## **Eruditio interest – scholarship matters**

The (neo-)latinate legacy in scholarly historical dictionaries of west-european vernaculars in the modern era.

I am speaking to you this evening as a non-European ex-lexicographer and digital alien, speaking in English with a deal to say about Latin, and addressing (in the main) practising European lexicographers who are necessarily digital immigrants, if not natives. So I approach my role with due caution. I should like to raise questions, make observations, and put forward some suggestions. My talk falls into two parts: the first, more by way of a lecture to set the context by giving background information; the second, more of a seminar to discuss matters arising in concrete detail.

First, the lecture. Let me approach my topic from three angles. First, for me, with what is known as my upside-down view of the world map, Europe is the antipodes. It appears as a small distant north-western appendage on the vast continent of Asia, as an entity, if not a unity. Propinguity has meant that cultural encounter and exchange is constant and ongoing. I am as much interested in what is common to (western) Europe as in what is diverse within Europe, certainly in terms of culture, language and lexicography. This has determined my choice of topic. In those terms any competence I can claim is limited and mixed, so bear with me if I have to restrict myself to modern Germanic and Romance standard languages in western Europe and their traditions of historical scholarly lexicography with particular reference to English, German and French. Very regrettably, I have to leave aside encyclopedias, which I regard as an integral and vital part of historical scholarly lexicography, and concentrate on dictionaries of language. Historical dictionaries are cultural artefacts that tell history through words. I know that there is much more to European cultures, languages and lexicographies than that. I am conscious, for example, that there are seemingly infinite different types of dictionaries, that Norway has two standard languages, Nynorsk and Bokmål, and that in Spain Catalan must be distinguished from Castilian. A comprehensive historical dictionary of modern English must needs be much more than a dictionary of the language of England or indeed Britain, and fortunately the Oxford English Dictionary online or OED<sup>3</sup> now incorporates as a matter of course at least what might be called the first-language Englishes of many nations – the question of the so-called new Englishes rather remains open. Modern standard German is pluricentric with three main geopolitical centres in German-speaking Switzerland, Austria and present-day Germany. I emphasise the attribute **present-day** to acknowledge the complex and ever-changing political landscape of "Germany" in the New High German period. A comprehensive historical dictionary of modern standard German is therefore necessarily an international undertaking. In this context it bears mention that the first edition of Grimms' DWB was first published in Leipzig by a Swiss, that later, for example, Moriz Heyne in Basle and Viktor Dollmayr in Vienna worked on it, and that both the first edition and the new edition survived the split between East and West Germany along with another important historical dictionary, the Goethe-Wörterbuch.

Second, I am not a practising lexicographer, but I believe I am familiar enough with the triple nightmare of space, time and money that haunted the leading editor of the first edition of the OED, James Murray, and that usefully sums up the main external constraints placed on lexicographers. From my observations, the conflict between lexicographers seeking to set and maintain scholarly standards on the one hand and publishers interested in (tangible) commercial returns or managers focussed on (speedy) outcomes on the other hand has been and is inevitable. All the evidence indicates that precise planning of large reference works in advance, for instance, is subject to so many imponderables as to be unrealistic or impossible.

In European historical lexicography there are few, if any, exceptions to this rule. I will spare you details. Accounts such as the biography of James Murray caught in the web of words provide an object lesson and should, I suggest, be compulsory reading for all concerned. There is no way of telling in advance what personnel changes there might be, what particular problems the source materials might throw up, or what particular difficulties individual lexical items might confront the lexicographer with once editorial work begins. It is incumbent on lexicographers to set realistic time lines and goals and to review progress regularly. It is incumbent on publishers and managers to be equally realistic and not to make unreasonable demands or unwarranted criticism. If they want standards maintained but progress speeded up, for instance, they must first and foremost train and appoint more lexicographers and / or concentrate staff resources on but a few major projects rather than spreading them thinly over a greater number. In this context, comparisons between different west-european dictionary projects can be instructive: the (large) number of lexicographers and others who worked on the TLF, for instance, or who are working on the OED online and in institutes in Nancy and Leiden compares markedly with the (small) number of lexicographers working, for instance, on the new edition of the DWB. Given the quality of the work and the sheer amount of material covered, the progress of the DWB commands respect in my view. People power is the key here; not, I am convinced, the computer.

Which brings me to my third approach. I am a digital alien to use a current expression, with no hope of becoming a digital immigrant and no intention of ever trying to be a digital native. Nonetheless, I am in absolutely no doubt that the computer has opened up entirely new possibilities both for lexicographers, including those writing scholarly historical dictionaries, and for the users of such dictionaries, at least in their digital or (retro)digitised versions, on CD or DVD or especially online on the internet. These users have much more varied and sophisticated access to the lexicographical data, which can now be updated regularly across the alphabet. I am a convinced advocate of e-dictionaries, especially as many now feature in websites that offer a great deal more than just the dictionary text itself and especially if they offer a flexible printing option. It is an absolute boon, to mention but a few examples of outstanding dictionaries, to have desktop access to The Century Dictionary Online or the OED and not to have to use the beautiful, but wrist-breaking printed tomes. The same holds good of the online TLFi and WNT and their Scandinavian counterparts, and the first edition of Grimms' DWB. By the same token, I am both frustrated by and incredulous at the lack of digitised versions of two indispensable historical dictionaries of modern standard German, the new edition of Grimms' DWB and Deutsches Fremdwörterbuch DFWB, and I still seem to be largely dependent on printed historical and / or etymological dictionaries of modern Italian and Spanish. In short, online access, preferably open access, to websites incorporating historical scholarly dictionaries of european standard languages must be a given today, that seems to me to be incontrovertible. Equally, however, computerphoria seems to me to be misplaced: many questions remain. Rapid change and planned obsolescence are features of

our digital age, as are international charters and conferences on the long-term preservation of digital heritage. Sixteenth century dictionaries are still available today five centuries later as an integral part of historical lexicography: what of today's dictionaries even fifty years hence? Electronic text corpora can provide masses of basic material and sophisticated sorting procedures, more than enough to submerge even the most workaholic lexicographer: what about meaning- or word-class-related filters, directed reading programmes and supplementary extra-corpus material? Electronic editorial templates provide a means to and a check on overall consistency: do they risk becoming procrustean straitjackets? The list of questions could easily be expanded. Of the many potential benefits of e-lexicography let me mention but one notable positive here: space no longer needs to be a nightmare. In telling history through words, historical e-dictionaries can and should in my view move away from extremely condensed text riddled with abbreviations and symbols towards discursive treatment in full sentences with a degree of redundancy to make the text more explicit and hence more reader-, yes: reader-friendly, for example, by explaining semantic distinctions and shifts in words rather than relying so heavily on numbers, letters, commas and semicolons and the like. In short, they should spell things out in plain language and eschew lexicographese: advanced learner dictionaries (of English) provide object lessons in this respect. I note in this context that the literature on the applications and possibilities of computer technology in lexicography far outweighs that on the art and craft of lexicographers. I note further that at both national and supranational level (government) funding for computer-based networks, systems and projects and for IT specialists, even for updated hardware, seems to be much more readily available than salaries for lexicographers. I consider that to be mistaken and that such funding should be invested first and foremost in lexicographers. For – and remember it is historical scholarly lexicography that is under discussion here – it is humans, i.e. historical scholars, who write dictionaries and it is humans who use or even read them. That has been and is the case, regardless of whether the work first appears in print form or is digital from the outset, and it will remain the case. Computers can assist the lexicographers and enhance their work in many ways; they cannot replace them nor can they, in my view, usefully accelerate their work in what really matters. Which is what? What matters? What is the standard that is not only a means to an end - as arguably the many technical standards currently being discussed are – but also the essential end in itself? In my view, what matters is scholarship.

Which is the main title of my talk: **Eruditio interest – scholarship matters**. Even a reductionist attempt to define scholarship is clearly fraught with difficulty, but an idealised historical lexicographer-cum-scholar must obviously have – inter alia and at the very least – a profound linguistic and textual knowledge of the language being documented, an ability to understand texts in their historical context and to analyse the meaning or function of lexical items as used in context, an ability to synthesise the results (of perhaps hundreds of individual analyses) through generalisation and abstraction and to formulate them in a way that is both accurate, i.e. reflects actual usage, and user- or reader-friendly, i.e. is comprehensible to the user / reader. S/he must have encyclopedic or world knowledge and literary skills in order to understand general content words and explain their meaning and their semantic shifts perhaps over many centuries, and technical expertise to understand specialist terms (in many different disciplines and fields) and define their use in specific contexts, again perhaps over time. In respect of etymology – the tracing of the origin and history of lexical items – s/he must not only have knowledge of older stages of the language and an ability to reconstruct unattested forms, but also knowledge of the other languages that have impacted on the language being documented, or at least familiarity with the scholarly historical dictionaries of those

languages. I return to this last point later. That is a tall order indeed, impossibly tall for any one person today given today's demands on and expectations of lexicographers. Teams which include specialists in different areas or at least have access to consultants in such areas alongside generalists are needed if scholarly standards are to be met. The standard of scholarship is primarily a factor of the number and range as well as the knowledge and experience of the lexicographers, as is in large measure the pace of production. In this regard, it cannot be emphasised enough that scholarly historical lexicography of high quality is and will remain very time consuming. The more primary and secondary material it is based on, the better its quality, but the longer it will take. Time remains and will remain a nightmare.

I have formulated my main title in Latin and in English. One reason is that the cultural encounter between Latin and the vernaculars (of western Europe) is the major focus of my talk. Another is the profound and ongoing influence of Latin on such vernaculars: if **one** language had to be nominated as **the** dominant donor language to modern west-european vernaculars, it would have to be Latin. A third is that English now seems, first, to be assuming some of the *lingua franca* roles once played by Latin, certainly as the language of science and academe. English has become, second, a major donor language in Europe and elsewhere: anglicisms, including latinate anglicisms, have become a prominent and at times contested feature of present-day european vocabularies. Indeed, English has become as multi-headed a hydra as Latin once was, and it is now current and appropriate to talk about the English languages or use the plural Englishes. This development has been recent and rapid; Latin on the other hand has developed its many guises over millennia.

Let me comment on two issues that arise here. The first comment is brief. It concerns the spate of books aimed at the educated public that have recently appeared in different languages on Latin, its history and its status. This surely reflects a widespread recent decline in the learning and teaching of classical Latin – let alone classical Greek – at all levels of education: no longer can a classical education be assumed, even amongst academics in the widest sense. Hence the recent advocacy and the need for such advocacy of Latin, particularly but not exclusively of classical Latin. Hence also warnings about the poor knowledge of Latin leading even to serious mistakes and misinterpretations among scholars. The point is well made and must be taken.

The second comment is not brief. It goes to the heart of the matter I want to discuss, which I have tried to sum up in my subtitle: The (neo-)latinate legacy in scholarly historical dictionaries of west-european vernaculars in the modern era. It begins with the axiom or truism that the study of Latin influence on or latinisms in modern west-european vernaculars has been and is extensive and intensive. I should speak of classicisms rather than latinisms here in order to allow for the demonstrated and pervasive influence of classical Greek, directly on classical Latin in antiquity and in the modern era mediated and transmitted predominately through Latin, quite particularly through Neolatin. Present-day vernaculars have immediate access to classical Greek as a source especially of word-formation items, including those not represented or mediated by Neolatin as such. These items are usually, and rightly, termed neoclassical. Nonetheless, I prefer to retain neolatinate here to emphasise the role of Latin and particularly Neolatin. As to Neolatin, I accept the current broad definition of the International Association for Neo-Latin Studies IANLS: "writings in Latin since the beginnings of Humanism". In Italy this relates to the age of Dante and Petrarch in the fourteenth century; in other regions Humanism and Neolatin followed sooner or later. In respect of the modern era I see the middle of the fifteenth century as a watershed marked *inter*  alia by the introduction of printing, the fall of Constantinople with the concomitant migration of Greek scholars from the eastern Empire to the Latin west, followed by the Renaissance and Reformation. If I were engaged on a comprehensive study of classicisms in (west-)european vernaculars in the modern era – or writing a scholarly historical dictionary of or including such classicisms – I would want to cover the five centuries from 1450 / 1500 to 1950 / 2000. It is only the classicisms of this period that are considered here.

Neolatin was a pan-european phenomenon. It was the dominant language of European scholars in the Republic of Letters until the late seventeenth century and in many cases well beyond that. It must be differentiated from written medieval Latin – as opposed to spoken vulgar Latin as the precursor of the Romance languages –, but the break does not seem to have been as great as is sometimes suggested: Neolatin continues a tradition of graecisms, neologisms and vernacularisms that marked learned and scientific vocabulary in medieval Latin. There was also much interaction between the vernaculars and Latin with works being translated in both directions and vernacular traditions continuing and developing alongside Latin in learned usage, for example, in medicine in English. Similarly, the study of Neolatin is a pan-european phenomenon. To a non-neolatinist it appears as a comparatively recent and rather diffuse field of study which is difficult to oversee and is now served in addition to individual studies inter alia by an international association which holds triennial international congresses, university departments, institutes and centres, informed and informative companions and surveys, specialised periodicals and databases, most of which are situated in different European countries. Neolatin studies seem to date to have focused primarily on the edition and analysis of literary texts; the lexicological and lexicographical documentation and description of Neolatin vocabulary or vocabularies does not appear to be very advanced as yet. In this respect classical Latin and medieval Latin have much longer traditions with international support and are hence better served in comparison. Writing in 2001 about the importance of Greek in the coining of new words in the sciences in the Neolatin period, Hans Helander sums up as follows:

Thus, what is traditionally called 'scientific Latin' will on closer examination turn out to be 'Latin' words formed on Greek word elements. There are so far very few investigations into this world of neologisms [...] The best dictionary in this field is actually the *Oxford English Dictionary*, which will usually supply us very generously with etymologies, semantic distinctions and first occurrences of *termini technici*; it is true that the entries are English words, but the normal background, up to the beginning of the 18th century, will be that the word was coined as a purely 'Latin' word (from Latin or Greek morphemes) which then some time afterwards

appeared as an English word in the English literature. The elucidation of the growth of Latin vocabulary in scientific and learned texts should be seen as one of the most important areas of Neo-Latin philology. In general, it must be said that the investigation of the learned discourse in factual literature, e.g. in the dissertational academic prose, is one of the most interesting and urgent tasks.

I should like to pick up on two points in Helander's summary. First: elucidation of the growth of Latin vocabulary in scientific and learned texts (notably up to the beginning of the 18th century) indeed remains important to Neolatin philology. Equally, however, elucidation of the growth of latinate vocabulary in scientific and learned texts (from the beginning of the 18th century at the very latest and preferably or essentially from the middle of the 15th century!) is one of the most important areas of vernacular philology in western Europe. West-european scholars now very seldom write in Latin, they use their vernacular and in some domains increasingly use English. And not only do they tap into the seemingly inexhaustible lexical resources of Neolatin, deriving ultimately from classical Latin and Greek, but they also have recourse directly to classical Latin and Greek in developing vocabularies, terminologies and

nomenclatures. All these resources are now available to them in the vernaculars, as many lexical transfers or borrowings indicate. In addition, wide-spread vernacular word-formation on a (neo-)latinate basis and the ready transfer of lexical items so formed between vernaculars are two pervasive features of modern scientific and scholarly discourse and a major reflection of ongoing cultural encounter and exchange between the different scientific and scholarly communities. Allow me to use the tags Eurolatin and euroclassicisms to sum up these phenomena. West-european communities have very different traditions in their treatment of euroclassicisms. I cannot elaborate further here, but must note, first, that the different historical scholarly dictionaries both influence and are influenced by these traditions; and, second, that many classicisms originate in languages for special purposes LSP, especially the languages of the sciences, medicine and other academic idioms. While many may have become part and parcel of general parlance and many others may have become integrated into educated usage, many others again have remained restricted to LSP and to academic use. This too varies from one language community to another: lexicographical variation is an inevitable concomitant. I return to this issue.

The second point concerns the supply of etymologies, semantic distinctions and first occurrences of termini technici. I should like to examine more closely the supply particularly of etymologies, not just in the OED but in a range of west-european scholarly dictionaries. Ideally, in my view, etymology should cover both the origin and the history of lexical items, considering both their immediate origin or provenance and their ultimate source and, where relevant, intermediary steps. It should be meaning-related so that the different meanings of polysemous items are etymologised individually. It should consider, as integral to the history especially of lexemes, signifiant-related word families and signifié-related word fields, including, where relevant, lexemes proposed or introduced as substitutes for classicisms deemed to be foreignisms. In respect of euroclassicisms etymology is necessarily a european endeavour. If we look only at the chronologically first meaning attested of an item, a classicism or (neo-)latinism in German, for example, might derive from classical Greek, in which case Latin, including Neolatin, is a likely intermediary; it might be transferred from Latin, classical, medieval or Neolatin; it might be transferred from one of the modern vernaculars, in this case perhaps French or English in particular; or it might be coined as a neologism in German on a (neo-)latinate basis. What applies to German applies equally to most other west-european vernaculars, except that the modern donor languages will differ as the case may be. I simply take it as axiomatic that all such items in general or educated usage will be entered and etymologised in scholarly historical dictionaries, regardless of whether they originated as technical terms. More problematic are items which originate and largely remain as technical terms in different fields. The use of largely here hints at the problem of setting limits: each dictionary will doubtless have a different policy on what and how much to include from the scientific and technical periphery of vernacular lexis.

There would seem to be two main issues facing lexicographers in respect of latinate or neoclassical technical terms: which should be entered and how should they be etymologised? History provides lessons, as so often, and I take instruction from the history of Englishlanguage scholarly lexicography. On the first issue Dwight Whitney, writing in 1889 in the preface to *The Century Dictionary*, made the case as follows (p. vi) – and in my view his arguments carry even more weight in the 21st century, especially if we add mention of the biological or life sciences:

Another notable increase in the vocabulary [included in the dictionary] is that due to the admission of the many terms which have come into existence during the present century – especially during the last twenty years – in connection with the advance in all departments of knowledge and labor, scientific, artistic, professional, mechanical, and practical. This increase is nowhere more conspicuous than in the language of the physical sciences, and of those departments of study, such as archaeology, which are concerned with the life and customs of the past. Not only have English words been coined in astonishing numbers, but many words of foreign origin or form, especially New Latin and French, have been imported for real or imaginary needs. To consign these terms to special glossaries is unduly to restrict the dictionary at the point at which it comes into the closest contact with what is vital and interesting in contemporary thought and life; it is also practically impossible, for this technical language is, in numberless instances, too closely interwoven with common speech to be dissevered from it. A similar increase is noticeable in the language of the mechanical arts and trades. The progress of invention has brought nearly as great a flood of new words and senses as has the progress of science. To exclude this language of the shop and the market from a general English dictionary is as undesirable as to exclude that of science, and for similar reasons. Both these lines of development have therefore been recorded with great fullness.

The second issue concerns etymology. In what follows, I concentrate on etymology in a narrow sense, on the origin of lexical items. Historical dictionaries have traditionally focused as a matter of course on the history of items, including, where appropriate, recording movement away from the periphery towards or to the centre of lexis. Is it important to establish authorship (*paternité*), i.e. to establish who coined a particular item in which vernacular, which will obviously predetermine the etymological classification of the item in other vernaculars? James Murray, like Whitney writing in the 1880s, recognised the problem, but had his doubts. After discussing the (avowedly questionable) identification of main words as naturals, denizens, aliens and casuals and distinguishing between the (popular) adoption and (learned) adaptation of borrowed items in terms of morphology, he introduced a further etymological category, modern formation (OED¹: General Explanations, p. xxxi):

Much of the terminology of modern science is identical, or as nearly so as the forms of the languages permit, in English and French, in English, French, and German, or sometimes even in most of the European languages. It would often be as difficult as useless to ascertain in which language a particular scientific term first appeared in print, this being, linguistically, a mere accident: the word was accepted as common property from the beginning. In such cases, *modern formation* (mod. f.) is employed to intimate that it is uncertain in what modern language, English or continental, the word was first used; it may indeed have occurred first in some modern Latin work, either of English or foreign authorship.

Philip B. Gove, editor in chief of *Webster's Third New International Dictionary* W<sup>3</sup> and inheritor of a rich tradition of encyclopedic dictionaries from *The Imperial Dictionary* of Ogilvie and Annandale to *The Century Dictionary* of Whitney (and his principal etymologist Charles Scott) and earlier editions of *Webster*, had a slightly different take on the issue in the 1960s. In his instructions on etymology in W<sup>3</sup> he introduced the category International Scientific Vocabulary ISV, the brainchild of his chief etymologist Charles Sleeth:

A very large body of scientific vocabulary found in English circulates freely also in French and German or both; at a slightly greater cultural distance, Italian, Spanish, Russian, Swedish, and occasionally other languages enter the picture. Scientific terms, and their compounds and derivatives, flow back and forth across language boundaries, constituting an *international scientific vocabulary* which we will find it necessary in 3d ed to recognize explicitly, by the abbreviation ISV. This abbreviation is to be used in 3d ed etys as a language label, in most respects on a par with any other language label, whenever it is convenient and accurate.

Detailed instructions follow, including a differentiation between ISV and the label NL, the abbreviation for New Latin or Neolatin, first introduced by the German romanist August Mahn in the 1864 edition and expanded in use by the chief etymologist of the 1909 edition, Edward Sheldon.

No word that can be regarded as borrowed unchanged from New Latin is to be given an ISV ety. Although New Latin is an international scientific vocabulary, it is distinct from our ISV (most notably in that its spelling is uniform among natives of all vernaculars). Do not use ISV when NL will serve.

Gove entered very many terms from science, medicine and technology, more indeed than Murray or Whitney. Each of them lemmatised latinate word-formation items as a matter of course alongside lexemes, an essential policy in this area. Like Murray, Gove introduced a compromise in respect of etymological description in terms of origin or authorship. Both compromises were plausible in my view, certainly for their time: they recognised problems and set standards. But what about the 21st century? Does authorship in a more precise sense matter? I think it does, certainly in an era when the sciences and medicine – perhaps the field where science and society interact most directly – have such a very marked impact on the wider community and when laypeople inevitably have difficulty understanding specialist terminology in particular or, more generally, technical terms that have moved from the periphery to or towards the centre of lexis. Explanation is needed, and I believe there is a case for more lexicographical attention now being paid to the (scientific) periphery rather than the (common) centre of lexis, where updating might suffice. This is, of course, at the same time a strong plea for encyclopedic dictionaries, encyclopedic in both the inclusion and the description of lexical items. If a dictionary includes etymologies, and in my view scholarly historical dictionaries must as a matter of course, then on principle the etymology of each and every lexical item entered matters equally, regardless of whether it is (originally) a scientific. medical, theological, philosophical, literary or other item. It may be a detail, but then dictionaries are by their nature composed of a myriad of such details, and a good scholarly dictionary gets as many details as possible right. The ubiquitous devil is in such detail, scholarship in lexicography is exorcism. It must be evident that the european latinate or (neo-)classical lexis of interest here raises questions not necessarily answered by an electronic text corpus of any one vernacular, however comprehensive or representative, nor indeed by lexicographers working on any one vernacular. The questions require other answers. One might be found in the findings of non-lexicographical scholars, namely linguists, philologists, literary historians or historians of science and culture, working on original historical sources. often across languages. The current revision of the OED, for instance, not only stands in a lexicographical tradition very sensitive to the issue, but also benefits palpably from the contributions to the study of early modern English lexis made by Jürgen Schäfer und Rod McConchie, to name but two such scholars. For its part the new edition of the DWB cannot benefit from such a tradition, but it does have at its disposal a wealth of secondary literature on words and word histories in addition to its basic textual material. The same must be true of similar lexicographical projects elsewhere. The ongoing etymological work on French and other romance languages in Nancy, in particular, is setting high standards of etymological scholarship. Another answer might be found in institutionalised west- or pan-european cooperation between scholars, namely lexicographers and etymologists, specialising in the origin and history of (neo-)latinate vernacular lexis, both as an integral part of scholarly historical lexicography on the one hand and as a contribution such lexicography can legitimately make to the intellectual, cultural and scientific history of (western) Europe in the modern era on the other. The scholarly lexicography of both classical and medieval Latin is currently international in character and is supported by international advisory bodies. Something similar is advisable, in my view, for the lexicographical documentation and description both of Neolatin and of the (neo-)latinate heritage in european vernaculars. A (west-)european cooperative or association of vernacular etymologists, classicists and neolatinists together with historians of science and medicine working with consultants and

supranationally, be it in person or virtually, might perhaps be a fruitful way forward towards future standards of etymological description in scholarly historical lexicography?

This brings me to the second part of my talk, the seminar. To put these issues into sharper focus, I should like to look at a very few such items as type cases and discuss how they are presented in a number of current scholarly dictionaries of west-european vernaculars. It is a question of establishing their origin or authorship (*paternité*) in one vernacular and hence determining their etymological category in others. The items are – in their English form – *alcoholism, centrifugal* and *centripetal*; the dictionaries are those listed in the dictionary dossier handed out.