Fred W. Riggs
University of Hawaii, Department of Political Science

Onomantics and Terminology Pt. I: Their Contributions to Knowledge Organization

Riggs, F.W.: Onomantics and Terminology.
Knowl.Org. 23(1996)No.1, p.25-33, 28 refs.
Lexicography is the science that undergirds the preparation of dictionaries as lists of words and phrases whose meanings are defined on the basis of semantic analysis. By contrast, Onomantics reverses this paradigm: it identifies concepts that are related to each other and need to be represented as important tools in the production and organization of knowledge. Terminology bridges these two approaches: it draws heavily on the lexicographic model while moving stolidly toward an onomantic framework — from a semantic focus on the meanings of words to an onomasiological concern with the identification and representation of concepts. The article is the first of a Two Part sequence in which the basic concepts and the rationale of Onomantics are identified. They provide a framework for enhancing the ability of Terminology to contribute to Knowledge Organization. The essential logic of Onomantics as the science of concept representation is explained and its general relationship to Terminology as a growing but mixed field of applications is discussed. (Author)

1. Introduction

Does *Knowledge Organization* include *listing* or should we view the two processes as different, though perhaps overlapping? Perhaps we can make the question more concrete by thinking about *classification*. When knowledge is classified, its systemic linkages are highlighted, especially in hierarchies which relate superordinate to subordinate concepts, whole to parts, actions to their functions, etc. — by contrast, lists enumerate items in more or less random order. For example, librarians assign a *serial number* to each book as it is acquired, but they use *class numbers* to connect books on similar subjects with each other: the first generates a list of books in random array, whereas the latter permits them to be shelved in a systematic order. Similarly dictionaries alphabetize entries as lists but a conceptual glossary has to classify concepts in order to learn how they are related to each other. Of course, both lists and classifications are important and they supplement each other — yet each serves quite different functions. In this article I will write primarily about the systematic framework needed for the analysis of concepts as they relate to the organization of knowledge.

No doubt both principles — systems and lists — are sometimes combined: for example, the *call number* for a book is composed of a *class number* to identify its subject

matter, plus an *author number* used to order different works on the same subject. The alphabetical code for ordering books within a class is a listing process used to supplement a classificatory process: sometimes, as under a category like *novels*, a long list of books are arranged alphabetically by their author's names. By contrast, in very specific fields of knowledge, where only a few works have been published, alphabetizing by authors also occurs but it plays a secondary role.

2. Lexicography and Terminology

This basic distinction has many applications but here I want to focus on some differences between *Lexicography* and *Terminology*, two activities that overlap and are often confused with each other — I will explain *Onomantics* later. Lexicographers focus on lists of words and phrases, preparing entries for each in a dictionary. Items in such a list can be found by their alphabetized arrangement — to find the meaning of LIST you may hunt for the right entry between LISP and LISTEN. The meanings of these three words have nothing in common conceptually, but each starts with the letters „L-I-S" and this puts them together in a single list.

By contrast, Terminologists are interested in problems of *concept representation* — i.e. how best to identify any given concept by means of words or phrases. Equally important, however, is their interest in relations between concepts, how ideas fit together in an organized or systematic way. This compels them to pay attention to classification and to coding schemes that link related concepts. There are two reasons for this interest.

The first is quite practical: in order to find out how concepts relate to each other, one cannot just list them in alphabetical order — one needs to identify their linkages with other concepts and find a way to bring closely related concepts together — just as librarians need to bring books that focus on a common theme together.

However, there is a second more substantive consideration. Many concepts can best be defined contextually,

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomantics and Terminology

25

often as specific examples of a more general concept (e.g. sparrows are a kind of bird; vertebrates include birds, lizards, and humans). Frequently, they are related as parts of a whole: thus our bodies include hands, heads and hearts. Functionally, the purpose of a shoe is to protect and decorate a foot, or of a text is to convey information. In order to identify any particular concept, therefore, we need to identify other concepts to which it is related in various ways. By classifying concepts, determining how they fit in systems, we can simultaneously establish procedures for finding them in a book or computer files, and we can see how they relate to each as items in a system.

3. Linguistics and Semantics

Language (including symbols, like numbers) provides the necessary tools for both processes: for listing words and for describing concepts. Of course, language itself is a phenomenon that deserves careful study — and we have an important discipline, *Linguistics*, that can tell us a great deal about language in general, and the many different languages which, of course, support overlapping yet often different ways of coding concepts and using words. I shall not discuss language in general, however. Instead, I will focus on one sub-field of Linguistics, i.e. *Semantics*. Specialists in this field study relations between units of language and the concepts they represent, i.e. their meanings.

At the practical level, Lexicography is an important field of applied Semantics — every dictionary contains entries in which, as a result of the semantic analysis of texts, someone has identified a lexeme — which is what linguists call a minimal unit of meaning in language, whether it takes the form of a word, phrase, or part of a word (affix). Lexemes provide the starting point („entry word") for preparing an entry, and all entries must begin with a lexeme — except for those which identify a particular person, place or object, where a capitalized name is used. Normally the lexemes which represent concepts are not capitalized. However, all entry words are linguistic units which can be represented by letters of the alphabet that, of course, can be used to list all dictionary entries in alphabetical order. Since lexemes often designate more than one concept, each entry is likely to contain a numbered list of senses for each of a given word's meanings.

Because alphabetically arranged entries are both easy to place in order and easy to find, most dictionaries are lists. As noted above, the only reason for putting LISP, LIST, and LISTEN together in a dictionary is their orthography — i.e. how they are spelled. However, some dictionaries have organized words in a systematic way. One of the most original is Henry G. Burger's *Word Tree* in which a large collection of transitive verbs have been systematically arranged and defined by pairs of superordinates in a comprehensive network. However, the best known example of a systematic dictionary is

Roget's Thesaurus, which has been published in a great many versions and editions — see, for example, the 1996 version cited below in the bibliography. Its founder was Dr. Peter Mark Roget whose interest in human anatomy led him, as early as 1805, to start compiling terms needed to link body parts. He went on, by 1852, to publish his first *thesaurus*, as he chose to call the book. It organized words by subject field in such a way that synonyms could easily be found. However, no definitions are included in any editions of this work and it remains a list — though an amazingly useful and important one. Actually, even the data in *Roget's Thesaurus* can be arranged alphabetically, as illustrated in *Thesaurus II*.

In the related field of Information Science, *thesaurus* is used for a different though analogous concept, namely that of a work containing an indexing language. Its contents usually link an alphabetical with a systematic part. Each may be used to index the other. Typically, the former contains most of the information about authorized descriptors and related/narrower terms, but the hierarchic display of terms (with or without notation numbers) provides a systematic way to find related concepts.

The classification schemes used in creating a thesaurus are applicable to the design of *conceptual glossaries* which specialists in any subject field need in order to help them identify useful concepts and find suitable terms to designate them. However, instead of focusing on words and their meanings, such schemes organize information about related concepts as identified by linked texts which describe their necessary characteristics — this is the primary function of such works. Moreover, like a thesaurus, conceptual glossaries must provide alphabetized lists of designators, usually as an index. Sometimes, however, concept records are also listed alphabetically by „entry terms."

4. The Systematic Design

Although the systematic arrangement of conceptual glossaries is a salient characteristic, the fundamental difference between them and dictionaries is reflected in the design of individual entries (or records). Each such component describes (*defines*) a single concept. The different designators (*terms*) that can be listed in a single record (*entry*) are not *synonyms* in the usual meaning of this term as a set of words with very similar meanings — rather, they are *equivalents* in the sense that they can all be used, in context, to represent the same concept, even though, in other contexts, each term may have quite different meanings.

In the previous paragraph, I placed three words in parentheses: *term, define* and *entry*. Each of these words has several meanings that are so similar that ambiguity can easily occur. Let me comment on each of them.

First, a *term* can refer to (1) any word, phrase, or word-component used to mean something reported in a dictionary entry (a lexeme), or it can mean (2) an expression that

26

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

represents one concept (a designator). I used *designator* above to mean the second concept but added term in parentheses because *term* can often be used to represent this concept.

However, more often this word has a lexical meaning: all dictionary entries start with *terms* (in the first of these senses). It would be better to use *lexeme* for this concept. It designates precisely the units of language that lexicographers identify when they decide whether or not to create an entry. Lexemes are not only *words* in the orthographic sense that they are separated from each other by spaces, but bound phrases and affixes can also be lexemes.

By contrast, although affixes are lexemes, they are almost never designators. Moreover, only those phrases that have an independent meaning are lexemes — for example, „blue bird" meaning a particular species of bird is a lexeme, but „blue bird" in the sense of a bird colored blue is an open phrase and not a lexeme — the former can have a dictionary entry but not the latter. However, both bound and open phrases can be used as designators. Consequently, although lexemes are a basic unit for the design of dictionaries, not all lexemes can be designators, and many designators are not lexemes. These words refer to overlapping concepts and they are not good synonyms.

Moreover, another conceptual distinction adds a further complication. Designators are not necessarily linguistic units — they may also be non-lexical forms, such as numbers, icons, letters of the alphabet, etc. Any symbol or lexeme that can represent a concept unambiguously may be viewed as a *designator*. By contrast, most people think of *terms* as referring only to lexical units, thereby excluding the symbols that can also represent concepts in a very useful way. Since dictionaries arrange their entries alphabetically they can write entries only for linguistic items, not for symbols. But this distinction need not hamper terminologists since both symbols and lexemes can designate concepts.

Although *term* can often be used without ambiguity as an equivalent for *designator*, the words have both broader and narrower meanings that hamper clear communication whenever one has the concept of a *designator* in mind. In short, although most designators are lexemes (terms), some are not, and although most lexemes can be designators (terms), some cannot. To use *term* as a synonym for these two concepts, therefore, invites confusion.

As for *define* this word normally characterizes sentences which have two parts:
— a *definiendum* as something to be defined, and
— a *definiens*, the expression that identifies its meaning.

Most dictionary entries actually contain more than one definition (definiens) because they identify the various concepts that a single lexeme (definiendum) can represent. By contrast, in a conceptual glossary we need to start with texts that identify a concept, whether or not there is any established term (word, phrase or symbol) that can represent it unambiguously. To call such an expression a 'definition' confuses readers who almost always understand this word to mean a text that defines a word, phrase, or affix. To avoid such ambiguities, I speak of concept *descriptions* but, clearly, *definition* can also be used, in context, to mean the same thing. Thus *description* and *definition* refer to overlapping concepts that often, but not always, can be understood as meaning the same thing.

Entry is normally used to signify an item in a list, such as a dictionary, encyclopedia, diary, contest or database. It can also refer to the contents of such an item — how it is designed. Clearly the content of an entry varies with its context — diary entries start with a date, and dictionary entries begin with a headword to be defined. Among lexicographers, the content of an entry, therefore, is always an entry word (lexeme) followed by a text. By contrast, one can think of a *record* as a text or object on which information, music, or data is recorded. Although all entries are records, some records do not have the same format as an entry, especially not a dictionary entry — instead of identifying words to be defined, they might describe concepts to be designated. To avoid the ambiguity which results because 'entry' calls to mind a dictionary entry, I prefer 'record,' or 'concept record,' using a qualifier to indicate what kind of record I have in mind. Moreover, records need not occur in lists as entries typically do — hence it is easier to think of records as coming in systematic classifications while entries occur in lists.

To conclude, we have two sets of words with related meanings, but one is designed primarily to list and explain lexemes (term, define and entry) and the others help us identify concepts and relate them to each other (designator, describe and record). To use them as equivalents (synonyms) often generates confusion and ambiguity as we shall now see.

5. Concept Representation

These observations help, I think, to underline the fundamental difference between knowledge in systematic forms, and lists. This distinction supports a clear dichotomy between the normal format of dictionaries and the systematic mode illustrated by *Roget's Thesaurus*. However, both reflect a semantic orientation which, as explained above, starts with lexemes to be defined and published (whether in alphabetical or systematic lists).

By contrast, we need to identify a reversed format based on the identification of concepts rather than of lexemes. Information about concepts cannot (typically) be arranged alphabetically[1]. In order to present information about concepts, it is necessary to understand how they are related to each other in systems because, significantly, the characteristics which identify a concept are linked to each other — in order to understand any one concept we must also become aware of closely related concepts with which they are associated. Consciousness of concept systems not only helps us understand these relationships but clarifies the import of each concept in a given system of concepts.

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

27

The only efficient and clear ways to identify a concept within such a system requires that we
(1)   describe each concept separately and
(2)   show how it is related to other concepts belonging to the same system.

Unfortunately, we still lack a familiar term to designate this ana-semantic perspective — i.e. one that reverses the normal semantic paradigm. The word, *onomasiology*, has been used to identify any naming process, including both the naming of places, persons or inanimate objects and the assignment of terms to concepts[2].

I believe it is important to make a clear distinction between two levels or kinds of onomasiology: one involving the naming of objects, and another the designation of their concepts. The former has long been studied and referred to as *onomastics*. There are organizations and groups devoted to onomastic studies. In practice, those who speak of onomasiology often have its best-known subfield, onomastics, in mind.

However, a second subfield of onomasiology, involving the designation of concepts, is extremely important for anyone interested in Knowledge Organization and needs to be emphasized by contrast with the coordinate process of naming objects. I have, therefore, proposed a neologism, *onomantics*, to identify this related sub-field. We need to describe the concepts required in any field of knowledge, and make sure that we have designators (terms) that can represent each of them unambiguously. This approach which I call *onomantic* (or *ana-semantic*) will now be explained and contrasted with *Terminology* as a closely related field or discipline that has evolved under the leadership of Technical Committee #37 of the International Standardization Organization where an emphasis on standardization and on the study of terms already established in the lexicon of special languages prevails. Consequently, although terminologists need Onomantics, they also work on closely related non-onomantic problems[3].

6. The Onomantic Perspective

It is often necessary, as new concepts emerge, to create unambiguous *designators* to represent them. I have already illustrated this process by explaining the logic that led to the suggested use of *ana-semantic* or *onomantic* to designate this process. There are two basic reasons, I believe, why Onomantics — as a field concerned with the analysis of concepts and the problems involved in representing them unambiguously — is crucial for the development of Knowledge Organization.

First, because it clearly rests on the systematization of concepts (rather than the listing of terms) it depends on and contributes to Classification as a familiar and fundamental basis for the organization of knowledge. Readers of *Knowledge Organization* will scarcely need any further explanation of this fundamental linkage. The core concepts of any field of knowledge are, obviously, both a

product of its development and necessary resources for its practitioners. The classification of these concepts also helps to provide tools for the organization of knowledge within each such field.

A second reason for stressing Onomantics is its temporal perspective. Lexicography (semantics) is essentially retrospective: it focuses on words (lexemes) that are already in use, primarily in ordinary language contexts. Special Lexicography, also, is concerned primarily with terms that have already become part of the vocabulary of specialists in any given field of knowledge — it is, therefore, necessarily oriented primarily to the past, to the analysis of existing texts.

By contrast, Onomantics (ana-semantics) is future-oriented[4]. Because it focuses on emerging fields of knowledge in which new concepts are struggling to become recognized, its primary focus is on concepts for which unambiguous designators are needed. Instead, therefore, of looking at words which already have well-known meanings, it must focus on concepts which still need to be clearly represented — or, perhaps, on the proliferation of synonymous terms for a concept when practitioners are seeking to simplify their problems by reaching agreement on a preferred term for each of the concepts they know they need.

Knowledge Organization shares this future orientation. No doubt in some fields of knowledge, the structures and practices needed to organize its contents have already been stabilized. Such subject fields might provide models for emulation in other fields, but the crucial problems of KO arise in emerging subject fields where the basic problems, concepts, rules and findings are still taking shape. This means that KO is also, essentially, future oriented — it looks to the future and the need to solve problems that are still seeking clear formulation, analysis, and resolution.

Onomantics, like statistics, offers tools that anyone can use to help develop a field. Imagine that a Department of Statistics should simultaneously serve as a Census Bureau — much of the attention of its staff would focus on demographic questions in which statistical methods play an important part. Mathematical notions about statistical methods could suffer as a result, and outsiders would easily confuse statistics with one of its important applications. I believe something like this has happened in Terminology where the problems of Special Lexicography (compiling dictionaries for special languages), preparing standards for specialists in selected fields, helping to prepare indexing languages (thesauri) or supporting the efforts of translators to find equivalent terms in different languages, have been combined with a focus on the problems involved in developing the science and methods of Terminology. By separating the onomantic core of Terminology from its various important applications, it may become possible to see more clearly what concepts and terms are needed to help this field to develop. Specialists in the various fields where Onomantics can be helpful need to develop the concepts and terms that

28

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

they alone can evaluate and use. A specialist in Onomantics can help them understand the problems they face and steer them away from the Lexicographic model which really hampers their efforts to understand the most difficult problems they face.

One of the misleading models attributable to Lexicography involves the possibility of creating from the top down a kind of *dictionary* or *glossary* for selected fields which specialists could use as reference tools. I confess that was the idea I had in mind when I first began to work on the INTERCOCTA pilot project for Ethnicity Research. More recently, with the help of my associate, Matti Malkia, I came to see that it would be better for individual scholars, cooperating with each other, to evolve a computerized hyperglossary, using the resources of the World Wide Web, to help each other construct and share an understanding of the important new concepts and designators that they need. Such a bottom-up approach would utilize the expertise of Onomantics (Terminology) as a methodology and perspective to be used by those who best understand the theories and concepts that they require in their own work.

7. Concept Representation

The fundamental aim of *Onomantics*, therefore, is to help subject field specialists find ways to represent clearly and systematically the concepts they themselves need. This goal imposes two requirements: each concept must be clearly described, and its connections with related concepts have to be specified. A few key concepts are needed to provide the basis for any such enterprise, and I shall speak briefly about them, avoiding some parallel words now used by terminologists — later, I will also identify some of their words and show how their connotations differ from those needed in Onomantics.

The first concept is, of course, that of a *concept*. There seems to be little fundamental disagreement between the usage of terminologists and what I have in mind when I use this word[5]. Consequently, I shall not say anything more about it here except that, for me, it is a *unit of knowledge* or, more precisely, a unit of *nomothetic* knowledge. *Nomothetic* is mentioned here by contrast with *idiographic* to parallel the distinction between onomantics and onomastics explained above.

All theoretical or scientific work is, by definition, nomothetic: it seeks to establish generalizations based on the observation and comparison of different cases or objects. By contrast, work that focuses on a single object in many or all of its aspects is idiographic: examples include biographies, case studies, historical narratives, and news reports (please distinguish between *ideographic* which pertains to the analysis of ideographs, like Chinese characters, and *idiographic* which relates to individual cases). Although Knowledge Organization can, no doubt, be understood as including idiographic reports about individual objects or cases, it is my impression that normally anyone using this phrase has in mind the organization of systematic (i.e. nomothetic) knowledge.

By contrast, when we talk about how to represent concepts, we run into a minefield of controversy. I shall focus on three forms that need to be clearly distinguished from each other based on the functions they perform. The first involves the identification of the essential characteristics which pertain to any concept used as a unit of knowledge — i.e. for nomothetic purposes, not just to talk about an individual object. The simplest way to represent this format that I can think of involves using the word, *description*. Of course, one may describe an object too, so we may need a modifier to avoid ambiguity — for example, concept description is a synonym for this particular sense of the word *description*. Here, however, I shall use *description* without a qualifier to mean *concept description*, but add qualifiers whenever referring to any other kind of description.

For convenience in communication, it is clearly a nuisance to have to repeat its description every time we want to use a particular concept. Consequently, we need a convenient short form, a word, phrase, symbol, acronym, graph, or icon that can conveniently represent whatever concept we have in mind. For example, the concept of *zero* can also be represented by *0*, the concept of *plus* by „+“, *equals* by „=“, and *Knowledge Organization* by „KO“. The form of the representation is not so important as its convenience and clarity— we have to ask whether or not it represents the concept well enough so that anyone reading or hearing us will know what we have in mind.

For the moment I shall not mention any word already in use to represent this concept — rather, let me use *cue*. This word is used in theaters to mean any sound, sign, or gesture to be followed by a specific action. We can borrow it to refer to any convenient form used to represent a concept. Alternatively, we could use *sign* for the same idea, but this word already has connotations in semiotics that might prove confusing. At least, provisionally, let me use *cue* to refer to any convenient short expression that identifies a concept without specifying its characteristics — readers are urged to propose other convenient words for this concept. Whenever anyone is not sure what a cue stands for, a concept description may be needed to specify the intended unit of knowledge.

8. Cues: Tags and Notations

In practice, we may not need to use *cue* very often because there are two kinds of cues, each of which is very important for Onomantics, and we will use them much more often than we do the more generic term which includes both of them.

The first type of cue, and by all means the most common, brings to mind a concept without reference to the system in which it is lodged. If, for example, I say *knife*, you will probably understand that I am thinking about an instrument with a sharp edge that can be used for cutting. Thus *knife* is a type of cue that we might refer to

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

29

as a *designator, label* or *tag*. Without discussing the pros and cons of these words, let me arbitrarily say that, for the moment, I shall use *tag* to mean any word, symbol, or image that simply and conveniently points to a particular concept. After more consideration, I may drop *tag* in favor of another word, but for the moment, please remember the meaning stipulated for it here — it is the second of the three forms mentioned above.

The second type of *cue* is system-bound. It links particular concepts with other concepts in a system. The system may be hierarchic, running from more general to more specific concepts, or partitive, going from wholes to their parts, or functional, indicating what functions something performs, etc. Consider, for example, how we might place knives in a systematic context. Someone doing kitchen work might enumerate useful implements and relate knives to preparing, cooking and serving food. Another may place it in a design context and relate it to scissors, swords and lances, each of which has a related but different set of uses.

To mark these relationships, some kind of coding system is normally used, as we see in every classification scheme. An item in any such scheme can be referred to as a *notation*. Again, this word has other meanings, but librarians typically use it for a class number found in a classification schedule (see Wersig and Neveling, p.131). I think we can easily remember to use notation here to refer to a cue that identifies the location of a concept within a system of concepts. Typically, notations are symbols, such as numbers or letters, or alpha-numeric compounds: 523, or DCZ, or TL76, for example. Such expressions never identify a concept out of context as tags can — but, within a particular context, they unambiguously point to a particular concept. Just as a class number identifies a class in a schedule of classes, so a notation in a glossary, like the ISO 1087, points to one concept and only one concept. However, it also helps readers understand how the designated concept is related to other concepts.

9. Conclusion

To summarize, in onomantics the key concepts needed for concept representation include the following:

Schedule Ia: Core Concepts Needed in Onomantics

{1}   any form used to identify units of nomothetic knowledge:
concept representation; representation

{1.1}   a representation {1} that specifies the essential characteristics of a concept:
concept description; description

{1.2}   a representation {1} that succinctly identifies a particular concept: *concept cue; cue*

{1.2.1}   a cue {1.2} that identifies a general concept without reference to how it may be linked to other concepts: *concept tag; tag*

{1.2.2}   a cue {1.2} that identifies a general concept as part of a system of concepts:
concept notation; notation

Braces are used here to mark notations — thus {1.2} is a notation that identifies the notion of a „concept cue" in this paper — obviously, the same symbol will have quite different meanings elsewhere. The notations show that these concepts are related to each other hierarchically: the same relations can be shown by indentations, as follows:

Schedule Ib: Basic Onomantic Concepts

concept representation: {1}
    description: {1.1}
    cue: {1.2}
        tag: {1.2.1}
        notation: {1.2.2}

Please note that the three most important forms of concept representation are written here in bold face: *description, tag,* and *notation*. The other two identify superordinate concepts needed to show how the three key concepts are connected with each other — we will not need to say much more about them.

In Part II of this article, to appear in a future issue, I shall discuss the concepts and terms now used by terminologists, as reflected primarily in the text of ISO 1087, the proposed standard of the Committee on Terminology of the International Organization for Standardization, that was published in 1990. The onomantic concepts and terms presented above in Schedule I will provide a basis for comparing and assessing the prevalent ideas used by terminologists. As a prelude, however, let me offer a couple of quotations from leading experts who have written textbooks on Terminology.

No doubt most terminologists agree that *concepts* provide the core basis for their work: thus Picht and Draskau have written: „In the theory of terminology there is widespread agreement that the concept occupies a central position". (1985, p.36). By contrast, although Juan Sager asserts that „...terminology is concerned with concepts, their definitions and names..." he also asserts that „Terminology is the study of ... lexical items belonging to specialised areas of usage of one or more languages... it is akin to lexicography" (1990, p.2). In Sager's view, Terminology „is primarily a linguistic discipline", as he wrote in a definition proposed in 1982 for the abortive *International Association of Terminology*.

These quotations suggest the contrast between a purely onomantic focus based on the centrality of *concepts,* as

30

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

PRELIMINARY PROGRAM AND REGISTRATION MATERIALS
INTERNATIONAL SOCIETY FOR KNOWLEDGE ORGANIZATION
FOURTH INTERNATIONAL CONFERENCE
"Knowledge ●rganization and Change"
July 15-19, 1996—Washington, DC, USA
Co-sponsored by the Library of Congress

Conference activities will take place in the James Madison Memorial Building, Library of Congress, 101 Independence Avenue, SE, except where otherwise indicated. The registration/information desk will be staffed 8:30am-3:30pm, Monday-Wednesday; on Monday it will be located outside the Digital Library Visitors' Center (ground floor, Madison Building), and on Tuesday and Wednesday, outside the Mumford Room (6th floor, Madison Building). Exhibits will be open 8:30am-3:30pm, Tuesday-Thursday.

Monday, July 15

Tools of Knowledge Organization: Discussions and demonstrations of online classification systems (Library of Congress and Dewey Decimal) and other digital initiatives and products. Indicate session preference on registration form. (9:00am-4:00pm)
Dewey 120th Anniversary Address, *Fran Miksa,* and Reception (5:00-8:00pm)

Conference sessions will be held Tuesday-Thursday, 8:45am-5:00pm, in the Mumford Room. Morning and afternoon breaks occur between sessions 1 and 2 and sessions 4 and 5. A lunch break separates sessions 2 and 3.

Tuesday, July 16

Session A1a: Opening
• Welcome and Introductory Remarks, *Sarah Thomas, Ingetraut Dahlberg*
• Keynote Address, *Roland Hjerppe*

Session AIb: Library of Congress Classification
• Bringing the Library of Congress Classification into the Computer Age: Converting LCC to Machine-readable Form, *Rebecca S. Guenther*
• Library of Congress Classification: Classification for a Library or Classification of Knowledge?, *Jolande Goldberg*

Session A2: Management of Change in Knowledge Organization Schemes
• Change as a Problem of Classification System Development, *Eduard R. Sukiasyan*
• Emerging New Roles for Future Libraries: Knowledge Integration, *Erol Inelmen*
• New Wine in Old Bottles: Problems of Maintaining Classification Schemes, *Ia C. McIlwaine*

Session A3: Knowledge Organization in Cross-Cultural and Cross-Linguistic Settings
• Towards A Unified Medical Language in a Diverse Cultural Environment, *Marcia Lei Zeng*
• Concept-based vs. Word-based Measures of Medical Information Transfer via English-Chinese and Chinese-English Translations of Medical Titles, *Shaoyi He*
• Terminology Organization and Change, *Faina Citkina*

Session A4: The Role of Relationships in Knowledge Organization
• Standardization of Inter-Concept Links and Their Usage, *Pat Molholt*
• Development of a Relational Thesaurus, *Rebecca Green*
• Analysis of Explicit Non-Hierarchical Associative Relationships Among Medical Subject Headings (MeSH): Anatomical Terminology, *Carol Bean*

Session A5: Knowledge Organization in the Online Environment, I
• Online Classification: Implications for Classifying and Document [-like Object] Retrieval, *Diane Vizine-Goetz*
• Classification to the Rescue: Handling the Problems of Too Many and Too Few Retrievals, *Karen M. Drabenstott*
• Visual Dewey: DDC in a Hypertextual Browser for the Library User, *Pauline A. Cochrane and Eric Johnson*

Software demonstrations (5:00-6:00pm)
Lecture, *Douglas Bennett,* and Banquet, held at the Supreme Court of the United States (7:00-9:00pm)

Wednesday, July 17

Session B1: Knowledge Organization in the Online Environment, II
- Hypertext and Indexing Languages: Common Perspectives and Challenges, *Javier Garcia Marco*
- A Library-Organized Virtual Science and Technology Reference Collection, *Gerry McKiernan*
- Ontology-based Information Capturing from the Internet, *Michiaki Iwazume, Hideaki Takeda, and Toyoaki Nishida*

Session B2a: Impact of Technology on Bibliographic Elements
- The Impact of Cultural and Technological Changes on Titles Content and Their Use in the Process of Information Retrieval, *Snunith Shoham and Moshe Yitzhaki*
- Description in the Electronic Environment, *Rebecca Green*

Session B2b: Knowledge Organization in the Economic Environment
- The World Bank's Information Management Architecture: A Blue Print for Building the World Bank's Institutional Information Services, *Harold C. Steyer, Jr., Ana Flavia Fonseca, Diane D. Hopkins, Marc Nodell, Irene L. Travis, and William S. Wahl*
- Business Productivity and Organization of Knowledge: A Look at the Emerging Requirements, *Philip C. Murray*

Session B3: User Focus in Knowledge Organization
- Empowering Users for Improved Database Access and Analysis through the Application of Knowledge Structure Views, Progressive Refinement Techniques and a Design Approach Driven by Usability, *A. Steven Pollitt, Patrick Braekevelt, Geoffrey P. Ellis, Janet E. Finlay, Martin P. Smith, Mark Treglown, and Steven J. Wade*
- User Education Librarians: Teaching for Every Level, *Michelle M. Foss*
- Selection of Search terms as a Meeting Place of Different Discourses, *Mirja Iivonen*

Session B4: Thesauri and Metathesauri, I
- Preparing Terminological Definitions for Indexing and Retrieval Thesauri: A Methodology, *Michèle Hudon*
- Building a Multilingual Thesaurus Based on UDC, *Victoria Francu*
- Deriving a Thesaurus from a Restructured UDC, *Nancy Williamson*

Session B5: Knowledge Organization and Images
- Is a Picture Worth a Thousand Words? Classification and Graphic Symbol Systems, *Elin Jacob and Debora Shaw*
- The University of Michigan Art Image Browser Project, *C. Olivia Frost*
- The Applicability of Selected Classification Systems to Image Attributes, *Corinne Jorgensen*

ISKO Business Meeting (5:15-6:00pm)

Thursday, July 18

Session C1: Interplay of Epistemology and Knowledge Organization
- Dewey Thinks Therefore He Is: The Epistemic Stance of Melvil Dewey as Manifested in the Dewey Decimal Classification Past and Present, *Hope A. Olson*
- Ontology and Knowledge Organization, *Roberto Poli*
- L'Apparition du Computer: Epistemology and the Impact of Networked Computers on Society, *Thomas D. Walker*
- Critical Notes on the Use of Knowledge in Knowledge Management, *J.F. Schreinemakers and J.P.J.M. Essers*

Session C2: Interdisciplinary Approaches to Knowledge Organization
- An Exploratory Study into Requirements for an Interdisciplinary Metathesaurus, *Lynne C. Howarth*
- Evolution of a Concept System. Some Reflections and Study Cases, *Giliola Negrini and Giovanni Adamo*
- An Inductive Approach towards Integration of General Information Systems for Agriculture. The Case of CERETHES, with Particular Examples, *Massimo Ragucci*
- Controlled Vocabulary and Classification Scheme for HIV/AIDS: An Evolving Nosological Record of a Diseased Body of Knowledge, *Jeffrey T. Huber and Mary L. Gillaspy*

Session C3: Natural Language Processing
- PROMETHEUS: An Automatic Indexing System, *A.R.D. Prasad*
- Intelligent Support for Construction and Exploration of Advanced Technological Information Space from Technical Papers in Metallurgy, *Toshiyuki Matsuo and Toyoaki Nishida*
- Evaluation of Terminological Database Building Tools Using Linguistic Knowledge, *Widad Mustafa-Elhadi and Christophe Jouis*

Thursday, July 18—cont.

Session C4: Thesauri and Metathesauri, II
- A Generalized Model for Thesaurus-aided Searching, *Ron Davies*
- Library Catalogs in the Internet: Switching for Future Subject Access, *Ingetraut Dahlberg*
- SemWeb: Proposal for an Open, Multifunctional, Multilingual, Integrated Knowledge Base of Concepts and
    Terminology : Exploration and Development of the Concept, *Dagobert Soergel*

Session C5: Dewey Decimal Classification
- The Dewey Decimal Classification at 120: Edition 21 and Beyond, *Joan S. Mitchell*
- Revising Life Sciences in Dewey Edition 21, *Gregory R. New*
- Dewey for Windows, *Julianne Beall*

Concluding Remarks, *Robert Fugmann* (5:00-5:30pm)

Reception, German Embassy (6:30-8:30pm)

Friday, July 19

Post-Conference Excursions: National Library of Medicine **or** National Agricultural Library (morning); indicate
    preference on registration form.

Conference chair: Sarah Thomas, Office of the Director for Public Service Collections, LM 642 - Library of Congress,
Washington, DC 20540-4600, USA; phone: +1 202 707-5333; fax: +1 202 707-6269; email: stho@loc.gov. Program
chair: Rebecca Green, College of Library and Information Services, Hornbake Bldg. (So. Wing), Rm. 4105,
University of Maryland, College Park, MD 20742, USA; phone: +1 301 405-2050; fax: +1 301 314-9145; email:
rgreen@umd5.umd.edu. Local arrangements chair: Jolande Goldberg, Cataloging Policy and Support Office,
Library of Congress, LM 556 (COLL/CPSO), Washington, DC 20540, USA; phone: +1 202 707-4386; fax: +1 202
707-6629; email: goldberg@mail.loc.gov.

Program committee (*regional chairs): *Hanne Albrechtsen, James D. Anderson, Kenneth Bakewell, Clare Beghtol,
*Pauline A. Cochrane, *Ingetraut Dahlberg, Brigitte Endres-Niggemeyer, Raya Fidel, Robert Fugmann, Alan
Gilchrist, M. A. Gopinath, Roland Hjerppe, Hemalata Iyer, Krishan Kumar, Tamiko Matsumura, A. Neelameghan,
Giliola Negrini, Bluma C. Peritz, Dagobert Soergel, and Nancy J. Williamson.

CONFERENCE REGISTRATION INFORMATION

REGISTRATION FEE
US $250 (members) or $US 300 (non-members) per participant. Mail **OR** fax your registration form by **MAY 2, 1996.** After May 2, 1996, the registration fee is: US $300 (members) or US $350 (non-members). The fee covers printed conference proceedings and attendance at all sessions, excursions, breaks, receptions, and banquet.

PAYMENT
Make all checks payable in US Dollars to: **LIBRARY OF CONGRESS ALA/LIBRARY SERVICES GIFT FUND.**

Agency invoices and credit cards are not accepted.

REFUNDS
After May 2, 1996, only 50% of the registration fee is refundable. No refunds after July 2, 1996.

Please complete one registration form per participant and mail with payment to:
ISKO REGISTRATION
OFFICE OF THE DIRECTOR
FOR PUBLIC SERVICE COLLECTIONS
LM 642 - LIBRARY OF CONGRESS
WASHINGTON, D.C. 20540-4300
CONTACT: THEODORE MORGAN
Phone: + 202 707 5325
Telefax: + 202 707 6269
Email: tmor@loc.gov

HOTEL RESERVATIONS
Conference hotels (in most convenient locations to the conference site) where participants may register at a special rate, are:
1. Capitol Hill Suites
200 C Street, SE
Washington, DC 20003
USA
Phone: + 202 543 6000; + 800 424 9165
Telefax: + 202 547 2608
Single/double occupancy: $114.00/$129.00 per room. Reservations must be made by close of business, June 3, 1996.

2. Holiday Inn
550 C Street, SW
Washington, DC 20024
USA
Phone: + 202 479 4000; + 800 469 4329
Telefax: + 202 479 4353
Single/double/triple/quadruple occupancy: $110.00 per room. Reservations must be made by close of business, June 16, 1996.

Special rates are offered from Saturday, July 13, 1996 to Saturday, July 20, 1996. All rates are subject to a 13% sales tax and $1.50 per night occupancy tax. **In order to get the special rate, you must identify yourself as a participant of the ISKO Conference, sponsored by the Library of Congress.** Participants will be responsible for payment of room, tax, and incidental charges.

ISKO CONFERENCE 1996 REGISTRATION

Name_____
    Last   First   Initial

Institution   Position_____
Address
City   State   Zip   Country
FAX   Email

AMOUNT SUBMITTED: ISK● Member US $250   Non-Member US $300

DIGITAL LIBRARY VISITORS' CENTER:
DEMONSTRATION SESSIONS, July 15, 1996
(indicate 1st and 2nd choices)
☐ 9:00 AM - 10:45 AM
☐ 10:45 AM - 12:30 PM
☐ 12:30 PM - 2:15 PM
☐ 2:15 PM - 4:00 PM

POST-CONFERENCE EXCURSIONS (choice of one)
☐ National Library of Medicine
☐ National Agricultural Library

LIBRARY TOUR, July 15, 1996
☐ 10:45 AM
☐ 2:15 PM

LIST EVENING FUNCTIONS YOU WILL ATTEND:
☐ Reception, July 15, 1996
☐ Banquet, July 16, 1996
☐ Embassy reception, July 18, 1996

SPECIAL NEEDS: ☐ Check here if you have a disability which may require auxiliary aids and services.

Services requested: _____

reflected in the words of Picht and Draskau and the semantic orientation reflected in Sager's work. Actually, the linguistic and lexicographic premises espoused by many terminologists presuppose a semantic orientation. I attribute this to the influence of closely related activities, especially the translation of texts, in which terminologists have been actively involved. For translators, the semantic analysis of source texts is more important than the onomantic effort required to express novel ideas in target languages. Term Banks designed primarily to help translators are, therefore, preoccupied with efforts to understand the meanings of words and phrases as they occur in the texts to be translated. Term banks are also used to support the preparation of glossaries for special languages in which most of the important concepts and terms to be entered are already well established. In them, semantic analysis prevails over onomantic concerns.

Similarly, specialists involved in the design of thesauri as indexing languages necessarily spend most of their time studying the meanings of words and their mutual relationships. Such growing fields, as Knowledge Engineering, Artificial Intelligence, Knowledge Organization and Cognitive Science also require multi-disciplinary inputs and cooperation. Terminologists have become actively and fruitfully involved in all these efforts.

An analogy might be drawn with the field of Statistics in which it is possible to distinguish between the work of mathematicians who have developed the field's concepts and techniques and the many fields of application of statistical methods. similarly, we may distinguish between the conceptual core of Terminology, as a science, and the multidisciplinary contests of its various fields of utilization. Among them, Terminography (also called 'terminology work') may be understood as the preparation of dictionaries for subject field specialists, an activity about which Juan Sager's textbook on Terminology (1990) offers authoritative advice. Because the Committee on Terminology (TC37) of the Internationasl Organization for Standardizatrion (ISO) arose in a context where standardization of products, methods and vocabulary were all important, this committee had to invest much of its energy in the continuing struggle to establish and secure consent for standards, an arduous effort that utilizes but does not generate onomantic concepts.

A natural consequence of these many applications of Terminology means that, often enough, they take priority over the core concepts of the field which can all too easily be taken for granted. Persons working on the applications of any field of science are likely to see a preoccupation with its core concepts and methods as too 'theoretical' and remote from the urgent daily problems which they need to solve. In this context, it is scarcely surprising that terminologists can easily become impatient with the continuing need for a reassessment of fundamentals.

In fact, the established concepts and terms used by terminologists today often seem to reflect the requirements of the diverse fields in which they have been working rather than the scientific and logical core of the

'discipline'. Although Onomantics no doubt lacks the intellectual or organizational status that academic disciplines have achieved, it has the potential for contributing significantly to its many fields of application. I believe that if we could recognize the core of Terminology as a distinctive discipline or field of study, we could create a clearly identified methodology and framework (like pure Statistics) which would then provide a stronger basis for carrying out the many tasks which terminologists have accepted.

If this speculation is correct, it may mean that a clear focus on Onomantics as the study of problems arising from efforts to represent concepts as clearly as possible can be used to create such a core. In order to test the validity of this idea, I am preparing an analysis of key entries in the text of ISO 1087, a glossary which, after frequent revisions, is intended to supply terminologists with a lucid picture of the set of interdependent concepts and terms they need in order to do their work.

The results of this analysis will be published in due time as Part II of this essay. It will show how the core concepts of Onomantics compare with the core concepts of Terminology; it will examine the influence of terms taken from other fields, especially from Lexicography, in the shaping of these concepts; and it will identify some of the important concepts needed by Terminology that have been omitted from the text of ISO 1087. In all humility, this project has been started with deep respect and admiration for the pioneers who were able, despite wide-spread resistance, to launch the very important field of Terminology. The time has come, nevertheless, to move on to a higher level of achievement based on a more soundly rooted conceptual core. I believe, Onomantics provides the building blocks for such a development.

Notes

1. No doubt after a standard term for each concept in a system has been accepted by those who use it, one can produce alphabetized lists of these terms followed by descriptions of the concepts they designate — an example can be found in the *Compilation of Engineering Terms* produced by the American Society for Testing Materials (ASTM). However, alphabetized lists of concepts are as exceptional for describing sets of linked concepts as is the systematic format used in *Roget's Thesaurus* for listing lexemes — actually, some versions have been alphabetized — one of the best is Roget II.

2. Although some folks argue that any object can only be understood or talked about as an *individual concept*, my own preference is to make a sharp distinction between objects and the characteristics, actions, or properties of objects that come to our minds as notions or concepts. By contrast, objects have an independent existence outside of our perceptions.

3. *Terminology*, as a field of research and practice, has been handicapped from ist origins, by its use of *term* as part of the name of the field. Although its fundamental goals and methods include onomantic (ana-semantic) analysis, the *term* misleads those who have only a superficial knowledge of Onomantics. They easily accept *Terminology* as a type of semantic or lexicographic field that

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

31

focusses on the technical vocabulary of well-established subject fields or *special languages*.

Of course, we do need the help of linguists and specialized lexicographers to analyze the vocabulary used in special languages, but the problems involved in the lexicography of LSP (Languages for Special Purposes, as it is often also called) differ significantly from those involved in the onomantic analysis of the concepts represented in these languages. The distinction is, essentially, the difference between the semantic analysis of lexemes already in use and the ana-semantic processes involved in identifying the related concepts needed in a given subject field whether or not they already have terms or may, as is typical for newly created fields, offer several ambiguous synonyms for each important new concept.

4. One might oversimplify the time perspective of Lexicography and Onomantics by saying that the former is *conservative* while the latter is *radical*. This might help one understand why *Lexicography* is well-established and can boast with hundreds of dictionaries as proof of its importance. By contrast, Onomantics is struggling for recognition and may even be viewed as a possible threat to the status quo. It cannot even boast of any well recognized conceptual glossary that is clearly based on an onomantic perspective — my INTERCOCTA GLOSSARY for Ethnicity Research, although distinctly onomantic in design, is not an exception because it is scarcely „well recognized" — nor should it be, because it was only a demonstration model of what could be done. As for the many familiar glossaries („terminologies") prepared by terminologists, I believe they are not unambiguously onomantic in design, as I try to prove in this paper.

The use of *conservative* and *radical* in the preceding paragraph invites criticism because these are fighting words, often used in political controversy. I wanted to replace them with two better words, but they are not familiar and will also, I fear, invite controversy. Both have a mythic origin: *Epimetheus* as a Greek god oriented to the past, and his brother, *Prometheus*, looked to the future. The attempt by Prometheus to help humans by bringing fire to them offended Jupiter who promptly condemned him to be enchained on a mountain side where vultures could daily feed upon his liver.

A parallel fate awaits modern Prometheans whose future orientation leads them to propose innovations that seem to threaten the established interests defended by the world's Epimetheans. This metaphor is not my invention — I learned it in the 1930's when, as a college student, I read William Sheldon's *Psychology and the Promethean Will*, a profound but unfairly neglected work. In it, he wrote of the Promethean that „He is the inventive genius of the human mind, but he is thereby always tempting the patience of morality, and so becomes the object of intense suppression... It is only the rare Promethean who lives to see the triumph of his own vision". By contrast, „Epimetheus is the follower of the right, the adapter to the present, and the worshipper of the wisdom that is" (p.79). Sheldon himself observed that „Prometheus is radical, and Epimetheus is conservative," but „there are many conservative people who are not Epimethean, and many radicals who are far from Promethean" (p.80). No doubt Sheldon saw himself as an unrewarded Promethean.

5. To say that terminologists are in agreement about the meaning of concept is not precisely true. In a version of ISO 1087, *Vocabulary of Terminology*, that appeared in 1969, the text quoted above appears as a definition of concept: i.e. „any unit of thought..." However, in its 1990 version, this definition was narrowed to read „a unit of thought constituted through abstraction on the basis of properties common to a set of objects," but in a revision proposed in 1994, this definition was expanded to include „...a set of one or more objects." Three marginally differentiated concepts are identified by these three definitions:

I. 1969 — any unit of thought
2. 1990 — any unit of thought abstracted from two or more objects
3. 1994 — any unit of thought abstracted from one or more objects

Let me offer some comments based on these definitions each of which, I think, actually identifies a marginally different concept. How should we evaluate their comparative utility?

First, all three definitions repeat the phrase, *unit of thought*. To my mind, *unit of knowledge* may be more useful since, clearly, we can easily have random thoughts that make no contribution to our systems of knowledge — they are so fuzzy or irrelevant that we could disregard them as mere *conceptions*. After refinement they could become useful units of knowledge, i.e. *concepts*. By contrast, if an idea — like that of *nothing* or *zero* or *infinity* or *void* — contributes to our knowledge, we accept it as a concept whether or not it has been abstracted from any object. If changes are to be made in the original definition, therefore, I would prefer to think of *concepts* as *units of knowledge*, using knowledge as it is understood in research on Knowledge Organization. The focus on Units of Knowledge, incidentally, was proposed as early as 1977 by Ingetraut Dahlberg in her Bangalore lectures on *Ontical Structures and Universal Classification*.

Since the focus of this essay is on the representation of concepts rather than on their definition, I shall avoid further comments on *concepts* except to mention a point reflected in the definitional shift from 1990 to 1994 identified above. Perhaps the 1994 version evolved from discussions about the meaning of *object* which had been defined in 1990 as „any part of the perceivable or conceivable world". Did this not involve a distinction between the existence of objects outside our perceptions and our human capacity to imagine objects that, in fact, may not exist? If so, it may have become apparent that one could not only name real objects but also those that we only imagine. Perhaps as a result, in 1994, an additional entry for *individual concept* got into the draft of ISO 1087. It was defined as a „concept that refers to an individual object", illustrated by „Saturn", the name of a planet — this name, incidentally, also raises questions about the mythical deity who, originally, carried this name. By contrast, *general concept* was substituted for concept as it had been described in 1990 as an abstraction based on two or more objects.

No doubt, the idea of an *individual concept* has philosophical validity insofar as an object can exist in time/space, but our image of that object, as reflected in our minds, is only a concept. Moreover, knowledge includes idiographic information about individual objects as well as scientific or monothetic knowledge generated by abstractions based on comparisons between sets of two or more objects. The theoretical framework for recognizing individual concepts was explained in Dahlberg's Bangalore lectures and in subsequent papers (Dahlberg 1978, 1981, 1988, 1995). The case for recognizing *individual concepts* has also been advocated by some main stream terminologists, see, for example, Picht and Draskau's text on Terminology, 1985, p.38-39.

For practical purposes, however, I shall not speak further about this matter in the body of this article. The word *concept* is polysemic and it can obviously designate a variety of ideas. If we distinguish clearly between *general* and *individual concepts*, we can make two relevant points. First, in practice, as revealed by the text of ISO 1087, all of the concepts defined in this glossary are general concepts. If there is no need for individual concepts in the vocabulary of Terminology, why not ignore them here and use the word *concept* to mean only *general concept*?

When and if it is also useful to introduce any individual concepts, we could then take care to distinguish between these two types of

32

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

knowledge units. The selection of *Saturn* as the name for a planet was based on a prior descision to borrow names from Greek mythology for this purpose. By contrast, the decision to use *onomantics* to characterize the representation of concepts was based on an etymological logic rooted in the Greek meaning of *onoma-* to mean a naming process. Thus the logic of designation for concepts differs from the logic parents use when chosing a name for a newborn child.

A second consideration arises from our organizational context. I argued above for a basic distinction between two kinds of Onomasiology: Onomastics involves the naming of objects and Onomantics concerns the representation of concepts — or, to be more exact — the designation of *general concepts*. Anyone wishing to develop a theory of Onomasiology should, surely, distinguish between Onomastics and Onomantics as two branches of the field: the first requires concepts needed to talk about the naming of objects (individual concepts) and the second needs terms that will help us discuss the designation of general concepts. Here, I wish to focus only on the latter and this paper, therefore, is limited to questions that involve general concepts and the problems that come up when we try to represent them — in the text, I shall refer to them as *concepts*, dropping the word *general* as unnecessary in this context.

References

(1) Burger, Henry G. 1984, The Wordtree. Merriam, Kansas: The Wordtree.

(2) Compilation of ASTM Standard Definitions. Seventh Edition. Philadelphia, PA: ASTM Committee on Terminology 1990.

(3) Dahlberg, I. 1978a, Ontical structures and universal classification. Bangalore: Sarada Ranganathan Endowment for Library Science.

(4) Dahlberg, I. 1978b, A referent-oriented, analytical concept theory for Interconcept. Int. Classif. 5(1978)No.3, p.142-151

(5) Dahlberg, I. 1981, Conceptual definitions for Interconcept. Int. Classif. 7(1981)No.1, p.16-22

(6) Dahlberg, I. 1988, Concept and definition theory. In: Classification theory in the computer age. Conversations across the disciplines. Proc. Conf. A,.gany, NY, Nov.18-19, 1988. (School of Inform.Sci. and Policy, SUNY).

(7) Dahlberg, I. 1995, Conceptual structures and systematization. In: Negrini, G. (Ed.) Categories, Objects, and Structures of Knowledge. Atti del Seminario Consiglio Nazionale delle Ricerche, ISRDS, Roma, 1-2 Dec.1994. Roma: CNR 1995, p.135-161. Also in: IFID Journal 20(1995)No.3, p.9-24

(8) Hartmann, R. R. K., ed., 1983. Lexicography: Principles and Practice. London: Academic Press.

(9) Hartmann, R.R.K., Stork,l F.C., 1972. Dictionary of Language and Linguistics. London: Applied Science Publishers.

(10) SO/TC37, 1969. Vocabulary of Terminology. Geneva, Switzerland: International Organization for Standardization 1969.

(11) ISO/TC37, 1990. Terminology — Vocabulary: International Standard. ISO 1087. Geneva, Switzerland: ISO.

(12) ISO/TC37. 1994. Terminology Work — Vocabulary — Part I. Geneva: ISO.

(13) Picht, Heribert; Draskau, Jennifer, 1985. Terminology: An Introduction. University of Surrey, GB.

(14) Riggs, Fred W., 1982. COCTA-Glossaries: the ana-semantic perspective. In: Riggs, F.W. (Ed.): The CONTA Conference: Proc. Conf. Conceptual and Terminological Analysis in the Social Sciences. Frankfurt: INDEKS Verlag. pp.234-276.

(15) Riggs, F.W., 1985. Ethnicity — Intercocta Glossary. Concepts and Terms used in Ethnicity Research. Honolulu, HI. (available via INDEKS Verlag, Frankfurt)

(16) Riggs, F.W., 1989. Terminology and Lexicography: Their Complementarity. Int.J.Lexicography. 2(1989)No.2. p.89-110.

(17) Riggs, 1993a. Social Science Terminology: Basic Problems and Proposed Solutions. In: Sonneveld, K. (Ed.): Terminology: Applications in Interdisciplinary Communication. Amsterdam: Benjamins. pp. 195-220.

(18) Riggs, F.W. 1993b. Review of Juan Sager: A Practical Course in Terminology Processing. Int. J. Lexicography. vol.6:1, p. 70-77.

(19) Riggs, F.W., 1995. The Representation of Concept Systems. In: Wright, S.E., Strehlow, R.A. (Eds.): Standardizing and Harmonizing Terminology. Philadelphia, PA: ASTM. p. 63-74.

(20) Riggs, F.W., Malkia, Matti, Budin, Gerhard, 1996. Descriptive Terminology: the INTERCOCTA approach. In: Wright, S.E., Budin, G. (Eds.): Handbook of Terminology. Amsterdam: John Benjamins. (in press)

(21) Robinson, Jennifer, 1993. A Glossary of Contemporary English Lexicographical Terminology. In: Dictionaries: J. Dictionary Soc. North America. No.5, p.76-114.

(22) Chapman, R.L. (Ed.): Roget's International Thesaurus. New York: Harper Collins 1996.

(23) Roget II: the new Thesdaurus (1980). American Heritage dictionary (Eds.). Boston: Houghton Mifflin Co.

(24) Sager, Juan C., 1990. A Practical Course in Terminology Processing. Amsterdam: John Benjamins.

(25) Sheldon, William H. (1936). Psychology and the Promethean Will. New York: Harper & Brothers.

(26) Sonneveld, Hehni B., Loening, Kurt L. (Eds.): Terminology: Applications in Interdisciplinary Communication. Amsterdam: John Benjamins.

(27) Webster's Encyclopedic Unabridged Dictionary of the English Language. New York, NY: Gramercy Books 1989.

(28) Wersig, Gernot, Neveling, Ulrich: 1976. Terminology of Documentation. Paris: UNESCO.

Prof. F.W. Riggs, University of Hawaii, Department of Political Science, Honolulu, HI, 96822, USA.

Knowl. Org. 23(1996)No.1
Fred W. Riggs: Onomatics and Terminology

33