'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-

ing such matters as evolution and irreversibility, the principles of dissipation and of flow equilibrium, structuralization through breach of symmetry and the functioning of feedback, he turns – though regrettably only in a roundabout way – to their application to economics, such as was elaborated e.g. in certain approaches to an „evolutionary management" and evolutionary management in the field of economics.

The results of chaos research and fractal patterns are clearly discernible in the quality philosophy and company strategy of Total Quality Management (TQM) (J.Ebeling: (5.) *Little Apple Men and Total Quality Management?*). Also – and maybe especially – for the systematizer not specialized in economics this presentation – loosely interspersed as it is with diagrams, graphs and tables – offers useful insights gained from paradigmatic cases.

Quite generally, in fact, the perusal of these refreshingly readable contributions proved to be a fascinating and demanding, yet never laborious and always rewarding undertaking. If any wishes remain open, they pertain to a more precise checking of one or another point in the technical literature. For the elaboration of classifications of knowledge the question as to a taxonomy (or of taxonomies) of change and its control presents itself implicitly, namely the question of how to organize knowledge with a view to political decision-making and action. What becomes equally clear is the sheer necessity of such an approach as a sine qua non for social control on all levels. After a few earlier, initial attempts (e.g. K.Deutsch: *The Nerves of Government*, 1963; St.Beer: *Designing Freedom*, 1974), subsequent approaches were published only in the past few years (see e.g. St.Beer: *Beyond Dispute*, 1994; M.van den Erve: *Evolution Management*, 1994). On the other hand there is no lack of interdisciplinary works (most recently: M.Gell-Mann: *Das Quantum und der Jaguar*, 1994), which lay the foundation for a creative, innovative organization of thinking. The discipline which has interdisciplinarily committed itself to knowledge organization may well feel called upon to take this task in hand even more consistently.

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Union of International Associations(Ed.): **Encyclopedia of World Problems and Human Potential.** 4th ed. München: K.G.Saur Verlag 1994. Vol.1: 1258p., Vol.2: 929p., ISBN 3-598-10842-7 + -11226-2

Much effort has gone into the focus on seemingly isolated world problems, such as unemployment, boredom, endangered species, desertification or corruption. Work on the 4th edition of this Encyclopedia (for reviews of earlier editions see Int.Classif.15(1988)No.2, p.104-107 by M.P.Satija, and 18(1991)No.4, p.235-238, by Ju.Shreider) has now shifted its focus to the hunt for vicious cycles of problems. A cycle is a chain of problems, with each aggravating the next – with the last looping back to aggravate the first in the chain. The more obvious loops may be composed of only 3 or 4 problems. Far less obvious are those composed of 7 or more. An example is: *Alienation* > *Youth gangs* > *Neighbourhood control by criminals* > *Psychological stress of urban environment* > *Substance abuse* > *Family breakdown* > *Alienation*. Such cycles are vicious because they are self-sustaining. Identifying them is also no easy matter. Like the search for strange particles in physics, much computer time is required to track through the aggravating chains linking problems. A preliminary search along 9 million such pathways has so far identified only 7,000 cycles composed of up to 7 problems. Organizational strategies and programmes that focus on only one problem in the chain tend to fail because the cycle has the capacity to regenerate itself. Worse still is that such cycles tend to interlock, creating the complex of global problems which causes so many to despair. The good news is that identifying vicious cycles is a first step towards designing strategies to reverse or break them. Better still, some problems are linked by serendipitous cycles in which each problem alleviates the next.

Vol.1 of the Encyclopedia currently describes 9,836 world problems clustered into 320 overlapping hierarchies. The problems are linked by some 120,000 relationships of 7 types (*Broader, Narrower, Related, Aggravated by, Reduced by, Followed by, Preceded by*). Problems included are those identified in international periodicals but especially in the documents of some 15,000 international non-profit organizations (profiled in the companion 3-volume *Yearbook of International Organizations*, now in its 31st edition). The Encyclopedia includes problems which such groups choose to perceive and act upon, whether or not their existence is denied by others claiming greater expertise. Indeed such claims and counter-claims figure in many of the problem descriptions in order to reflect the often paralyzing dynamics of international debate. In the light of the interdependence demonstrated among world problems in every sector, emphasis is placed on the need for approaches which are sufficiently complex to encompass the factions, conflicts and rival worldviews that undermine collective initiative towards a promising future.

Volume 2 contains the most comprehensive description of the variety of approaches to human development. While their intention may be to alleviate suffering, paradoxically their blinkered pursuit is often a prime cause of world problems, notably in the case of religious conflict. Not only are there some 1,400 understandings of human development from the spiritual and psychological disciplines of different cultures and traditions, but also 3,050 modes of awareness or experience that are reported to be accessible through such disciplines, often through identifiable sequences or pathways. Buddhism offers the most elaborate perspective, requiring 1,360 interlinked entries.

The Encyclopedia takes an unusual approach to the range of human values. Rather than limiting its focus to the dozen values most frequently discussed (*peace, justice*, and the like), Vol.2 identifies 987 "constructive" or positive values as well as 1,990 "destructive" or negative values. The positive and negative values are clustered into 230 value polarities (like beauty-ugliness) to transcent the semantic confusion associated with many value-words. It is however the negative value terms which are used to sharpen the problematic