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 organiization 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.

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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

'rose' and 'red rose' is identical to that of a 'dragon' and 'red dragon' (even though there exist no dragons, red or otherwise)

Searle (in this case), similarly as linguists, is concerned with intensions (existing sometimes only in the language system) rather than with empirically established extensions.

For the general language speaker and for the linguist it is not so important whether a noun has or has not a denotation (cf. 'rose', 'dragon', 'flying saucer' – to quote examples with, without and with a controversial denotation). For a logician and for the language of some domains of science, this differentiation is of paramount importance (because of paradoxical behaviour of 'empty' concepts).

As long as language treatment in AI limits itself to „the language of science", it is psychologically and linguistically unrealistic but possibly logically consistent.

Way's future work will show how far it is possible to give up the straight-jacket of the currently predominating AI paradigm and remain computationally tractable.

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REHM, Werner, WELSCH, Horst, FAIX, Werner (Eds.): **Synergetik. Selbstorganisation als Erfolgsrezept für Unternehmen.** (Synergetics. Self-organization as a recipe for company success. A Symposium organized by IBM. Ehningen bei Böblingen: Expert Verlag 1993. 132 S. ISBN 3-8169-1021-1.

Self-organization as a recipe for entrepreneurial success – thus reads the catchy subtitle of this book. A book which, however, for all of its gratifyingly modest size, aspires to be more than a mere introduction, in generally understandable terms, to the concepts of synergetics and self-organization, two words that long ago became a must for the „in crowd". Also, the contributions to this symposium start out from a deeper level than that of company self-organization – whatever that may mean. It is only in the fifth and last contribution that synergetics is described – and then mainly by means of examples rather than of prescriptions – as a formative principle for companies.

In its core, synergetics is the doctrine of working together, of the concerted action of physical, physiological and other forces, structures and systems, including conscious human ones. Just what specific scientific and pragmatic concepts lie behind this is presented in rigorously organized fashion and demonstrated through well-founded answers to relevant questions: An (economically colored) introduction (1) is followed by (2) a presentation of synergetics as a scientific approach to the problem on hand, (3) a discussion of the consequences of the synergetic view for the understanding of social systems, and (4) an introduction to the non-linearity of our world, to its structures abiding in chaos. As an exemplary illustration, as it were, of the concept thus roped in, the final contribution (5) presents a well-structured and graphic picture of the role of applied synergetics in the company: the idea of Total Quality Management (TQM).

Accepted new ideas regularly constitute the answer to urgent problems. The growing multi-layeredness, variety and polyvalence of our sphere of existence and the requirements imposed thereby on man's controlling capacity in his entire physicochemical and environmental world, down all the way to other individual and social fields, can no longer be adequately grasped with the old, monocausal and linear patterns of understanding. We need to think in comprehensive – meaning also: open – dynamic systems. Development is taking place time and again in qualitative so-called phase jumps, through which an only seemingly irregular chaos is gradually replaced by the order hidden in it. But it is precisely this open indeterminateness in the individual case which offers man the chance to control the development going on. Chaos, now understood as a field of potentially ordered systems, obeys rules of law which must be purposefully and methodically utilized to control the changes taking place. Creative „imagination is called for" ((1.) M.Michelitsch: *Darstellung der Problematik* (Definition of the problem), p.11). It must integrate the forces of self-conscious systems so that they may, in the long run, hold their own in a world that has become a vast interrelated network.

(2.) *Synergetics: a magic formula for management?* Displaying the didactic mystery to which earlier publications have accustomed us; H.Haken, the founder of synergetics, here presents synergetics as a '*general theory of self-organization*' (p.15). Strict order, so he formulates pointedly, is replaced by 'creative chaos'. Using the laser and other paradigmatic examples from physics as illustrations, he shows here by what unmistakable rules of law chaotic developments are governed in the macro field, notwithstanding all indeterminacy in the micro field. It is these very rules which, as becomes evident from the example of business investments or of human relations as order-creating factors, provide the chance of conscious control of the ongoing development. A key area of such control is that of research and development within the company, whose efficiency or inadequacy is determining for the company's economic future (and in fact for more than that). Synergetics, so Haken concludes, is certainly not a magic formula, but in any event an important navigation instrument.

In a regrettably only brief contribution, H.Wunderlin leads us to the (3.) *Consequences of synergetics for social systems.* It is assumed that it will be most carefully examined whether the conditions are fulfilled under which the interpretative patterns of synergetics as an interdisciplinary approach to social problems may be made use of. Once this is assured, however, the principles of synergetics – openness, multiplicity of subsystems, and non-linearity – may be put to use to obtain patterns for a proper understanding of the organization of societies. A critical application of synergetic concepts to the dynamics of the processes of social change may help to identify collective behavior and development patterns. Such patterns, in turn, may supply hints for the identification of possibility fields for a realistic, i.e. workable and effective policy.

In order to „facilitate the transfer of essential aspects of the non-linear mode of thinking to extrascientific fields", H.J.Schlichting outlines in his contribution – (4.) *Our World is not Linear – Structures in Chaos* – the background furnished by the history of things and of ideas. After discuss-