

Historical Astrolxicography and Old Publications

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Abstract. I describe how the principles of lexicography have been applied in limited ways in astronomy and look at the revision work under way for the third edition of the *Oxford English Dictionary*, which, when completed, will contain the widest and most detailed coverage of the astronomical lexicon in the English language. Finally, I argue the need for a dedicated historical dictionary of astronomy based rigorously on a corpus of quotations from sources published in English from the beginnings of written English to the present day.

1. The Role of Lexicography in Astronomy

Lexicography is defined in the *Oxford English Dictionary*¹ as “the writing or compilation of a lexicon or dictionary.” Among the various senses for *lexicon* listed in *OED2* is, “The vocabulary proper to some department of knowledge or sphere of activity.” I define *astrolxicography* as the application of the practices of lexicography to the astronomical lexicon. However, the discipline of lexicography may be applied to many types of reference works other than dictionaries (for example, “encyclopaedic dictionaries”, glossaries of technical terms, thesauri, lists of key words, etc.). A full survey of astronomical lexicographical works will be the subject of a future paper. Here I shall limit myself to identifying what I consider to be an important lacuna in astronomical literature.

2. The Need for a Historical Dictionary of Astronomy

Most astronomical dictionaries are *synchronic* (they aim to be up-to-date and eschew obsolete forms), *prescriptive* (they tell us what the entries are *meant* to mean rather than *how* the terms are actually used) and *encyclopaedic* (they generally include far more information than is necessary for the purposes of definition). There is no *diachronic*, *descriptive* dictionary of astronomy, i.e. one that lists and succinctly defines the entire astronomical lexicon from the beginnings of written English to the present day, including all obsolete terms

¹*OED*[*n*], where *n* is the edition number. *A New English Dictionary on Historical Principles* was published in fascicles between 1888 and 1928; it came to be known as the *Oxford English Dictionary* and was published in 12 volumes in 1933; its four-volume *Supplement* was published between 1972 and 1986.

and changes of sense. The work that comes closest to providing such coverage is the *OED*. The present (second) edition has many gaps in its general scientific coverage which are now being filled for the third edition².

OED2 is the source of most of the historical information about the English language found in other dictionaries. The *OED* has as its aim “to present in alphabetical series the words that have formed the English vocabulary from the time of earliest records down to the present day, with all relevant facts concerning their form, sense-history, pronunciation, and etymology” (Simpson & Weiner 1987). That is a fairly stiff challenge and one which the *OED* compilers have met admirably. The *OED* has been criticized for its relatively unrepresentative science coverage (Landau 1989). This problem was partially addressed in the second edition, but only now, with the new revision programme (under way since 1995) and the regular publication of volumes in the *OED Additions Series* (Simpson & Weiner 1993a,b; Proffitt 1997) is the problem being tackled in a thorough and systematic way. A considerable investment is being made in updating and extending the coverage of the astronomical lexicon, and on its completion *OED3* will incorporate the widest coverage of astronomical vocabulary from the dawn of the English language to the present time.

The task of producing a new edition of the *OED* is twofold. First, there is the revision of all the entries in *OED2*. Secondly, new senses of existing entries and entirely new entries need to be drafted and incorporated into the body of the dictionary. Proofs for entries are sent out to specialist advisers, who check the accuracy of the definitions, and, where necessary, provide further illustrative quotations (ante-datings are the most important, but sometimes it is necessary to provide more recent quotations, especially for entries that have not been revised since the last century!). Staff editors then modify the entry in the light of the specialists’ comments. Suggestions for new entries come from many quarters. The principal criterion is frequency of occurrence in print: the more quotations there are for a new-word candidate, the better its chances of acceptance for inclusion. Concerning astronomy, the number of new words (including old words that were left out of earlier editions) that have been drafted, or are earmarked for drafting, is growing apace, and no realistic estimate of the eventual size of the astronomical lexicon to be included in *OED3* can yet be made. Meanwhile, new words and senses are being published, in batches of 3000, in the *Additions Series* (Simpson & Weiner 1993a,b; Proffitt 1997).

In *OED2* the coverage of the astronomical lexicon is rather uneven in that a number of common terms are not in. As an example, comparatively few constellation names are included in *OED2*; this has now been remedied, at least for the 88 “official” IAU constellations, all of which now have entries (both for the full Latin names and their IAU abbreviations). As an example, *Microscopium* now has an entry in its own right with a precise coinage reference to Lacaille in 1752 (the IAU-approved abbreviated form *Mic* also has an entry). The illustrative quotations for astronomical entries in *OED2* are often fairly easily antedated,

²The following web sites give further information on progress towards *OED3*: <http://www.oed.com/inside> (“Inside the *OED*”), <http://www1.oup.co.uk/reference/> (*OED Newsletter*), and <http://proto.oed.com/> (*OED online*—under development). There is also: <http://www.oup.co.uk/jnls/list/lexico> (*International Journal of Lexicography*).

but this can only be truly remedied by a systematic search of the entire bibliography of astronomy in the English language (i.e. pre-XIV Century to the present day). Some of the entries have not been revised for over a century; this is being put right with the present revision programme, which will revise all of the *OED* in a uniform manner. A good example of an antedating occurs for *Medusa's head*, which has an earliest quotation dating 1706 in *OED2* and 1556 in *OED3* (English constellation names are an area that still needs to be charted in detail). The progress of the revision process can be followed in the *OED Newsletter*, which is published biannually (available at <http://www1.oup.co.uk/reference/>).

Astronomical entries (both for revision and new-word entries) are revised by the Astronomy Adviser who checks that their content is accurate, up to date and fully covers all senses. An important part of this work is to look for antedatings of the illustrative quotations (inter- and post-datings can also occasionally be of use). New quotations are written down on 6" × 4" white slips and full bibliographical details given. The slip contents are later keyed into the dictionary database by staff at the *OED*. The *OED* is now fully processed by computer (otherwise certain aspects of revising its more than 21000 three-column pages of dense text of *OED2* would be a hopelessly unmanageable task on human timescales); nevertheless, the white slip is an essential way of recording data for quotations and new entries for the simple reason that it is the most transportable, silent and user-friendly means of recording written information and can be used in any library! The word or sense under revision will nearly always act as a node for further new-entry suggestions (I refer to this as the nodal approach to corpus building). The drafting of entries (usually done by staff editors) involves providing, apart from the definition, information on the etymology, grammatical function and pronunciation of the term and illustrative quotations.

3. Is OED3 the Answer for the Astronomical Lexicon?

The *OED* is a unique work and offers invaluable information to the scholar interested in the development and evolution of the English language. In terms of astronomy *OED3* will provide the best available overall picture of the evolution of the English astronomical lexicon, but for finer detail a change of scale will be necessary. The range of spacing between quotations is insufficient for answering, for example, the question of how astronomical terminology varies over a timescale of less than, say, 50 years or more (although the coverage is quite adequate for modern terms). The subtleties of the changes in the astronomical lexicon really need a specialized dictionary based on historical principles which has more space to devote to a denser coverage of the corpus. For this a dedicated *Historical Dictionary of Astronomy (HDA)* is needed.

4. An Astronomical Corpus in English

Before a historical dictionary can be even considered, a corpus of quotations illustrative of all known words and senses is required; the compilation of such a corpus from the entire range of printed matter in the English language pertaining to astronomy will require an effort even greater than writing the *AHD* itself.

Apart from astronomical publications as such, astronomical vocabulary occurs in a wide range of other publications (works of literature, navigational treatises, newspaper reports, historical works, etc.). All of this needs to be scanned and quotations recorded for all types of usages of all astronomical terms. This is clearly a long-term goal, and the writing of the *HDA* cannot await its completion. There are two methods of working towards overall representativeness of the corpus. First there is the systematically thorough reading programme. This is the surest way of building a representative corpus, but it is also the most time-consuming and is better treated as a long-term project aimed at completing an already existing corpus. The second method is to sample current journals and books for synchronic vocabulary and to complement this by a judicious sampling of the literature of past centuries. For historical and some modern astronomical vocabulary, *OED2* already provides a very useful database³.

The *preliminary* task of identifying a representative subset of the astronomical lexicon is to compile a wordbase from other astronomical dictionaries (and the *OED* for obsolete terms). However, this will yield only a subset of the true lexicon and, without further research, would look (and rightly!) like mere plagiarism (see Landau 1989 for an instructive history of English lexicography).

5. HDA Entries

The *HDA* should aim to *describe* the entire English lexicon of relevance to astronomy, from its very earliest beginnings to the present rather than *prescribing* rules for “correct” usage. It should also be diachronic rather than synchronic. Above all, the *HDA* should give *concise* definitions, including only such information as is necessary for the strict purposes of definition. Our knowledge of astronomical phenomena is constantly evolving; ideas that seem perfectly clear and obvious to us today may well be totally overturned tomorrow. A historical dictionary indicates past examples of such vocabulary changes reflecting “paradigm shifts” (Kuhn 1970) by tagging past senses as obsolete where necessary and recording all instances of sense changes and multiple meanings (“polysemy”). The *HDA* should be designed to appeal to a very wide range of users, from the student of literature puzzled by a poetical reference to, say, *Astraea’s diadem* to the professional astronomer who wishes to jog his memory on the meaning of, say, *Swan band*. Historians of astronomy would certainly benefit from an exhaustive catalogue of obsolete words and senses in their constant vigilance against committing that most embarrassing of historical errors, the anachronism. A record of astronomical usage through the centuries will also provide historians with a valuable chronology of the scientific ideas reflected in the words and senses recorded. The *HDA* should provide authoritative information of the first recorded use of every word and sense in the astronomical lexicon.

³As a by-product of my work as *OED* Astronomy Adviser I have also started my own astronomical corpus, which now amounts to several thousand entries. This has necessarily been built nodally while treating *OED* entries in alphabetical sequence; however, I have also begun a reading programme with the recently published correspondence of John Flamsteed (see Forbes et al. 1996, 1997). Already, this reading programme has resulted in some interesting ante-datings of *OED2* entries.

In general, *HDA* entries should have: i) a highlighted headword; ii) a grammatical function label; iii) an International Phonetic Alphabet pronunciation guide (perhaps both British and American); iv) pertinent etymological information; v) an indication of currency of use; vi) (for modern terms) an indication of whether the term is IAU (or similarly) approved; vii) a subject label, especially where the usage is relevant to other fields, such as geology, navigation, literature, etc.; viii) one definition per sense; ix) highlighting of terms cross-referenced elsewhere in the dictionary; x) illustrative quotations (at least one per decade, with greater density of coverage for the modern period); xi) tagging of earliest known occurrence; xii) line drawings where these aid comprehensibility, and xiii) appendices of tables containing information on present and past nomenclature systems for planets, stars, nebulae, galaxies, etc. Entries would be arranged alphanumerically, probably according to a system that is both case and font sensitive (to allow for commonly used mathematical symbols and variables), and there should be a thesaurus to indicate interrelations among the entries.

6. Some Working Rules for Historical Astrolexicography

When drafting definitions for a diachronic dictionary of astronomy, the most fundamental rule is to define strictly according to the evidence provided in the quotations. We are interested in how astronomers (and others) *use* the astronomical lexicon, not in how they *think* a given term *should* be used. Hence, *major planet* will be found to mean either one of the four gas giants or any one of the nine principal planets. Individual astronomers may have their own ideas on what the term *ought* to mean, but the evidence (and I have plenty) indicates that both the meanings just given are in current use in astronomical publications. Similarly, three definitions may be derived for such an apparently straightforward term as *astronomical unit*: i) the mean distance of the Earth from the Sun, ii) by dynamical arguments, a value equal to 1.00000003 times the mean distance of the Earth from the Sun, and iii) any other physical unit of measurement (mass, etc.) used in astronomy as a standard quantity.

All quotations must be carefully checked against original copies on paper. Of course, all quotations would need to be keyed into an electronic database for ease of manipulation, and of course the computer keyboard is the best place to start looking for quotation sources, especially in recent research papers. The news of progress in the project to scan historical astronomical literature for access on the ADS (Eichhorn & Kurtz 1998) is most welcome and will be of great assistance to astrolexicographers. Nevertheless, the white slip continues to play a unique role in historical lexicography. Verified hand copying according to well defined editorial rules will also ensure homogeneity of treatment of the entire corpus (which, I repeat, would definitely need to be computerized).

Implicit in all that has been said so far is the need for collections of early books, journals and, especially for very early material, either manuscripts or reliable modern editions of pre-twentieth century works. Modern compilations of historical material need to be examined critically for editorial “improvement” of the original for the modern reader’s supposed benefit (the Victorians were great “improvers” in this respect). If, say, Flamsteed is cited, it is preferable to raise the quotation directly from a source that reflects his original spelling

and punctuation rather than a more recent, polished version; in this respect the recent publication of Flamsteed's entire correspondence by Forbes et al. (1996, 1997) is an extremely valuable lexicographical resource (not to mention its even greater historical worth). Much of the correspondence of English astronomers of the 15th and 16th centuries is still unpublished and contains valuable lexicographical information. It is vital, from all points of view, that this material be efficiently and safely archived for future use. Apart from *OED2*, there is little information on how language has been used by scientists in general and on how their use of language has shaped their approach to science. Astronomy is the ideal science for such a study since it has been a recognizable discipline for more than two millenia, whereas physics and chemistry, became recognizable in their modern guise a mere four or five centuries ago. Astronomy was already a fully-fledged science while the English language was evolving from its Anglo-Saxon and medieval French roots to become today's *lingua franca* of world science. The English astronomical lexicon is therefore the ideal candidate for a dedicated dictionary of astronomy based on historical principles. Apart from the scholarly interest of such a work it would also serve as a solid foundation on which to base all future discussions on terminology and nomenclature.

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