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English Spelling and Educational Progress

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"...contrairement aux lois phonétiques, les lois graphiques relèvent bien de décisions humaines."
- Nina Catach (1988)
(*... unlike the laws of phonetics, the laws of writing do indeed arise from human decisions.)*

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CONTENTS

0 ABSTRACT

Traditionally English spelling has been noted for its irregularity, but many recent accounts have stressed pattern, rule, regularity and design instead (§2). This paper argues that proper analysis of the synchronic and diachronic evidence shows rather that it is unplanned, phonographically highly inconsistent, and historically, pragmatically and geographically fluid (§3). Its lack of coherent system and its unpredictable deviations from the spelling of other languages are detrimental to its role as a medium of international communication, while for native speakers of English it has proved a serious obstacle to the acquisition of literacy (as has been demonstrated by comparison with the Initial Teaching Alphabet and with languages that have a more regular spelling system), and it is cumbersome and inconvenient for users generally (§4). Previous accounts of English spelling have varied in approach, highlighting specific features, identifying structures and subsystems, or classifying sound-symbol correspondences; but this paper uses functional efficiency as its chief criterion (§5). Patterns of misspelling are seen as the prime indicators of dysfunctionality, and error-analysis suggests that phonographically redundant letters are the prime source of difficulty (§6). Their removal is shown not merely to make the spelling of many English words far more predictable, but it also clarifies stress- patterns and greatly simplifies the rules for representing the morphology of the language; in conclusion the paper advocates renewed pressure for the modernisation of written English (§7).

1. INTRODUCTION: technology, not science.

The purpose of this paper is to suggest a rather different approach to the present spelling of English (traditional orthography, or TO) from that which has been frequently adopted by linguists, educationists and psychologists in recent decades. The analogy of the relation between science and technology may serve to illuminate the difference of approach: where science seeks universal laws of nature, technology seeks to apply them to the design of human artifacts. Science explains the molecular structure of materials, but technology uses the explanations to choose the most appropriate material, its most effective shape and the most economical quantity for the task in hand. In the past 20 years or so scholars have concentrated on interpreting the molecular structure of TO; but spelling is an artifact, subject to stresses and strains, with its own kind of breaking point, and economic factors apply to it as to any other artifact. Johnson (1755) implicitly understood this when he wrote in his dictionary preface that English orthography "has been to this time unsettled and fortuitous... every language has ... its improprieties and absurdities, which it is the duty of the lexicographer to correct..."

2. CHANGING VIEWS

2.1 Before the 1960s.

Before the 1960s descriptions of TO were typically based on an account of its evolution as an explanation for its anomalies. Thus Bodmer's *Loom of Language* (1944) described TO as "chaos" and said. "Pronunciation may change in the course of a hundred years, while writing lags behind for centuries". Similarly, in the chapter 'Sound and Spelling' in Potter's popular paperback *Our Language* (1950, but recently reprinted): as well as treating sound and spelling together, he adopted a historical approach, and listed anomalies, inconsistencies and discrepancies, by which he implicitly meant departures from a predictable reflexion of pronunciation, i.e. from phonographic representation. He did nevertheless also state an objection to a plain phonographic orthography for English, namely that a pair of words like *nation, national* would be dissociated by the different spelling of their first vowel, and that inflexions would need to be differentiated, as in forms like *cats, dogz* and *dropt, turnd.*

2.2 Chomsky, objectors and followers
More recently the emphasis in descriptions of TO has moved away from its history and the dentification of inconsistencies, towards the search for patterns of regularity and even apologias which suggest that the inconsistencies actually assist the user.

Particularly influential in the United States have been the views of both Noam and Carol Chomsky (1970). Thus *The Sound Pattern of English* by Noam Chomsky and Morris Halle (1968, p. 49) describes TO as a "near-optimal system for the lexical representation of English words", on account of the orthographic stability observed in such cognates as *courage, courageous* whose vowel-letters remain unchanged despite the shift in pronunciation. Indeed, Chomsky and Halle generalise from this phenomenon, saying that the "fundamental principle of orthography is that phonetic variation is not indicated where it is predictable by general rule"; taken at face value, this would seem to imply that the <s> inflexion spelt in the third person singular of the present tense of most verbs and in noun plurals is undesirable since it is predictable.

This view has not gone unchallenged, particularly by psychologists. Yule (1978, pp. 10-12) for instance analysed a sizeable corpus of spellings and concluded that lexical consistency on the model of *courage, courageous* is the exception rather than the rule in English. Likewise Downing & Leong (1982, pp. 67-79) reviewed structural descriptions of TO by Chomsky and others, and concluded that they have not been shown to possess psychological reality and fail to take proper account of the known facts of the historical evolution of TO. We may also note (Knowles, 1988 forthcoming) that although Russian follows the Chomskyan principle of lexical stability in its spelling, some other Slavonic languages, such as Byelorussian and Serbo-Croat, do not, and we may ponder the implications of this for Chomsky's "fundamental principle of orthography".

Nevertheless Chomsky's idea that such orthographic stability is a dominant and useful feature of TO has been echoed by many subsequent writers, as when Hawkins (1987, p. 100) writes that "a closer correspondence of written to spoken forms would deprive readers of the immediate association apparent between words like... *electric and electricity*". By this reasoning, the French and Germans must fail to sense an immediate association between their differential spellings *électrique, électricité* and *elektrisch, Elektrizität;* and in English the link with the verb *electrify* and the earlier form *electrick* would be obscure.

2.3 The educational/psychological context.
If the above descriptions of TO may be considered 'pure' rather than 'applied' linguistics, other accounts arise from the study of its practical application, i.e. how human beings cope with TO psychologically or in education. The same swing from a critical-historical to an analytical-justificatory approach is found in these 'applied' accounts as in 'the 'pure' descriptions.

Thus an earlier writer, the teacher and educationist G H Vallins (1951), could entitle a chapter 'The Bugbear of Spelling': most of the chapter consists of practical hints as to how TO may be mastered, but it opens (pp. 228-29) with a brief general description dominated by historical explanations of features described as "difficulties", "peculiarities", "aberrations", "contradictions", "arbitrariness". However more recently Richard Venezky in the United States (1983, pp. 132-54) has emphasised the patterning of TO in terms of the environment in which letters are found, distinguishing for instance between the function of <gn> in *poignant, malign, malignant,* and between relational units and several kinds of markers; so he classes <ch> in *chair* as a relational unit, the <e> in *cute* or *able* as a marker of vowel or consonant correspondence, the <e> in *have* as a graphotactical marker, and the <e> in *nurse* as a morphophonemic marker. He is however cautious about advocating such an analysis in teaching children.

An analysis which received wide attention in Britain was Albrow (1972). He described his purpose

as "attempting to find ways of showing order" in TO, which by comparison with Spanish orthography he says "may even be regarded as linguistically the more sound because of its apparent complexity" (which he describes in Firthian terms as "polysystemicness"). He analyses TO as constituting three systems, and distinguishes the spelling patterns found in monosyllables and polysyllables, accented and unaccented syllables, grammatical and lexical items, basic English patterns and other patterns. "Plurality of symbolization", he says, "may be seen as an advantage", but he counsels firmly against his analysis being used in schools. The present writer has to say he finds Albrow's account essentially procrustean, in that it attempts to force a fundamentally untidy system into tidy categories which have limited objective (e.g. etymological or morphological) reality and therefore lack reliable predictive value.

The purpose of Smith's account (1980) is explicit in his title, 'In Defence of Conservatism in English Orthography', which paradoxically was based on a paper given at the Second International Conference of the simplified Spelling Society. He writes as a psychologist, reporting on experiments which show how fluent readers generalise from the various spelling patterns in TO; thus they can take the doubled consonant in *antenna, umbrella* etc. as the key to the pronunciation of, say, *dilemma,* which they are then not tempted to model on, say, *cinema.* The limitations of such analogies are however seen when one tries to decide on this basis how to pronounce, say, *enema* or *(o)edema.* Using the same rule, Smith justifies the doubled <f> in *giraffe* by saying it has an underlying three-syllable form, from which the third syllable has been deleted; but this then fails to account for the single <f> in *carafe.* He speculates that a "highly phonemic alphabet' might even be detrimental, as it would overemphasise the sound of words at the expense of meaning, but there is no evidence that phonographically spelt words are less well understood, or that children reared on a more phonographic orthography achieve lower levels of literacy. His conclusion that "spelling should contain as much information as the reader and speller can usefully handle" is hardly an argument for conservatism in English spelling, whose problem, as this paper will attempt to show, is *too much* information for the user to handle.

A fuller perspective than any of these is provided by Sampson (1985, pp. 194-213) whose chapter on English spelling assesses many different approaches to TO, including the psychology of the user. He finds it "difficult to accept Albrow's polysystemic account as a well-founded theory of English orthography" (p. 203), and suggests as an alternative description "a compromise between the phonographic and logographic principles - somewhat akin, in fact, to Japanese script though with a much higher proportion of phonography." To illustrate the logographic aspect, he points out that different spellings visually distinguish such homophones as *right, rite, write, wright.* (Both in the logographic principle and in this particular example, Sampson appears to be following Vachek [1973, p. 23], of the Prague school of linguistics.)

To keep the logographic aspect of English in proportion, however, we should note how much more dominant it is in French. In English a 4-member set of heterographs like *right, rite, write, wright* is exceptional, constituting under 3% of all sets of heterographs, while over 85% consist of pairs like *ail, ale* (Upward, 1987a). In French there are more multi-member sets (e.g. *vain, vin, vingt, vint),* and significant morphological distinctions are made in writing which are not normally heard in speech, e.g. between singular and plural as in *vain:vains, vin:vins, vingt:vingts,* or between persons and tenses of verbs as in *vins:vint:vînt.* Furthermore, unlike French, written English is widely characterised by polysemy, which runs directly counter to the logographic principle, as when the semantically distinct noun, verb and adjective *tender* or *(river-)bank* and *(money-)bank* are written identically. Indeed insofar as the paucity of inflexions in English enables countless words to function as different parts of speech without any change in spelling, we may even consider polysemy to be fundamental to the very structure of the language, with virtually unlimited application, whereas the logographic principle applies somewhat randomly to a strictly limited (if rather large) number of words.

Sampson goes on to examine various theories of the psychology of spelling, in other words how readers and writers mentally process TO as they interpret the signs they see (whether whole words or single letters), and conversely how they commit their verbalised ideas to writing. In particular he discusses the controversy about the different strategies used by readers and writers with phonographically and non- phonographically spelt words, and concludes that because readers of English often have to use strategies other than the direct derivation of pronunciation from spelling, the variety of sound-symbol correspondence positively assists them. Thus it should be easier to read *debt* than *det,* since the latter would be more easily confused with *bet* etc; this however raises the question why it should be more helpful for *debt* to resemble non-rhymes such as *dent, deft* than rhymes like *bet, let,* and indeed in general whether words with multiple rhymes are more difficult to read than words of similar frequency but with no rhymes. Likewise Sampson claims that the <sc> in *sceptre* (formerly often written *ceptre, septer* etc) is "more distinctive than if (the) spelling was predictable from (the) sound"; but we must ask whether this distinctiveness vis-à-vis, say, *septic, sceptic* is of positive value for any user, or whether it is not a source of confusion not merely as to its own spelling, but as to the pronunciation of *sceptic* (US spelling *skeptic)* as well. Altogether there appears to be a certain circularity to Sampson's argument which implies that because readers have to resort to roundabout strategies (gestalt, analogy, etc) to read TO, TO must be a psychologically appropriate system - otherwise these strategies would be unnecessary.

Just as Albrow suggested TO might be superior to the writing system of Spanish, so Sampson suggests that Chinese may be superior to TO for the skilled reader. In sum, although Sampson's account of TO goes beyond the previous accounts described above in considering users' needs, and although his argument is couched in very tentative terms, it does ultimately amount to an apologia for TO, concluding: "Our orthography is possibly not the least valuable of the institutions our ancestors have bequeathed to us."

Another recent publication, Working Paper No.10 of the Committee for Linguistics in Education, compiled by Stubbs (1986), reported a discussion held at a meeting of the Linguistics Association of Great Britain on *The Synchronic Organization of English Spelling.* It explicitly excluded some broader aspects of the question, such as the development of TO, how it can be taught how other languages are written, how TO might be reformed, how TO is punctuated etc, but it did begin by considering the wider social context of TO, in the sense of its status as a spelling norm and how far the norm is actually observed by users at large. It explored some of the patterns of morphophonemic variation in TO and of borrowing from other languages, as well as the nature of spelling rules. Even without discussing the many contradictions and exceptions to the patterns described, the paper conveyed an impression of TO as a highly complex mosaic, it stressed the lack of typological consistency, and it recognised at one point that "whether a human speller could cope ... is a matter of some doubt" Nevertheless the paper ended by restating its premiss: "The descriptive approach taken in this paper begins from an assumption that the system is organized, in sometimes non-obvious ways, and seeks out the organization ".

Most recently, the *Report of The Committee of Inquiry into the Teaching of English Language* (Kingman Report, DES 1988) represents perhaps the most extreme expression of the view that TO is fundamentally regular. Nowhere does it suggest that irregularity in TO constitutes an educational problem, and its overall approach is epitomised by the bald statement that "spelling obeys rules" (p. 56).

2.4 How organised is TO?

As we have seen, the idea that TO is in a useful sense 'organised' underlies many of the more recent accounts. However such judgments - whether TO is a basically regular system containing irregularities, or a basically irregular system containing certain patterns - are not matters of factual

observation but of attitudinal perception (like the bottle described by the thirsty as half-empty and by the non-thirsty as half- full). There is no objective yardstick by which we can say that the spellings *receipt, reception* or *electric, electricity* (rather than, say, *receit, reception* or *electrik, electrisity)* are inherently characteristic of English spelling, and that *deceit, deception* or *advice, advise (*rather than, say*, deceipt, deception* or *advice, advice)* are anomalous.

We can however say that in terms of the alphabetic principle of sound-symbol correspondence it is sets like *electric, electricity* and *receipt, reception* that are anomalous. Because this criterion for judging TO has not been prominent in the mainstream of linguistic, psychological and educational debate on the question in the last twenty years, those accounts of TO which apply it as an argument for some kind of spelling reform have so far been ignored in this paper; but of those published since World War II the following at least should be mentioned: Daniel Jones & Harold Orton (1948), Axel Wijk (1959), Sir James Pitman (1969), Harry Lindgren (1969), Edward Rondthaler & Edward J Lias (1986). More will be said about some of these in Section 5 below.

These reform-oriented works demonstrate that ultimately the judgment reached about the degree of Organisation of TO must depend on the purpose, for which English spelling is being described. Chomsky, for instance, was seeking evidence in English for the idea of a universal grammar, and for that purpose patterns were what he was looking for, and educationists may wish to highlight patterns as a learning aid. But for other purposes it may be more interesting or more important to concentrate on the irregularities of the system: the historian of spelling may wish to register the emergence of an unplanned consensus of printers, the misinformation of renaissance scholars, or the inconsistencies of Samuel Johnson; educationists and psychologists may wish to identify the obstacles to easy literacy in English; and spelling reformers naturally wish to publicise the difficulties as the foundation for their case.

3. A BROADER PERSPECTIVE

This paper will now suggest that to understand and draw useful conclusions from the study of TO, it is necessary to see the system in a broader perspective. The accounts discussed above have for the most part adopted a narrowly 'scientific' rather than a comprehensive 'technological' approach; that is to say, they have tended to concentrate on examining the internal features of the system as though these were fixed by nature like the molecular structure of a substance, rather than considering what the substance is to be used for. The 'scientific' approach has given rise to a certain kind of vocabulary which both reflects and reinforces it. Thus TO is sometimes described as being "designed", and evidence is sought that it is "synchronically motivated", these terms implying that the spellings used in the late 20th century originate from some conscious plan.

3.1 Historical evidence

There is little historical evidence for such a view, whatever influence a few individuals such as Samuel Johnson and Noah Webster may have had on the evolution of TO. Rather, TO appears as a collective, social creation. It originated from the merger of two radically different writing systems, and was further influenced by the importation of countless words from many other languages, whose spellings have in various ways often been retained. The two original systems were firstly Anglo-Saxon (with a Scandinavian admixture) whose writing had indeed initially been "designed" by the fairly straightforward technique of applying, where possible, the sound-values of the Roman alphabet to spoken Anglo-Saxon; and secondly Norman-French, whose writing was not so much designed as haphazardly adapted from Latin as the French language itself moved away from its roots. In the process of the merger between Anglo-Saxon and Norman-French both systems were changed, and some of their differences became blurred (e.g. adoption of Norman- French <qu> for Anglo-Saxon <cw>, as when *cwic* became *quick);* but at the same tune, Parisian French and the Latin of the church continued to impose extraneous models of writing which prevented that blurring

from eventually producing a unified, coherent system for written English. On top of that, major changes occurred in pronunciation, especially of vowels, but without being systematically reflected by spelling changes. Furthermore, until the 17th century written English was to a great extent "unsettled", as Johnson put it, and the precise forms that were eventually preferred by printers and which came to constitute TO were inconsistent and not selected on the basis of any overall "design" concept.

The lack of "design" in TO is not merely apparent from its history and from internal evidence, but also by comparison with languages like Spanish whose spelling has been reformed to maintain a relatively high degree of correspondence between speech and writing, and with those many languages that were first committed to the Roman and Cyrillic alphabets in recent times. The design of an alphabetic writing system is based on one primary principle: that the symbols should consistently represent sounds; and whatever complications may arise in defining pronunciation or in representing allomorphs, no designer of an alphabetic writing system would depart fundamentally from that principle. That principle has however not been systematically applied in the development of the writing system of English since the Norman Conquest.

A historical analysis of English spelling tells us, so this paper maintains, far more about TO than analysis confined to the present forms of TO can; thus where synchronic analysis only explains forms like *debt, receipt* in terms of distinctiveness, diachronic analysis tells us why <b> rather than any other letter was inserted in ME *det, dette, dete,* and why it was inserted in *debt* but not in *let, set* etc; and why Johnson preserved the phonographically wayward <p> in *receipt* while letting it lapse in *conceit, deceit.*

3.2 Fluidity of TO

A historical perspective is however incomplete if it stops at the point where printed TO more or less achieved its present form (say, 1700); for in several important respects it is still fluid. Firstly, Webster's dictionaries established the mainly shorter, more regular American forms such as *ax, esthetic, fetal, labor, plow, sulfur, traveled,* and some of these are spreading into spheres of previously British orthographic influence, especially Australia (where schoolchildren use both British and American textbooks), but also Britain itself. Secondly, in the course of time such forms as *encyclopaedia, leuchaemia, musick, phantasy, shew* have given way to the simpler and/or more phonographic *encyclopedia, leukaemia* (US *leukemia*), *music, fantasy, show.* Thirdly, a substantial number of words are still 'unsettled' and have no single agreed spelling, some of them, like the *-ise:-ize* suffix, even having morphemic status; a few examples of this kind of uncertainty are *debatable: debateable, gaol: jail, gibe:gybe:jibe, lichi:lichee:litchi:lychee* and perhaps *even hoofs:hooves.* A fourth factor is the inventiveness of commercial and publicity interests, which surround us with often witty non-TO spellings for trade-names and in advertisements; a few examples of such innovative forms are *Softone, Weetabix, Softwear, anywear, Rong writers, Computacenter* and the wide use of *u* for *you*; a glance at a trade directory gives some idea of how widespread such deviations from TO are. Fifthly, and most importantly of all, the sheer difficulty of the system results in frequent unintended but often systematic deviations from its norms ('misspellings'; see §6.2-6.4 below). In short, narrowly synchronic accounts of TO imply a clear-cut, fixed system, whereas a broader diachronic perspective shows that the system is continuously in flux and that our present writing-system has no special status beyond that of a temporarily and rather vaguely approved convention.

The absence of an Academy or other authority to 'design' or impose 'official' spellings for words distinguishes English from many other languages. Publishers, lexicographers, printers have their preferred styles, but there is no machinery to ensure agreement between them. There is no global 'motivation' behind the forms used, merely a widespread but patchy and shifting consensus among users, determined by tradition, education, fashion, geography, economics and spasmodic

etymological insights and prejudices. Typically, a guide such as OUP's *Dictionary for Writers and Editors* (1984) contains little more than a list of those words which are often spelt in a manner to OUP's disliking. Thus instead of the phonographic Central French (and American) form *jail* it instructs writers to use the systemically anomalous Norman-French form *gaol*. Even on a point having more general application such as the choice between the <-ise, -ize> suffixes, it merely says that for words in which both spellings are in use, <-ize> is to be preferred - then lists 30 words such as *advertise* whose roots are of Latin derivation and which it requires always to be written <-ise>. *Analyse, paralyse* are not mentioned at this point but against the headword *paralyse* we are told "*not* -ise, -ize, -yze", although no such warning is given for *analyse;* Webster (1986) on the other hand dismisses *paralyse* as a British variant of *paralyze.* These are just a few entries from a style dictionary of some 450 pages. The benefits of applying some design and motivation to this situation are self-evident both for the convenience of learners and professional users and for the economic efficiency of the publishing industry.

3.3 World English.
An adequate appreciation of TO however must take a broad view not only historically and pragmatically, but geographically too. TO is not just a linguistic system; it is also a world-wide medium of practical communication. It may have originated in England, but it has spread first throughout the British Isles, then to other continents through the growth of British colonial power, and now it has become sometimes the mother tongue, sometimes the official language, sometimes the lingua franca, sometimes a second language of many countries, large and small around the world. The spelling of English pidgins and creoles represents a further extension of the question (Yule 1987). Above all, though, partly because of the dominance of the United States, TO has become a medium of communication between individuals and nations for whom it is a learnt foreign language. It has long ceased to be the property of one nation, and it is now no longer even just the property of those nations who use it domestically. It is the language in which, more than any other today, the knowledge of the human race is recorded, the politics of the human race is negotiated, the trade of the human race is conducted. To be a conscious participant in or follower of the affairs of the human race, it is therefore effectively necessary to master TO, and it is now estimated that most people who learn TO are not native speakers of English.

This simple but gigantic fact transforms the rationale behind TO. Twenty years ago Chomsky wrote: "Orthography is a system designed for readers who know the language". We have already questioned the concept of 'design', and we must now question the idea that TO primarily serves the needs of native speakers. There is however an important difference between native and non-native speakers' appreciation of a writing system: native speakers carry the pronunciation of commonly used words in their memory, while foreign learners initially do not, and subsequently mostly do so less reliably. The native speaker has usually, though not always, learnt effortlessly and unconsciously whether to rhyme *bow* with *low* or with *cow,* and that *ginger* has the <g>-sounds of *George* and not of *gingham*; while to master such sound-symbol correspondences the non-native speaker usually has to make an effort of conscious learning which is often only partially successful. It has even been said that the non-native speaker has to learn two languages, one spoken and one written, whose relationship to each other is forever hazardous. While naturally the non-native speaker will always be at a considerable disadvantage in the learning process compared with the native-speaker, the particular severe disadvantage just described is solely the product of an undesigned, unmotivated orthography. (Not that native-speakers are entirely immune to the same problem, but their situation will be examined later.) Again, the benefits of applying some design and motivation to TO as a world communication system are self-evident, both for the convenience of foreign learners and for international understanding in general.

3.4 Fluidity between languages.
We have to take a broad geographical view of TO not only for these socio-linguistic reasons, but

because of the nature of the language itself and the way in which we can foresee it developing in the future. We have already noted that TO is in origin an amalgam of two different writing systems, Anglo-Saxon and Norman-French, to which numerous other languages and their writing systems have been added in varying amounts, often hardly assimilated. Many native speakers perceive the English language as a largely self-contained entity, in which however certain words are felt to be to a greater or lesser extent 'foreign'; but these foreign words are becoming more common. One example is the recent flood of borrowings of culinary terms, as British eating habits have become increasingly international. At the same time English words are being borrowed in large numbers by many other languages, and sometimes assimilated in spelling and/or pronunciation in the process: compare the word *football* as written m French, German, Spanish, Japanese-romaji and Russian: *football, Fußball, fútbol, futtoboru, φ γ τ δ ο π*. This trend has become extremely pervasive in for example West Germany today, and in France it has been officially declared a threat. Furthermore, English in different parts of the world develops its own local vocabulary, often borrowed from indigenous languages, to designate local phenomena. In Canada the policy of bilingualism has led to an actual merger of English and French in the logo of the airline CP Air, *Canadi>n,* which French speakers can read as *canadien* and English speakers as *Canadian.*

So it is important to envisage the main languages of the world less as discrete entities, and increasingly as merging facets of a linguistic global village. It is a trend which we must expect if anything to accelerate, and it may even be welcomed as encouraging a sense of world-citizenship. (This trend of course has its political counterpart in supra-national organisations such as the European Community and the United Nations.) A major consequence for the future of written English is that TO will contain an ever larger proportion of recently imported words which mostly reflect the spelling-system of the source language, and hence in their own terms will often be more phonographically spelt than is usual in TO.

There are two reasons why we should begin to think more to the future, about a design for world spelling which could help all languages along this path of integration, rather than to the past, about the centuries-old spelling-patterns of TO. The first reason is that people increasingly need to migrate between languages, and the task could be made much easier if spellings of shared words were harmonised (English and French do not have to spell *Canadian:canadien* differently). The second reason is that words increasingly migrate between languages, and if the leading world language uses a spelling system like TO that is not merely internally dysfunctional but out of step with all other languages, then its dysfunctionality will invade other languages (the spelling of many imported English words is perceived as highly anomalous in French); and more seriously, TO will itself become even more complex as it absorbs ever more words from outside whose spelling is totally at odds with familiar TO patterns.

4. THE FUNCTION OF SPELLING

4.1 International, social and individual role of literacy

Having widened consideration of TO to include both historical and geographical factors, we will now turn to the function of spelling as a system that individuals learn and use. TO can only serve as a medium of international communication because enough individuals use it for that purpose. These individuals are able to use TO because they have been taught it, most often as children within the educational system of a given country. The educational system of a country is however not in itself primarily designed to facilitate international communication; its main purpose is to produce, as far as possible a fully literate population. If English is the mother tongue, that will in itself give access to the international medium, while if English is not the mother tongue, it will commonly be taught as the first foreign language and so likewise give access to the international medium. But TO as a system of communication, national and international, is founded on the success of individuals in mastering it - and here lies its greatest weakness.

4.2 Failures in teaching TO

For over 400 years the teaching of written English has been recognised as a frustrating task that meets with only limited success. Even before TO as we know it had taken shape and long before universal literacy was an aim of education, scholars and teachers were concerned with the problem. Thus in the 16th century scholars such as Sir Thomas Smith (a Secretary of State to Elizabeth I and a Cambridge don) and John Hart, and schoolmasters such as Richard Mulcaster and Edmond Coote were already suggesting how it might be alleviated. However, their ideas had little impact on the one constituency which could have brought about change: on printers. As Scragg (1974, p. 63) writes, "the printer through whose hands their very volumes have passed has preceded along his chosen path with barely an acknowledgement" And the essential problem persists to the present day, only its gravity is multiplied many times over by the increased scale of the task, which now requires not merely that the whole population of English-speaking countries shall master TO, but that even more millions of non-native speakers shall do so too. One of the most thoroughly researched estimates of the extent of functional illiteracy in Britain, the ALBSU report *Literacy, Numeracy and Adults* (1987), which drew its data from a longitudinal survey of all children born in England, Scotland and Wales in one week in 1958, concluded that 13% of the targeted group suffered difficulties with either reading, writing or numeracy, and of these, 72% admitted difficulties with writing/spelling; these data were widely interpreted at the time of publication as indicating 6 million illiterates. At about the same time Kenneth Baker, Secretary of State for Education and Science, visited the United States, where a figure of 20 million functional illiterates was reported, although much higher estimates have also been quoted.

4.3 TO compared with i.t.a. and other writing systems.

That there has always been a problem with teaching literacy in English appears unquestionable; less self-evident is that the writing system itself may be an important cause. Perhaps, it may be argued, mastery of any writing system is simply beyond the powers of a significant proportion of the population; or perhaps other factors, such as social disadvantage, lack of motivation, inadequate educational facilities, or inappropriate teaching methods, are largely responsible. Here some basis of comparison is needed: is there evidence to show that a more regular writing system would be more effectively mastered? Some of the most extensive research material on this question was assembled by the late John Downing, who investigated the results of teaching the first stages of literacy in English through a more or less phonographic system, the Initial Teaching Alphabet (1967); subsequently he directed a major comparative study (1973) of how literacy was taught in thirteen different countries using the most varied writing systems, including English, Finnish, French, German, Hebrew, Japanese, Spanish, Russian, Chinese. These were no slight studies, the first containing over 300 pages, the second nearly 600.

His findings have however not received the recognition one might have expected. The Bullock Report (Department of Education and Science, 1975, pp. 111- 112) briefly reviewed the i.t.a. research as follows: "When groups of t.o. and i.t.a. children were matched in the main British experiments, the writing produced by the latter was of consistently higher quality. (Downing and Latham subsequently ... found that the i.t.a. pupils remained superior in t.o. reading and spelling even after five years at school, i.e. well beyond the transition stage.)", but the Report then added, without further comment, "many critics of i.t.a. do not accept that such gains are attributable to the medium itself." Downing's own writings however give a persuasive psychological explanation for the advantages of initial learning through a phonographic orthography: namely that literacy is a skill, and once the basic skill has been mastered in a simple phonographic system, it can be transferred to a complex system like TO with greater success than TO can itself initially be mastered. Furthermore, some of the results he reports even suggest (pp. 233-34) that starting with TO induces a state of cognitive confusion in learners which is itself then transferred to their learning processes in other fields; in other words, TO is not merely more difficult than a phonographic

system, but it actually damages children's powers of logic and perception more widely. Downing remained convinced of the validity of this research, and reiterated the essence of his findings in an article (1987) published just a few weeks before his death.

As regards comparison with literacy-rates in other languages, there are of course enormous difficulties in trying to ensure that other variables do not vitiate the conclusions, and Sampson (p. 211) even dismisses such comparisons as meaningless on these grounds. Downing devotes most of the first 11 chapters of his *Comparative Reading* (1973) to examining the difficulties, and indeed his book may be regarded as aiming primarily to create a new discipline by laying the methodological foundations for such studies. Nevertheless a few quotations from the specialist contributors, all natives of the countries concerned, are perhaps indicative, even though taken out of context. Spanish (Argentina): "...most of the resources for children who fail to read are found in hospitals..." (p. 280); in Finnish "each phoneme always has the same letter... This feature enormously facilitates learning to read" (p. 308); "although French orthography is far from phonetic, its forms are more organized and regular than in English" (p. 330); "Preston, in his study comparing the reading attainments of German and American pupils, concluded that 'the German language is more consistent phonetically than the English language', and that this difference 'may account for the superiority of German children in learning to read'" (p. 342); "Hebrew script lacks distinctive word patterns but requires a hint of those on the way while his that the beginning reader pay attention to every single detail... On the other hand, Hebrew boasts of a nearly perfect one-to-one symbol-sound relationships (p. 434); discussing the allegedly 10 or 20 times better literacy rates of Japanese compared with western children, it is noted that "whereas each syllable sound is represented by a specific corresponding Kana in Japanese, as is each phoneme in the i.t.a. medium for English, this is not the case in the traditional use of the Roman alphabet in English" (pp. 459-61); "Swedish spelling is relatively phonetic... the English language, with its great differences between spoken and written forms, makes the teaching of reading much more difficult than it is in many other languages, for example, Swedish" (p. 470). Downing generalises from findings in Finland, Germany and Norway, saying: "It seems to be generally believed that children just do not find it difficult to learn to read in these countries" (p. 107). These studies were however not specifically intended to test the hypothesis that TO impedes literacy, and further comparative research (Nyikos) is now proceeding with that aim; as Yule (1986, p. 288) says, "other languages provide natural laboratories around the world." Whatever caution one must exercise in judging the above comparative statements, their quantity and unanimity all suggest that simple, regular writing systems are indeed more easily mastered than TO. And in all common sense, the reverse assumption hardly appears plausible.

This paper therefore concludes that overall the evidence (however imperfect) is more than sufficient to dispel doubts about the educational problems caused by T'O: problems of alienation and failure to achieve functional literacy in the worst cases, problems of frustration, confusion and uncertain command of TO in the majority of cases, and waste of time in all cases. Recent comparisons of educational standards in Britain and America with those in countries that are important economic competitors such as Germany and Japan have not been reported as considering the possibility that the writing system of English may be an important obstacle to higher standards in general; but TO is clearly an obstacle, and any improvement in standards of literacy can only assist improvement in all school subjects.

4.4 Problems of TO in publishing

TO is not only a problem in education or for adult illiterates; it is wasteful in other ways too. The uncertainty of spellings in TO is irritating, time-consuming and expensive for the printing and publishing industries. Considerable time is spent checking and changing spellings in accordance with the style-preferences of individual publishers, which may not accord with the preferences of authors. Avoidable misprints and misspellings still escape proof-readers, and howlers are a

continual source of embarrassment. Above all, perhaps, TO is an unnecessarily cumbersome writing system (although text in English usually occupies less space than its equivalent in other European languages), and ways are constantly sought to shorten it for various practical purposes, in shorthand, telex messages, road signs, and elsewhere. Without at this stage providing evidence, it is here worth anticipating later findings in this paper: the cumbersomeness of TO results from the large number of redundant letters it uses, which, as also hinted earlier, represent far more information than the user can conveniently handle, and furthermore account for a large part of TO's irregularity. As well as being potentially more phonographic, for the publisher shorter forms also have the advantage of greater economy in terms of time and materials saved.

5. ANALYSIS BY STRUCTURE, SOUND AND FUNCTION.

Unlike many recent analyses of TO, this paper began by considering TO from the outside, how it arose and developed, its role in the world as a medium of communication and in its relations with other languages, how individuals attempt to master it and how difficult they find it compared with other languages. Words such as chaos, absurdity, inconsistency, irregularity, have been quoted to describe
it, but apart from a few examples to illustrate particular arguments, the essential structure and features of the system itself have as yet scarcely been touched on.

5.1 Eclectic accounts of TO.

We have already noted some techniques of analysis used by other writers to highlight this feature or that of TO. Thus Chomsky emphasised patterns of lexical stability, while Yule showed in just how many related words there is no such stability, as with pairs such as *fire:fiery, high:height, speak:speech,* where spelling varies even when pronunciation does not. Albrow proposed three spelling systems to explain the spelling patterns of most English words, and Smith showed how certain patterns were internalised as models from which the pronunciation of other words could be derived. Sampson emphasised the logographicity and distinctiveness of many non-phonographic English spellings, while Stubbs' paper, drawing to some extent on Albrow, observed that TO offers some distinguishing patterns, such as that words of foreign origin *like fresco* may end in <o>, but that native English words typically spell the same final vowel <ow> as in *window.* These analyses are however all highly eclectic, picking on this detail or that from the overall system of TO as best suits their particular argument, and with the partial exception of Albrow none seriously attempts a comprehensive description.

5.2 A structural account of TO.

A comprehensive, structural account of TO, by contrast, might be developed by trying to apply the elegant analysis of French orthography used by Nina Catach (1988, p. 55), which in the terminology of her research group constitutes a "plurisystème". The system is visualised as a series of concentric circles, at the core of which are the *archigraphèmes.* In English these would perhaps be most of the consonant letters, the consonant digraphs such as <ch, sh, th, ng> and the vowel letters <a, e, i, o, u> with their 'short' values; by means of these graphemes most of the phonemes of English can be conventionally represented; problematic items within this central core would be the 'long' vowels which we may schematically represent by /e:, i:, ai, o:, u:/ as in *mate, meet, might, moat, moot/mute,* the two short values of <u> as in *but, put,* and the consonant found at the centre of a word like *vision,* for which the 'foreign' digraph <zh> used to represent Russian <ж> as in *Brezhnev* might be least ambiguous. Immediately outside this inner core of *archigraphèmes* lie the *phonogrammes,* which could include such digraphs as <au, ou, ph, qu>; without having a strict phonetic correspondence, these digraphs have nevertheless achieved conventional status. The next ring contains the *graphèmes positionnels,* which might include the environmentally determined final <aw, ow> in place of medial <au, ou>. There then follow in the *morphogrammes,* which could include the sets of parallel endings such as <-cion, -sion, -ssion, -tion, -xion>, as well as many

affixes. Outside this circle lie the *logogrammes,* covering for instance the heterographic distinctions emphasised by Sampson such as *right, rite, wright, write*. Finally, on the outer perimeter are *lettres étymologiques et historiques,* which would cover such dubious or spurious insertions as the <b> in *debt,* the <p> *in receipt,* the <s> in *island* or the <gh> in *delight.* Such an analysis, merely adumbrated here, might provide a conceptual framework for a systematic synchronic description of TO, some elements within which also contain functional implications.

5.3 Phonographic analysis.

A conceptually far less ambitious global analysis of TO is often indirectly provided by advocates of spelling reform. Commonly they have examined TO, asking how far the spellings represent what is deemed to be the pronunciation, and they then propose a reform that entails respelling words to match that pronunciation; and in the process they implicitly reveal ways in which TO is phonographically aberrant. Thus a sentence in the Ripman/Archer/Jones/Orton *New Spelling* (p. 94), such as "Dhe wurdz dhat giv trubl ar dhe wurdz ov Tuetonik orrijin", or in Harry Lindgren's 'Phonetic A', such as "Wen hi hd gon, mai frend ent'rd int' sm ekspl'neish'nz" (p. 139), immediately tells us by implication a great deal about the nature of the TO equivalent Very different, in that it is analytically and exhaustively explicit, is Axel Wijk's major work *Regularized English,* which treats the vowel and consonant graphemes of TO in alphabetical order, giving copious examples of each of their various phonographic representations in TO, right down to unique correspondences such as <oo> for /o:/ in *brooch.* However, valuable though such a comprehensive catalogue is, it offers no kind of systemic overview. A reverse approach - cataloguing correspondences by phonemes rather than by graphemes - is adopted by Rondthaler and Lias in their *Dictionary of Simplified American Spelling,* and as their list gives only one example of each phonographic correspondence and covers only 4 (large) pages, it is far easier to assimilate; their analysis owes much to earlier statistical analyses of TO by Godfrey Dewey.

5.4 Functional analysis

In Section 6 below, this paper will attempt a different kind of analysis from any of those described above; it will be based neither on selected patterns, nor on any global, structural concept, nor on variations in phonographic representation for their own sake. Its purpose is functional, asking what features of TO in practice cause users most difficulty, in other words in what ways TO is dysfunctional. Like the phonographic spelling reformers, however, it takes as its premiss that by and large (homophones possibly excepted) the most user-friendly orthography will exhibit a predictable relationship between sounds and symbols, so normally enabling readers to derive the pronunciation of words from the spelling, and conversely enabling writers to derive spelling from pronunciation. (This after all is the essential principle of alphabetic writing systems.) Therefore it will not be concerned with phonographically straightforward spellings, such as *hat, bed, sip* etc, since such forms will only cause difficulty to users who have not mastered even the most basic elements of sound-symbol correspondence (or, occasionally, to those who have an unusual vowel-inventory in their accent). Rather it attempts to follow the precept Yule proposed in her survey of research past and future (1986, p. 291): "Spelling must be investigated in terms of human capacities, needs and feelings."

5.5 Lack of a pronunciation standard

A serious obstacle to the straightforward implementation of this phonographic principle in English is that, unlike some European languages, English has no agreed standard of pronunciation. Defenders of TO sometimes conclude from this that because TO so often fails to represent the sound of words, it therefore constitutes an ideal, accent-neutral writing system. This paper hopes to demonstrate that this is far from the case, and that many non-phonographic forms in TO are dysfunctional for all users. However, as Wells (1986) has shown, the relationship between the various accents and the spelling is complex, indeed often contradictory. A few examples will now be discussed, to illustrate the considerations that need to be taken into account

Perhaps the most obvious division between types of pronunciation in English is that between rhotic and non-rhotic accents, i.e. between those that normally pronounce <r> (e.g. most Americans, Irish, Scots) and those who only pronounce <r> if it is followed by a vowel (e.g. most English, Australians, South Africans). The accent-specific discrepancy between speech and writing produced by this frequent non-pronunciation of <r> then gives rise to accent-specific spelling-problems, as when non-rhotic learners fail to spell an <r> they do not pronounce (e.g. **supprise*), or over-compensate and insert one where it is not needed (e.g. **idear* - a case of orthographic hyper-correction). One might try to overcome this difficulty of non-rhotic speakers by cutting such non-prevocalic <r>s out of the spelling; however serious problems would then result for the writing system as a whole. If those <r>s were removed even for speakers (the majority) who pronounce them, the spelling would cease to represent their pronunciation; if those <r>s were removed only for non-rhotic speakers, the world spelling standard would have been lost; the spelling of vowels preceding the <r> in TO would be distorted, if *port for* instance were written **pot*; the <r> would need to be specially inserted before a vowel (e.g. *fathe* but *fathe-r and mothe);* and important etymological information and parallels with other languages would disappear. In view of all these disadvantages, we have to conclude that such accent-specific dysfunctionality in TO (of which there are many other examples) is a price that has to be paid for the world-wide unity of written English, and in such cases the needs of some speech-communities have to be subordinated to larger considerations.

A different case is a form like *what,* which probably most speakers in England perceive to conflict with the pronunciation in two respects, the presence of <h> and the use of <a> (hence the mock spelling *wot*). The initial <wh> is dysfunctional for all those speakers who, unlike Scots, Irish and many Americans, do not distinguish /w/ and /hw/, and it produces hyper-corrections like **whent, *whould, *whorthwhile* as well as the omission of <h> as in **wiskers* and **wether* for *whether.* The parallel with <th> is instructive here: TO has no regular means of distinguishing and feels no need to distinguish the voiced and unvoiced values of <th> (as in *this, thin;* the distinction as in *breath, breathe* involves other factors) although they are almost universally distinguished in speech; but in the speech of those who distinguish <w, wh>, the two sounds are sometimes also considered voiced and unvoiced articulations of <w>, and there is no more reason to distinguish them in writing than to distinguish the two articulations of <th>. If, alternatively, the pronunciation of the grapheme <wh> is analysed as /hw/, then the spelling <hw>, as used in Anglo-Saxon, would at least be more logical. The etymological and semantic significance of the <h> appears minimal (unlike the silent <r> discussed above). In short, the accent-specific dyfunctionality of <wh> is sufficient grounds for considering it dysfunctional as a feature of TO as a whole. In practice this amounts to saying that the <h> in <wh> is not necessary for any speakers and a positive trap for many; and it would therefore be best abandoned.

The <a> in *what* involves different considerations again. While most speakers in England perceive the word as rhyming with *hot,* many Americans perceive it as having the vowel of *far* or even *hut;* it thus appears that even those speakers for whom the <a> is non-phonographic would not agree on a more appropriate letter to use in its place.

The least dysfunctional spelling for *what* would therefore seem to be *wat* (cf. German *was),* a conclusion generalisable to all words containing <wh> and to very many words containing <w(h)a> pronounced roughly as in *what* such as *wad, want, was, wash,* and probably to such as *walk, war, water, wharf* too.

6. DYSFUNCTIONALITY.

6.1 The ergonomics of spelling.

These examples show how the lack of a standard pronunciation in English complicates the identification of dysfunctionality in terms of straightforwardly non-phonographic spellings, i.e. in terms of a systemic breakdown of the alphabetic principle. But the concept of dysfunctionality to be developed here is not primarily a matter of systemic breakdown; rather it implies breakdown of the human ability to use the system by the conventions of TO. The dysfunctionality may thus be described as ergonomic, in the sense that any system designed for human use, whether the controls of a jet plane, a gas cooker or a computer, can be set up to be more user-friendly or less, and dysfunctionality amounts to user-unfriendliness. In this sense the measure of dysfunctionality may be other than a simple count of how many letters in a word do not accord with its pronunciation. For instance, many very common words of basic English vocabulary are flagrantly non-phonographic (e.g. in *one, two, who* only one letter out of three reflects common pronunciation); however the very high frequency of such words (Hofland & Johansson [1982, p. 441 rank *one, two, who* as the 38th, 67th, 49th most commonly occurring words, with frequencies of 3088, 1549, 2200 per million respectively) means that the spelling will often be more readily mastered, because more intensively practised, than that of less common words whose spelling only marginally fails to match pronunciation; common words are usually also short, and their spelling is easier to learn for that reason too. Therefore a criterion other than straightforward defective sound-symbol correspondence is needed in order to establish the main patterns of dysfunctionality in this sense of user-unfriendliness.

6.2 Misspelling as a criterion.

One way of assessing human failure to master TO is by analysing misspellings. An error analysis (Upward, 1987b) of three corpora of texts written by British native speakers was carried out to test the hypothesis that phonographically redundant letters in TO are a prime cause of misspelling and hence lie at the core of its dysfunctionality. A total of nearly 1,900 misspellings was examined (about 50 from university students, 444 from an intelligent 9-year old, and 1,377 from free writing by a cohort of 15-year old comprehensive school students), and the results appeared to confirm the hypothesis to a significant extent: a very large number of the misspellings were associated in one way or another with phonographically redundant letters. (Misspellings by other major categories of user, such as, among native speakers, Americans, adults of average education, and very young learners, and, among non-native speakers, a range of nationalities, would need to be analysed before any definitive conclusions could be reached about the dysfunctional role of redundant letters. Some such corpora are available that could be analysed by this criterion [Mitton, 1987], but for all its limitations the following analysis is thought to be of interest in itself and very likely generalisable.)

6.3 Patterns of redundancy.

Most of the redundant letters could be fairly simply classified under three main headings: irrelevance to pronunciation (e.g. <b> in debt), post-accentual shwa before the liquids and nasals <l, m, n, r> (e.g. <e> in *chapel,* <o> in *atom,* <a> in *organ,* <u> in murmur), and doubled consonants (e.g. *committee).*

The first category, irrelevance to pronunciation, includes many silent letters, but not for instance the 'magic' <e> that indicates a preceding long vowel, as in *late,* since it is then not irrelevant to pronunciation. The university students made virtually no errors of this kind, except possibly in **forfront* and **historiographicly,* though the latter shows that the distinction between a misspelling of post-accentual shwa and a silent letter may be blurred. Examples from the 9-year old's writing included **aile, *bissness, *brekfast, *color, *desperatly, *hankerchiefs, *hansome, *honymoon, *lether, *Iovly, *merangs, *mesure, *mustache, *nervus, *pius, *plesant, *straitening, *swet, *varius, *wiskers.* Such areas by the comprehensive school students often involved omission of final silent <e> (**aprehensivly, *befor, *Iovly, *somthing, *oposit) or* <e> in the past tense

inflexion *(*gatherd, *marrid, *murderd, *Iockd*) or <e> in association with <i> or <y> in final syllables (**mony, *pitis, *denyd*); the forms **frend, *helthy* occurred 5 and 3 times respectively and other vowel-letters were omitted as in **corse, *cruse, *truble, *sholders, *beutiful;* among consonants <gh> was a frequent source of difficulty, being omitted in **fite, *Iafe, *neibour, *tuff*, and <h> was often dropped as in **disonist, *mecanic.* All the above examples involve omission of a letter from TO that plays no part in representing pronunciation; but the frequency of such letters in TO causes confusion more widely, commonly leading to the insertion of extra letters by false analogy or to their misplacement, as in **truely, *arguements, *eigther, *figthing, *Iaugth, *biuld, *buisness, *whould, *whent, *whorthwhile.*

A much larger category of errors was that of post-accentual shwa before <l, m, n, r>, for which many unpredictable alternative spellings are available in TO, for instance in the case of <r> in final syllables as many as 10, as in *burglar, teacher, amateur, cheshire, doctor, vigour, centre, murmur, injure, martyr,* and several in medial syllables too, as in *disparate, desperate, doctorate.* The university students made several mistakes in such environments *(*independant, *preambel, *seperate),* and the 9-year old made at least 56, involving complete omission of vowel letters *(*diffrence, *choclates),* or partial omission *(*certin, *cushon),* or American-style inversion *(*somber, *theater),* or substitution *(*consciunce, *elegent, *resterant, *ancester),* or substitution and inversion *(*musicle, *portles),* or insertion *(*rithum, *spasam).* Nearly 120 errors of this kind were made by the comprehensive school students, including **probabal, *famly, *dismell, *modle, *travill, *vandle, *hansem, *hansum, *enames, *enimies, *certian, *couson, *Iisn, *persnaly, *pleasent, *pregnent, *bachler, *neighboor, *tempar, *militery, *misarable.*

Errors to do with doubled consonants were the most common category among the university students, and included both mistaken doublings (**coallition, *resurrgence*) and failure to double *(*accomodating, *embelishments, *conotations),* and, morphologically very striking, **openess,* which was written by no fewer than 20% of the students. The 9-year old made over 50 such errors, while the comprehensive school students made at least 80, including confusion of *of/off 5* times and failure to represent the distinct consonant sounds in **acident, *sucess.*

6.4 Phonographic redundancy as dysfunctionality.

While it is notoriously difficult reliably to quantify misspellings (how does one count illegible words, repeated errors, different misspellings of the same word, words containing more than one error, slips of the pen, errors of word-division, misuse of the apostrophe, etc?), it appears from the 3 corpora discussed here that a substantial proportion of errors arise under the three headings of redundancy, though probably under 50% of the total. Other common errors, but individually less widespread than the above categories, included confusion over the two sound values of <g> (leading to **gorgous, *majic* etc.), the spelling of /k/ (should it be <c, cc, ch, ck, k, qu> etc.?), and palatalised <s, t> (misspelt as in **pleashure, *profeshion, *tishu, *parshial).*

This error analysis brings together several strands developed earlier in this paper. Historically, we know that many redundant letters are arbitrary anyway, more consistent spellings being often found in texts dating back a few centuries: why do we now write <p> in *receipt* but not in *deceit?* why *assistant, resistant* but *consistent, persistent?* why *island* when formerly the word had no <s>? Internationally, the historical accidents of TO have often made written English inconveniently different from other languages, especially with regard to the above categories of redundant letters: French has <a> in both *assistant* and *persistent;* German has *was (=what), bilden* (cognate with *build), Hure (=whore);* Spanish simplifies almost all doubled consonants *(acomodación); committee* in those three languages is respectively *comité, Komitee, comité;* and as a result TO is harder for speakers of those languages to learn, and those languages are in turn harder for English speakers; in fact the spellings of other languages are sometimes unintentionally transferred to English, as when British students of French write *negociate* by analogy with French *négocier.*

Psychologically, we see how dependent users are on close correspondence between sight (spelling) and sound (pronunciation); a misleading letter may be recalled visually, and if the pronunciation reinforces the visual recall, then the word can be correctly spelt (thus if we can recall the misleading <o> in *woman, women,* the pronunciation tells us it belongs between the <w> and the <m>); but if the letter is actually redundant we have only visual recall to help us and misspelling is far more likely (we may visually recall that *build* contains a <u> and *business* an <i>, but the sound does not tell us not to write *biuld, buisness).*

7. ORTHOGRAPHIC PROGRESS.

7.1 Main conclusions.

Inevitably many of the ideas presented in this paper have had to be treated superficially, but it is hoped that a number of important points have been established:

- TO is not a well-organised, sacrosanct writing system immune to change for all time. It is slowly but continuously changing, yet because the changes are not coordinated, they are also liable to be inconsistent.
- The defects of TO are harmful: they make literacy in English far harder to achieve than it need be; they make the writing system unnecessarily cumbersome and therefore wasteful; and they are an obstacle to worldwide communication.
- A serious, yet easily remediable, defect of TO lies in its many phonographically redundant letters, most of which can be categorised under three headings.

Particularly the last of these three points requires a detailed exposition for which this paper is not the place. Nevertheless, a brief illustration of the effects of removing such redundant letters and some mention of the systemic advantages are called for.

7.2 Removing redundant letters.

If certain categories of letters in TO are truly superfluous, then their removal should make the writing system less dysfunctional, more phonographic, more economical, more user-friendly, and in every respect more efficient. The rest of this section will be written in the so-called Cut Spelling (CS) system, to show how written English appears when the redundant letters as defined above have been removed; it will be noticed that CS as used here also regularises a few other problematic TO patterns by actually changing letters.

An importnt considration behind th Cut Speling systm (Upward, 1985) is that th apearance of words shud not chanje so drasticly that peple uninstructd in th rules of CS find them hard to read. Only rarely dos th removal of redundnt letrs make words dificlt to recognise: one exampl is *eye,* if it is cut to just *y* to mach its rym *my*. Th forms *det, dout, receit, thum* bring those words into line with ther ryms *let*, *out, deceit, sum* with litl visul disturbnce, but th removal of silent initial letrs as in *nome, neel, sycolojy, rong* jars slytly mor at first syt. Shortning th definit articl mainly servs as an econmy, tho it also removes th fonograficly misleading resemblnce to th pronouns *he, we, she.* CS gets rid of <gh> entirely, either by omiting it *(eit, tho, thru)* or by replacing it with <f> *(ruf, cof)* or by repacing <ig>
by <y> *(sy, hyr, syn).* Consnnts ar seldm dubld, tho ocasionl minml pairs like *discus, discuss* hav to be kept distinct; but othrwise we find that anomlis in TO like the cognates *abridge:abbreviate, afraid:affray* alyn as *abrij:abreviate, afraid:afray* wile ryms like *habit:rabbit, proper:copper, apple:chapel* then hav th apearance as wel as th sound of ryms: *habit:rabit, propr:copr, apl:chapl.*

Th last two pairs *propr:copr, apl:chapl* demnstrate th use in CS of <l, m, n, r> as sylabic consnnts in post-accenul sylabls. This device ocurs in TO, as in *apple, chasm, hadn't, centre,* but in CS it becoms centrl to th systm. In so doing it elimnates one of th worst sorces of confusion in TO: th

numerus unpredictbl endings like <ar, er, ur> etc, wich ar alynd in CS by th simpl procedur of omiting th vowl letrs by wich they vary in TO: thus *burglr, teachr, amatr, cheshr, doctr, vigr, centr, murmr, injr, martr*. By th same procedur th awkwrd <ant, ent> endings ar asimilated, as in *asistnt, consistnt.*

A less obvius efect of CS is that th patrns of accentuation in english becom clearr, to th particulr benefit of lernrs of english as a foren languaj. Thus th pair *ravenous, intravenous* read in TO as tho they myt rym, but in CS *ravnus* loses th posbility of stress on its secnd vowl, wich is representd by sylabic <n>; and pairs of hetrofones like th verb *to present* and the noun *a present* can then be distinguishd in riting so that th readr nos that th secnd <e> in *present* must hav its ful fonemic valu, wile th secnd vowl in *presnt* must be representd by sylabic <n>, i.e. it canot be stressd. CS similrly ensures that a word like *natur* no longr apears to rym with *mature*.

Th speling of TO hetrografs merjs in CS only wen they contain th same letrs: thus *their:there, peace:piece, write:rite* merj as *ther, pece, rite;* but many othr hetrografs remain distinct, as *ail:ale or write:right* (wich becom *rite:ryt).* Similrly, CS frequently distinguishs hetrofones, as wen *bow, row, sow* lose <w> if they rym with *so,* but not if they rym with *cow*, or wen th metl *lead* machs th past tense of th verb as *led* rathr than its present tense, and th past tense of *to read* machs its homofone, th color *red.*

CS also regulrises th patrns of inflexion wich giv rise to so much uncertainty and so many mispelings in TO: thus TO *visited, committed, benefit(t)ed* alyn as *visitd, comitd, benefitd,* wile *travelled:compelled* ar distinguishd as *travld:compeld.*

7.3 Scenarios for implementing change.

In the last four centuries there have been numerous schemes for reforming the spelling of English, but apart from some of Noah Webster's proposals in America, they have had little effect on actual use. Yet change has occurred, markedly from Elizabethan times, though barely perceptibly since 1700. The burden of this paper has been above all that the benefits of improving TO would be so considerable that pressure for change ought now to be revived (at certain times it has been quite strong in the past, notably under President Theodore Roosevelt in the early years of this century). However an inescapable but at first sight unanswerable question imposes itself: how could a systematic, linguistically and educationally sound, universally beneficial reform be introduced around the world? No institution at present exists which has it within its power to design, coordinate and implement any changes whatsoever in English spelling. Dictionaries determine 'correct' spelling, yet they see their role as reflecting public opinion in the matter, not as giving it a lead. In this country or that, printers and publishers may confer (as at the Australian Style Council in 1986 [Yule, 1988]), education authorities may launch campaigns to combat illiteracy (such as *The 3R's At Work* in the UK [ALBSU, 1988]), but unless they have a sense of purpose or direction such events are unlikely to tackle the root of the problem.

Systematic change could come from more than one quarter, from publishers if they had an incentive to break with tradition, or from education authorities if they decided that simplifying English spelling was educationally advantageous, or from international organisations like the EC or UN, if they could see their work being dramatically facilitated by the streamlining of written English. At present there is no widely organised pressure on any of these bodies, although individuals and small organisations in the UK, the USA, Canada and Australia do what they can. In fact, there is general public ignorance of the issue, and raising public awareness of it is a task to which academic linguists could have much to contribute (it is notable the attention that David Crystal [1987] gives to it in his *Cambridge Encyclopedia of Language*).

The overall purpose of this paper has been to do just that: to try and raise awareness of an issue of

which there often seems to be at best fragmentary understanding. Many of the statements made here may appear controversial and worth disputing or investigating empirically, and it is hoped that readers will not hesitate to challenge or query. This paper makes no pretensions to representing the last word on the subject, indeed it hopes to trigger off debate. Widespread discussion is in fact a precondition for doing to written English what in recent years has been done to the systems of currency and of weights and measures in several English-speaking countries, not least in the UK, and to other major writing systems throughout the world: modernising it. For English spelling is a human creation like all other systems of notation, and like them, it must change to meet human needs.

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