Prospectives in the World," *J.C. Sager* first lists the individual groups which require instruction in terminology. He then considers the level of knowledge needed by each individual group and describes the forms of teaching terminology which are presently in use in various countries. In the concluding remarks on the further development of the instruction of terminology the interdisciplinary character of terminology play a special role.

In their contribution "Erfahrungen mit der Terminologiearbeit in der Bundesrepublik Deutschland" the authors *G. Beling, W.H.U. Schewe, H.-R. Spiegel* and *G. Wersig* divide up the entire field of terminological work. They differentiate between four levels, each of which presupposing the others: 1. lexicography, 2. terminological work, 3. standardization, 4. terminological public relations. They describe in particular the work of the standards committee on terminology of the Deutsches Institut für Normung (DIN) and the work of the Verein Deutscher Ingenieure (VDI) in the fields of terminology standards and research on technical language.

The peculiarities and function of technical language as well as the differences in the structures of technical and general texts are central to the contribution of *W. Wilß* "Fachsprache und Übersetzen." The author underlines the eminent role of terminology and analyzes methods and problems in technical translating.

Part 4 of this volume, is dedicated to information and documentation and their relationship to terminology. *G. Wersig* points out similarities and differences between these two fields in his article "Terminologieforschung und Informationswissenschaft – Zwei Disziplinen in Kinderschuhen." Common to both fields are, in the views of Wersig, in particular the task of producing a communications process free from interference, and further the close relationship between theory and practice. Possibilities for a working exchange present themselves in these common tasks. Here information science anticipates in particular more exact explanations on possibilities of describing the structure of technical language. Information science for its part can help terminology in overcoming its present lack of theory.

Central to the article "Klassifikation" by *F.H. Lang* are Wüsters efforts for further developing the UDC.

R. Supper handles coding problems in his contribution. He makes reference here to ISO 3166 (Codes for the Representation of Names of Countries) and ISO/R 639 (Symbols for Languages, Countries and Authorities) as well as the corresponding DIN standards.

The concluding section of this book, with the heading "Plansprachen," includes three articles with quite different topics. In his article "Interlinguistik – Teil der Linguistik?" *H.M. Ölberg* defines interlinguistics in the limited sense as the branch of linguistics which is concerned with artificial international languages; he emphasizes the interdisciplinary character of interlinguistics.

M. Mangold investigates the Esperanto phonetic system in Africa. He compares the sounds present in Esperanto with those of about 30 African languages and comes to the conclusion that Esperanto is phonetically easier for Africans than, for example, English or French.

The final contribution deals with system quality, function equivalence, and difficulties in artificial and ethnic languages. The author, *O. Back,* starts from the concept "Systemgüte" which was coined by Wüster who saw precision and convenience as its fundamental requirements. Back counters the claim that all languages are equally difficult, or equally easy, with extensive evidence; he is of the opinion that linguistics ignores artificial languages unjustly, as a comparison of artificial and ethnic languages is of great methodological interest.

If the work is viewed as a whole it appears, at least partially, to be rather heterogeneous despite its convincing organization. However, that was almost unavoidable. Eugen Wüster, to whom this work is dedicated, was a man with unusually widespread interests. Besides, terminology is a young subject with an interdisciplinary orientation, in which there are diverging opinions. The editors are to be applauded for allowing the expression of differing opinions in this volume. Here one need only mention *Wiegand's* critical article. The other authors who worked with comparable topics, for example *Lang,* assume that the "concept" forms an indispensable instrument for terminological work, and backs this up with examples. Unfortunately this interesting controversy cannot be dealt with in more detail here. At any rate terminology continues to be called upon to further establish and – if necessary – to modify its position on concepts. In this respect critical articles of the type described are certainly important.

The large spectrum of the contributions and their, at least in part, controversial character make the work appear suitable only in a limited sense as an initial introduction to terminology problems. On the other hand, it can be unconditionally recommended to all those who wish to acquire a comprehensive overview of the present discussions within terminology, of terminology's relationship to neighboring sciences, and of the future tasks of terminology research. In particular the extensive bibliographical references offer a good basis for further studies.

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SAGER, J.C.; DUNGWORTH, D., MCDONALD, P.F.: **English Special Languages: Principles and Practice in Science and Technology**. Wiesbaden: Oscar Brandstetter Verlag 1980. 368 p.

Special languages, much more than ordinary language, reflect an underlying classification system or taxonomy of objects and properties. One of the most well developed special languages, in this respect, is that of Botany, as reflected in the well-known binomial nomenclature designed by *Carolus Linnaeus* (Carl von Linné), based on an elaborate hierarchical classification of plants. In order to represent this taxonomy, a comprehensive New Latin nomenclature was devised to replace ordinary language words which, according to Sager and his associates, "implied misleading relationships." "The classificatory use," they continue, "being highly developed in special languages, assumes great significance and is the basis of much special communication." (p. 20, 22)

The same theme is elaborated in a later discussion of "nomenclatures" which contains the following:

Without classifying the great multiplicity of objects, their characteristics, their common features, their use and adaptability to

human needs, no meaningful generalisation can be made and no useful and structured knowledge can be gained. Different sciences have evolved different criteria of classification according to the nature of the objects observed and according to the purpose to which this knowledge is put.

. . . it has always been feld convenient to use the naming process for classificatory purposes as far as possible and to supplement it by definitions. The classificatory principle, therefore, becomes the chief motivation in designation and thereby fundamentally distinguishes the special designation [i.c. special language] process from the arbitrariness of general language. (pp. 291–2)

This perspective makes Sager's book (I shall personalize subsequent references even though Sager is just the first listed of the three authors of the work) especially relevant to the interests of *I.C.* readers. The book contains a comprehensive analysis of the "principles and practice" of special languages in English, especially in the fields of natural science and technology. Sager (et al) asserts that the growth of new knowledge, as a result of scientific and technological progress, generates a need for new words to represent "new concepts and their relationships." The proliferation of technical vocabularies occurs within a framework of ordinary language usages, creating what are called "special languages." (p. xvi)

These languages are not readily disengaged from each other, however, and the increasing interest in cross-disciplinary analysis greatly complicates the problem of maintaining communication among specialists. In the case of linguistics itself – the discipline of the authors – contributions to the study of language by sociologists, psychologists, psycholinguists, sociolinguists, and philosophers who are, themselves, not familiar with "basic linguistic terminology" has led to "such a diversity of terms that the subject becomes impenetrable and worse than arcane, incomprehensible to either the pure linguist or the interdisciplinary linguist representing another approach." (p. xvi–xvii) In the face of such obstacles to unambiguous scientific communication, Sager mentions the important contributions that can be made by information scientists, terminological data banks, glossaries of technical terms, and standardized vocabularies. In a useful discussion of rules for term formation, he draws heavily on ISO R 704, "Naming Principles" – to be renamed "Principles and Methods of Terminology." The book supplies an extended discussion of the various lexical forms taken by new terms, and supplies useful data – including a list of affixes, with their meanings.

In a concluding section of the book, the standardisation of terminology and the functions and structure of glossaries are discussed. The methods used by the British Standards Institution (BSI) are described, with helpful examples. The more useful documents of the BSI and the ISO are listed, followed by a 20-page bibliography. The index, which refers to decimally notated sections, is somewhat confusing, and contains a few errors: e.g. 'hyponymy' refers to a section that fails to mention this word, but does discuss 'hyperonymy,' although this term is not indexed.

The general scope of the book includes much more than the classificatory and terminological aspects of special languages. There is a good introductory discussion of the functions of language and sub-languages, the communication process, the theory of special reference, speech acts and message types, the syntax used in special languages, and a typology of forms used in special language communication, including a 35-page glossary of traditional forms, from "address" to "yearbook" – including "glossary," "nomenclature," and "thesaurus," but not "terminology" or "vocabulary." As a compendium, this work brings together into a synthesis the findings reported in many scattered monographs and articles, including materials published in German and French, as well as in English.

It is scarcely possible, no doubt, in a book of 368 pages, to cover everything that a reader might be looking for, and it is admittedly unfair to criticize an author for having failed to deal with subjects that were intentionally excluded from the scope of the work. Nevertheless, as a social scientist, I must confess that the book would have been more interesting to this reader if it had examined the problems involved in creating a special language – especially for the "softer" sciences, including both the social and information sciences, and even linguistics. For such fields the boundaries between ordinary and special language are, of course, less sharply drawn than they are for technology and the "hard" sciences. Nevertheless, specialists in these disciplines do seek to identify and define as precisely as possible a wide range of phenomena of the utmost importance for interacting and intercommunicating human beings.

Interestingly, although the writers approach their subject from a linguistic point of view, they draw virtually no examples from the problems involved in developing the special language and terminology used by linguists – except for the comments noted at the beginning of this review.

The contrast between a "hard" and a "soft" science perspective comes into focus when one considers the process of terminological standardization. As described by Sager, the promulgation of terminological standards, under the auspices of the BSI, is based on decisions by a committee representing "organizations who can put forward the views of an industry, a trade, users, etc." (p. 337) It is understandable that, in technological fields, the financial interests of users induce them to accept decisions on preferred terms made by a "representative" committee. In the social and information sciences – and even in linguistics – such pressures are scarcely operative.

An illustration of the terminological difficulties that face many creative scholars can be found in a book on *Linguistic Units and Items* by Göran Hammarström (Berlin: Springer-Verlag, 1976) where the author protest that ". . . a standardization of terms would be most desirable." This comment was a reaction to the author's frustrating experience of finding "as many as 24 different terms" for two linked concepts which he calls a "prosodeme" and a "contoureme." (p. 30) The notion itself is elemental, inasmuch as variations in pitch, intonation, and stress affect the meanings that speakers impart to their speech acts. Such a proliferation of synonyms for a fundamental linguistic unit of analysis would not surprise social scientists who struggle to establish shared terms that unambiguously communicate far more complex aspects of human interaction. Surely no committee of "representatives" can speak for the scholarly communities concerned, nor would individualistic social and information scientists ever feel themselves

obliged to conform to the usages laid down in a standardized vocabulary promulgated by an official agency.

Although, as a linguist, Sager describes the point of view of terminologists and term planning in a detached way, he seems to accept the premise that, ideally speaking, there should be only one (preferred) term for each concept designated in a special language. When describing the rules followed in scientific nomenclature, Sager writes that "names should be univocal and unique but simple and concise." (p. 293) However, he admits that this is possible only when "all users agree on concepts and their terms . . . standardization of designation can only begin when conflicting theories are resolved." "Since knowledge is constantly evolving . . ." however, Sager concludes that this is a rare condition. (p. 330)

Nevertheless, Sager describes with apparent approval the methods used by the BSI in which glossaries *prescribe* for their users a "preferred term" that is presented as an "entry term" for the definition which follows. Also included in an entry may be "alternative" and "deprecated" terms: an example is FEATURE CARD (preferred); ASPECT CARD, and TERM CARD (alternative); and DESCRIPTOR CARD (deprecated) – taken from BS 5408 (1976). More acceptable in the social sciences, by contrast, would be a *descriptive* approach that simply identifies the terms in use (with information about their users) and does not seek, overtly, to influence usage. To sustain this descriptive stance, it is possible in a classified glossary to abandon the use of "entry terms" by listing all the terms in use *after,* rather than *in front of,* their definitions.

Admittedly it is easier to accept the prescriptive norms of terminology (by contrast with the descriptive method) when attention is focused on the fields of technology and natural science, as they are in this book. Nevertheless, specialists in the social and information sciences are interested in the development of their own special languages even though they cannot reach the levels of terminological rigor achieved in the "harder" subject fields.

A major obstacle to the formation of special languages in the "softer" sciences arises from the difficulties encountered by creative scholars when they attempt to validate a claim that they have discovered or created a "new" concept. Although the validation of such claims in the "hard" sciences may not be automatic, it is certainly easier than in the social and information sciences, in part because existing concepts are both more tangible and also better defined and named. The point is that if an author cannot win acceptance of a claim for conceptual innovation are presumtuous and ego-gratifying, even though they cannot themselves cite earlier works in which the supposedly new concept had been defined and named.

The elaborate discussion by Sager of the linguistic forms and processes used to name new concepts begs this prior question which every author must face: is this indeed a new concept and, if so, will my efforts to name it lead to acceptance or baffling frustrations?

The uses of a glossary in this connection deserve careful attention. Sager writes (p. 335) that glossaries "can greatly simplify communication among specialists and ensure unambiguous and therefore more economical and effective communication." Glossaries that follow the British Standard are always classified: ". . . they are ordered by concepts so that related terms are grouped together." Yet in their own glossary of "traditional forms," a "glossary" is described as ". . . a list of terms with explanations and/or definitions." (p. 162) Clearly Sager thinks of a glossary as an alphabetized dictionary restricted to a single subject field or special language. Such glossaries cannot help authors establish the newness of new concepts. Only a classified glossary can do that, provided it is widely accepted as comprehensive among users working in its subject field, and provided the logical place for a concept can be found in the scheme, even though it lacks a "term" to be defined. The fact that BS glossaries are actually classified means that the kind of tool which could potentially be used to provide this fundamental service to writers is already available – yet its use for this purpose is not examined in this book.

These considerations bring us back to the emphasis placed by Sager in his Preface on the ability of special languages to provide *new words* to designate the *new concepts* generated by scientific and technological progress. Such progress is, indeed, a continuing and even accelerating phenomenon – thus the emergence of new concepts that need to be named has become an ever-increasing flood. Until the writer's need for help in making the case for novelty, and thereby legitimating the subsequent process of naming, is recognized, the core problem involved in the efficient generation and stabilization of special languages has escaped attention.

The problems of text production are complementary to those of text interpretation. The practitioners who create special languages are, for the most part, engaged in text *production.* Information scientists and linguists, by contrast, focus on problems of text *interpretation* – even though, as writers about their own subject field they are themselves also engaged in text production. *English Special Languages* gives us an important and useful analysis of how to interpret special languages *after* they have taken shape. It provides, regretably, little help for those who are interested in the complementary processes: how to *create* special language.

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OPITZ, Otto: Numerische Taxonomie. (Numerical Taxonomy). (In German) Stuttgart–New York: Gustav Fischer Verlag 1980. 191 p., DM 16,80 = Grundwissen der Ökonomik: Betriebswirtschaftslehre, UTB Nr. 918. ISBN 3-437-40079-7

This is an introductory textbook on numerical taxonomy in its wide sense embracing different problems and mathematical techniques from multivariate analysis, exploratory data analysis and cluster analysis. The author emphasizes on three main topics: classification of objects (i.e. the construction of homogeneous groups of objects), representation of objects (as points in some multivariate space), identification of objects (extraction of representative features explaining a given classification or representation). In each case the starting point is a set of objects whose properties are described by a set