

forms of arrangement of the subheadings under a subject heading are discussed, with particular attention being paid to the theme-by-theme arrangement (only rarely encountered though it may be), such in contrast with the alphabetic and chronological arrangement. Assignment indexing is indispensable, as only very few of the subheadings closely match the text, and as the reader cannot be assumed to have knowledge of the authors' selection of words. Typographic advice on the shaping of the layout concludes the book.

The reader is given a good overview of many a difficult question, since not only the pertinent opinion of the authoress is given, but also the dissenting advice of other authors.

The booklet can be recommended to anyone setting him- or herself the task of compiling an index to a book of this special nature. Much effort is involved in such a task, and the circle of interested persons may be assumed to be small, limited as it will usually be to persons intending to conduct literary studies on the given texts.

Robert Fugmann

Dr.R.Fugmann, AltePoststr. 13, D-65510 Idstein, Germany.

DELGADO, Rodrigues, BANATHY, B.H. (Eds.): International Systems Science Handbook. An Introduction to Systems Science for Everybody. Madrid: Systemic Publications 1993. 512p.

The various systems approaches have mushroomed rather explosively. It proves less and less possible both to focus on a necessarily specialized field and at the same time to follow the general trend. The first is necessary to be pragmatically efficient. The second is to retain an at least general overview over the larger field of systems in general, which is a must if the results achieved are not to remain isolated aspects. – Any attempt thus to provide a view on what is going on in systems science is doubly welcome. In addition, special concepts and tools, e.g. algorithms employed, normally require considerable effort to be adequately understood. Systems Science for everybody will also be gratefully accepted, namely if it is understood as a qualified generally understandable pointing out of just the basic structures which can be derived from its fundamental principles. Likewise, finally, an introduction for systems non-specialists/addicts is much needed to interdisciplinarily bridge the gaps still existing in disciplinary research. None of these endeavors being easily accomplished in itself, this goes all the more for the combination claimed in title and subtitle. How does the volume approach these goals, and how far does it succeed?

As the editor states, *The general purpose of this book is to bring into focus the significance and contribution of systems education to the advancement of systems inquiry* (p.16). This rather abstract and equally abstractly elaborated goal is intended to further systems educational programs. Only sixty (of 500) pages, however, belong to the chapter labeled 'Education'. Even there theoretical considerations prevail; teaching/learning systems themselves are scarcely touched. Thus the necessary limitation and the strength of the, in toto, 37 contributions lie in the confinement to fundamental concepts, i.e. systemic perspectives, basic methodologies

and a small number of important applications (p.11). They are accordingly clustered into six chapters. 1. *Introduction* provides definitions of the terms on education. 2. *Generalities* covers and explores basic concepts of systems theory. 3. *Systems Science* refers to Science as a system from the systems science point of view. 4. *Education* deals with relevant aspects like the biological and cognitive functions. 5. *Methodology* offers a general view of systems methodologies and systems methods: systems analysis, systems dynamics and systems dialectics, considered as a basis for integrated development. 6. *Some Applications* discusses in some applications seen as characteristic, such as ecosystems, innovation, time management and morality.

Again: the volume is only abstractedly, and on a very high theoretical level, concerned with learning. It devotes itself to a general overview in the areas chosen rather than focussing on the latest developments. Moreover, it favors the formal/mathematical conceptual side. For example, the Soft Systems Method (P. Checkland, Lancaster) is only briefly and partly dealt with. These confinements accepted, the perusal of the book proves quite rewarding and often exciting. Resisting the temptation to get lost in interesting details – and there are plenty of them all over the book – just a few highlights may be pointed out. They can be very roughly labeled as peculiar aspects of systems modeling as a means to perceive new realities, to find innovatively new orders within these realities and to acquire heuristic tools to deal with – or possibly even to control – change.

The brilliant '*Systems Theory. Basic Concepts*' (Delgado, p.18) plainly shows just where within comprehensive models of the systems concept white spots still need to be filled with concrete/conceptual programs for practical application. This is true in particular in the societal and the human domain. The same applies to '*Main Currents in Systems Thinking: General Systems Theory and General Evolution Theory*' (Lazlo, p.105). Under the auspices of the systems approach, Systems Science, Psychology and Cognition (Andreevsky, p.176), the different approaches to and within the discipline psychology are extended up to the impacts of computer science. '*The Integration of Systemic and Interpretative Thought*' (Snow, p.136) I found to be highly recommendable from the point of view of hermeneutics, philosophy of science and methodology in general. '*Social Systems*' (Bunge p.210) engages in – on first sight – somewhat bewildering attempt at the study of social facts, consisting mainly of definitions and principles. Considerations nearer to concrete systems, namely economics and corporations, will be found in '*The Systems Paradigm in Organization and Management: From Open Systems to the Chaos Hypothesis*' (Broekstra, p.69) and in '*Cultural Change, Strategic Management and Organizational Change*' (Ulloa, p.222). Their reasoning explicitly includes 'soft' factors like Weltanschauung, and a reliance on the Soft Systems Method SSM (Checkland), coming near to pragmatic application, as does '*A Cognitive Map of Cultural Change*' (Lazlo, p.315).

Closing the circle: '*Conceptual Tools*' (Manzelli, p.329), '*Systems Dialectics for Integrated Development*' (Rodriguez-Delgado, p.349) and '*General Rules for System Dynamics Modeling*' (Martinez, p.381) appear to be strongly attached

to systems modeling. 'To Use the Soft Systems Methodology to Develop an Entrepreneurial Metamodel' (Filion, p.471) and 'System Characteristics of Innovation' (Marinova, p.481) similarly point to key 'right terms', and indicate pressing challenges and attempts to meet them. The latter contribution attempts to realize what could be described as a Taxonomy of Innovations.

The key word taxonomy having fallen: what can be won for the organization of knowledge? As was to be expected: little directly in terms of classification concepts or concrete schemes. Much, however, when considering the ordering character of systems modeling and the classificatory properties of systems design. If the book presents an excellent dialogue partner for the systems designer, it does likewise for the conceptualization of order systems. In particular if these are aimed at a dynamic, a generic quality.

Conclusion: rewarding, a comprehensive if circumscribed overview, a rich data and concept bank, a fund for stimulation and inner dialogue, and therefore recommended as a 'should'. Remains to ask a marginal favor from the Madrid publisher: to try a little harder to eliminate printing errors.

Hellmut Löckenhoff

Dr. H. Löckenhoff, Consulting, Training, Ossietzkystr. 14, D-71522 Backnang, Germany

WAY, Eileen Cornell: Knowledge Representation and Meaning. Oxford, England: Intellect Books 1994, 267p., ISBN 1-871516-39-0 (first published by Kluwer Academic Publishers 1991)

After introducing her basic views of the metaphor, her terminology and her opinion on other theoretical approaches (sometimes unnecessarily severe), the author deals with knowledge representation and particularly with Sowa's Conceptual Graphs. Her Dynamic Type Hierarchy (DTH) is presented in the context of various computational approaches to the metaphor.

She explains aspects of DTH by confronting it with theories of concept relations (Frege, Carnap, Quine, Searle) and the corresponding semantic hierarchies. On this occasion she expresses her opinion on a number of relevant subjects (Ideal Language Philosophy, Ordinary Language Philosophy, Nominalism, Realism, ..).

Last but not least she describes C-GEN, an existing semantic interpreter based upon Sowa's conceptual graphs and implemented in 1985 while she was collaborating with Sowa at IBM's Systems Research Institute. DTH would use the same data structures and parser as C-GEN but would have additional capabilities.

The whole of the book is very well written and documented, with clear examples and illustrative figures. The chapters devoted to Conceptual Graphs, to DTH, and to computational issues represent the core of the book.

Whereas Sowa's original graphs support a static data base specifying permanent relationships between concepts in a particular domain, Way's hierarchy is a dynamic one, the changes being a response to the input of the system. She starts with Sowa's conceptual graphs as a basis and adds a number

of new concepts (especially that of inheritance based on Searle's Determinate-Determinable relation).

Her system is devised as a model of reorganization of the hearer's concept hierarchies in the process of understanding metaphors and other kinds of figurative speech.

She is very familiar with philosophical literature on the metaphor (together with AI the probable source of inspiration of her work), with a part of relevant psycholinguistic research (understanding figurative speech), and with the views of some computationally biased linguists. Still, there are relevant general linguistic issues she has not addressed. Let us mention two of them:

1) Linguists differentiate language (system with a particular norm: code), speech (messages in the code and the corresponding activity), and the individual language competence (of a speaker and of a hearer, developing and changing from the individual's infancy to his death), i.e. the capability to use the code and the messages to communicate.

In these terms, Way's DTH is only concerned with the hearer (or reader). But the metaphor (and e.g. its lexicalization) is also a problem of the speaker and of the language norm (she mentions the difference between live and dead metaphors but not the lexicological consequences).

The language norm and the language competence of a particular speaker/hearer are two different objects of potential study. – The lack of clarity on this point might be the reason why Way misinterprets or misunderstands what she calls „the anomaly theory“ of the metaphor. A metaphor may well be an anomaly (relative to a particular language norm) but hardly any linguist (or e.g. literary critic) would agree that it means that it is „a kind of semantic category mistake“ (p. 42).

2) The determinate-determinable relationship of Searle and Way is very near to the so-called privative opposition (marked:unmarked – originally terms of Trubetzkoy but used later by many other linguists), one of relationships (oppositions) between language phenomena studied and defined in the structural linguistics in the first half of this century. Searle – possibly without knowing it – analyzed facts in a similar way as some linguists before him. For a linguist, Way's adoption of this relation is a very exciting experiment.

In our understanding of Way's views it may mean a serious methodological and philosophical dilemma for her:

On the one hand, in her book, she dismisses pure symbolic logic as psychologically and linguistically unrealistic (being a „scruffy“ rather than a „neat“ – term for different trends in the AI community, excellently characterized in her book). On the other hand, she seems to remain an empiricist seeking semantic criteria exclusively in the extralinguistic world and never in the system of a particular language (cf. her concern for „the truth status of metaphor“ etc.).

Searle's conditions (pp. 191 – 193), however, are not necessarily concerned with empirically observable facts but certainly with the exact repertoire (system and structure) of the studied meaning entities (possibly different in different languages – English, Japanese, Arabic – and even with different speakers of a single language).

Thus, the determinate-determinable relationship between