(p.177-179). The next two chapters 4 and 5 analyse in a critical way the data presented in Chapter 3. Here some of the modifications made in different classification systems are enlisted. The information is skilfully presented and analyzed. A commendable and interesting aspect of the book is the stalement of historical reasons which led to the adoption of a particular scheme in many of the libraries surveyed. The book is skilfully summarised in Chapter 6; it provides some recommendations to make the use and teaching of classification systems more effective and problem oriented. The appendices enlist mostly some of the larger modifications made in different libraries.

The book endeavours to draw a picture of the state-of-the-art of classification practice in Indian libraries. The results may be useful to Indology librarians to design succinctly suited classification systems for Indian subjects. There is no cumulated bibliography except the sparse references given as footnotes; the printing leaves much to be desired. M.P.Satija, I.V.Malhan

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(3) Pandey, Sh.S.K.: Depth schedules: Indian philosophy and religions for Dewey Decimal Classification (19). New Delhi: Ess Ess Publ.1986. VII,189p.
(4) Momeni, M.K.: Socio-cultural factors affecting the adaptation of the Dewey Decimal Classification in the Middle East. PhD Thesis, University of Maryland, 1982. 320p. (typed)
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ROWLEY, Jennifer E.: **Abstracting and Indexing. 2nd ed.** London: Clive Bingley 1988. 181p. ISBN 0 - 85157 - 411 - 4

In comparison with the first edition of Abstracting and Indexing (London: C.Bingley 1982; henceforth called A1) which has already been reviewed - more precisely: slated - in this periodical (H.H.Wellisch, Int.Classif. 9(1982)No.2, p.106-7), the current second edition (henceforth called A2) features some changes based almost entirely on a greater emphasis on *computerized* information-retrieval systems and abstracting products. The following revisions, though rarely of a substantial character, nevertheless deserve both the reviewer's and the reader's attention:

(1) A new chapter on "Computers and abstracting and indexing" (p.1-9) has been added, obviously misplaced as an introductory chapter: Whereas A1 started from a definition of the abstract (rightly called a "useful starting point", A1, p.9), A2 begins with a - from a didactic and propaedeutic point of view - more unfavourable introduction, due to its abstract quality, into the concepts of 'database', record', 'field', and 'data element' which are arranged in the following hierarchy: "Information is held in *files* or databases, which are comprised of *records*, which in turn are comprised of *fields* or *data items*, which again may be comprised of *subfields* or *data elements*" (p.1-2). The publisher's announcement, welcoming the chapter on "Natural-language indexing" (p.89-103) as a newcomer, is unfortunately not correct. Large parts of this chapter (the sections on "Title indexes", "KWIC indexes", "Limitations of KWIC indexes", "Further title indexes and their variants") have - with almost identical wording - already been published in A1 (combined in a chapter on "Natural-language indexes"). Solely new are the sections on "Natural-language indexing on abstracts and full text", "Attractions of natural-language indexing", "Problems with natural- language indexing" and "Circumstances in which natural-language indexing is particularly appropriate".

(2) Moreover, A1 has been enriched by some more or less detailed insertions on new storage media ("Optical disks", p.166), on "Abstracting and computerized information retrieval systems" (p.31-32) - a section followed by "Some guidelines on the content of abstracts for use in free-text searching" (p.32-33) - on "Multi-lingual thesauri" (p.66), the "ROOT Thesaurus" (p.67-68), "PRECIS and online searching" (p.148-9).

(3) The reworking of the complete text of A1 comprises a broad spectrum: from rather lightweight insertions ("Post-coordinate indexing is important in computer-based information retrieval systems", A2, p.54) to a thorough and comprehensive updating of a section on "databases" (p.156-7).

(4) Often the original text has been completed by further references to basic codes, regulations and indexing rules (for example, ISO 214: "DocumentationAbstracts for publication and documentation", p.31); other citations of standards and guidelines have been updated.

(5) A welcome need for linguistic regulation, in an attempt to meet the growing importance of computerized information, is noticeable in the consistent and thorough change from "machine" to "computer" (in compounds such as "computer-selected thesaurus", p.75; formerly: "machine-selected thesaurus"), from "mechanized" to "computerized" (for example, "Computerized systems", A2, p.105 instead of "Mechanized systems"); also note the change from "mechanically" to "automatically" (A2, p.57), from "manual" to "card-based" (A2, p.105), from "Hard-copy abstracting" to "Printed abstracting" (A2, p.151).

(6) The comments on "card-based systems" (p.107-8) have been shortened; somewhat overhastily they are disqualified as "more-or-less redundant" (p.104), as being of "historical value" (p.107) only.

(7) The index of A2 is more detailed than that of A1 and offers a better reliability of access. The bibliography has been updated to a moderate extent. All in all layout and typography are more user friendly (cf., for example, some additional italics).

To a large extent the additions on computerized and automated information reveal a misinterpretation of the prospects and opportunities of electronic data processing.

Firstly EDP is, by mistake, assessed as a relief from intellectual activities ("The advent of computerized systems has, in general, reduced the amount of checking and proofreading..." A2, p.168), whereas, generally and more realistically, the use of EDP is not seen as a saving on human input, but, more appropriately, as a "sophistication of capabilities which we cannot be without"[1]. Secondly, EDP-based storage media and instruments of indexing are wrongly considered to be mere extensions of their manual predecessors: a position which repeatedly, though only halfheartedly, has been revised by the author. Thus, optical disks are introduced as "merely an additional way in which to store and make available databases or sections of databases" (A2, p.166), an assessment followed shortly by the misgiving that "optical publishing could affect the entire information retrieval and the positions of the online hosts" (A2, p.166). At another point of Jennifer Rowley's study the terse statement, that "the style and content of the abstract should not be affected by its storage in a computer database" (A2, p.31) is followed by the justified supposition that "editors have developed abstracting policies from their own experience of free-text searching, rather than from any research results" (A2, p.31). Ms.Rowley's interpretation of EDP, "the computer is merely a store" (A2, p.31), is based on an impermissible reduction of complexity, not suited for assessing the diverse, complicated, indeed dialectical correlations between the *media* and *structures* of information.

More important than these revisions, however, are the alterations not carried out by the author, the changes she refuses of the reviewers of the first edition of her book. Almost all weighty mistakes and shortcomings, which H.H. Wellisch complained about in his review (Int.Classif.9(1982)p.106-7), reappear unchanged in A2. Also in A2 we are offered the amazing insight "all nouns have a plural and singular form" (p.49), also in A2 we encounter the astonishing opinion that "authors' names present relatively few problems" (p.51): a slap in each cataloguer's face! Also A2 suffers from a one-sided emphasis on the interests of scientific and technical abstracting and indexing, also A2 deals almost exclusively with indexing for A&I services and neglects the peculiarities and technicalities of the indexing of monographic documents.

A2 (to a great extent identical with A1) is marred by a superficial treatment of most subjects. So we have factual mistakes (p.14 should read "user orientation" instead of "abstract orientation"), trite assertions and vague wordings ("Some authors make good and others poor abstractors", A2, p.23), doubtful demands, for example, that within an abstract "style and order of ideas should mirror that of the author" (p.27): a claim prone to find itself in opposition to the legitimate demands for "brevity" and "conciseness" (A2, p.26).

Among the blemishes and faults of the book - not criticised by Wellisch - the author's definitions may easily claim the foremost position. Often they are tentative, far too approximative, rightly called "simple" (A2, p.10). They are partly descriptive ("A précis is...", A2, p.11), partly normative ("A digest should be ...", A2, p.11), sometimes recall more or less obsolete meanings: A "*synopsis* is the term that was originally used to denote a resumé prepared by the author of a work" (p.11-12). Compare this definition with the far more helpful one given by the *ALA Glossary of Library and Information Science*[2]: "A condensed, orderly abridgement of a written word, such as the skeletal plot of a novel and the main points of a periodical article, often prepared by someone other than the author of the original". Some definitions - due to a striving for a highly intellectual and highly conceptional styling - sound sophisticated, rather highfalutin without pinpointing the essentials. The index, for example, is defined as an "organized series of access points which lead from information known to the user to additional previously unknown information" (A2, p.48). Also, in this case the definition offered by the *ALA Glossary*[3] - seemingly more pedestrian - is more helpful: "a systematic guide to the contents of a file, document, or group of documents, consisting of an ordered arrangement of terms or other symbols representing the contents and references, code numbers, page numbers, etc., for accessing the contents".

Sometimes the tasks of the information specialist and of the scientist are confused, for example, in a passage where the "selection of documents" (A2, p.22) is assigned to the information specialist. Is the information specialist able to decide which documents will represent "novel contributions to a given field of endeavour", which reports are "well supported by sound methodology and convincing evidence" (A2, p.22)?

After the reading of A1 Wellisch quoted a suggestion by E.B.Jackson made in 1980[4], that "no more books on indexing ought to be published during the next five years or so, there being a surfeit of them already"[5].
Equally justifiable would be the wish for yet a further book on abstracting and indexing, a book which, at last, would combine the conceptual demands of the information scientists[6] with the love of detail characteristic of the more workmanlike British practicians[7], the interests of science with the "humanities tone"[8], a study dealing with both the indexing of monographs and the indexing of articles in periodical publications.

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Notes:

1 Rice, J.: Introduction to library automation. Littleton, CO: Libraries Unlimited 1984. p.150
2 Ed.by Heartsill Young. Chicago, Amer.Libr.Assoc.1983, p.223
3 Ibid., p.116
4 Jackson, E.B.: Indexing: a review essay. J.Libr.Hist. 15(1980)p.320-5
5 Wellisch, op.cit., p.107
6 To this school belongs, among others, Harold Borko's and Charles L. Bernier's "Indexing concepts and methods" (London: Academic Press 1978), "designed as a textbook", written to "provide perspective and understanding" (p.IX).
7 Special mention should be made of Knight, G.N.: Indexing, The Art of. A guide to the indexing of books and periodicals. With a foreword by Harold Macmillan. London: G.Allen & Unwin 1979. Note the difference between Rowley's careless dictum that "authors' names present relatively few problems" (p.51) and the careful discussion of "Proper Names Headings" characteristic of Knight's book. Knight discusses: "Personal names", "Pseudonyms", "Repeated sur-

names", "Compound surnames", "Compound surnames with prefixes", "Royalty and nobility", "Saints and ecclesiastical dignitaries ", "Married women", "Change of title or status", "No-surname headings", "Foreign personal names" (Arabic, Burmese, Chinese, Indian, Indonesian, Japanese).

8 A phrasing, used by D.B.Cleveland and A.D.Cleveland (Introduction to indexing and abstracting. Littleton, CO: Libraries Unlimited 1983. p.12), which aptly characterizes N.Knight's book (note 7).

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Bock, Hans H.: **Classification and Related Methods of Data Analysis.** Proceedings of the First Conference of the International Federation of Classification Societies (IFCS), Aachen, FRG, 29 June - 1 July 1987. Amsterdam/ New York/Oxford/Tokyo: North Holland 1988. XV,749p. ISBN 0-444-70404-3

Eighty-six invited or selected and refereed papers bring together a wide range of topics and perspectives in the field of classification, clustering, and data analysis. They may be subdivided roughly into four groups. In reviewing them, we refer to the concise summary given by the editor in his preface.

The papers in the first group deal with various mathematical and statistical aspects of clustering and classification. Their scope is indicated by keywords like (dis)similarity measures, clustering algorithms, classification criteria, optimal partitions, trees and hierarchies, fuzzy classification methods, mixture analysis, discriminant analysis and image segmentation. Special emphasis has been given to topics like probabilistic clustering models, inferential statistics, the assessment and evaluation of clustering, and cluster or homogeneity tests.

The second group is devoted to consensus and aggregation methods for relational and qualitative data. The papers survey the theoretical background as well as applications in the social and biological sciences, including methods for biological taxonomy, the reconstruction of phylogenies, and the analysis of molecular structures in chemistry and microbiology.

The third group covers topics from multivariate statistics and exploratory data analysis in the broad sense. These papers deal with (ordinary and constrained) multidimensional scaling, related graphical data representation methods, correspondence and canonical analysis (comprising its nonlinear and loglinear extension), seriation methods, multiple and pairwise comparisons, ordinal network and graph analysis, algebraic methods from formal concept analysis, and model selection criteria.

A major topic of the conference was the presentation of relevant software packages and the investigation of the interrelationship and mutual impact between classification, retrieval, and expert systems. The papers of the last group reflect these activities and describe or analyze expert and data management systems developed for classification purposes.

From many topics worth mentioning, we have selected some which are important in practice but under-represented in this volume (as in many others before). The handling of measurement errors is such a neglected topic; only two papers were found dealing directly with it. One adopts methods from the syntactic pattern recognition using a formal language approach to inexact graph matching (M.Kaul). It combines two interesting aspects, the handling of structural information, and error handling. The structural knowledge is incorporated into a graph grammar, and error handling (of possibly distorted input graphs) is performed with an error-correcting parser. The reconstruction of phylogenesis by weighted genetic distances (P.O.Degens) is the other approach tackling with the error problem. It is based on a generalization of average linkage for a Gaussian error model.

A serious problem which should be given more attention concerns the danger of losing track of things in the mass of details. Above all, this shortcoming is felt by practitioners who have to select the model and perform the analysis. Software tools with a large number of routines are available now, but less guidance is present in making decisions about the order in which different algorithms should be applied. Expert systems are in development to overcome this problem for cluster analysis (E.Backer) and exploratory (election) data analysis (F.Gebhardt). These attempts are still in their initial state. Designed for a general application, they require general principles for their foundation, not available as yet. In the future such projects will certainly promote theory-oriented studies. Approaches like the new information-theoretic measure of complexity for model selection (H.Bozdogan) may be a good starting point for this. It provides a new criterion of goodness for the fit of a model. Some values from the new criterion are compared with those obtained by the fundamentally different Akaike Information Criterion.

The volume contains a noticeable number of survey lectures and invited papers. The opinions may differ on the usefulness of this practice. The classification problem dealt with from the pattern recognition point of view (H. Niemann) stands out from them on account of its succinct formulation. A negative example is, in my opinion, the paper on the modern fundamental measurement theory (R.D.Luce). Continuing an old tradition in mathematical psychology, 'measurement' is confused with 'metrization', so that the theory appears neither modern, nor fundamental.

The contributions, although varying in their quality, convey a good overview about the state of the art in numerical classification and related methods of data analysis. Many of the papers demonstrate the usefulnees of these methods in applying them to real data, e.g. from astronomy, biology, marketing, psychology, the social sciences, etc. The subject index of this volume facilitates cross referencing between these practical applications and the methods. Mathematicians, statisticians and data analysts as well as researchers and practitioners will find many stimuli for their work. Peter Jaenecke

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