

solution results from the interaction among the experts. Thereby, it is unimportant whether the method which is employed to solve the problem goes forward from the elements to the models or whether vice versa, or whether it is circular interaction. In any case, the problem-solving can be looked at as a dynamic path through a network, whose knots (cores) are the expert subsystems. In general, the problem-solving follows the rules of a cognitive structure, whose main law consists in the arbitrary change of the system-subsystem-relation. Thus in cognition, the feature analysis (structural stage) can be a subsystem of template matching (monadic stage), and furthermore, template matching can be a subsystem of the analysis by synthesis (cognitive stage). In this way, a circular paradox network of inferences appears as the law of the dynamics in which the expert systems interact. That means, the subsystem that has just been subordinated can be the higher system in the following step of the problem-solving procedure. It is easy to see, that this law represents Russell's antinomy of the set which contains itself as an element, although the stage structure is implemented in a type-theoretical manner.

Marc De Mey did not realize this phenomenon. I do not want to say, that he gets entangled in contradictions, but he missed the chance to make use of this main figure of cognition that contradicts all formal logic for a theory of dynamics. For, the inference of "all in all" forces unfolding, that is a process creating situationally the formation of a hierarchy, that is of a problem-oriented, unstable nature. The hierarchy has to be unstable enough to collapse at any time, in order to give way to a new unfolding process. Instability on the one side and heterarchical control on the other side are thus the main features of cognition. This is what Piaget – still being caught in the idea of a harmonical equilibration – called mobility.

Therefore, the reader is not surprised to see De Mey referring to Piaget in the last chapter of his book, in order to explain the dynamics of cognition. This reference certainly points in the right direction, for it is unquestionable, that Piaget's genetic psychology has to be understood as a decisive attempt to grasp theoretically the nature of the process in which thinking and knowledge develops. For this purpose, however, neither the concept of scheme nor the concepts of mental balance in scheme, that is achieved in the course of the development, is appropriate. For, the former is a far too static concept and the latter in being a teleological concept submits a harmonizing tendency. Harmony denotes the state of rest of intelligence, that means the stage in which intelligence is exhausted on its path through the world. Piaget being highly sensitive to the cognition demands the mobility of a scheme even if he does not give reason for it.

However, this concept too is not able to grasp theoretically the dynamics of intelligence. It only marks the basic restlessness, that becomes dynamic in the case of quantitative supercomplexity in one stage, in order to perform "Superzeichen" and thus to emerge on a higher level of quality, for example from the monadic stage to the structural stage, for example from alphabet to meaning and thus cognition goes on to reduce complexity. Instability results from the overstrain and forms the actual motor of development. This theoretical state of

affairs – that I could only outline briefly – has not been seen by DE MEY and thus constitutes the main weakness of the book. In spite of the sensitivity for the problem and the historical and interdisciplinary context he presents, De Mey has not been able to transform his feeling for right position into a systematical discussion in order to lead to an appropriate solution. This is deplorable, for it throws the high quality of the book into the shade. This quality consists of the author's ability to bring together various ideas and thus provides a basis for a reformulation of a cognitive theory. I have enjoyed reading De Mey's book very much and have recommended it to my friends.

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RICHARDSON, Jacques (Ed.): **Models of Reality: Shaping Thought and Action**. Mt. Airy, MD: Lomond Publ., Inc. (P.O. Box 88) 1984. 328 p., ISBN 0-912338-35-0. US \$ 22.95 (Microfiche ed. \$ 15.00. ISBN 0-912338-36-9)

This book with its 21 contributions in two parts covers a rather wide range of a both comprising and intricate subject. Such an undertaking, however meritorious in itself, has to meet inherent requirements, e.g. in structuring the material as to facilitate an overview and to show, what has been included, why so, and what has been left out. Accepting the title as a sufficient attempt, the volume presents several informative articles, that is, critical approaches for the expert as well as well written descriptions on familiar subjects to further the understanding of a larger public. Especially for the latter one, parts I and II distinguish between 'Concept' and 'Application'.

But what is a model? What is it designed and what is it applied for? The Earth as a System (ch. 2) proves an excellent example of the systems approach in general, stressing the relationships between man, ecology and, most importantly, policy making as derived from the world wide problems of preservation and evolution. Though pointing out the main factors of modeling the introductory chapter 'A Primer of Model Systems' falls short of expectation. The tables on model systems and forecasting scenarios do not, in the reviewers opinion, make up for the lack of vivid and systemized, graph supported basic information on the nature of models and for what they are meant to serve. Granted that this is a nearly impossible task: a more thorough attempt would facilitate insight into the meaning of the twenty one mosaic chapters as a coherent body. Thus it could better contribute, in addition, 'to bridge . . . awareness of the nature of models . . . for a better understanding of the complex world . . .' (Publishers foreword p. iii) and, it might be added, for a globally responsible problem solving.

Measured by this yardstick the chapters 6 to 8 contribute excellently to critical insight into modeling as a tool: that is for analysis, responsible choice and sophisticated, long-term, sensible implementation of human problem solving. The outline of 'Interactive Modeling Systems for Complex Socio-Economic Problems' (ch. 6)

builds on the long standing experience on computer supported central planning in the USSR. This highly controversial approach — as also its counterpart, the free market concept — shows the bias of the mathematical versus the scenario concept, of the tendentially closed description of large scale systems and the supposed possibilities of fuzzy ecological modeling modes. The emerging principle is that of openness and dialogue, which applies to all phases from model development up to implementation. It effects, as is shown (ch. 7) via urban planning, when goals are identified, problems are defined, and by the choice of the appropriate type of models: Newtonian calculus, stochastic, mimicing biological processes and/or topological models using concepts derived from dissipative structures/processes, synergetics etc. Because we shape the world by the way we see it, by what kind of problems we formulate and by the modes we adapt to solve them, this point seems crucial for our self-determined existence and evolution. Even the data we acquire predetermine already the result of complicated processes of choice, decision and evaluation.

This influences the long-term effects the more, since models, and not only fuzzy social models, concomitantly inhere value systems. The provoking question, whether models are blueprints or processes, is paralleled by the likewise urging but seemingly trivial answer. Social planning implies the consideration of values. In this respect ch. 8 is the more important since, in practice as well as seen from epistemology, social planning should be seen, as for instance recently Werner Ulrich has shown (*Critical Heuristics of Social Planning*, Bern 1984) essentially as a value evolving process of critical heuristics. Or, as the author states (ch. 8 p. 107), as a contingency process. Otherwise an at best wellmeaning (what is, after B. Brecht, the opposite of well) bureaucracy will feel justified in prescribing ways making happy citizens, as this is, already the case not only in socialistic governments. In support of these suspicions, ch. 10 concentrates on the modes of politics in model implementation underlining modeling as an essentially political process.

... Knowledge about model development has by far outstripped the capabilities for implementing those tools .. (ch. 10, p. 132). Putting that more generally: Where do the advantages and limits — especially of the distinguished use of modeling and modeling implementation for society — if necessary against the expressed will of the citizens affected — lie? What is the possible impact on the development of society? Beginning with the cognitive aspects: is there for instance a valid base concerning rules and regularities (to avoid the terms laws and causal relationships)? The case is exemplarily discussed in ch. 11 on Information Sources for Modeling the National Economy Using Systems Dynamics. The mental data base — observations, experience — interacts with the written and the still smaller numerical data base. Implicitly it appears, that the existing high technology status of modeling requires an at least evenly selective, value-critical act of deliberate choice of sources regarding their range of application and their reliability. The topic is enlarged by questioning advantages versus limits and dangers in policy planning and evaluation.

Ch. 15 poses the old controversy — or better the com-

plementarity — between structure and strategy in its systems formulation: the appropriate application of models related mainly to their internal elements compared to those stressing systems processes, thus tackling both the most unclear as well as controversial problem of (structural and/or processual?) change.

Though fully acknowledging the quality of the single contingent control, should not be omitted. As for the application to society one misses both a comprising and a pragmatic approach to systems, e.g. similar to that presented by P. Checkland (Wiley, 1981). Such an approach could at least partly give further answers to the challenge of time, in a new view of physics, enhanced in ch. 20. or expressed in the concept of synergetics (H. Haken, Springer, 1978). The very conceptual approach of a system — and evolution oriented model, implying that of contingent control, should not be omitted. As for the application to society one misses both a comprising and a pragmatic approach to systems, e.g. similar to that presented by P. Checkland (Wiley, 1981). Such an approach could at least partly give further answers to the challenge put in ch. 13. It concerns the highly actual controversy on the use of society of scientific and technical research, including the validity of the existing and so-called alternative models. Even more important: the systemic concept of pragmatic systems control proves valuable to understand the didactic impact of modeling as below.

Previously ch. 16 reminds one of the statement of a leading OR specialist: that not the least contributing factor of OR is a more thorough understanding of modeling, namely, the ability to build effective and sufficiently simple models. A location management model cherishes the hope, that high technology expertise will mature into transparent, still to be handled modes of problem solving, even if and because of using computers. Most importantly in achieving this goal appears the implicit dialogue between manager and model. That is, modeling and model implication are seen as a learning process.

The core of modeling and model application, that, being the dialogic act of learning: how should that process be structured for instance long-term valid, non-destructive, recycling, systemic problem solving?

Or expressed in terms of the more narrowly defined didactic process: how can models be used in education, science education at universities or even elementary education in primary schools? The reviewer readily admits being highly biased in favour of model use in education. So the authors of ch. 17 are most convincing. Models, in short, enhance the contact and, hence, the understanding and the respect for the reality, for nature. They complete and go beyond the mere learning of facts using textbooks by creative playing. A very broad field is adressed here, ranging from didactic models for open, dialogic learning up to the sophisticated, complementary use of cases as opposed to the traditional lecturing or the case method. Carefully chosen, critical, value-conscious use of modeling and models appears to be one if not the main mode to educate both realistic and responsible problem solvers. The ideas expressed by the authors are similar to the approaches known as for instance practised in English universities (e.g. Lancaster).

The 'Brain Builders' (ch. 18) fortunately do not try another more or less fitting analogy of the brain model:

the left and right hemisphere, favoured so abundantly. It describes but a most successful non-deterministic fuzzy computer simulation of the cerebellum. Its unique – one is tempted to say evolutionary – design makes the structural and the related functional properties of the brain, e.g. pattern building (!) and transmission more transparent.

More than a friendly surplus is presented by the reprint of the famous treatise on 'Quantum Physics', published first in the *Economist*, London (ch. 19). Thus completing the concluding chapter on 'Models of Reality' it shows the possibility and, too, the beauty of the Quantum model, and how it aids to understand even revolutionary changes in thinking. Revolution often had its aesthetic appeal, which helps to overcome scientific inertness. The three aspects of information: confirmation, novelty and pragmatics do necessarily apply to the highly structured set of heuristic information called models. The impending fundamental and global changes will be met if and only if we systemically control the process, securing confirmation from reality and actively asking for novelty, thus keeping alive the pragmatic learning process of selforganization. That is the message of the book, which should be received the more often the better. Owing to its qualified contributions, 'Models of Reality' will be recommended by its readers.

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**MOMENI, Mahvash Kashmiri: Socio-Cultural Factors Affecting the Adaptations of the Dewey Decimal Classification in the Middle East.** PhD Dissertation. University of Maryland 1982. XIII, 326 p.

Eric de Grolier aptly writes that "No classification in any field is 'value free'" (1). Therefore, every general classification system has to be adapted when it is used in a culture other than it was produced. This law applies the more to: (a) an internationally used scheme which was not designed for this use and (b) to a scheme which is still based on Wyndham Hume's principle of literary warrant. When the Dewey Decimal Classification was conceived and executed, the libraries of New York and New England, unlike today, were not procuring much literature from the outside world. Therefore, it is no wonder that such a pragmatic scheme is biased towards the culture in which it was conceived. It is all unconscious but natural and inevitable. In the modern fashion of acronyms it is described as WASPish (White, Anglo-Saxon, Protestant) bias by Hans H. Wellisch.

Abetted by blind chance as well as its intrinsic merits, the DDC was an instant success in the USA. The use of the scheme abroad, too, spread infectiously, and in Dewey's own life time it was being used in 32 nations of the world; and now it is being used in more than 104 nations in all the continents. It was said, "the sun never sets on it". The story of the diffusion of the DDC has been narrated in detail by John Comaromi (2) and W. Boyd Rayward (3). Paradoxically, the increasing use of the DDC and its criticism on account of American bias have always gone hand in glove. Once the scheme was adopted all the world over, the libraries outside of

the USA, not only in Africa and Asia but in Europe too, began to realise the meagre treatment doled out to their subjects. Many of the non-WASPish subjects have been poorly represented; and many subjects get no better treatment than a mere blanket mention. Their librarians, though dissatisfied with DDC, are not however disappointed: they do not abandon the scheme for the numerous advantages accruing from its use. So they resort to the next best thing they could: to adapt the scheme from here and there to suit their local needs. This internecine tendency became so fashionable that once it was considered that there was no library outside the USA using DDC as such. It was a matter of serious concern which thwarted the original identity of the DDC.

To offset this tendency the Forest Press and the Editorial Policy Committee took some effective steps. The first being to provide some options to empty the notation of its biased Western subjects and refill it with the desired subjects and their home-made details. This mutual transportation has its own ill effects which have been explained in detail elsewhere (4). The second remedial action was to authorise and sponsor, translations, though purient translations were in vogue quite early. Now about fourteen authorised translations are available, besides many unauthorised and unpublished ones. (To make an inventory of such DDCs, as it has recently been done for the UDC, will be a useful and interesting exercise). These are known as international editions and are mostly based on the abridged editions, and in no way are their literal translations. It has been made clear by the Forest Press that "While retaining the basic structure of the Dewey, they also contain expansions and revisions of parts of the schedules and tables to take into account local traditions and culture" (5). Such editions do not bring forth any absolute benefits. Some of them are not even used much. The Hindi Edition, for example, is a little used edition; it is not even much talked about. If any side sees victory in such editions, it is certainly a pyrrhic victory; which may prove to be a beginning of fresh troubles.

The dissertation under review is a study of four such DDCs: three from Middle Eastern countries and one from India. These editions collectively called MEDDCs are:

- (1) Arabic Edition (1960) (AE), based on DDC-16 prepared by Mahmood Al-Sheniti and Ahmad Kabesh (published in Cairo).
- (2) Farsi Edition (1971/1975) (PE) based on DDC-17 prepared by Tehran Book Processing Centre (TEBROC).
- (3) Hindi Edition (1976) (HE) based on 18th edition, prepared by PN Gour and published and printed in India by the Forest Press.
- (4) Turkish Edition (1962) (TE), based mostly on the standard 15th edition, and to some extent on the 16th edition, published by the National Education Press, Istanbul).

One is at a loss as to why the Hindi Edition produced in India has been treated as a Middle Eastern Edition. If the Hindi edition was as important (rather comparable) as the other three editions to this study, then why this information has not been revealed through the title of the dissertation? Nevertheless, the Hindi edition has been subjected to a thorough and drastic examination for the first time.

The whole study has been divided into four chapters.