rather, it seemed to me, we urgently need to develop methodologies for dealing with the inevitable *lack* of comprehensiveness in all our knowledge and understanding (Ulrich 1981: 7; 1983: 21 and 260–62; 2001: 5 and 23f). In systems language, what matters in the first place is not how comprehensive are our systems maps and designs but, rather, how we handle their inevitable limitations.

In 1975, a postdoctoral scholarship of the Swiss National Science Foundation finally allowed me to prepare my move to Berkeley. West did not exactly invite me to come, though. I wrote several times, expressing my urgent wish to work with him at the University of California, Berkeley (UCB). Alas, he did not care to respond. I had to find a different way of 'convincing' him. Perhaps that was the first lesson he wanted to teach his future student: if you are not persistent, bold and imaginative enough to overcome minor obstacles such as this one, forget it! Persistent I was, but what should be the bold idea that would convince him?

It slowly dawned on me that my best chance to get close to Churchman was probably to apply to UCB's Graduate School of Business Administration (now Haas School of Business) for admission to their Ph.D. programme. Having just recently completed my Ph.D., the insight was not much fun. Worse, it meant a high-risk strategy, for the School's policy at that time was to admit no more than ten to twelve candidates worldwide each year; if I was not admitted, I risked losing my scholarship. For lack of a better idea, I applied. In my application, I made it clear that my actual purpose was to

criterion is probably more up-to-date. Conversely, Singer's concept more explicitly addresses the need for avoiding the relativistic implications of any pragmatic notion of truth, by associating it with the search of all human beings for absolute (unconditional, invariant) goods. See on this the discussion of Singer's and Churchman's core concept of the 'pursuit of ideals' in a later section of this paper.

4 The term 'environment' is to be understood here in the systems-theoretic sense of referring to the environment of a problem (that which does not belong to the assumed definition of 'the' problem but may nevertheless influence the outcome of a problem-solving effort) rather than in the ecological sense of referring to the natural environment (the household of nature).

5 Methodology refers to the study of methods of inquiry, usually in particular disciplines or object-domains (e.g. chemistry, history, empirical social science, management, or ethics). A methodological analysis thus examines how we can translate epistemological principles into a research practice that is adequate to a particular object domain of interest, so that it is practically relevant (it generates useful knowledge) as well as theoretically tenable (it raises no claims that cannot be justified through argumentation and evidence).

work with Professor Churchman. They accepted. By March 1976, I had become West's Ph.D. student, against his and my initial intentions.

Churchman's philosophy: core concerns

Working with West Churchman during almost five years at UCB exposed me to a wealth of new ideas. They were and remain difficult to overview. For this reason, I would like to introduce the reader to some of the core concerns and related core concepts that motivated his relentless quest for comprehensiveness. I'll make no claim to be exhaustive. Instead, I'll select a few central themes that I find particularly relevant. Among these (I have already hinted at some of them) I count his philosophical roots in American pragmatism; his specific notion of the nature and aims of science; the way he associated scientific inquiry with (social) systems design; his conception of ethics in terms of an 'ethics of whole systems'; and finally, resulting from all these notions, his understanding of the systems approach as a form of rational inquiry and practice that would live up to all the concerns he associated with these concepts. Table 1 gives an overview.

As I have said, Churchman's thinking had its roots in the philosophical tradition of American 'pragmatism' (C.S. Peirce, W. James, J. Dewey). Pragmatism is a philosophical stance that sees purposeful action as an essential expression of human nature. Accordingly, it stipulates that the meaning and value of all human endeavours, including philosophy and science, is to be measured by the way it serves the practice of human life. This pragmatic orientation sets Churchman's systems philosophy apart from the mainstream of systems thinking, which is rooted in analytical philosophy and biology (L. Bertalanffy, K.E. Boulding, A. Rapoport, N. Wiener, and others) and which, as far as I can see, continues today to pursue a naturalistic idea of 'systems science'.

The pragmatic philosopher who most influenced Churchman's thinking was one of his two main philosophy teachers at the University of Pennsylvania in Philadelphia, Edgar A. Singer, Jr. (1923, 1936, 1945, 1959). The other was Henry Bradford Smith (1923), with whom he did his doctoral dissertation in mathematical logic and who himself had been a student of Singer.[6]

Singer had studied with William James at Harvard but had developed a somewhat different version of pragmatism. He sought to avoid the relativistic implications of pragmatism (especially in James' version) by associating it with the pursuit of 'ideals'. An ideal is an ultimate intended outcome and as such is an absolute good that we cannot usually obtain; but we can try to approximate it forever more, without any predefined limit. Singer and Churchman held that every human being will at all times pursue a number of basic, invariant ideals. Everyone desires to be happy, or in Singer's language, to progress towards the ideal of 'content-

Table 1 (opposite): Some central themes of C. West Churchman's philosophy of social systems design.

Core concerns	Major concepts	Major reflections
American pragmatism (Peirce, James, Dewey, Singer)	'Pursuit of ideals'	Scientific inquiry, like all human activity, is of an ideal-seeking nature; hence, a proper understanding and practice of science requires us to understand the implications of this pursuit of ideals for our notions of truth, knowledge, science, and so on.
	'Improvement'	Improvement is a never-ending process of approaching ideals that as such cannot be achieved. One way to analyse the process is in terms of alternatively wide conceptions of purposeful activity in terms of the pursuit of goals, ends, and ultimately, ideals ('ideal planning').
	'Teleological' or purposeful nature of all inquiry and practice	The rationality of inquiry and practice is to be measured by the purposes (goals, ends, ideals) they serve and by the degree to which they approximate them (teleological measurement).
Ethics of inquiry	Inquiry in the 'imperative mood'	Whether the purposes served by some inquiry are adequate can only be understood by asking what *ought* to be the purposes; hence, well-understood inquiry is always conducted in an 'ought' mood, whatever the conventional concept of science says to the contrary and although most questions are asked in an indicative ('is') rather than imperative ('ought') mood.
	'Whole systems ethics'	Purposes can be properly chosen and evaluated only in terms of an ethics of whole systems, for improvement is a property of the whole system. Any system's improvement has to be assessed in terms of the improvement of the respective larger system.
Science	'Experimentalism'	Science is a model of inquiry based on the core ideas of empirical control of assertions (prototype: laboratory experiment), teleological measurement, and careful inference. Experimentalism combines the requirements of scientific control with the insights of pragmatism so as to achieve a non-relativistic pragmatism.
	Teleological theory of measurement	Adequate and accurate measurement is crucial for experimental control but is impossible without pragmatic assumptions as to what is to be achieved by the inquiry (purposes).
	Pragmatic-dialectical theory of experimental inference	Experimentally controlled observations always allow of different interpretations and inferences; which ones are 'true' depends on pragmatic assumptions on the purposes (goals, ends, ideals) to be pursued.
	Inquiry as 'systems design' and 'sweeping in'	Since the adequacy of pragmatic assumptions can only be understood and justified in terms of their whole-systems implications, well-understood inquiry is to be considered as a form of systems design.
	Design of 'inquiring systems'	Designing adequate approaches to inquiry amounts to the design of inquiring systems, i.e. forms of inquiry that have a built-in capability of exploring ('sweeping in') their own whole-systems implications.
Social systems design	Operations research, management science, 'systems approach'	OR/MS and the systems approach are to be forms of science that do justice to the insights of pragmatism and thereby extend the tools of classical experimental science to the world of social problems.
	'Enemies' of the systems approach	There are approaches to social problem solving that do not respect the rationality criteria of a scientific approach but merely seek to achieve their own particular rationalities (e.g. of a political or religious nature). Although they are the 'deadly enemies' of the inquirer's conceptualization of rationality in terms of whole-systems design, they cannot be ignored.
	The 'systems approach and its enemies'	Although the 'enemies' subvert the inquirer's indispensable quest for comprehensiveness, sound inquiry cannot avoid listening to them and trying to do justice to them without abandoning the quest for comprehensiveness – the ultimate paradox of all search for rational inquiry and practice.

6 Throughout Churchman's writings, we can recognize these two major influences. In Churchman's pragmatic-philosophical thinking, Smith represents the analytical pole and Singer the humanist pole.

ment'. Consequently, everyone also desires the 'knowledge' (education, information) and the 'power' (competence, control) necessary to promote one's contentment. Likewise, everyone desires 'plenty' of resources and opportunities to this end, and so on. Because we will always seek to get closer to these ideals, they provide us with an orientation for purposeful action; because they are absolute, they provides us with anchor points, as it were, for judging the merits of an action, namely, in terms of its progress towards the ideal. For both Singer and Churchman, the pursuit of ideals thus constituted a core element of rational action. This is why the concepts of 'ideal planning' and 'idealized design' were later to be so important for the systems approaches of Churchman and of Russell L. Ackoff, his first doctoral student at Penn and long-time collaborator (compare, for example, Ackoff 1974, 1981; also Ackoff and Emery 1972).

Two related core concepts of Churchman were his understanding of inquiry as a rational approach to securing 'improvement', and the importance he gave to a 'teleological' theory of measurement. All defining and calibrating of adequate measures of progress depends on pragmatic assumptions about the purposes to be served. But this poses a serious problem: how do we know that our individual purposes (the specific goals and ends by which we try to approximate ideals) are adequate? How can we avoid a total relativism of individual purposes in favour of a rational quest for improvement?

This is where two other core concepts of Churchman's come in, his understanding of rational inquiry as 'systems design', and his search for an 'ethics of whole systems'. For the answer to the above question is that we cannot, except by examining what our individual goals and ends mean for the whole of humanity. Kant had reached a similar conclusion before; but Churchman gave it a different, systems-theoretic twist. While all ethical approaches had thus far identified ethical action with individually good action, as measured either by the agent's goodwill (Kant) or responsibility for the consequences (Weber), Churchman accepted that the meaning and merit of ends could only be understood by identifying their whole-systems implications. Consequently, well-understood inquiry had to be conducted as a form of systems design and its ethics could only be an ethics of whole systems. Unlike conventional ethics, it recognized that no measure of progress could be valid unless it was applicable to the 'whole system' of relevant circumstances and concerns.[7] In this radical sense, ethics became 'the theory of the appropriate goals of a system' (Churchman 1979: 21). Designing rational inquiry, too, gained a new sense; it now amounted to the design of 'inquiring systems' (Churchman 1971), that is, forms of inquiry that would have a built-in capability of exploring ('sweeping in') their own whole-systems implications.

The last of Churchman's central concerns that I want to discuss briefly is his notion of science. It results from all the previously mentioned considerations. Churchman did not reject the classical notion of science as an empirical and analytical method for controlling assertions, but he sought to

enrich it so that it could be applied to society's problems. To this end, the pragmatic core concepts just discussed needed to be translated into a practical framework. Following Singer, Churchman and Ackoff initially called this framework 'experimentalist philosophy' or 'experimentalism'. They sought to develop it in many publications (compare, for example, Churchman 1938, 1948, 1959, 1961, 1972b; Churchman and Ackoff 1946, 1947, 1950a, 1950b; Ackoff 1953, 1962; Ackoff and Emery 1972).

The name of the framework was later to change; first to 'operations research', then to 'management science', later to 'systems approach' and in the end, to 'social systems design', as an approach that was to do justice to both the 'systems approach and its enemies'. Each change of name stood for a renewed attempt to revive the original ambition against the eternal tendency of being absorbed into the mainstream of the professional fields that had developed under these names. Each of these subsequent efforts was once again intended to demonstrate how the pursuit of ideals was possible in a rational manner, or in other words, how we can use science to better manage our human problems.

What at first may look inconsistent and disturbing to many a reader, namely, Churchman's seemingly technocratic faith in science and systems design as tools for securing improvement in the human condition, thus becomes understandable as a consistent expression of his far-reaching notion of rational inquiry. I do not know of any corresponding formulation in his writings, but I suspect 'science' as he understands it embodies the sum total of all it takes to achieve a rational pursuit of ideals. Science, then, is itself an absolute ideal; which in turn explains why it ultimately led him to a dialectical conception of inquiry in terms of the 'systems approach and its enemies', a conception that most professionals in the fields he had helped to establish found difficult to accept. He took the ideal of a scientific approach to managing human affairs seriously enough to follow it through to its ultimate consequence.

7 I have discussed the implication of this systems-theoretic shift of ethics a little further in Ulrich (1994: 32–34).

A short biography of C. West Churchman

In the 1930s, Churchman studied philosophy at the University of Pennsylvania in Philadelphia (BA in Philosophy, 1935; MA in Philosophy, 1936; Ph.D., 1938). At Penn he also began his career of half a century of academic teaching and writing. Already before completing his dissertation, in 1937, he became Assistant Instructor of Philosophy; in 1939, he was appointed Assistant Professor.

The beginning of the Second World War interrupted his career at Penn. From 1940 to 1945 he was serving as a mathematical statistician at the Frankford Arsenal of the US Army in Philadelphia, working on experimental methods of testing small-arms ammunition. Back at the University of Pennsylvania, the young assistant professor was elected Chairman of the Department of Philosophy - partly because he was brilliant and partly because the philosophical faculty was split into two contending pragmatic and analytical factions that could not agree on any other candidate.

In the years 1945 till 1948, he and Ackoff tried to establish in the Philosophy Department an 'Institute of Experimental Method'. It should have developed E.A. Singer's 'experimentalist' philosophy and apply it to societal issues such as problems of city planning, business management, education, and others. However, the Department did not appreciate the idea of practising philosophy as an applied discipline. The Institute could not be founded formally. Ackoff's teaching appointment was not renewed.

In 1948, Churchman consequently resigned his chairmanship of the Philosophy Department and accepted an appointment as Associate Professor of Philosophy at Wayne University (now Wayne State University) in Detroit, where Ackoff had gone the year before as an assistant professor. Again the Institute could not be founded, though, despite earlier promises of support. Churchman and Ackoff had to realize that they could not do what they wanted to do within philosophy departments. It cannot surprise us, then, that these early efforts were soon to be followed by academic appointments and mandates outside philosophical faculties.

But 1948 was also the year in which West's main philosophical book of those years, *Theory of Experimental Inference*, was published. His recognition grew so much in the philosophical community that when in the same year the first editor of *Philosophy of Science*, W.M. Malisoff, suddenly died, he was appointed his successor. From 1948 to 1958, Churchman served as the journal's second editor-in-chief.

In 1951, Churchman became Professor of Engineering Administration at the Case Institute of Technology in Cleveland, Ohio (now Case Western Reserve University). Ackoff moved to Case along with him and together, they immediately set up the first operations research (OR) group. By 1957, the group had increased to a strong multidisciplinary team of 30 faculty members. They also started a series of major annual OR conferences (1951–57) and began to teach the first short OR courses for industry practitioners (1952). The success of these initiatives (Dean 1994 gives a detailed account) led in 1954–55 to the establishment of the first MS and Ph.D. programmes in operations research. For the first time, opportunities were plentiful and Churchman and Ackoff were able to do what they had wanted to do.

During these years, the new fields of operations research and management science were really taking off. In the United Kingdom, the Operational Research Society (initially called Operational Research Club) was created in 1948; in the United States, the Operations Research Society of America (ORSA) was founded in 1952 and the Institute of Management Science (TIMS) soon followed in December 1953. Its mission should be 'to design a science of management that lived up to the standards of good science, whereas OR would be the practical application of that science' (Churchman 1994: 107; cf. 1955: 187f). Note that the founders of TIMS used 'Management Science' as a convenient label for 'science of management' rather than (as it was later increasingly understood) as a mere synonym for operations research.

To promote the new vision, TIMS quickly set up the journal *Management*

Science. In 1954, Churchman became its first editor and managed to bring out the first issue by October of that year. Under his editorship until 1961, when R.M. Thrall succeeded him, the journal rapidly became the field's most prestigious journal and was of paramount importance for the development of operations research/ management science to a recognized academic and professional discipline. Despite the journal's success, however, it could not fulfil Churchman's original hopes, as he was to avow years later. With increasing scepticism, he observed the metamorphosis of the 'science of human administration' he had envisioned, in which mathematical modelling would play an important but by no means the only part, to a 'mathematics of management' (Churchman 1994: 103; cf. 1955: 197). Cooper (2002) and Hopp (2004) provide useful historical accounts.

In 1957, Churchman, Ackoff and Arnoff published their *Introduction to Operations Research*. It became the field's first internationally recognized textbook and brought them new fame. Churchman was offered a visiting professorship in the Graduate School of Business Administration of the University of California, Berkeley, and after a year became Professor of Business Administration there. Thus ended what must have been one of the most exciting and happiest times of his life, the years at Case.

At UCB, Churchman established Berkeley's graduate programme in operations research and co-founded the Center for Research in Management Science. Many additional appointments outside of the Business School made sure he did not get absorbed into the mainstream of his colleagues. Just to mention a few, from 1962 to 1963 he served as a research director of System Development Corporation. In 1963, consultations with NASA Director James Webb concerning the need to apply the tools of the space age to society's problems led to a decision by NASA to fund a Social Sciences programme at the Space Sciences Laboratory of the University of California at Berkeley; Churchman was appointed Research Philosopher and Associate Director of the Laboratory and until 1971 directed the programme. Other engagements included teaching mandates in the interdisciplinary Ph.D. programme of the Graduate Division of UCB and in other universities as well as consulting mandates with many commercial corporations, non-profit organizations, and government agencies. Among the latter were, in addition to the National Aeronautical and Space Administration (NASA), the US Office of Education; the Educational Testing Service Research Committee in Princeton, New Jersey; the US Department of Energy; the Texas Energy Council; the US Public Health Service's National Advisory Allergy and Infectious Diseases Council; and the US Fish and Wildlife Service. After retiring, in 1981, from his professorship in the Business School, he continued to teach at UCB as a Professor of Peace and Conflict Studies until 1996.

Major books[8]

Let us now turn to Churchman's major books, some of which I have already briefly mentioned. The first work to be mentioned after his doctoral thesis, *Toward a General Logic of Propositions* (Churchman 1938), is

8 This section has been adapted from Ulrich (2002b).

probably 'Psychologistics', a manuscript he co-authored with his then doctoral student R.L. Ackoff (Churchman and Ackoff 1946). It aimed to provide a framework for the social sciences that would conform to their experimentalist philosophy. Churchman (1961: ch. 7) later included a summary of this early effort in *Prediction and Optimal Decision*, a book to which we will turn in a moment; an extensive revision was published by Ackoff and Emery (1972) as *On Purposeful Systems*.

During those early years in the philosophy departments of Pennsylvania and Wayne Universities, Churchman also wrote his early masterpiece, *Theory of Experimental Inference* (1948), and co-authored with Russ Ackoff *Methods of Inquiry* (1950). *Theory of Experimental Inference*, especially, brought the young philosopher wide recognition in the philosophical community. It offered essential reflections on the experimental method, particularly concerning the importance and problems of metrology (the theory of measurement) and of statistical inference. It showed that there could be no single 'best' model of science - an insight to which the analytical philosophers and critical rationalists of that time had hardly advanced.

Although acclaimed by the philosophical community, the book stood alone against the mainstream tendency toward analytical philosophy. The American philosophical community honoured it not by taking up its argument but (as mentioned above) by entrusting its author with the editorship of its prestigious journal, *Philosophy of Science*.

After moving to Case together with Ackoff, they began their previously described initiatives in operations research, which led to the publication of *Introduction to Operations Research* (Churchman et al. 1957). The book defined operations research as a team-based, interdisciplinary 'application of scientific methods, techniques, and tools to problems involving the operations of a system' (Churchman et al. 1957: 8f and 18). Its purpose should be

> to provide managers of the organizations with a scientific basis for solving problems involving the interaction of the components of the organization in the best interest of the organization as a whole. A decision which is best for the organization as a whole is called [the] optimum decision. (Churchman et al. 1957: 6)

And further,

> The comprehensiveness of OR's aim is an example of a 'systems' approach, since 'system' implies an interconnected complex of functionally related components. (Churchman et al. 1957: 7)

The text strongly emphasized the necessity of avoiding any one-sided reliance on specific techniques or tools (e.g. of modelling). Operations research should maintain 'an openness of mind about techniques, together with a broad knowledge of their usefulness and an appreciation of the over-all problem' (Churchman et al. 1957: 12). As the programmatic

title of the second chapter proposed, operations research should be 'the study of a system as a whole' (Churchman et al. 1957: 20). At least one-third of the text deals with philosophical and methodological aspects of such an interdisciplinary approach to real-world problem solving.

The book's success in promoting operations research as a new academic field had paradoxical consequences. The field rapidly developed into a highly technical discipline. The majority of its practitioners no longer thought of it in terms of an interdisciplinary science of management in the way Churchman and Ackoff had envisioned it, but as a field of applied mathematics and modelling.

Events somehow repeated themselves: the OR/MS (operations research/management science) community, as the field was now generally called, honoured its pioneer but did not really *hear* him. In 1954, Churchman became the first editor of *Management Science*; in 1962, he served as President of TIMS and in 1963, as its Council Chairman; from 1962 to 1965 he also was appointed to the Council of ORSA.

During these years he began, for the second time in his career, to swim against the stream. Returning to his original vision of a science of management, he once again sought to open the field up to the ethical dimension. In his difficult book of 1961, *Prediction and Optimal Decision: Philosophical Issues of a Science of Values*, he struggled to gain a basis for a scientific treatment of value judgements in applied science. The effort produced more questions than the book could possibly have answered, but I think it, nonetheless, provided a necessary bridge to his later work.

In the 1960s, Churchman took the step from operations research to the 'systems approach'. As with operations research and management science before, he wanted the systems approach to be understood as an effort of applied pragmatic philosophy. There he was out again swimming against the stream of the day, against those true believers in *The New Science of Management Decision* (Simon 1960; cf. Churchman 1970; Ulrich 1980) who thought that the new tools of systems engineering, RAND systems analysis, PPBS (project planning and budgeting system), and so on, would finally turn the art of decision making into a question of technique.

In 1968, Churchman presented two important books: *Challenge to Reason* and *The Systems Approach*. The first book offered a philosophical discussion of the question quoted at the outset of this essay, 'How can we design improvement in large systems without understanding the whole system ...?' (Churchman 1968a: 2). In spite of its philosophical nature, this book was distinguished by the American Academy of Management as one of the 'best books in management of the year 1968' - truly a distinction for an author who seeks to practise philosophy as an applied discipline! The second book (Churchman 1968b) was to become his most popular book; over 200,000 copies were sold. It, too, received a prestigious award, namely, the McKinsey Book Award as one of the best management books of the year.

The year 1971 was to see the publication of yet another important book, *The Design of Inquiring Systems*. It is one of the more difficult books by

Churchman, but perhaps it is also his most original one. It is the book that many, especially in the field of information systems design, today consider his best. It is certainly among his most influential books; it 'reached' a significant part of the academic community to which it was addressed and continues to be read and cited today. However, one should not see the book exclusively, or even mainly, as an essay on information systems design. In my understanding, the book represents yet another attempt by Churchman to pursue his fundamental vision. Improvement implies learning; can systems design *secure* learning? His idea was to look at different epistemological conceptions in the philosophical tradition as designs for 'inquiring systems', that is, systems that would be capable of learning. What could we learn from Leibniz, Locke, Kant, Hegel, and Singer about the possibilities and limitations of systems design in securing improvement?

As a stepping stone to discovering the inherent limitations of design, Churchman (1971: 6) employed the question of 'whether it is possible to tell a computer how to design an inquiring system' - not because he was eager to contribute to the development of artificial intelligence, but, rather, because this question should help 'to discover what in the research process is truly the "lonely" part, the part that cannot be designed, at least relative to a standard computer'. Just to mention one basic finding of this very rich book: each design is bound to remain incomplete in respect of at least one crucial aspect. None can validate by itself all the conditions that would secure learning. Hence it is always a relevant question for systems designers to ask: What is a design's supposed 'guarantor of design', that is, where are its built-in sources of deception? (for a more extensive discussion, see Ulrich 1985).

In his subsequent major book, *The Systems Approach and Its Enemies*, Churchman (1979) took up a similar concern, though in a different way. With the provocative term 'enemy', he meant to point to the irreconcilable conflict between the whole-systems perspective of the systems approach and other perspectives that contest its rationality. Their kind of rationality may be the 'private', subjective rationality of politics, morality, religion, or aesthetics (examples that easily come to mind are the recent anti-globalization protests of environmentalists and other citizen groups, or the contemporary crisis of understanding between parts of the Islamic world and Western democracies); but that did not mean to him, as the book's title is sometimes misunderstood, that their concerns should be ignored or suppressed. Rather, Churchman understood them dialectically as opportunities for the systems perspective to understand its own deep-seated limitations. What systemic inquiry needs more urgently than ever-new analytical techniques, are better ways to appreciate such other rationalities dialectically as that which they are - mirrors of its failure to be comprehensive (Ulrich 1983: 34). I would argue that in the *Enemies*, the systems approach for the first time has become truly self-reflective with respect to the value content of its seemingly value-neutral quest for comprehensiveness.

Churchman's last single-authored book is *Thought and Wisdom* (1982b). Although all his books describe his personal journey, this is

surely his most personal book ever. It offers a self-reflective account of his never-ending struggle to probe the limits of the human intellect in understanding, and better managing, the complex social and environmental issues of our epoch. No need to say, he remained aware up to the last page that the struggle, far from being completed, had hardly begun:

> I had not planned that this final chapter would come to a conclusion, except that I would stop writing. (Churchman 1982: 135)

Conclusion

I would like to conclude this commemorative essay with a few reflections on what remains of West Churchman's work and what it may take to carry it forward. In this context I would like to return to the question that I raised in the second section, of whether my reading of Churchman's ideas was doing justice to his intentions. I believe this is indeed the case, and I would like to explain why I think so.

Looking back on the development of his thought, from its origins in American pragmatism and mathematical logic, through his early efforts to develop an 'experimentalist' philosophy of science, to his work on operations research, management science, and the systems approach, and ultimately to his mature thought on social systems design in terms of 'inquiring systems' and the 'enemies', a central theme becomes visible in the variety of his writings. All these efforts consistently aimed at his lifelong ambition of expanding the application of science to the realm of organizational transformation and social change.

His perseverance in pursuing this effort, but also his occasional despair, become understandable if one considers that the more he opened his notion of scientific inquiry up and adapted it to the requirements of his ambition, the more his methodological core principle of 'sweeping in' was bound to lead him into a fundamental, unresolved dilemma of his philosophy of science. On the one hand, science, if it was to live up to his ambition, needed to be practised as a systems approach that would, in each specific application, consider the whole system that might be relevant to a problem; on the other hand, science had no conceivable method for achieving this. I think this dilemma became the core difficulty with which he was struggling in much of his work since (at the latest) the 1970s.

His way out of the dilemma was, ultimately, the concept of the 'enemies'. Enemies, as I understand West Churchman, are those viewpoints which contest and undermine the system designer's quest for whole-systems rationality - and with it, for whole-systems ethics - by elevating their own partial rationality to the status of the only arbiter of rationality. The systems approach must not commit the same error but must take the enemies seriously, for otherwise it betrays its own quest for comprehensiveness. West suggested that the four most important sources of such unholy particularism were to be found in politics, morality, religion, and aesthetics. A proper notion of systemic inquiry thus needed to find ways of incorporat-

ing these enemies, in the dialectical sense suggested above. This ultimately meant to him that his hero, the systems designer, had to heed the biblical message: 'Love your enemy' and ultimately, '*Be* your enemy' (Churchman 1979: 149–51 and 204–14). That is to say, a systems designer should so much sympathize and identify with the enemies that he or she could understand their objections authentically and could then scrutinize his or her systems maps and designs in the light of these objections.

Churchman, of course, wants us all to become systems designers, whenever we do a piece of inquiry or otherwise engage in purposeful action. If we understand ourselves as systems designers, we will ultimately have to see ourselves as our own enemies, that is, become self-reflective:

> If your *are* your enemy, you can begin to learn what you yourself are like, as you look on yourself from the vantage point of the enemy: how foolishly you push one point of view, of model building, statistical analysis, game theory, ethics, or holism. (Churchman 1979: 214)

I believe this idea embodies a significant revision of the contemporary notions of 'sound science' and sound professional practice. However, as Britton and McCallion observe in their remarkable overview of the Singer-Churchman-Ackoff school of thought (it is actually rather an overview of the 'experimentalist' framework underpinning it):

> When one becomes one's own enemy, the scientific strategy will be seen in a new light, and can be modified accordingly. Churchman discusses the nature of the enemies but provides no guide on how to be your own enemy. (Britton and McCallion 1994: 498)

Churchman was the first philosopher to take the systems idea seriously enough to examine its epistemological implications; but in the end, these implications were so overwhelming that his inquirer, the systems designer, had to become a hero who was fighting a lonely struggle. The struggle turned out to be too heroic to have a chance of being taken up by the academic community at large. The trouble was that Churchman pursued his epistemological insights so consistently and relentlessly that in the end, his understanding of the task he had set himself left him no room for translating these insights into a practicable, yet philosophically tenable, framework for critical inquiry and practice. As such, his 'systems approach' ended up being a sceptical rather than a critical approach as I would understand it.

Another reason why Churchman's systems designer had to become a somewhat hopeless hero probably was that this hero grew up in the world of the 1950s and 1960s, when pursuing a rational approach to society's problems meant to apply the tools which were available and *en vogue* at that time and to which West himself had contributed so much. To a large extent, these tools were based on a goal-seeking model of human behaviour and an engineering view of planning that both appear rather narrow,

if not naive, to us today. From today's viewpoint, with the benefit of historical distance and of complementary 'soft' and 'critical' approaches being available, we refer to this perspective as 'hard systems thinking' and have a better grasp of its limitations (which is not to say it does not have its proper applications); but at the time when West Churchman was developing his ideas, he did not have these advantages.

We have to be all the more grateful to West Churchman that he, like no other scholar of his epoch, was working at the limits of the fields he had co-founded and thus helped us become aware of their limitations. But does that mean that in order to remain faithful to his intentions, we must stay within those limitations? I do not think so. As I know West, he would have been the first to get rid of them, had he enjoyed the distance and the additional approaches available to us today. After West Churchman, the systems approach cannot be what it was before. As Peter Checkland concluded in a review of the importance West's work had to him:

> Churchman demonstrates in all his work, but especially in *The Design of Inquiring Systems,* that the epistemology of a systems approach, as embodied in systems engineering, systems analysis, and 1960s management science and operations research, contains many subtle traps for the unwary. His body of work makes it impossible subsequently to display the naive hubris with which a systems approach was advocated at that time. His method is to adopt the epistemology of 'hard' systems thinking and then to reveal its problems. This approach makes that revelation cogent, but by basing itself upon the hard paradigm of the assumption of a systemic world and the need to design goal-seeking systems within it, it cannot transcend that *Weltanschauung.* (Checkland 1988: 383)

I would argue that any attempt to take West Churchman's work seriously today and to bring it to bear on our contemporary notions of sound science and sound professional practice, will require us to deal with the methodological implications of his unresolved dilemma. As Churchman himself concluded in the *Systems Approach and Its Enemies*:

The choices for the hero-planner seem clear. One option is to maintain the spirit of the classical laboratory by collecting just those data that appear relevant and can be obtained objectively ... The other option, the harder one, is to recognize that the unpredictable human is an essential aspect, and to begin to invent a methodology in which human bias is a central aspect. Will this methodology be 'scientific'? No, if we doggedly stick to the assumption that the classical laboratory *is* the basis of science. Yes, if 'science' means the creation of relevant knowledge about the human condition. (Churchman 1979: 62)

Looking back on my years with West at UCB, I see more clearly than I did at the time what was motivating much of my work on critical systems heuristics (CSH) and why its methodological core concept became the idea of promoting a systematic, discursive process of boundary critique.[9] The

principle of boundary critique had to replace the sweep-in principle in the role of a methodological core concept, I believe, because CSH embodies a methodological pragmatization of precisely this hope of West Churchman: that we should 'begin to invent a methodology in which human bias is a central aspect'. No need to say, I am only too aware that the search for such a methodology, far from being completed, has hardly begun.

9 By 'boundary critique' I mean a critical employment of boundary judgements, that is, the way we delimit the relevant 'whole system' that we actually consider in professional intervention or inquiry, whether consciously or not. There are two basic applications of boundary critique: handling boundary judgements in a reflecting, transparent way, and using them for emancipatory purposes against those who may not handle them so. The term is just a convenient short label for what in *Critical Heuristics of Social Planning* (Ulrich 1983) I preferred to call 'the critical employment of boundary judgements'.

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Contributor details

Werner Ulrich is based in the Faculty of Philosophy at the University of Fribourg, Switzerland. E-mail: wulrich@gmx.ch