REVIEW ARTICLE

COGNITIVE SEMANTICS AND THE LEXICON

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1. Preamble

Do lexicographers need to know about linguistic theory? Until the beginning of the present century, the answer given by many dictionary project leaders, echoed by some linguists, would have been (and, when asked, often was) a resounding No. This was especially true in the English-speaking world, particularly America, where linguistic theory has had little to say about lexis and still less that was relevant to lexicography. Lexicography was seen as a practical activity, like joinery, requiring skill in using the tools of the trade (definition writing in particular), wide reading in the literature of the language, Sprachgefühl, common sense, and above all mental and physical stamina, rather than knowledge of the grammatical speculations of academic linguists. Taxonomic botanists and classicists, as well as students of literature, could be rapidly turned into practical lexicographers, but from the 1960s to 1990s young people who had been trained in what then passed for theoretical linguistics in the English-speaking world seemed to have acquired an insuperable blindness to distinctions of lexical meaning and an inability to write simple, well-focused, elegant paraphrases or translations. The main task of professional lexicographers was seen as churning out new dictionaries or (more commonly) revising old dictionaries or condensing entries so as to cram a quart into a pint pot, while adding a few new words or new senses to justify the claim 'new edition' in response to the marketing needs of dictionary publishers, some of whom took to debasing the term 'new edition' with increasingly flagrant cynicism.

The handful of great scholarly dictionary projects in the world had no place, either, for theoretical speculation. The principles governing national dictionaries such as the *Oxford English Dictionary,* the *Woordenboek der Nederlandsche Taal,* and the *Deutsches Wörterbuch* were laid down in the 19th century. The task of 20th-century lexicographers employed by these great works was and is seen as one of completion, maintenance, extension, and improvement within established principles, not reconsideration of the theoretical foundations. These 'established principles' go all the way back to the *Thesaurus Linguae Latinae* of Robert Estienne (1531), a magnificent work that is an inventory of the vocabulary of classical Latin, illustrated by citations from selected authors, with almost all the apparatus that we have come to expect of a dictionary, including definitions in Latin augmented by occasional glosses in 16th-century French. See Hanks (2010) for further discussion of the importance of Estienne's work.

However, we live in interesting times. The traditional business model for commercial dictionaries as printed books has collapsed, and with it the main source of funding for lexicographical innovation. Lexicographers and would-be lexicographers currently live in a sort of interregnum. Pioneering studies such as the *Wörterbuch der Deutschen Gegenwartssprache* (WDG; Klappenbach and Steinitz 1964-1977), Cobuild (Sinclair, Hanks, et al. 1987), FrameNet (Baker et al. 1998; Johnson et al. 2001), and Corpus Pattern Analysis (Hanks 2004) have shown that a need—or at any rate an opportunity—has arisen for a systematic re-examination of the lexicon, based on new theoretical principles of lexical

semantics. The theoretical principles inherited ultimately (via Leibniz) from Aristotle, which are the basis of definitions in almost all current monolingual dictionaries (whether the people writing them know it or not), are only partially adequate. The main problem is that these principles are essentially reductionist, i.e. they assume that each word has one or more meanings that can be attributed to the word in isolation, rather than in context. They are more appropriate to the stipulative definition of scientific concepts than to the empirical analysis of word meaning in natural language.

Two things at least are now becoming clear: 1) the next generation of lexicographers, focusing on language as a means of communication, will need to systematically research observable facts of language use, associating word meaning more firmly with context than is currently fashionable; 2) this new generation of lexicographers will need to develop and use new models of language that will take account of domain and context of utterance as well as phraseological context. They will not be able to bask in the blissful state of theoretical ignorance that their predecessors have enjoyed. They will need to be aware of relevant theoretical work and will need to take a view before moving on.

Into this turbulent state of affairs comes a beautifully written book by Dirk Geeraerts, summarizing the main relevant strands in at least one aspect of current lexical-semantic theory, which goes some way towards meeting this need. The main part of this review will be an extended summary of the content of the book. I shall not try to mention all the many theories and theorists discussed by Geeraerts. Instead, I shall focus on those aspects that seem to me seminal or particularly interesting from the point of view of monolingual lexicography. The final section of the review will be a brief evaluation.

2. Content

Chapter 1 is entitled 'historical-philological semantics'. It sketches the various attempts from classical Greece and Rome onwards to address the question, 'How does a word get its meaning?' In the 18th century it was believed, especially by speakers of French, Italian, and Spanish, that etymology guarantees meaning, but as Samuel Johnson recognized in the Preface to his 1755 dictionary, this is unsatisfactory. To take just one example (one that was used by Johnson himself), etymologically, the adjective *ardent* means 'burning'—it is the present participle of the Latin verb *ardere* 'to burn'—but it has never meant 'burning' in English. If your house is on fire, you do not say that it is an ardent house. Since Saussure and, even more importantly, the German semantic field theorists of the 1920s and 30s, it has been recognized that word meaning is a matter of arbitrary convention—so a theory of convention is needed, one that will interact with etymological principles.

There is then a huge leap forward to the emergence of scientific methods of diachronic linguistics in the 19th century. It might be said (though Geeraerts does not put it quite this way) that for some twelve hundred years (from about 450 AD to about 1650) nothing worthy of note happened in lexical semantics. Medieval European thinkers were concerned with elaborating Aristotelian propositional logic and theories of truth (generally, within the constraints of theological dogma), rather than with empirical investigation of the nature of word meaning. The latter in fact would have been extremely dangerous during the Dark Ages of Christian dogma, as it would inevitably have called into question some of the central tenets of the Catholic Church: an offence for which people could be and were tortured and burned alive. The objective study of word meaning unavoidably calls into question theological assumptions about the nature of truth.

After paying homage to historical philology from the mid 19th century to about 1930, Geeraerts takes as his true starting point the psycholinguistic orientation of Michel Bréal

(1897). A key quote from Bréal is 'Language makes thought objective' (1897: 273). This sets the tone for the whole book, which focuses on meaning as a cognitive rather than a social phenomenon.

Chapter 1 goes on to summarize, in thematic rather than chronological order, the work on psychological meaning in a historical context of continental scholars such as Arsène Darmesteter (1886) and K. O. Erdmann (1910). Darmesteter insisted on the dynamic nature of words in use ('*la vie des mots*'), while Erdmann explored lexical connotation (distinguishing *Nebensinn* 'secondary sense' from *Gefühlswert* 'emotive value') as a component of word meaning alongside denotation. Acknowledging the fundamental instability of word meaning, Geeraerts offers a useful typology of semantic change, assigning a central role to analogy as an agent of change in general and to metaphor and metonymy in particular (pp. 26-35). Pages 32-33 include a fascinating list summarizing types of metonymies, gleaned from early 20th-century authors.

Towards the end of the 1920s a major development in lexical semantics took place, mainly in Germany, that is semantic field theory. This is the subject matter of Geeraerts' Chapter 2. Inspired by the structuralist theory of Ferdinand de Saussure (1916), a disparate and somewhat quarrelsome group of German linguists began to investigate the nature of the lexicon as a system of relationships among words and their meanings, rather than a haphazard collection of referring expressions.

Geeraerts suggests that a paper by Weisgerber (1927) was the seminal moment in the emergence of semantic field theory. Weisgerber was a Celticist and comparative linguist, who was later employed by the Nazi war machine in a rather bizarre attempt to enlist Breton and Irish support for the German cause in World War II. It is an unfortunate fact that many of the semantic-field theorists of the 1930s were caught up in the racist ideology of their time, just as their contemporary, the great Russian lexicographer Lev Vladimirovich Shcherba (1880-1944), was obliged to present himself as a Stalinist. Superficial cruelties of historical accident such as this should not be allowed to blind us to the value of the achievement of the individuals involved.

The central idea of semantic field theory is that different languages divide up conceptual fields and the representation of reality in different ways. As a result, the lexical items of different languages cannot be mapped precisely onto one another. For example, in German, it is (or was until recently[1]) not possible to talk simply of 'going' somewhere; speakers were obliged to choose a verb that committed them to the manner of motion. Thus, Porzig (1934) pointed out that the general field of 'going' verbs is divided up among terms such as *reiten* 'ride (on horseback)', *fahren* 'drive (in a carriage or car)', and *gehen* 'walk (on foot)'.

Jost Trier (1931) started a monumental project (never completed) to investigate the relationships among German terms in the field of cultural education, or rather 'formation', from the Middle Ages to the 20th century. He never got further than the Middle Ages. His study (1934) of changes between 1200 and 1300 in the meaning of the Middle High German terms *wisheit, kunst,* and *list* was to form part of this project. *List* became debased, coming to denote 'cunning' rather than 'skill', and was partly replaced by *wizzen,* while the meaning and connotations of the other terms was also adjusted, leading to a quite different view of what the mental constitution of a well-educated, cultured German speaker might be. Trier demonstrated that even central terms such as *knowledge, wisdom, culture,* and *art,* which might have been expected to be stable, can in fact change their meanings quite dramatically within the short space of only a hundred years or so, leading to a new conception of what it is to be an educated, cultured human being. This, of course, has important implications regarding the stability or otherwise of word meaning in general.

Geeraerts comments that the theoretical contribution of field semantics had been anticipated a hundred years earlier by Wilhelm von Humboldt (1836), who observed that a language is not merely an *ergon*: 'a static fact', but also an *energeia*: a dynamic process or force. Geeraerts might also have pointed out that this view of language as a conceptual layer between the mind and the world is not dissimilar to the famous semiotic triangle of Ogden and Richards (1923), illustrating the point that the relationship between linguistic objects (words) and objects in the world is always mediated (in ways that are still to some extent mysterious) by concepts or structures in the mind.

Other important semantic field theorists include Helmut Gipper, noted for his study 'Sessel oder Stuhl' (1959), a detailed investigation of two terms denoting different types of chair, used differently in different contexts and different regions, and Eugene Coseriu, a Romanian scholar whose intimate knowledge of Latin and Romance languages enabled him to show that the conceptual structure of a language varies independently of variations in the meaning of its lexical items. A major paper by Coseriu on diachronic structural semantics was translated into English for the first time (astonishingly enough) nearly half a century after it was written, for inclusion in a collection of writings on lexicology from Aristotle to the present day (Hanks 2008).

Field semantics led naturally to another equally important development in lexical semantics, namely componential analysis, to which Geeraerts devotes ten pages of insightful comment. The core meaning of many but not all words can be discussed in terms of components of meaning, contrasting one word with another and indeed with other senses of the same word. For example, the words *uncle* and *aunt* both denote human beings and they are both relationship terms with reference to a third person. They differ, of course, as to gender: +MALE vs. +FEMALE or +MALE vs. –MALE (in pre-feminist linguistics, when MALE could uncontroversially be regarded as the 'unmarked' term and FEMALE was 'marked'). The same components differentiate *nephew* and *niece*, with the debatable addition of the marked semantic component –ADULT, a componential classification that is still acceptable as politically correct. This apparently simple system has proved useful to anthropologists working on the analysis of kinship terms in a variety of languages, where kinship terminology can be extremely complex—and puzzling to outsiders. There are many such studies, notably two classic papers by American anthropologists Floyd Lounsbury and Ward Goodenough, both published in 1956 (Goodenough 1956; Lounsbury 1956). It is not clear that componential analysis is of much use to lexicographers, though it had some influence on at least one major English learners' dictionary, LDOCE (Procter 1978).

Chapter 3 of Geeraerts' book discusses the attempt by generative linguists to extend tree structures from syntax into lexical semantics, partly under the influence of componential analysis. The principal work in this regard was Katz and Fodor (1963), which was extremely influential for a decade or two among speculative linguists (though it had little impact on lexicography). Despite several rescue attempts, it is now discredited and can be seen as yet another *Irrweg* in theoretical linguistics. It is memorable mainly because it provoked a thoughtful and insightful response from Dwight Bolinger (1965), which described a dictionary as 'a nosegay of faded metaphors' and asserted that the purpose of a dictionary was to enable the user to associate the unknown with the known. (Of course, for productive language use such as translation into a foreign language, it can be argued that the purpose of a dictionary is to associate the known with the unknown.)

Chapter 4, entitled 'Neostructuralist semantics', is a curious ragbag bringing together a variety of unrelated theories. It starts with an account of Anna Wierzbicka's 'Natural Semantic Metalanguage' (NSM) (e.g. Wierzbicka 1972). Wierzbicka and her colleague Cliff Goddard argue that, if the meaning of a word must be defined in terms of other, 'more basic'

words, then ultimately the meaning of all content words in all languages must be reducible to a set of undefinable 'semantic primitives' (Goddard and Wierzbicka 1994, 2002). These semantic primitives are (presumably) innate: we are born with them, and (collectively, as members of a speech community) use them as a basis for building a language—an analysis of the world we live in. Unlike others who have proposed the existence of semantic primitives, Wierzbicka is prepared to put her money where her mouth is: over several decades, she has devoted substantial efforts and great logical ingenuity to actually identifying and naming the whole set of semantic primitives. There are currently 62 of them; they are updated from time to time, and can be seen online in the relevant Wikipedia article ('Natural Semantic Metalanguage'). They include not only logical concepts (*not, if, because, can*) and personal pronouns (*I, you, someone*), but also a few content words such as *think, know, want, feel, hear, say*—and, importantly for those of us who believe that every natural language is a fuzzy analogical system, the adverb *maybe* and the preposition *like*. Goddard is a major figure in comparative linguistics, while Wierzbicka has contributed valuable insights into the meaning of cultural terms in English and other languages, also to analysing the meaning of English speech-act verbs and other sets. Given that, their NSM theory is not to be lightly dismissed. However, the weak point in their argument lies in the premise with which it starts: why should we believe that the meaning of all words must be defined in terms of other, 'more basic' words? The alternative is the sort of massive circularity that we see in monolingual dictionaries: the meaning of all words (including words representing Wierzbicka's semantic primitives) are defined in terms of all other words.

Chapter 4 continues with an account of Ray Jackendoff's Conceptual Semantics (1996), which considers semantic knowledge in combination with syntax: there is a 'formal semantic representation' of the meaning of each word, but, as Geeraerts rightly observes, it 'does not contain all the information that is relevant to explain the language user's conceptual competence' (p. 138). To take just one example, Jackendoff represents the meaning of the verb *run* as:

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| run                    |
| V                      |
| __<PP_j>               |
| [event GO              |
| ([thing]_i, [path]_j)] |
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'*Run* expresses an event in which a thing (the subject) moves along the path optionally expressed by the prepositional phrase' (p. 139).

Jackendoff's account of the meaning of the English word *run* is, of course, utterly inadequate in lexicographical terms, but, as Geeraerts makes clear, that is not Jackendoff's aim. The purpose of diagrams such as this is to elucidate some kind of truth about the central or basic meaning of the words, and to show that, logically, this can be expressed in terms of 'a restricted set of conceptual primitives of the type EVENT, STATE, THING, PATH, PLACE, PROPERTY, AMOUNT.' Geeraerts adds that, collectively, 'These constitute an ontology, in the sense that they are assumed to be innate and universal categories of human cognition.' The notion of an ontology consisting of a very small number of basic concepts can be useful in lexicography, not as a means of expressing all aspects of the meaning of a word, but as a way of deciding how to select an appropriate genus term for each basic definition. Somehow, the lexicographer has to say that the basic meaning of *run* denotes an event. If the lexicographer chooses 'move' as the superordinate (i.e. genus term) in the definition of *run*, (s)he must be confident that the definition of *move* in the same dictionary makes clear that it denotes an event. Lexicographers tend to focus on differentiae rather than genus terms; as a result (in the

English-speaking world, at least) definitions can be inadequate, offering only a synonym, a couple of synonyms or a paraphrase, rather than an analysis of the word's meaning.

Geeraerts (p. 141) draws attention to an apparent shortcoming of theories such as Wierzbicka's Natural Semantic Metalanguage and Jackendoff's Conceptual Semantics, which aim to decompose the meanings of terms into 'semantic primitives':

> Talking about the difference between *duck* and *goose,* he [Jackendoff] mentions (1990: 33) that it would be 'patently ridiculous' to suggest a feature like [± LONG NECK] as a conceptual primitive, with possibly universal status.

A possible solution to this problem is proposed by Hanks and Pustejovsky (2005), namely to distinguish between the intrinsic semantic type of a lexical item and its contextually assigned semantic role:

> A semantic type is a class to which a term can be assigned, e.g. *Peter* or *the old man* belong to the semantic type [[Person]]. In the context of treating patients, Peter or the old man may be acting as a doctor or other health professional; in the context of being treated by a doctor, Peter or the old man fulfils the role of patient.

An advantage of this approach is that it enables lexical analysis to be undertaken using a conveniently small inventory of basic semantic types such as ENTITY, PERSON, ARTEFACT, EVENT, STATE, etc., while consigning all other features, which would include 'having a long neck' to the role known in the Aristotelian tradition as 'differentiae'. Hanks's *Pattern Dictionary of English Verbs* (http://pdev.co.uk) classifies nouns within an inventory of some 230 semantic types. Typing of nouns in this way is used to group collocates of verbs in such a way that they distinguish one verb semantically from another, as well as distinguishing different senses of a verb. Perhaps it can be applied to distinguishing the denotata of different nouns, e.g. ducks from geese, without venturing into patent absurdity.

The next section of *Theories of Lexical Semantics* (pp. 142-147) is an account of the 'two-level semantics' developed by Manfred Bierwisch and Ewald Lang in the 1980s (for example Bierwisch and Lang 1980), which also addresses the interaction between knowledge of a language and knowledge of the world, postulating a 'dynamic interaction' between them. 'Cognitive behaviour,' says Geeraerts, summarizing Bierwisch and Lang, 'is determined by the interaction of systems and subsystems that operate as largely autonomous modules of the mind.'

The third major theory summarized in Chapter 4 is Generative Lexicon Theory (GL; Pustejovsky 1995). GL shows some of the ways in which the meaning of an utterance is spread across its constituents. It is relevant to lexicography for several reasons, among them the following:

> 1) The meaning of a term can be summarized as a **lexical conceptual paradigm** (lcp), consisting of many components, not all of which are simultaneously active when the word is used.

> 2) The function of a term includes any of four aspects, called **qualia** (singular: **quale**). These four qualia are:

> - the *formal* (answering the question, What sort of thing is it?);
> - the *constitutive* (What's it made of, or What are its component parts?);
> - the *telic* (What's its purpose?); and
> - the *agentive* (How did it come into being?).

Not all terms activate all four qualia, but failure to consider a quale can risk inadequate definition, as in the case of a lexicographer who correctly observes that a table is a piece of furniture (its formal) and agonizes over questions like how many legs a table may have and what it's made of (mainly wood, but then also glass, plastic, metal...) (both questions being part of the constitutive of the concept *table*) but who may neglect to say that a table is for putting things on (its telic).

3) **Lexical inheritance** exploits the formal property of a term in various ways: the term may *match* its semantic type (for example, in normal usage a *hotel* is a type of *building*), but it may also be *coerced* into having a different semantic type (for example, it would be unusual, but possible and meaningful, to talk of the human mind as a *hotel for ideas*, exploiting the property of hotels that they provide accommodation for transients, while at the same time suppressing their formal property 'building'). Coercion is part of the mechanism that enables metaphors to be meaningful.

4) The formal property of an object or a concept points to a hierarchy, which allows properties to be inherited: for example, if a hotel is a building, then it may be expected to have many of the properties (constitutives) of buildings, for example a roof, walls, doors, and windows. But **multiple inheritance** is also possible: a term may have more than one semantic type. For example, a book is both a physical object and an information source. In contexts such as 'He was reading a book' it denotes an abstract information source, while in the context 'He dropped the book on his toe' the same term denotes a physical object.

Unfortunately, Pustejovsky's insightful accounts of lexical meaning are illustrated with structural diagrams, derived in the Generative tradition from formal logic. They are more suitable for logicians and computer scientists than lexicographers. One such diagram is reproduced on p. 149 of Geeraerts' book (Fig. 1.).

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[1] The German word *laufen* 'run' (cognate with English *lope*), has in recent years come to be used to fill the gap of a general superordinate term meaning 'go', though it still implies 'on foot' rather than 'in a vehicle'.
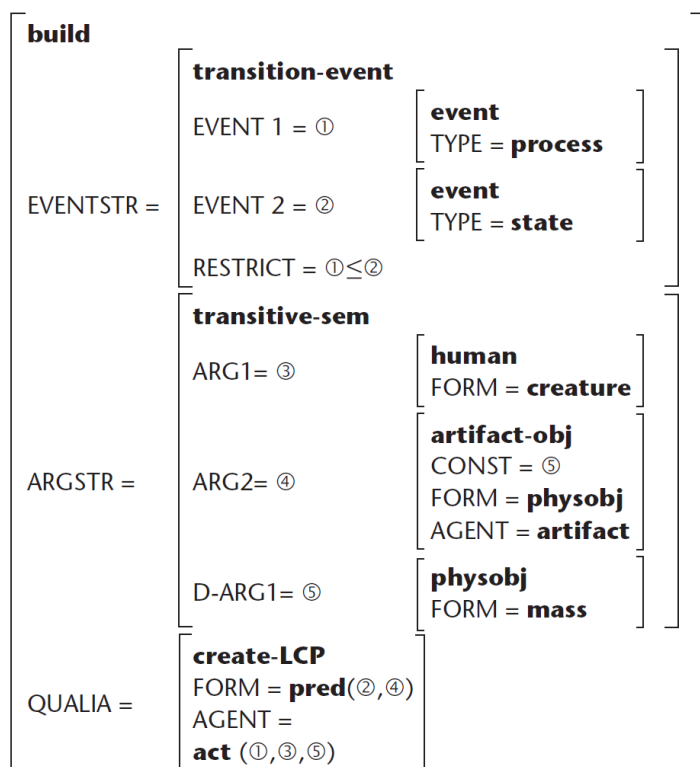
build

EVENTSTR =
- transition-event
  - EVENT 1 = ① → event / TYPE = **process**
  - EVENT 2 = ② → event / TYPE = **state**
  - RESTRICT = ①≤②

ARGSTR =
- transitive-sem
  - ARG1 = ③ → human / FORM = **creature**
  - ARG2 = ④ → artifact-obj / CONST = ⑤ / FORM = **physobj** / AGENT = **artifact**
  - D-ARG1 = ⑤ → physobj / FORM = **mass**

QUALIA =
- create-LCP
  - FORM = **pred**(②,④)
  - AGENT =
  - **act** (①,③,⑤)

Fig. 1. Representation of *build* in Pustejovsky's formalism (reproduced from p. 149 of Geeraerts' book)

It would be a pity if such diagrams were to deter lexicographers from reading Pustejovsky's *The Generative Lexicon,* which (as I have suggested here) is both insightful and relevant to lexical analysis.

WordNet (pp. 158-160) is without doubt the best-known electronic lexical resource used by computational linguists. As one has by now come to expect, Geeraerts' account of it is lucid and fair. In WordNet, lexical items are arranged in synonym sets ('synsets'). The synonym sets are relational items, the main relations being *hypernyms, hyponyms, antonyms,* and *meronyms.* (Meronymy is a part–whole relation: for example *seat, legs,* and *back* denote concepts that are part of the concept *chair.* The converse of meronym is holonym: *chair* is a holonym of particular—chair-related—senses of *seat, legs,* and *back.*) In British English, *hypernym* and *hyponym* are pronounced identically, so the term *superordinate* is often used instead of hypernym. One of the great merits of WordNet is that it is a true inventory of English: it has something to say about the lexical relations of every word in the language, including many rare and obsolete ones. Its greatest weakness is that it does not pay serious attention to the question of how to distinguish one sense of a word meaning. Senses in WordNet are equated with synonym sets, with much overlap, which is politely referred to in the NLP community as 'fine-grained sense distinctions'.

Geeraerts rightly draws attention to the existence of WordNets for languages other than English. It has to be said, however, that both the principles and the execution of WordNets for different languages are somewhat variable. Bond and Paik (2012) give a summary of membership and activities of the Global WordNet Association.

Pages 161-165 of *Theories of Lexical Semantics* constitute an account of the Meaning-Text Theory (MTT) of Igor Mel'čuk, which has been influential in much thinking about meaning relations. This is not the place for a critique of Meaning-Text Theory. As Geeraerts rightly observes, the biggest single problem with Mel'čuk's work is lack of completeness. This incompleteness manifests itself in two ways. First, the Explanatory-Combinatorial

Dictionaries (ECDs) that constitute a large part of Mel'čuk's life's work are no more than an extensive investigation of just a few French (and, at an earlier stage in his career, Russian) words, not a full-scale dictionary. Second, the inventory of lexical functions is not exhaustive. Scholars working on collocations within a Mel'čukian framework find themselves compelled by observation of natural language from time to time to supplement the Mel'čukian inventory of lexical functions in various ways. This incompleteness is a warning to those of us engaged in the compilation of lexicons driven by novel theoretical principles. The principles must be simple and robust enough to make completion possible, which implies that the apparatus must be open-ended, allowing additions from time to time according to need.

This brings us to an essential difference between academic research and lexicography. Completing the inventory does not matter a damn in most academic research. A researcher struggling with the problem of too much content can solve it by simply narrowing the object of research. Like Jim Dixon (the 'Lucky Jim' of Kingsley Amis's 1954 novel), if the topic—in Dixon's case *Developments in Shipbuilding Techniques, 1450 to 1485'*—proves too challenging, the researcher can always resort to chopping off a decade or narrowing the topic in some other way. Lexicography is different. The lexicographer is, by the nature of the task, committed to saying something about everything, even if he or she has nothing to say. An incomplete inventory in lexicography is doomed to be nothing more than an experimental excursion, of theoretical rather than practical interest.

The final section of Chapter 4 (pages 165–178) discusses corpus linguistics, which Geeraerts addresses as 'distributional corpus analysis'. It starts, rather surprisingly, with an attempt to fit corpus linguistics into the framework of conceptual semantics in the generative tradition. The first two authors discussed in this section are Jackendoff and Levin, neither of whom are noted for their attention to analysis of corpus data. Geeraerts evidently subscribes to the notion that Levin's classification of English verbs (1993) is corpus-based. It is not. Levin conducted her research using the traditional American approach of speculative introspection. She also had a quick look at a corpus-based dictionary to see if she had missed anything. She did not use the corpus-based dictionary to see if she had made errors in her classification. Her 'English verb classes' owe nothing to distributional semantics or corpus analysis. In fact, many Levin classes contain errors, which can be identified with the benefit of corpus evidence. For example, Levin classes *grasp* as a 'verb of HOLDING'. Verbs of HOLDING do not participate in the conative alternation: it would be ungrammatical in English to say, 'He was holding *at* something'. So far, so good. However, a glance at any general corpus of English would have given Levin many examples of people *grasping at* things (including straws) or *grasping for* something (for example, a bottle of milk). This might then have prompted a distinction, which Levin does not make, between verbs of HOLDING (a state) and verbs of SEIZING (an event). The FrameNet team (who likewise use a corpus as a source of examples illustrating their speculations rather than as a collection of data for empirical analysis) have drawn attention to untenable statements in Levin (1993). Despite the prevalence of such demonstrable errors, computational linguists, with touching naivety, persist in citing 'Levin classes' as if they were revealed truth and building elaborate and weighty computational structures on this theoretical sand. The real value of Levin's work lies in her theory of 'alternations' (active/passive, causative/inchoative, reciprocal, conative, and others), which should be studied by all serious lexicographers. This section continues with a brief discussion of the work of neo-Firthians such as Stubbs and Sinclair in doing corpus analysis. There is also a useful but by no means exhaustive summary of statistical approaches to corpus analysis of collocations, initiated by Church and Hanks (1990).

All of this leads up to what is clearly Geeraerts' central interest, namely Chapter 5, 'Cognitive Semantics' (pp. 182-266). This chapter consists of 91 pages—very nearly a third of the entire

book. Geeraerts starts by commenting (p. 182): "Meaning is a cognitive phenomenon that exceeds the boundaries of the word." Corpus linguists working in the Sinclairian tradition would agree emphatically with the relative clause here, but some might wonder whether it is right to define meaning as a cognitive phenomenon. Some of them at least would argue that meaning is a social phenomenon, requiring the presence of both a speaker and a hearer or, with displacement in time, a writer and a reader, and a social interaction between them. The truth, of course, is that meaning is both a cognitive and a social phenomenon. Much confusion, reinforced, alas, by dictionaries, has resulted from excessive emphasis on meaning as a cognitive phenomenon, a static entity, 'identical copies of which are implanted in the brain of each member of a speech community' (*une somme d'empreintes déposés dans chaque cerveau, à peu près comme un dictionnaire dont tous les exemplaires, identique, seraient répartis entre les individus* – Saussure 1916: 38). 'Identical copies' is, of course, an exaggeration—every user of a language enjoys innumerable idiosyncrasies of meaning (belief) and usage, of endless fascination to lexicographers and other nitpickers (among whom I proudly number myself). Nevertheless, if people did not believe that others mean the same thing by the words that they use, they would give up on using language altogether. The processes of normalization—how these 'identities' are arrived at—are of great interest. They are a central topic in Michael Hoey's (2005) theory of lexical priming, to which Geeraerts makes only a passing reference (on page 180). They include the pressing desire of ordinary human beings to conform to norms—the conventional beliefs and patterns of behaviour—of the society in which they live (no matter how absurd those beliefs and behaviours may seem to outsiders) and to persecute and even kill those who do not so conform. In this context, G. K. Zipf's observations (1949) about the conflicting pressures of 'forces of unification' and 'forces of diversification' are of fundamental importance. However, Geeraerts does not mention Zipf at all and does not do justice to theories of lexical semantics developed in the empirical traditions of text analysis and corpus linguistics.

Section 5.1, entitled 'Prototypicality and salience' is an account of Eleanor Rosch's prototype theory, which argues that 'linguistic categories may be fuzzy at the edges but clear in the centre' (p. 183). In the opinion of this reviewer, it is desirable to reformulate this observation as follows: 'linguistic categories are fuzzy at the edges but may nevertheless be clear in the centre.' The point is of the greatest importance for any lexicographer attempting to write definitions based on observation of actual usage. The lexicographer must come to terms with the problem that there are and always will be recorded uses of words that lie outside the boundaries of normal usage, some of which may even enjoy pseudo-conventional status for a short time among small subgroups. An example is the ostensible verb *to newspaper,* recorded in the mid 20th century with reference to journalists in the expression 'to go newspapering'. Such ephemeral oddities have no place in a dictionary, but unfortunately they do occasionally creep into dictionaries—especially large, scholarly dictionaries of record.

Geeraerts comments (on p. 188), 'Not all … members of [a] category need have equal status. … Some may be more central than others.' This is a candidate for a prize as the understatement of the century. All corpus-driven projects—the *Pattern Dictionary of English Verbs* (www.pdev.org), for example—have found that almost all categories have non-typical members, extending gradually through figurative uses to metaphors and other 'honorary' category members—terms that are coerced temporarily and sometimes weirdly, but always meaningfully, into a category to which they do not normally belong. If a driver is said to *urge* his car onwards, this can be counted as such a coercion, because the verb *urge* normally expects an animate noun as its direct object.

Geeraerts' discussion (pp. 189-195) of prototypicality effects on the meaning of the term *fruit* should be required reading for all budding linguists and lexicographers. What could be more obvious than to say that something is a fruit? And yet, when we come to look more closely, we find that some fruit are edible but some are not; most are sweet but some (lemons, for example) are not; most grow on trees or bushes, but strawberries don't; most are juicy, but walnuts, which are classed as fruit by botanists, are definitely not juicy; and so on. And then there are conventional metaphors and idiomatic expressions such as 'the fruit of their labours' (meaning 'positive results') and 'the fruit of her womb' (meaning 'children'). An uncomfortable conclusion from this discussion, from a lexicographical point of view, is that some poorly authenticated senses should be deleted from even the largest dictionaries, while others (neglected on the grounds of their metaphorical status) should be introduced, because they have acquired the status of being conventional. From the dictionary reader's point of view, no dictionary definition can possibly 'define' all possible uses (in the traditional sense of determining all and only the members of a set); each definition must, instead, be read as if preceded by the word 'typically'. Geeraerts goes on to discuss the instability of the boundary between the 'semantic level' (senses) and the 'referential level' (pp. 196-199). The final part (5.1.3, pp. 199-203) of this section discusses basic levels and onomasiological salience. The 'basic-level hypothesis' (Berlin 1976) is based on the observation that in most if not all languages terminology is organized at five or six different levels, with differing degrees of semantic generality. Terms are organized around a 'basic-level' concept. For example, the basic-level concept *plant* includes the concept *tree* and the still more fine-grained concepts *pine, oak,* and *ash.* This is the basic principle of organization that governs projects such as WordNet.

One of the most important theories of lexical semantics to emerge in recent years is Charles Fillmore's Frame Semantics, summarized by Geeraerts in section 5.3.2 (pp. 225-229). This section sits rather uneasily in the midst of discussions of metaphor theory, to which it is irrelevant. Geeraerts' summary of FrameNet (the practical implementation of Frame Semantics) gets off to a somewhat rocky, confusing start, but by the second page of it, he has recovered his customary lucidity. Fillmore's main point is that each normal use of a word fits into one or more 'frames': each frame has several lexical elements. For example, the 'commercial transaction frame' require the explicit or implicit presence not only of an event (the transaction), but also of a buyer, a seller, a price, and goods or services. Different words activating such a frame highlight different elements—and, very often, different attitudes on the part of the participants and indeed of the speaker or writer.

Section 5.2 is a discussion of conceptual metaphor and metonymy, in particular the conceptual metaphor theory, which began with the work of Lakoff and Johnson, who famously argued (1980: 3) that 'our ordinary conceptual system is fundamentally metaphorical in nature'. Conceptual metaphors transcend individual lexical items. In the system of Lakoff and Johnson, they are written in capital letters and (true to the tradition of speculative linguistics) illustrated by invented examples, like this (p. 205):

> THEORIES AND ARGUMENTS ARE BUILDINGS
>
> Is that the *foundation* for your theory? The theory needs more *support*. The argument is *shaky*. We need some more facts or the argument will *fall apart*. We need to *construct* a strong argument for that. We need to *buttress* the theory with solid arguments. The argument *collapsed*. The theory will *stand* or *fall* on the strength of that argument.

The importance of conceptual metaphor theory has perhaps been exaggerated, but it certainly had an earth-shattering effect when it made its first appearance in 1981. With the benefit of hindsight, we can see that it was just one strand, albeit an important one, in a tremendous explosion of insight into the fundamentally metaphorical, analogical nature of language. Moreover, it is an overstatement to say that 'our ordinary conceptual system is fundamentally metaphorical in nature', because metaphor is a contrastive notion. There must be literal meanings if metaphors are to be possible.

The study of metaphor since 1981 has developed into a vast academic industry, to which even a scholar as knowledgeable and industrious as Geeraerts cannot do justice. He makes only passing references to important metaphor theorists such as Bowdle and Gentner, Glucksberg, Giora, Goatley, Steen, and Deignan, and none at all to many others who might be thought of equal importance. A separate book is needed, giving Geeraerts' account of metaphor! The psycholinguist Ray Gibbs fares rather better, with five index references. He has 'consistently argued for experimental corroboration of linguistic analyses' (p. 241), a point which could be extended to the need for other kinds of corroboration of linguistic speculative theories, in particular the need for textual evidence of actual usage. Even so, these five references do not add up to a coherent account (still less, a comprehensive one) of Gibbs's contribution. This selectivity is perhaps as it should be, as it is indicative of a willingness to focus somewhat ruthlessly on essentials, an important characteristic of such a wide-ranging work if it is to be helpful to the reader. Geeraerts' comments on metaphor spill over into the remainder of the chapter. This seems to be due at least in part, to a rather artificial distinction between theoretical linguistics and psycholinguistics, the latter being dealt with separately towards the end of the chapter (in particular, pages 259-263).

Section 5.3 is an account of 'idealized cognitive models and frames'. Lexicographers will be glad to learn from Geeraerts that in cognitive semantics 'differences between semantic and encyclopedic knowledge, or more generally, between semantics and pragmatics, are not taken as a point of departure' (p. 222). Everything that contributes to the conventional understanding of a term is grist to the lexicographic mill, and we should not allow ourselves to be distracted by academic demarcation disputes.

Section 5.4. entitled 'Usage and Change' introduces a diachronic or historical perspective. This too is extremely wide-ranging (perhaps too wide-ranging?). Perhaps the whole book would have been better without this large diversion. On the other hand, as every lexicographer knows (but perhaps students of linguistics do not know), meaning change is an extremely important aspect of natural language, and one that sometimes defies common sense. Geeraerts summarizes work that has been done, by Elizabeth Traugott and others, on the main force that motivates lexical meaning change, namely analogy and metaphor, but he does not say that other forces are at work too. How many people, other than lexicographers, know that the ordinary English word *size* is derived from the old word *assizes,* meaning a sitting of a court of law, and is due to the cheating habits of medieval bakers? A 'size loaf' in late medieval or Tudor English, was a loaf of a dimension approved by a court of law. A baker who gave his customers short measure was liable to be 'sized'—i.e. taken to court. Hence a new linguistic convention arose—but hardly through metaphor or metonymy.

Every reviewer has his hobby horses, and mine is the nature of conventional word meaning. I was therefore particularly interested to learn (on p. 230, picking up a point made near the outset of the book (p. 15)) about the distinction made by the German lexicographer Hermann Paul (1880, 5th edition 1920) between *usuelle Bedeutung* (conventional meaning) vs. *okkasionelle Bedeutung* (ad-hoc meaning). A goal for future corpus linguistics could be to relate this time-honoured distinction to modern work such as Pustejovsky's (1995) notion of

coercion, Steyer's (2013) *usuelle Wortverbindungen* (conventional collocations) and Hanks's theory of 'norms and exploitations'.

3. Evaluation

Geeraerts' book is an important contribution, essential reading for anyone interested in lexis and meaning. One of the best things about the first half is that it provides English-speaking readers with a clear, readable account of the history of the European mainstream in linguistics, with its emphasis on the nature of words and meanings in language systems (which contrasts favourably with the recently dominant American obsession with generative syntactic trees and the welter of speculation about supposedly grammatically possible utterances, with appeals to acceptability judgments, that have dominated much academic linguistics in the English-speaking world during the past half-century). Another excellent aspect is the beautifully clear exposition of prototype theory, conceptual metaphor theory, and other recent developments.

Moreover, the book has two excellent indexes (of people and of concepts), which makes it an indispensable reference tool for such a broad and wide-ranging topic.

However, it has to be said that Geeraerts' book has two noticeable deficiencies. The first of these is the absence of a discussion of relevance theory and the work of Sperber and Wilson in particular, which is based on the work of the philosopher H. P. Grice. The second noticeable deficiency is that, despite sixteen references in the index to 'corpus-based approaches to lexical semantics', Geeraerts has, in the opinion of this reviewer, missed the point about corpus linguistics.

As regards relevance theory, a theory of convention is needed to counter, offset, or supplement the Enlightenment belief that etymology guarantees meaning (a belief that flourished in the great Academies of southern Europe during the 17th and 18th centuries and still lingers on in a few conservative nooks and crannies). Such a convention theory does in fact exist, although Geeraerts does not discuss it. This is the Relevance Theory of Sperber and Wilson (1986), based on two short papers (1957, 1975) by the ordinary-language philosopher Paul Grice. It has spawned a huge literature, much of it dealing with unspoken 'implicatures'—meanings that are implied rather than stated explicitly. A much-cited example is someone who says, 'It's cold in here' and means 'Shall we shut the window?'

Geeraerts might defend this omission on the grounds that Relevance Theory is a theory of pragmatics and propositional logic—a theory of conversation rather than a theory of lexical semantics—but if you believe, as I do, that words only have meaning in context, then this excuse fails. Somehow, we need to account for the mutual confidence of speaker and hearer (and, with displacement in time, writer and reader) that they mean the same thing by the words that they use. Gricean theory does this, not only for straightforward factual propositions such as 'In October 2011 Colonel Muammar Gaddafi was caught hiding in a drain, dragged out, and killed', but also for implicatures such as *'Asad could well be heading for Gaddafi's drain'*[2], denoting an unpleasant death rather than a visit to a water-management installation. However that may be, Relevance Theory, whatever its intrinsic merits, is of comparatively little relevance to lexicography. The unspoken implicatures of conventional utterances cannot be recorded in a lexicon, though they might well be candidates for inclusion in what Charles Fillmore (Fillmore et al. 2012) has called a 'constructicon'—an inventory of the meanings that can be derived from the conventional constructions of a language rather that the words themselves. An often-cited [though invented] example is *'He belched his way out of the*

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[2] The second (italicized) example has been invented for the sake of exposition.

room', which, if it were ever uttered with meaningful intent, would surely refer to a movement event rather than an indigestion event, even though the only event word in the sentence, the verb *belch*, does not normally denote movement[3].

Towards the end of Chapter 2 (p. 59), Geeraerts briefly mentions J. R. Firth's (1957: 11) famous dictum, 'You shall know a word by the company it keeps.' He returns to this theme in section 4.2.3 (pp.165-178), headed 'Distributional corpus analysis'. On page 177 he comments, 'distributional corpus analysis is primarily a method, not a model.' This is odd, because examination of the work of corpus analysts such as Sinclair, Hoey, Wray, Stubbs, Moon, Partington, Semino, McEnery, Hanks, and others would show that corpus analysis lends support to a model of linguistic behaviour founded on prototypical usage—and Geeraerts himself is a proponent of the theory of conceptual prototypes.

If one were forced to select just one quotation to illustrate the relevance of corpus linguistics to lexical semantics, my choice would be this:

> 'Many, if not most meanings, require the presence of more than one word for their normal realization. ... Patterns of co-selection among words, which are much stronger than any description has yet allowed for, have a direct connection with meaning. (Sinclair 1998: 4).

This theoretical statement of Sinclair implies a model of linguistic behaviour—and a programme of research—that is of the greatest importance for the future study of language. To what extent, if at all, is it possible to defend the common-sense notion that a word may have meaning in isolation? What, precisely, is the nature of the connection between patterns of lexical co-selection and meaning? These are mysteries which empirical linguists, using various approaches to the analysis of corpus evidence, are only just beginning to address. Many modern linguists would probably agree that the future of lexicography and indeed of linguistics in general must include the task of marrying conceptual prototypes of the kind described by Geeraerts, Rosch, and others, to phraseological prototypes on the foundations laid by corpus linguists. Geeraerts does not make this point. He complains of lack of clarity in the goals and methods of corpus linguistics, but he does not seem to have considered the possibility that systematic corpus analysis might lead to a new model of human linguistic behaviour, which could be associated with a new theory of language, to the great benefit of language teachers, computational linguists, and lexicographers, among others.

Despite these reservations about what Geeraerts does not say, what he actually does say in most of the rest of *Theories of Lexical Semantics* is impeccable. He is a reliable, readable, and entertaining guide through a minefield of speculative theories. His book is, in part, a corrective to the Anglocentrism of much present-day writing about language, reminding us of the central role of lexis (rather than syntax) in the great traditions of European linguistics and the insights of European linguists. The only truly disappointing aspect of the book is its failure to get to grips with the implications of corpus linguistics for lexical-semantic theory—but that is a topic that deserves an entire book to itself. Readers who want to find out more about cognitive approaches to semantics can be referred to Geeraerts (2006), an excellent selection of basic readings.

Theories of Lexical Semantics is not only an important scholarly book, of value to thinking lexicographers and everyone interested in the nature of words and meanings; it is also a very readable one.

Notes

[3] A corpus linguist might observe that this example depends on an insufficient analysis of the noun *way*, but this is not the place to enter into that particular debate.

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