interesting in that it presents PRECIS (a string indexing language) at an early stage in its evolution. PRECIS, Austin argues, is not like the traditional classifications. Whereas the traditional classifications attempted with their main classes to systematize a universe of knowledge, the purpose of PRECIS indexing is to systematize a universe of concepts. Is the distinction between a universe of knowledge (main classes) and one of concepts philosophically tenable? Is there a method of retrieving information that is "nonclassificatory" in nature"? In the opinion of the commentator on Austin's paper, J. M. *Perreault*: "if we seek to escape from classification in its broad sense we are fooling ourselves". (p. 403)

There is one writer from the library classification group who does not contribute his own scheme of things to the *Proceedings*. This is R. A. *Fairthorne* ("Temporal Structure in Bibliographic Classification"). In a disorganized yet insightful way Fairthorne considers what it might mean to incorporate time structure into a classification. His contribution, however, is more remarkable, in light of the contributions discussed above in that he dismisses, with a simile, the possibility of a general classification. A general classification is something which only an omniscient and omnipotent observer of the classificatory landscape can apprehend. As mere mortals we are as observers looking at the classificatory landscape from different vantage points and all our maps will differ according to our perspective.

Elaine Svenonius

DAHLBERG, Ingetraut: **Grundlagen universaler Wissensordnung**. (Fundamentals of universal organization of knowledge). München: Verlag Dokumentation 1974. XVIII, 366 p. = DGD-Schriftenreihe, Vol. 3

This book is a fundamental treatise dealing with the theoretical foundations of classifying, where classifying is considered as a universally valid method for organizing the widest open set of knowledge-items by recognizing and displaying their interrelationships. The author's aim is to provide sufficient theoretical foundations for showing the feasibility of a new consistent universal classification system and she illustrates this by a brief (only 20 pages long) sketch of a proposed structure of such a system. But the main emphasis of the book is on the development and presentation of a consistent scientific theory of classification and this is an essential and unique feature distinguishing it from other, more locally oriented, previous studies.

It is likely that there will be considerable agreement about the importance of the urgent need for a new consistent universal classification of knowledge, convincingly discussed in the book, particularly in its final chapter describing the various areas of use of the information science (alias 'informatics'), the theory of classification at presents finds itself in the paradoxical situation of a Cinderella, whose dream about the fairy prince of an ideal classification is given less and less credibility. And this happens notwithstanding elements of classification (even in the most traditional sense of monohierarchical orders) are more and more frequently recognized as essential components of such tools of "entirely new type" as thesauri and postcoordinate index languages of the most sophisticated structure; at the same time the use of universal classification schemes is found to be the only way for bringing some order into the chaotically developing multitude of specialized thesauri and index languages. The author of the book is fully aware of this situation noticing that in the past few decades a critical attitude has developed towards classifications, in general, and towards universal classifications in particular. She provides fairly good explanation for this, considering it as a result of the increased awareness, during this time, of the inadequacies of the currently used universal classifications due to the deeper insights gained of the semantical structure of information. This view is supported by a detailed (80 pages) multiaspect analysis and a judicious comparison of the content and structure of six most used universal classification systems, including the Soviet Library Classification. One has to regret the lack of any discussion of patent classification systems in this fine chapter.

In this reviewer's opinion there is also another important reason for the present scepticism towards classification theory, namely the more or less intentional refusal of some theoreticians of classification to consider seriously and embed in their own thinking the achievements of such a young (compared with the centuries long history of classification) but rapidly developing, research area as that of mechanized information retrieval. Because one has to admit that there *was some* progress in this field, though I fully agree with the remark of D. Soergel (in: Subject retrieval in the seventies – new directions. Wellish, H. (Ed.) 1972, p. 36) that " . . . the results of classification theory have been neglected or sometimes reinvented in a rather amateurish manner in mechanized information retrieval systems . . .".

One important merit of Dahlberg's work is that it not only includes a short but valuable analysis (40 pages) of modern work in the field of post-coordinated index languages, but the experience gained from this analysis is really put to work in developing the theory of classification. At the same time full use is made of other important sources of relevant knowledge.

Some of these sources are analysed in a detailed (70 pages) study of the history of classification and of the various forms and application fields of classification (including the philosophic, pedagogic-didactic, encyclopaedic and library classifications and the different kinds of thesauri). Another source is the analysis of the philosophic (ontologic) bases of the theory of classification (18 pages), preceded by a new reasonable sound system of definitions concerning the meaning of the main terms involved (such a "concept", "characteristic", "category" etc.), proposed in the introductory chapter (30 pages). A different area of knowledge the impact of which on the theory of classification seems to be a particularly important one is that of the philosophy and theory of science. The, as yet unresolved, problem of the satisfactory organization of the great variety of different fields of pure and applied knowledge obviously is of great importance for the success of the operation of national and international information systems; the solution of this problem essentially depends on the

further development of the theory of science. This theory is thoroughly investigated (36 pages) including the problems of categorization, generation (dynamics) and denomination of areas of knowledge; this is followed by a review of the CRG theory of integrative levels (J. K. Feibleman) and of the related work of D. Austin.

The display and analysis on the book of all these different areas of research contributes to the visualization not only of the true scientific dimension of the problem of classifying the universe of knowledge-items, but also of the great complexity of the conceptual apparatus which has to be put to work in order to enable sensible progress in the theory of classification.

Such progress in Dahlberg's book is achieved along the different above-mentioned chapters by reviewing, analysing and reshaping the results of earlier work and displaying, step by step, her own new approach. The essential and original primary point of this approach is in considering the expressions for all kinds of classes as *sentences* in the logical sense of this term), called "classificatorial" sentences, having as any sentence, a predicate-subject structure; the sentences are built up from concepts, some of them expressing the predication and others the subject of the classificatorial sentence. (One may notice that this predicate-subject structure immediately imposes a primary formal differentiation on the categories of concepts used to build up classificatorial sentences.) The essence of constructing a classification system is seen not in the pre-listing of all possible classificatorial sentences, but in revealing the concepts from which such sentences may be constructed; in comparison with classificatorial sentences the number of these concepts is considerably smaller and their life-time is longer. Thus the classification system constructing appears to have very much in common not only with the elaboration of "information languages" intended to be used for formalized and fully explicit semantic representation of document and data contents (or, in computer-based artificial intelligence systems, for such representation of the facts of the real world), but also with the elaboration of a "semantic language" to be used for the explicit representation of the meaning of natural language sentences. Much attention has been paid in recent research on structural semantics to the latter of these tasks. Some works on structural semantics but only up to 1966 are briefly mentioned in the book, but one has to regret the lack of more fundamental consideration of the whole componential analysis approach to linguistic semantics and particularly to the more recent works of Ch. J. Fillmore, G. Lakoff, J. Lyons, J. A. Melchuk, A. K. Zholkovsky, I. Bellert, A. Wierzbicka and Yu. D. Apresyan. It is felt that a careful analysis of the experience gained by them in the development of systems of semantic representation of sentences and in revealing some "ultimate" semantic components of natural language words (which components are suggested to be really semantic 'universals') might give further insight particularly relevant to the problem of concept categorization.

An important distinction is established by Dahlberg between concepts reflecting some existential content of a more or less specific existential level – such concepts are designated as "object concepts" (Sachbegriffe; examples "to be of biological nature", "to be human", "to be of social nature") – and concepts reflecting characteristics (general aspects) of the existential forms, such concepts being designated as "form-concepts" (Formbegriffe; examples: "to be a process", "to be an object", "to be an attribute"). A special emphasis is placed on the role of form-concepts in shaping the proposed new universal classification system. Again it is felt that further support for this distinction, as well as for this emphasis, could be obtained from the results of structural semantics. The sketch of the proposed universal classification is based on the further development of this distinction resulting in the establishment of the following five fundamental categories: 1. General object-concepts (subdivided, following the somewhat modified lines of the theory of integrative levels, into nine object fields: Principles and laws; Atoms and molecules; Earth and stars; Plants and animals; Human beings; Societies; Artefacts; Information-content of sentences ("Informemes") and the documents containing them; Works of art and 'metaphysical creations' ("Metaphysische Werke"); 2. General form-concepts (which one could call also "general aspect-indicators", tentatively subdivided following a suggestions of A. Diemer into: Objects; Attributes; Relations; Orders; Determinations; Processes; Operations); 3. Space- and place-related concepts; 4. Time connected concepts; 5. Concepts of areas and fields of knowledge (subdivided, roughly speaking, also following the conceptual lines of the theory of integrative levels, the ultimate list of areas and fields of knowledge being at present elaborated in the framework of a comprehensive empirical investigation).

The class descriptions are then built up from: I. one or more concepts of category 5. indicating the relevant areas and fields of knowledge; II. the concepts of different other categories necessary to construct (eventually using syntagmatic relationship indicators) a brief sentence describing the "topical content" i. e. subject (Sachverhalt) of the knowledge-item, and III. a characteristic of the document type in which this item is recorded.

Though there is no intension here to attempt a detailed appreciation of the proposed superstructure of the system, in this reviewer's opinion this structure has important advantages in comparison with any of the existing universal classification systems; nevertheless it seems likely that in order to enable the practical elaboration of a new classification system further theoretical investigations will be needed. But one can see that the new proposal does make a sensible progress towards a more consistent universal classification of knowledge and, more than that, Dahlberg's book provides theoretical tools and guidance for the further investigations needed to elaborate such a classification. This is why it is an excellent book about a very difficult fundamental scientific problem.

The results of this study as well as the impressive display given in it of the complex area of theoretical investigations connected with classification construction might be a good antidote to the reigning at present, somewhat agnostic, scepticism towards classification research. At the same time this book is a challenge to the information science community urging more intensive fundamental research in this area. One has to hope that this challenge will be met.

George E. Vladutz (Vleduts)