Part I

Theory and the English writing system
English among the writing systems of the world

Richard Sproat

I am reminded at this point of a fellow I used to know whose name was Henry, only to give you an idea of what an individualist he was he spelt it <HEN3RY>. The 3 was silent, you see. Tom Lehrer

Introduction

Tom Lehrer was of course being silly when he used the introduction quoted above to his song ‘We will all go together when we go’, yet at the same time the joke would hardly have been possible were it not for the vagaries of English orthography. While no standard English word (such as one would find in a dictionary) includes numerals, there are many cases of words where a ‘silent’ letter has been inserted for one reason or another. A famous case is debt, originally spelled <dette> or <dete>, where <b> was introduced for etymological reasons (Latin debitum) certainly by the sixteenth century. After this the spelling with the <b> became standard, and English orthography happily accommodated this purely etymological ‘silent’ addition. Another example is island, from Old English īegland, with an <s> introduced on false analogy with isle (from Latin insula), with which island is completely unrelated. Johnson ensured the survival of <debt> by including it in his Dictionary of the English Language (1755). (Interestingly, he incorrectly gives the etymology of island as coming from Latin insula.)

These are some of the many aspects of English orthography that conspire to make it one of the most complicated modern writing systems. How does one classify such a system among the writing systems of the world?

In this chapter we will examine some of the proposals for where English falls in the typology of writing systems. But in order to do that, we first need to examine some proposals for the taxonomy of writing systems in general, and it is to that topic that we first turn.

Taxonomies of writing systems

One issue that it would be useful for the reader to bear in mind at the outset is the fact that a writing system for a language is designed or adapted, usually by native, but in any case
competent speakers of a language, in order to be used by native or competent speakers of that language. A writing system is not a system of phonetic transcription: rather it is a way to represent the words of the language. In this much, Chomsky and Halle (1968 – see below) were correct. Always this will involve some representation of the pronunciation, but that representation is not required to be regular, though of course regularity can often make the task of learning the system easier. But no matter how English orthography ends up being classified, it is no less ‘natural’ than other more seemingly regular systems.

For centuries scholars have been trying to make sense of the differences between how writing systems encode information. Bishop Wilkins in his Essay Towards a Real Character; and a Philosophical Language (1668) discusses ‘Aethiopic’, which he notes contains 26 consonants and seven vowels, the latter of which are applied ‘to every one of their 26 Consonants’, which along with 20 additional ‘aspirated syllables’ makes for an ‘alphabet’ of 202 units. The system, according to Wilkins, is ‘exceedingly complicated and perplexed’ (p. 14). Antoine Court de Gébelin in his Monde Primitif (1775) declared on the basis of an extensive survey of writing systems known at the time that there were three types of writing in the world, namely Chinese, Egyptian Hieroglyph and alphabetic (p. 399).

It wasn’t until the twentieth century, however, that systematic taxonomies of writing systems were developed. Ignace Gelb, often dubbed the ‘father of grammatology’, presented (1963) a teleological view of writing that saw all writing systems as being on a linear path from pictographic and ‘limited systems’ (into which category he classified Mayan, now known to be full-fledged writing), through ‘word syllabic systems’ (Chinese, Sumerian), through syllabaries and ultimately segmental alphabets. Gelb’s system forced some odd classifications: thus West Semitic abjads (writing systems where the basic characters of the script denote consonants) such as Phoenician were classified as syllabaries largely because he did not have any other category into which to shoehorn them.

Figure 3.1  Taxonomy of writing systems according to Sampson (1985)
Scholars of writing systems since Gelb have tended to take less teleological views, presenting instead classifications that put the various types of writing more on a par. Sampson (1985) and DeFrancis (1989) provide arboreal (or branching) classifications according to the function of the core units of each system.

Thus Sampson, for example, proposed the taxonomy depicted in Figure 3.1. At the top level of the taxonomy systems divide into semasiographic (systems based purely on meaning) and glottographic, those encoding specifically linguistic information, such as representing phonemes, syllables or morphemes.

Sampson’s semasiographic category has always been controversial: DeFrancis (1989) effectively demolishes Sampson’s ‘Yukaghir love letter’ as an example of writing of any kind, showing that it was instead a form of parlor game. But there have been genuine attempts at developing semasiographic systems, the most famous of these being Charles Bliss’s system that has come to be known as Blissymbolics. Rogers (2004) discusses this system, as does Sproat (2009), who notes that brave though the attempt was, Blissymbolics fails a crucial test for being a full writing system: it is impossible to express in Blissymbolics all of the nuances expressible in spoken language, and which are automatically expressible in any glottographic system. Today the main function of Blissymbolics is as a communication aid for children with severe communications deficits associated with intellectual disability or autism (see, again, Sproat 2009 for discussion).

With glottographic systems Sampson is on more solid ground, and here he divides the world into logographic systems, where each symbol represents a morpheme, and phonographic systems where the symbols of the system represent one or another phonological unit ranging from syllables down to phonetic features.

DeFrancis (1989) not only disagrees with Sampson on the existence of semasiographic writing. He also takes issue with the whole notion of logographic systems at one end of the scale (see also DeFrancis and Unger 1994), as well as featural systems at the other. His taxonomy is presented in Figure 3.2.

For DeFrancis all full writing systems are essentially phonological, with the main distinction being between syllabic and segmental systems, and within the latter, consonantal and alphabetic. Consonantal systems (e.g. the writing systems for Arabic or Hebrew) are those systems that are ‘defective’ in that they represent only consonants, or perhaps consonants with a limited amount of vocalic information. But within each basic category there is another distinction: between systems that are ‘pure’ and those that also encode morphological information. For Chinese, for example, many characters are a composite of two pieces, one piece that gives a hint about the pronunciation, and another that gives a hint about the meaning. Thus 橡 xiàng (in its modern Mandarin form) ‘oak’ is composed of two pieces, 木 mù ‘wood, tree’, which is typically used for characters denoting names of trees; and 象 xiàng ‘elephant’, which is used purely for its phonetic value. In this particular instance the semantic and phonetic hints are rather good, but this is by no means representative, and quite often the phonetic hint is quite poor. The reasons for this are several, including the huge phonetic changes in Chinese over the roughly 3500 year history of the script. Nonetheless the fact that over 95 percent of the Chinese characters ever developed are based on this semantic-phonetic construction – as well as the fact that this method for creating new characters was also borrowed into the Chữ Nôm system for Vietnamese (see Sproat 2000) – means that this was apparently considered the normal way to make new characters, which in turn is a powerful argument for DeFrancis’ theory.

Treating Egyptian as ‘morphoconsonantal’ makes a great deal of sense since, like Chinese, there are components of the writing system that clearly relate directly to the meaning of the morphemes being written. On the other hand, classifying English (and Korean) as
‘morphosegmental’ is not as obvious, since here there are no components that have a clear function of indicating the meaning. This issue relates of course directly to the topic of this chapter, and we return at length to it below.

DeFrancis’ neat separation of each phonographic type into ‘pure’ and ‘morpho-’ hints at a further refinement that could be made to taxonomies of writing systems. The problem with arboreal representations such as DeFrancis’ is that the type of phonography, and the existence or not of logography, are really two separate, indeed orthogonal, dimensions. Furthermore, while it usually makes sense to classify a system as basically segmental, basically consonantal, and so forth, logography is really a matter of degree. There are some systems that are heavily logographic, like Chinese. There are others, like Japanese, where a large portion of what one finds written on a page is purely phonographic, but there are still large amounts of logographic information conveyed (on Japanese writing, see Okada, this volume). There are some systems, like Finnish, where the amount of logography is essentially nil. Considerations such as these led Sproat (2000) to propose the planar classification system in Figure 3.3. This system was further modified by Rogers (2004), whose major points of disagreement with Sproat (2000) had to do with the precise divisions of the phonographic dimension.

At one end of the phonographic dimension are the (actually quite rare) full syllabic systems where every syllable of the language has one or more separate symbols to represent it. Much more common are what Sproat termed ‘core syllabic’ systems – developing an observation first noted by Poser – where the basic symbols generally do represent basic syllables (often just V or CV), but where for more complex syllables one must use a combination of symbols. Following the syllabic systems there are various segmental systems ranging from alphabetic, where all or nearly all segments of the language are represented in writing, to consonantal systems where the system basically just represents consonants. Egyptian is separated out as a unique polyconsonantal system – polyconsonantal since many of the signs represent sequences of two or more consonants (with no representation of the vowels). In this, and in
the treatment of *alphasyllabic* systems such as Devanagari, Rogers’ system differs. He does not treat ‘polyconsonantal’ as a separate category, and on the other hand does separate out alphasyllabaries.

As noted above, the logographic dimension is a scale rather than a set of categories. ‘Amount of logography’ is, as noted by Sproat (2000), very impressionistic – but see Penn and Choma (2006) for some interesting proposals on corpus-based ways to estimate it. Writing systems that have a large degree of logography – Chinese, Sumerian, Egyptian, etc. – are placed higher on the logographic scale than, e.g., most West Semitic writing systems, or Greek. On the other hand, some systems whose basic symbols are purely phonetic nonetheless can behave logographically: a good example is *heterograms* in Perso-Aramaic writing systems, a topic we return to below.

Sproat places English at the low end of the logographic scale – which as we shall see differs from where Sampson would have placed English had he adopted a planar taxonomy like Sproat’s.

Having laid out a few different ways to think about writing system classification, we are now ready to address the main question of this chapter: where does English fit?

**Theories of where English falls**

**Preliminaries**

It is no secret that English spelling is quirky and unpredictable. Indeed it probably has the most complicated letter-to-sound correspondence of any language that uses a segmental writing system. In quantitative studies of the complexity of letter-to-sound correspondence among Western European languages, English always tops the list (van den Bosch *et al.* 1994). This quirkiness also shows up in another way, in the difficulty that children have in learning the
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system, compared to any other alphabetic system (Dehaene 2009; see in particular Figure 5.3, p. 231). Its complexity has also manifested itself in innumerable proposals to replace the system by something based more directly on pronunciation. For various reasons, such proposals have never gained a foothold (for more, see Yule and Ishi, this volume).

But what is one to make of this unpredictability and where therefore English belongs in the taxonomy of writing systems just discussed?

Let us start with the obvious observation that the basic elements of English spelling, the letters of the Roman alphabet, were, as originally designed, purely phonographic symbols. Certainly if one traces the letters back via Latin, through Etruscan, Greek and thence to Semitic scripts ending ultimately with the Proto-Sinaitic scripts of roughly 1800 BCE (Daniels and Bright 1996), one finds that the symbols were originally pictographic, with the alpha / alef \( \times \) / \( < \alpha > \) representing an ox head, the beta / beth / \( \bar{a} \) / \( < b > \) representing a house, and so forth. But even there the symbols derived their function via the acrophonic principle – ‘alef (symbol for the glottal stop), being the word for ‘ox’, beth (\( < b > \)) the word for ‘house’, etc. At no time did the symbols have anything to do semantically with what they depicted. This is in marked contrast to all known independently developed ancient writing systems – Egyptian, Sumerian, Chinese and Mayan – where some of the elements were used for their semantic values.

This fact about the original function of the letters would appear to militate against analyzing English as a partly logographic system – as Sampson (1985) argued, see below – and would seem to suggest that the system must be some form of purely phonographic system. If nothing else, English orthography lacks anything corresponding to the semantic radicals that are part of Chinese writing, whereby lexical-semantic properties of morphemes have an explicit (if highly inconsistent) graphical expression. If the system is not logographic, then it surely must be classified as a phonographic system. Yet the original purpose of the symbols that became English letters gives us substantially less insight into the nature of English orthography than one might expect, for two reasons.

First of all, there are logographic systems that involve phonographic symbols in an otherwise phonographic writing system. A clear case of this are so-called heterograms in adaptations of the Aramaic script to Persian languages (Skjærvø 1996). In such cases, an Aramaic spelling for a word may be borrowed – e.g. \( < \text{ŠME} > \) ‘name’ – which is nonetheless to be read as a Persian word \( (\text{nām}) \). Such a system is clearly logographic since the Aramaic spelling is being used to represent a Persian morpheme that has totally different pronunciation from what the spelling suggests. Furthermore, these heterograms may combine with ‘phonetic complements’ which spell grammatical endings. The situation is, of course, highly reminiscent of the Japanese adaptation of Chinese script, with syllabic phonograms (known as \( \text{kana} \)) used for the Japanese grammatical endings. It is also reminiscent of the Assyrian adaptation of Sumerian script, except that here we are dealing not with logographic or morphosyllabic symbols, but with segmental ones. English orthography, of course, has nothing approaching Perso-Aramaic heterograms, but at the same time there is a clear precedent for systems based purely on phonographic symbols to involve some logographic elements.

On the other hand, supposing one wanted to argue that English orthography is purely phonographic. Clearly it cannot be transparently so: the letter–sound correspondence is in no way as regular as in orthographies such as those in Spanish or Finnish. But where does it say that the letter-to-sound correspondence has to be simple? For example, where does it say that the grapheme \( < a > \) must always represent the phoneme /\( a / \) (as it does in Spanish) or that the grapheme \( < p > \) always /\( p / \) ?

Indeed there are at least two sources of complexity in phonographic systems. The first relates to what level of phonological information is represented by the spelling, something
that corresponds roughly to the notion of deep (versus shallow) orthography familiar from psycholinguistic work on reading (Katz and Frost 1992), and something that was formalized in Sproat (2000) as the orthographically relevant level (ORL) of phonological representation. In that work I argued, for example, that the main difference between Russian and Belarusian orthography relates to the level of phonological representation assumed by the two orthographies, with Russian representing a deeper level than Belarusian. If one takes that approach, English spelling insofar as it does not obviously represent surface pronunciations in anything like a consistent way, must have a relatively deep ORL; indeed English is always characterized as a deep orthography in the psycholinguistics literature. But there is a second complication in that one could have a phonographic system that nonetheless admits of some lexical marking. Thus there may be several ways to spell a given sound, which is clear in English with pairs like seen and scene, and one must simply memorize which words take which spelling, with perhaps one spelling being the default. This seems obvious and simple enough, but crucially as we will see below, there is a trade-off between lexical marking and orthographic depth, insofar as one can assume a shallower depth, perhaps at the cost of more lexical marking. In any case, if one wants to assume that English is purely phonographic, there are options open to one.

With these preliminary issues in mind, we now turn to some previous attempts to categorize English orthography. Anticipating the conclusion, we will see that English is best characterized as being partly phonographic and partly logographic.

The taxonomy of English orthography

There have been many descriptions of English spelling. Many of them have focused on developing sets of rules that can characterize the relation between spelling and phonology. Perhaps the best-known example of this is the work of Venezky (1970), who develops a system based on a complex set of ordered rewrite rules from spelling to sound. It is worth noting that the small cottage industry of work on letter-to-sound conversion for speech technology applications largely views the problem as one of inducing the appropriate rules from a set of training examples, though the expression of those rules differs widely depending upon the technique used – see Bisani and Ney (2008) for a recent overview.

But there have been approaches that attempt to shift the burden from the letter-to-sound correspondences to the phonology. Thus, Chomsky and Halle in the Sound Pattern of English (1968 – henceforth SPE) presented what has been probably the most controversial thesis on English orthography, namely that English spelling is a near optimal orthography for English, in that it represents underlying morphophonemic representation. The arguments largely, though not exclusively, center on stress-induced alternations in Latinate morphology, cases like assign versus assignation, the former pronounced /əˈsaɪn/ and the latter /ˌæsɪgˈneɪʃən/, seemingly quite different in their surface forms. Yet if one assumes that the surface pronunciations are derived via phonological rules from something more like /æsign/ and /æsignətʃən/, then the spellings make sense. The surface forms are derived by rules that include reduction of unstressed vowels to schwa, vowel shift, and spirantization of /ty/ to /ʃ/.

Or consider the word nightingale. Chomsky and Halle argue for a general rule of ‘trisyllabic laxing’ whereby a vowel in a syllable third from the end of the word laxes. This explains alternations like opaque /ˈɔːpək/ versus opacity /ˈɔpəsɪti/, where the /ə/ is pronounced as a lax /æ/ in the second case, but not in the first. Yet nightingale has a tense (diphthong) /aʊ/ in the first syllable, which should have by rights become a lax /ə/ by the rule. Is something somehow ‘saving’ the /iː/ from being pronounced with a lax variant? Chomsky and Halle argue that there is, and more specifically that there is a missing phoneme following the /iː/ that is somehow
conspiring to prevent the deletion. Conveniently, they argue, that missing phoneme would appear to be a phoneme that has no surface form in standard English, but is still represented in the orthography as <gh>, namely /x/.

Thus two seemingly quirky and idiosyncratic properties of English, among others, can be explained by arguing that English orthography represents not surface, but underlying phonological representation. And this, argued Chomsky and Halle, is how things should be: orthographies are designed, or at least should be designed, with knowledgeable speakers of the language in mind. They are not intended, for example, to make life easier for second-language learners by representing the superficial pronunciation of words. Rather they are intended to show relationships between words that (putatively) share phonological properties, and are arguably morphologically related. Thus assign / assignation should share the same spelling for the root since they are related, as should electric / electricity despite the fact that in both cases the root portions have different pronunciations in the two forms.

The SPE hypothesis thus makes a direct claim about what type of writing system English is: it is a (segmental) phonographic system, just like Finnish, or Spanish. The only difference is that for Finnish and Spanish, the orthography largely represents surface phonology, whereas for English it represents a more abstract level of phonological representation.

There are, needless to say, so many problems with the SPE hypothesis, that few scholars take it seriously, and the thesis is at this stage largely forgotten, except perhaps as a classic instance of a reductio ad absurdum of an approach. But before examining some of those problems, it is worth noting one reason why the hypothesis is not problematic, namely, that there is nothing a priori silly about the idea that an orthography might represent a somewhat abstract level of representation. The notion of orthographically relevant level argued for by Sproat (2000) makes precisely this claim, and as noted above at least some of what counts as ‘deep’ orthographies in psycholinguistic studies of reading also depends on this assumption. Besides this, there are orthographies where this is obviously true, one such case being Korean (King 1996). Korean tends to be quite consistent in its spelling of morphemes across different derived forms, but the actual surface pronunciation of words is complicated by sometimes regular, and sometimes idiosyncratic morphophonemic changes. For example, the combination of 쫼 <ggae> /kkæ/ ‘sesame’ and 잎 <ip> /ip/ ‘leaf’ yields 쫼잎 ‘sesame leaf, perilla’, written as <kkaesip> but pronounced /kkaenip/. This is an instance of a fairly common nasalization process in compounds, one that is nonetheless hard to predict on the basis of the components of the compound. To take another example, 꽃 <ggoch> /kkot/ ‘flower’ restores the pronunciation of the <ch> in the nominative form 꽃이 <ggochi> /kkoč/i. Under the SPE hypothesis, English would then be just like Korean, except that the relation between the morphophonological forms represented by the spelling, and the surface pronunciation, is more complicated in the case of English.

This said, there are sufficient problems with the hypothesis that it can largely be rejected as a theory of English spelling. As Sampson (1985) notes, while Chomsky and Halle’s principle that roots should retain their spelling in alternative forms, there are many cases where this principle is broken. Thus a pair such as opaque / opacity respells the <c> as <q> in the first case, for no apparent reason. Perhaps the form *<opac> is ill-formed for independent reasons, but it is hard to see what they could be, especially given that English words can certainly end in <c>. Or consider collide / collision, where there is no apparent reason why the <d> should be respelled as <s> in the second word, since collision would surely be a much ‘better’ spelling from SPE’s point of view. Or why is there a change in the spelling of the identical vowel in the two related words speak and speech?

Sampson also discusses experiments by Carol Chomsky (1970), who attempted to find support for the SPE hypothesis as a pedagogical tool. If the hypothesis was on the right track,
then it ought to help children learning to spell English to point out how logical this seemingly illogical system is. Yet as Sampson notes, Carol Chomsky ran into a problem with one seventh-grader who was not able to recognize the relationship between signature and sign, and thus was not able to make use of her hint that he consider signature in understanding how to spell sign. This, strictly speaking, is a problem with morphological awareness rather than a direct problem for the hypothesis about English spelling. Still, the fact the two forms are obviously semantically related, coupled with the SPE hypothesis, would a priori suggest that readers ought to be aware that the forms are related, at least when prompted, something that Carol Chomsky found not to be the case.

Yet another reason for doubting the utility of the SPE hypothesis comes from statistical analysis. In Sproat (2000) I compared two hypotheses, one where English spelling is a representation of an underlying morphophonemic level, and the other where it is a representation of surface pronunciation. I based the analysis on a set of 1169 Latinate forms – the portion of the vocabulary where the SPE hypothesis is most relevant. Surface pronunciations were taken from an online dictionary of American English. SPE-style underlying pronunciations were also constructed. Obviously since the latter were influenced almost by necessity by the spelling, the experiment contained an inherent bias towards the SPE hypothesis. In the technical terminology of Sproat (2000), there were two hypotheses as to the nature of the ORL, the first that it is surface phonology, the second an underlying phonology. Then, for each of the two hypotheses, I computed the complexity of the rules required to predict the spelling from the phonological representation [sic]. The measure of complexity comprised two components: the number of rewrite rules needed; and the number of lexical markings required to override the application of the otherwise exceptionless rules.

The number of rules needed for the shallow hypothesis was somewhat larger (69 versus 58) and the number of lexical markings is much larger (1452 versus 509 lexical marks needed). However more than 40 percent of the 1452 lexical marks have to do with the spelling of schwa, not needed for the deep ORL; for example in the word geophagy, the spelling of the schwa of the second syllable as <a> needs to be marked. This would appear to support a hypothesis that English orthography represents something more abstract than surface pronunciation, but such a hypothesis need not assume such a deep representation as that assumed by SPE: it would suffice merely that vowels be represented in their unreduced forms. Alternations such as the /eɪ/~/æ/ alternation in chaste ~ chastity have little consequence since this only means a few additional rules specifying how to spell surface vowel forms. So on balance, I argued, the statistics provide at best weak support for the SPE hypothesis. And once one notes again that the 1169 examples were from that portion of the vocabulary most relevant to the alternations discussed in SPE – the vast majority of English words do not participate in such alternations – the import of the SPE theory as a general model of English spelling is weakened further.

On balance then the statistics do not strongly support English orthography representing anything nearly as abstract as assumed in SPE. At best one can assume a somewhat abstract phonological representation, with a fair amount of marking of lexical exceptions which even SPE’s abstract representations cannot avoid. For example there is no way to predict the <ph> in photograph from either deep or surface pronunciation, which has an initial /f/, other than marking the word with an ad hoc feature [+Greek].

And it is these lexical markings that are the crux of the matter: English orthography is surely phonographic to a large degree, whichever level of representation one takes it to represent, so the question of where to put it in the taxonomy of the world’s writing systems really comes down to what to do with the unpredictability.
The alternative to focusing solely on how exactly English orthography encodes phonographic information is to propose that, while the orthography is obviously phonographic to a significant extent, it is also partly logographic. This was proposed in Bloomfield and Barnhart (1961: 27), where they ask:

Now someone may ask whether the spelling of knit with k does not serve to distinguish this word from nit ‘the egg of a louse’. Of course it does, and this is exactly where our writing lapses from the alphabetic principle back into the older scheme of word writing. Alphabetic writing, which indicates all the significant speech sounds of each word, is just as clear as actual speech, which means that it is clear enough. Word writing, on the other hand, provides a separate character for each and every word ... Our spelling the verb knit with an extra <k> (and the noun nit without this extra <k>) is a step in the direction of word writing.

Sampson (1985: 203) proposes a similar idea when he suggests:

We may see another kind of method in the apparent madness of our spelling, though, if we avoid letting ourselves be obsessed by the phonographic origins of the Roman alphabet and think of English spelling as at least partly logographic.

Irregular or unpredictable spellings thus become simply a way of encoding the fact that two words that have the same pronunciation are really distinct lexical entries. Thus pairs like Bloomfield and Barnhart’s knit / nit, or knave / nave, knight / night, brake / break, see / sea, and so forth can be motivated by a general desire to keep different words spelled differently. Of course the system is hardly consistent: <crane> spells both the bird and the construction equipment; <bank> a riverbank or a financial institution; <mole> is an animal, or a chemical unit of measurement. And there are also many distinct words that share the same spelling but have different pronunciations: <bass> is either a musical instrument or range (/bæs/) or a fish (/beɪs/); <mole>, again, is either of the above-mentioned meanings (/məl/) or a Mexican sauce (/môl/). The objection that the mechanical crane is etymologically derivable from the bird name and therefore should be spelled the same can be countered by observing that orthographies that have more systematic semasiographic components as part of their logographic system, like Chinese, often will use different semasiographic components in two words even if they are transparently related. Thus in Mandarin, 梨 is either a loquat or a type of lute that looks like a loquat; see Figure 3.4. Even though the words are clearly related, the fruit / tree is written 枇杷 using the tree radical 木 that we saw above, whereas the instrument is written 琵琶 using the double-jade radical 王 commonly used for musical instruments. No such pressures exist in English since the logographic aspect of English is by no means as systematic as it is in Chinese.

Granting that there is something to Bloomfield and Barnhart’s and Sampson’s idea, it is worth noting that such an idea is more easily accommodated to a planar taxonomy of writing systems than it is to Sampson’s arboreal system. In the latter, one must shoehorn English under either logographic, or phonographic systems, neither of which it fits into exactly. In a planar system, on the other hand, every writing system is basically one or another kind of phonographic system, and at the same time has a greater or lesser degree of logography. English merely has more logography than many languages that use an alphabetic script.
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Unpredictability as a key feature of English orthography

English thus appears to be at least partly logographic, which allows one to handle the rather large amount of unpredictability by appealing to lexical marking. This may appear to be a ‘cop-out’: after all, it isn’t really ‘explaining’ anything at any deep level. But the unpredictability exists, and (partly) logographic systems also exist, and since the latter necessarily depend upon the assumption that words or morphemes can be marked for their spelling, calling English orthography partly logographic appeals to a mechanism that is already needed.

In any case whatever the correct characterization of the large unpredictable component of English orthography, there is little question that this unpredictability is seen as a key feature of the system. So key, in fact, that this unpredictability – and in particular the tendency to keep separate lexical items with separate spellings – can be borrowed.

A good example of this is the orthography of Manx Gaelic, discussed in Sproat (2000). Manx, though a Gaelic dialect, had lost contact with the Gaelic literate tradition in Ireland and Scotland that dated back to the Ogham stones of the pre-Christian era and the Roman-based orthography of the Christian era onwards (McManus 1996). An early seventeenth century translation of the Anglican Book of Common Prayer into Manx by the Welsh Bishop Phillips used an orthography partly inspired by Welsh, but for whatever reason this orthography never gained traction. A hundred years later Thomas Wilson, an English bishop, published a Manx–English bilingual edition of his 1707 treatise entitled The Principles and Duties of Christianity. The Manx spelling introduced there, which was heavily based on English, became with some
modification, the standard spelling for Manx from the eighteenth century through the end of the nineteenth, by which point the language had largely died out of common use.\textsuperscript{10}

The characteristics of the orthography are described at greater length in Sproat (2000), including the ways in which English conventions for spelling sounds were adapted to Manx. But what is of interest here is the large number of cases of words that are pronounced the same, or almost the same, and yet have different spellings. For example $<\textit{h}>$ is used widely as a marker that apparently served no phonetic function, but allowed one to distinguish homophones:

\begin{itemize}
  \item \textit{beill} ‘mouths’
  \item \textit{bheill} ‘grind’
  \item \textit{leih} ‘forgiveness’
  \item \textit{lheih} ‘place’
  \item \textit{lott} ‘lot’
  \item \textit{lhott} ‘wound’
  \item \textit{meeley} ‘soft’
  \item \textit{mheeley} ‘mile’
  \item \textit{taal} ‘flow’
  \item \textit{thaal} ‘adze’
  \item \textit{tie} ‘the ill’
  \item \textit{thie} ‘house’
\end{itemize}

This use of $<\textit{h}>$ is not very English-like, and many of the resulting spellings also look odd from an English perspective (though the $<\textit{bh}>$ and $<\textit{mh}>$ sequences are reminiscent of the traditional Gaelic spelling of lenited /b/ and /m/). So the spellings themselves are not English, but what is like English is the idea that words that mean different things ought to be spelled differently even if they sound the same. Or to take another set of words that have the same or similar pronunciations, but different spelling: \textit{leigh} ‘law’, \textit{leih} ‘forgive’, \textit{lheiy} ‘calf’ and \textit{lhiy} ‘colt’. It is hard to think of any reason why Wilson would have introduced these variant spellings for words with identical or very similar pronunciations other than that such a state of affairs was what he was used to from English orthography.

Before my trip to the Isle of Man to conduct research on Manx orthography, I was visiting the University of Liverpool to work with some colleagues there on an unrelated project. I was explaining to my hosts the reason for my interest in Manx orthography, namely that it was a spelling system for a Gaelic dialect that was based on English spelling. I also mentioned that it was highly unpredictable. One of my hosts commented that it made sense that if it was based on English, it should be highly unpredictable.

From one point of view that is a non-sequitur: after all there are common ways of spelling certain sounds in English – /eɪn/ is commonly spelled $<\textit{ane}>$, as in $<\textit{sane}>$, $<\textit{mane}>$ or $<\textit{pane}>$, for example – and anyone basing a new orthography on English could have adopted such spellings in a completely consistent fashion. Manx orthography need not have been unpredictable. But if one views unpredictable spellings as at the heart of English orthography, then my host’s view is eminently sensible: basing an orthography for Manx on English would almost be guaranteed to yield a system that is unpredictable in how it chooses to spell words.

Put another way, anyone familiar with English orthography and using that as a basis for a new spelling system, would not feel compelled to be consistent in how they spell given sounds; in contrast they would feel inclined to invent different ways to spell homophonous words, just to keep them distinct in writing.

The unpredictability of English spelling – the sense in which it is logographic – seems as much a part of the system as the actual letter–sound correspondences. So much so that this unpredictability itself can be borrowed or adapted.
Conclusions

Taxonomies obviously are most difficult to apply to those entities that violate the basic assumptions of the taxonomy. Taxonomies of writing systems have traditionally focused on the main type of unit encoded by the symbols, whether they be morphemes, syllables or segments. The assumption of the taxonomy, then, is that a writing system will fall neatly into one of the predefined bins. But writing systems are not always so cooperative, and English orthography is a good example of this. Calling it segmental because the basic units have a primary function of representing segments is misleading since it ignores the fact that the spellings for so many words must be specified: there is often no way to predict them from the pronunciation. Calling the system logographic also misses the point that there are broad generalizations about letter to sound correspondence of the kinds worked out in detail by Venezky (1970). (One important conclusion of Venezky’s work is that English spelling is far more regular once one includes word position and etymology as features in one’s rules.) It also misses the point that English readers expect a certain degree of regularity between spelling and sound, as the large number of spelling pronunciations discussed by Householder (1971) attest.

So the best we can probably say is that English orthography is a bit segmental, but at the same time a bit logographic. Planar taxonomies that separate logography and phonography onto two dimensions have a better chance of characterizing where English falls among the world’s writing systems, though that is of course only a beginning.

Notes

1 I thank Des Ryan and Vivian Cook for detailed comments on an earlier version of this chapter.
2 The spelling <debt> occurs in a 1549 edition of the Book of Common Prayer, and thus the occasional suggestions one sees to the effect that the spelling may have been invented by Samuel Johnson in the eighteenth century cannot be correct. Thanks to Des Ryan for pointing this out.
3 Interestingly, the phonetically inspired writing system that Wilkins himself designed bore a striking similarity to the way the Ethiopian Ge’ez script works.
4 Note that Court de Gébelin was writing several decades before the true nature of Egyptian writing was known.
5 Even segmental writing systems have their limitations: for example, most do not have standard ways to represent intonational or other phrasal prosodic features. The rare cases where one does find such mechanisms, such as the prosodic notation system of Masoretic Hebrew (Aronoff 2008), typically involve liturgical languages where the purpose is to instruct people, who are often not native speakers of the language in question, in the proper intonation of the text. Such systems are rarely if ever found in orthographic systems used in everyday settings.
6 As I noted in Sproat (2000), one could imagine further dimensions such as the depth of the orthographically relevant level (see below). Further dimensions could include finer-grained distinctions in how phonological properties are encoded: thus Weingarten (2011) in his theory of ‘comparative graphematics’ classifies different writing systems according to how they encode geminate consonants.
7 In an unpublished presentation at the 1992 Linguistic Society of America Meeting.
8 It is unclear which way the relationship goes: was the fruit named after the instrument as claimed on the Chinese Wikipedia page for the fruit (http://zh.wikipedia.org/wiki%E6%9E%87%E6%9D%B7), or was it the other way around? The English Wikipedia page for the instrument (http://en.wikipedia.org/wiki/Pipa) cites the second century AD Dictionary of Names as having枇杷 – the name of the fruit – as one of the spellings of the word for the instrument, suggesting that the instrument name is derived from the fruit name.
9 A few of the same issues were also discussed by Sebba (2007) who seems not to have been aware of my earlier work on the topic.
10 Spoken Manx survived into the first half of the twentieth century before completely dying out as a native tongue. In more recent years, a revival movement has succeeded in resurrecting the language among a small community of enthusiasts.
References


