Book Reviews

GANTER, B.; WILLE, R.; WOLFF, K.E. (Eds.): **Beiträge zur Begriffsanalyse** (Contributions to Concept Analysis). Mannheim/Wien/Zürich: B.I. Wissenschaftsverlag 1987. 255 p., ISBN 3-411-03157-3

Measures of science organization alone will not make for greater efficiency of research efforts. The thrust of both theoretical and practical investigations is therefore shifting more and more to the questions of how to rationalize the processes of knowledge processing by man and of how these processes can be assisted by "knowledge-based" computer systems. Since "knowledge-based systems" so far have been mainly oriented to the application of natural language, hence of "words" and "sentences" as the elementary units of language, the less than consistently positive experiences gathered so far with these systems makes it appear justified to start paying increasing attention to the elementary units of thinking (rather than of language): the "concepts" and statements.

Presenting a compilation of the most important papers read at the 1986 conference on concept analysis in Darmstadt, West Germany, the volume reviewed constitutes a commendable attempt to view the field of suitable knowledge presentation and rational knowledge processing – a field still as problematic as ever – also from the aspect of the "world of concepts" and to place the "concept", as the essential "unit of knowledge" (DAHLBERG) in the center of discussion.

As already suggested by the wide spectrum of subjects in this book, a multidisciplinary approach is an absolute precondition for illumining the essence of the concept in such a fashion that both theoretically and practically effective conclusions for the solution of specific problems of knowledge presentation and processing can be drawn.

The point of departure for such a – direly needed – multidisciplinary meeting of minds is formed by DAHLBERG's contribution: "Referent-oriented, analytical concept theory and its various kinds of definitions". The possibilities enumerated there for applying the theory presented furnish suggestions for numerous methods in widely varying fields. If "concept" is defined as "unit of *knowledge* ", then existing relationships to such concepts as "knowledge" ("technical knowledge"), "information" and "data" should also be laid bare.

How rewarding a retrospective glance into history can be for filling ideas of the past with new actuality becomes evident from NEDOBITY's contribution. Frege's more than a century-old "Begriffsschrift" (concept characters), when viewed under present-day aspects, can be quite useful in solving certain problems in AI research or in the elaboration of expert systems. Frege recommended in particular "that human thinking should free itself of the shackles of natural language, which frequently constitutes the cause of erroneous conclusions and misinterpretations". Frege's writings furnish valuable insights for modern terminology. Through application of Frege's "concept characters" we can acquire an even clearer and deeper understanding of language in the form in which it is applied in science. "5th generation computers specialized in the processing of symbols can also process characters of any degree of complexity" (NEDOBITY).

SIEGRIST's contribution deals with the graphic representation of the semantic relations of a given referential concept (e.g. "school") as a prerequisite for a computer-assisted aid for teachers and learners. The semantic relations can be immediately stored in the data bank. The exclusive consideration of the controversial concept "meaning" under linguistic aspects is not, in my opinion, very helpful when what we are concerned about is the processing of concepts (as "units of *knowledge* "). Human beings possess the faculty of grasping meanings immediately. Human "understanding" is based on the processing of "concepts" or "concept lattices".

The contribution by SEILER, in which the widely varying aspects are investigated under which the concept "concept" has been defined, may be regarded as a supplementation to DAHLBERG's fundamental remarks. While DAHLBERG designates every *statement* on the referent as an *"element of knowledge"* and the "concept" – as a combination of such knowledge elements – as a *"unit of knowledge"*, SEILER holds that "in the newer theories of the psychology of knowledge and semantic memory it is concepts" – rather than statements – "that are defined als *elements of knowledge* ". Now here a definitory clarification and terminological standardization would obviously be most desirable. In cognitive psychology it is regarded as rather firmly established that knowledge is stored in the human memory in the form of units which correspond to concepts. These concepts, in turn, are composed of smaller units, the concept characteristics. Moreover it is necessary to differentiate between "interconceptual" and "intraconceptual" relations.

To get out of this terminological dilemma it might possibly be expedient to proceed e.g. from the consideration that *"statements" – "concepts" – "concept characteristics"* represent in any event "knowledge components" of different degrees of complexity, approximately comparable to "molecule" – "atom" – "elementary particle".

To this reviewer, the separate treatment of "concept" and "meaning" appears to be of little use. SEILER takes the view that a strict differentiation should be made between "concept" and "meaning". In my opinion, the primary aim in our considerations should not be "differentiation" but rather investigations into the *connections* between "concept" and meaning. It is only when one proceeds from the structure of and the relations between concepts that the process of the grasping of meaning can be clarified.

As convincingly argued by LEX, it is particularly in the "machine treatment of concepts" that the necessity exists to "free of the fetters of natural language and interpret the concept as an abstract entity which exists independently of whether there is any natural language a word exactly denoting this abstract entity".

"For, in concept formation it appears to be essential that, on the one hand, the presence of a characteristic can be left open for the time being, but that, on the other hand, the presence of a characteristic may also have to be downright forbidden, negated" (LEX).

In the contribution by WILLE, the essence of "Formal Concept Analysis" as based on a set-linguistic model for hierarchical concept systems is explained in detail with the aid of examples. For better orientation in the application of this analysis as well, the various distinct possibilities of utilizing concept lattices are elaborated. A concept lattice, illustrated e.g. by a line diagram, can appear in various basic meanings, such as:

- hierarchical classification of objects,
- characteristics simplification system,
- structure for the representation and retrieval of knowledge,

etc., to mention only a few. Further meanings will be added to the above as the application field of Formal Concept Analysis widens.

WILLE's remarks are supplemented by "Algorithms for Formal Concept Analysis" and a few programming examples (GANTER).

The collection of papers reviewed may be expected to be of interest to a wide range of interested groups, such as computer specialists, mathematicians, philosophers, natural scientists, psychologists, linguists and information processors, and to furnish impulses for both theoretical investigations and practice-oriented applications.

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KAPUR, Shabad: **Classifieation and Cataloguing.** A Select Bibliography. New Delhi: Harmann Publishing House 1988. 392 p., 4510 refs. ISBN 81-85151-10-5.

Kapur's bibliography collects altogether 4510 references on classification and cataloguing; thereof numbers 1-1448 refer to classification and numbers 1149-4177 to cataloguing. A supplement, covering the years 1983–1986, yields further 333 references; hereof numbers 1-80 pertain to classification, numbers 81-333 to cataloguing. This gives a total of 1528 references on classification (34 %) and 2982 references on cataloguing (66 %).

In a rather vaguely formulated preface (p.V-VII) the author declares her bibliography to be "by no means exhaustive and authoritative" and then refers to a "selective scheme in which only really useful and important entries have been included" (p.VI), a plan of a rather enigmatic character, since it is never revealed to the curious, maybe even impatient reader. Instead of precise demarcations and definitions as one might expect of a preface the hardly helpful introduction abounds in pleasant-sounding platitudes and evasive half-truths: "literature . . . never suffers decline or destruction"; "bibliographies save the precious time and energy of the scholars"; there is "need to provide bibliographic control of the prolific literature" (p.V). The author abstains from an account of the criteria of selection, which have determined the inclusion of entries in her bibliography; therefore, one of the major tasks of the present review should be to state and evaluate some of Kapur's basic tendencies of selection.

The author's bibliography concentrates on those writings which focus on the practice, techniques and procedures of library classification and cataloguing. It excludes more conceptional and – from an intellectual point of view – more ambitious works (e.g., Dobrowolski, T.: Etude sur la construction des systèmes de classification. Paris, 1964); biographies of prominent librarians (e.g., Rider, F.: Melvil Dewey. Chicago 1944); studies of the history of classification and subject cataloguing seen as part of the heritage of librarianship (e.g., Lehnus, D.J.: Milestones in cataloging: famous catalogers and their writings, 1835–1969. Littleton 1974) and many full and abridged editions of the Universal Decimal Classification in the world's languages. Also excluded are works by noticeable theoreticians of classification (e.g., Dewey, M.: Decimal Classification beginnings. In: Library Journal 45(1920)p.151-154) as well as definite classics of the theory and management of cataloguing (e.g., Cutter, C.A., Sanborn, K.E.: Cutter-Sanborn three figures author table. Swanson-Swift revision. Chicopee, Mass. 1969). In some cases secondary literature gains admission into the bibliography, while important primary sources are left out. The bibliography mentions, e.g., Stevenson, G.: The Eppelsheimer subject catalogue. In: Library Resources and Technical Services, 15(1971)No.3, p.309-328 (3980), but ignores Eppelsheimer, H.W.: Der neue Sachkatalog der Mainzer Stadtbibliothek. In: ZfB 46(1929)p.406-24. Some theoreticians of cataloguing are represented by their minor writings, while their principal works are not deemed worthy of attention. Thus, J.W. Metcalfe's Information retrieval, British and American, 1876–1975. Metuchen, N.J. 1976 – "a chatty, historical narrative" [1] – is given an entry, while his more significant works – especially Information indexing and subject cataloging: alphabetical-classified, coordinate-mechanical (New York 1957) and Subject classifying and indexing of libraries and literature (New York 1959) – are disregarded.

The focus of the bibliography is on Anglo-American studies with an additional and – in view of the author's Indian origin – legitimate, though not obtrusive emphasis on South-Asian publications: The bibliography exploits, among others, the following periodicals: Indian Librarian, Indian Librarian Movement and Singapore Libraries. German and French studies are missing. This neglect affects even fundamental works and state-of-the-art reports such as Haller, K.: Katalogkunde. Formalkataloge und formale Ordnungsmethoden. Munich, New York, London, Paris 1980 and Burkart, M., Wersig, G.: Die Nutzung der DK in der Bundesrepublik Deutschland und Österreich. Ergebnisse einer Umfrage im Sommer 1981. Berlin 1982.

The bulk of the bibliography is made up of periodical articles, among them many trivial, some letters to the editor, announcements, notes, and a lot of highly specialized publications (e.g., Harris, G.: Classifying theology in Uganda. In: Librarians Christian Fellowship Newsletter 25(Winter 1983)p.26-27: Supplement, 2). Occasionally monographs and booklets are neglected, while less lengthy periodical contributions are included