Spelling Progress Bulletin Summer, 1980

Dedicated to finding the causes of difficulties in learning reading and spelling.

Table of Contents

[Spelling Progress Bulletin Summer 1980 p1 in the printed version]

1. Causes of Failure in the Schools, by Irene & Newell Tune

"The home has the most important part in the motivation of children (pupils)." (Irene Tune). Certainly the responsibility for achievement or failure in school by children must be shared as much or more by parents as by the teachers. Homes in which a parent is really concerned that his/her children get a good education and show the child that he/she is really interested in the child's progress, seldom have a failure or dropout of their children. Homes in which parents read to little children as soon as the children have a sufficient understanding of the spoken language, start the process of motivation early enuf to create in the child a strong desire to learn to read. So no matter how difficult it is to learn to read, the child will (eventually) be able to overcome the handicaps of our illogical spelling.

But should we be satisfied that our children can eventually learn to read even if it does take an inordinately long time? No, not if there is an easier way – a way to overcome the obstacles that every child finds in his path to learning – learning to read: the most important part of every pupil's goal in going to school.

Everyone knows, or should know, that English spelling which is an unsystematic, unreliable, archaic form of written communication is the greatest handicap to learning to read. Yet little has been done to alleviate this obstacle. In England, over a decade and a half ago, an experiment was tried to show that a detour around the boulders that obstruct progress in the path of education, can be a quicker, easier means of achieving the end – to wit: learning to read (and in our conventional spelling, too). Even tho

the results of this experiment were quite convincing, many of our stubborn, die-hard educational supervisors still cling to the unanswered prayer that there must be a better *way or method* of teaching reading – when a little logical thinking by out stubborn, unthinking educational administrators should have pointed out to them the folly of their present course of action. Until we can convince our educational hierarchy of the futility of searching for better methodology, when it is really the *medium* of education – our conventional spelling – which is the cause of the trouble, we will get no progress in achieving better reading achievement standards in our schools.

2. Annual Convention of the International Reading Association at St. Louis, Mo. May 5-9, 1980.

It will include two special meetings of interest to our readers: Committee on Spelling Research – co-sponsored by the British Simplified Spelling Society.

Program Organizer: John Downing, Univ. of Victoria, Can.
Chairperson: yet to be selected.
Speaker John Downing, President, Simplified Spelling Society. .
Subject: How Children Think About Spelling.

The other, a joint IRA-Phonemic Spelling Council meeting, will be held Thurs, May 8, 1980.
Organizer: Emmett Albert Betts, Ph.D., LL.D. Research Prof. Emeritus, Univ. of Miami, Fla.
Topic: "Word Perception: Strategies and Tactics"
Chairperson: Dr. Katherine P. Betts, Florida Southern College.
Panel:
Dr. Emmett A. Betts, Univ. of Miami
Dr. Lou E. Burmeister, Univ. of Texas at El Paso
Dc. John Downing, Univ. of Victoria
Dr. Thomas Horn, Univ. of Texas at Austin
Dr. Milton Jacobson, Univ. of Virginia
Dr. Donald C. McFeely, Indiana Univ. at Penn.
Dr. Michael Strange, Univ. of Texas at Austin

Abstract:
Panelists present facets of English orthography (writing system) which facilitate and interfere with pupil-acquisition of word-perception skills, e.g., phonic rules in terms of application/exception ratios, ambiguity of rules, syllabication generalizations, effects of syllable and phrase stress on applicability of phonic rules. Demonstrate techniques for application and for teaching, e.g., "first-aid" for pupils requesting help during silent reading, phonics countdowns and substitution methods, a Russian training system in word-perception skills. Audience questions may address the above, as well as constraints influencing word perception and factors contributing to effective teaching of word- perception skills.

Notice: Due to greatly increased costs, the cost of a subscription to *Spelling Progress Bulletin* will be increased to S 4.00 a year, effective July 1, 1980.

-o0o-

3. Is Spelling Reform Feasible?,
by Elsie M. Oakensen,*

*Northampton, England.

The Origin of Spelling

Spelling was originally the true matching of spoken sounds each with a different symbol. It began when symbols were first used to represent sounds instead of pictures. 4,000 years ago languages were simply spoken. The Greeks had 24 letters in their alphabet, Latin used 22, the Phoenicians 26. All symbols could be matched to sounds and the spoken languages had become visible.

When the Romans arrived in Britain bringing with them their alphabet, it was no doubt adequate for the purposes of written communication then (which was usually in Latin but since that time many influences have played their part and Weekley (1949 described the spelling of English as "so far as its relation to the spoken word is concerned, quite crazy."

John Downing says, "There is a logic in English spelling but it is very complex. It consists of several logical systems that were introduced at different times. Now they overlap and give the appearance of illogicality. This appearance confuses children because it is difficult for them to understand the complex logic involved." Our language is said to be made up of about 42 sounds and we have only 26 letters with which to spell words. Consequently letters must do double duty. Each of the vowel letters represents several or many sounds. All of the different sounds may each have several letters or letter combinations to represent them. Every letter of the alphabet is used silently in some word. Appendix 1 gives some examples of the different sounds for the same letter and the different letters or groups of letters for the same sound, and also words with silent letters.

Should a Reformed Spelling be Implemented?

Consideration should be given as to whether or not spelling reform should be implemented and I shall now examine the arguments for and against transferring to a fully phonetic alphabet.

English, although richly endowed with many advantages, has, in comparison with other languages, one serious defect – its unphonetic spelling. Many people from the 13th Century onwards have considered it worthwhile to spend many years of their lives designing alphabets which they feel would make it more phonetic or would help to simplify and regularize English spelling (Appendix 3, The Way to Spelling Reform). These devotees of spelling reform would consider the following of being the advantages for such a move.

1. *It is commonsense to enable English-speaking children to spell correctly without having to memorise every word,* and unreasonable to confront them with such a host of apparently irrational difficulties at the very outset of their careers. The perceived confusions and inconsistencies of the existing spelling impose an obvious burden on pupils and teachers throughout the English-speaking world.

One of the chief objects of education is to develop children's reasoning processes. This they cannot do with our spelling because it is so difficult to perceive its logical basis. Thus the discipline of "learning to spell" may be harmful and worthless.

2. *In foreign countries English is less effective than it might be as a second language because of its extremely complex spelling.* With a system which is free of unnecessary complexities or apparent irrationalities, and which offers a better guide to pronunciation, its acceptance as a world language could be made surer. Nothing stands so much in the way of English becoming the most important medium of communication as its spelling. This alone would justify our attempts to reform it. In 1975 H.R.H. The Duke of Edinburgh agreed to support the aims of the Simplified Spelling Society by becoming its first Royal Patron.

3. *The number of adult illiterates in this country is staggering.* Considerable sections of the adult population find difficulty in achieving literacy and communication. An alphabet relating written symbol to spoken sound would rapidly lessen the vast numbers of people who have failed to learn to read in traditional spelling.

In *A Plea for Spelling Reform,* W. R. Evans (1878), referring to the work of the Elementary Education Act writes, ". . . . that teaching our anomalous system of spelling to the children of the poor is in most cases impracticable, and that when the task is in exceptional cases accomplished, it entails the *loss of much other instruction that might be imparted during school* attendance. . . ."

Charles Dickens may have been expressing a similar view when, in *The Pickwick Papers,* he had old Mr. Weller say to Sam,
> "When you're a married man, Samivel, you'll understand a good many things as you don't understand now; but vether it's worthwhile goin' through so much to learn so little, as the charity-boy said ven he got to the end of the alphabet, is a matter of taste."

The Simplified Spelling Society estimates that at least a year of educational time would be saved by all English speaking children if their "New Spelling" system were used. Jamieson (1973), who designed 'sensubul speling', calculates an average of one-and-a-half misuses of symbols per word in traditional spelling. The time and energy saved when teaching a simplified and regularised orthography could be better used in meeting the increased educational demands of a changing civilisation.

4. *Paulsen (1971) and Rondthaler agree that the practical consideration of turning out printed material which is nonconventional is no longer a forbidding one.* During the last 25 years there has been a continuous state of revolutionary change in printing techniques. Today we can place a transliterating computer between the typesetter's keyboard and the photo-printout unit and at the turn of a switch, the traditionally spelt input comes out as the new spelling typesetting. These two writers both feel that the saving in printing bulk would pay for the computers again and again. "We have at last the technology to make the dream come true. Do we have the courage to use it?" Rondthaler, (1973) asks.

The opposers of Spelling Reform see as an insuperable obstacle. 1, that pronunciation is not uniform in all areas where the language is spoken, nor is it even static. It is forever changing. In Vallins (1973),
> "Swift and Johnson saw what Spelling Reformers have never been able to see, that phonetic spelling means swiftly changing spelling, with variations according to local types of pronunciation. The one thing that can be legitimately fixed in a language is the form of its words, and that must depend not so much on changeable and variable sound as on recorded history: in brief, spelling should be precisely what it is in English, etymological rather than phonetic."

The derivation of a word would be obscured by a new type of spelling. 'Words of Teutonic origin for

instance would be extensively changed.

English is a living language, outside influences add foreign words to our vocabulary, and the pronunciation of words is continually changing. The use of dialect is no longer frowned upon. At present all these changes are being gradually absorbed into our language, because with the large variety of combinations of letters required to spell a sound, a new group is accepted without comment. If we used a phonetic alphabet for our present 40-plus sounds, would new symbols need to be added in the future when new foreign words were admitted to our vocabulary, or would we accept the foreign spellings for these words, and by so doing, could this new simplified and regularised spelling become, in a thousand years time, even more confused than it is at present. We could, of course, copy the languages of other countries who adapt the spelling of foreign words to their own spelling rules, eg. picnic = pique nique (French).

2. *The learning of spelling it is argued, is a good mental discipline.* Children who never have to exercise their minds on anything difficult will not be good for much in later life. In Boyd (1924),
   "English spelling though teeming with irregularities is fundamentally rational, and in spite of confusion and uncertainty caused by irregularities, we learn to spell the majority of words on the basis of analogy."

Prof. Axel Wijk (1972) suggests that if we examine the entire vocabulary of the English language, we shall find that the vast majority of English words (about 90-95%) actually follow certain general rules and patterns and that only 5-10% display definite irregular spellings. (see Appendix II, Comparison of alphabets)

3. *With a new alphabet, words would have absurd representations and look unfamiliar.* Some would be shorter in length but with "New Spelling" and "Consistent Spelling", very many would be extended, so it would be doubtful if there would be an overall economy of letters or space.

4. *Homophones, words which sound alike, are spell differently at present, but when represented phonetically would have the same configuration and would cause confusion to the reader.*

Dr. Gassner has shown great concern about this problem in his "Consistent Spelling," and uses double consonants in words to show difference in meaning.

5. *If Spelling Reform were implemented, the millions of volumes in public and private libraries would become 'closed books' (without special study) to the children of tomorrow.*

My own observations on these points would agree that "A language requires an adequate collection of various signs for its spoken sounds. English spelling reformers say we need 40 or more phonetic symbols instead of the 26 we have." (Fairbanks 1970)

1. *The chief merit of a phonetic system would presumably be its consistency.* It may be argued that our not having such a system is indeed the root of our troubles. Goaman (1966) supports this. He stated: "It would make English a much easier language to read if we always used the same letters to represent the same sounds."

2. *After a short study of phonetic print, the reader will find he is able to read and write with perfect fluency.* The only difficulty will be to analyse the different sounds needed in formulating the written words, but this neglected part of our education can become surprisingly interesting.

3. *It is said that reformed spelling would obscure the etymology of* words. But in an approximately equal number of words wrong etymology would be clarified. A phonetic spelling would no doubt give many words a form farther removed from their Latin or other source than the old spelling, but the mass of those who learn the new spelling will also know the old, which will always be available for reference to those who are interested in etymology. The study of the derivation of words is a specialist subject for the scholar. As long as words convey meaning to the ordinary person, that is all he requires from them.

In the 8th Century Alcuin taught the scribes a development of script used by Irish monks. He introduced the small letters of the alphabet. Most of them have a different representation from their corresponding capital letters. [6] These were new characters and Alcuin could be accused of reforming the spelling of his day. He introduced new configurations to each word and we can assume that this was welcomed by the scribes who would find it much quicker and easier to write.

At first the unusual American spellings we see in many present-day books may be offensive to the eye. This would be so with any new spelling. We shrink instinctively from any change from the familiar, but in time the initial strangeness becomes accepted, and in turn, also becomes familiar.

4. *Pitman (1969) observed, with reference to Shaw's alphabet, that it was both more legible and one-third more economical in space than traditional printing,* and suggested that this could lead to a great increase in reading speed.

5. *The homonym-homophone argument is baseless.* It is maintained that confusion would arise if *right, wright, rite, write* (which are homophones) were all written with the same configuration, but confusion does not arise when these words are spoken, and it is impossible to make up a sentence containing one of these words so that any of, the other three could take its place and make sense. (Ben Franklin, 1783)

It is appropriate at this point to mention the confusion caused to children beginning to read, by homographs, [7] words such as *'read, tear, wind, row'* etc. which have different pronunciations, but the same configurations. This at present is a far more confusing situation than future similarly-spelt homophones would be.

With a phonetic alphabet, homographs would have a spelling in which their accurate sound would he read and the confusion we now have when reading them would be eradicated. In both cases the efficient use of context will establish the meaning of the words. And care in writing context would eliminate the need for differently-written homophones.

6. *All books in the old spelling would be useless it is said.* Those who use the new spelling would also be able to read the old without too much difficulty. Everyone would find it is relatively easy to read phonetic print. One verbalises as one reads. The future generations could apply this ability to reading the old print – they would not have to learn it and spell it – just read it.

Before a decision can be made about a reform which would affect us all to some degree, there are six questions to be answered.

1. *Is it fair that a year's education time should be wasted on teaching children to read?* i.t.a. has been proved to be a success in the initial stages of learning to read. The transfer from i.t.a. to conventional spelling is not as formidable as had been anticipated. Even the most sceptical observers have had to

concede that it helps dull children from poor homes and does not retard bright ones from good homes.

How much more reading could have been achieved by these children if they had not had the problems of changing to the traditional orthography and learning so many spelling rules! How much less would be the pronunciation problems of foreigners learning our language, if it were phonetically spelt!

In Fernwald (1974), "Learning to read the English language is one of the worst mind-stunting processes that has ever formed a part of the education of any people."

2. *Can we legitimately criticise the idea of Spelling Reform without first having a detailed knowledge of the imperfections of our present-day spelling system?*

Teachers and members of the public not familiar with i.t.a. are doubtful of the advantages of the use of a phonetic alphabet because they have the impression that this would mean learning over 40 completely new symbols – and even people in the teaching world cannot, or will not, realise that this is a complete falacy. Of the 45 symbols in the expanded i.t.a. alphabet, 24 are exactly the same as our Roman letters, 13 are easily recognisable digraphs of our common letters joined together, 5 are ordinary letters with slight distinguishable embelishments, and only 3 are completely new to be learned.

Prof. Walter W. Skeat (1942) felt strongly about this also. He said, "No one can possibly be in a position to judge as to the extent to which our spelling ought to be conformed (if at all) to that of Greek or Latin – for this is what supporters of the (so called) etymological spelling really mean – until he has first made himself acquainted with the history of our spelling and of our language. The plain question is simply this: how came we to spell as we do, and how is it that the written symbol so frequently gives a totally false impression of the true sound of the spoken word. Until this question has been more or less considered, it is impossible to concede that a student can know what he is talking about, or can have any right to be heard. It is surely a national disgrace to us, to find that the wildest arguments concerning English spelling and etymology are constantly being used by well educated persons, whose ignorance of early English pronunciation and of modern English phonetics is so complete that they have no suspicion whatever of the amazing worthlessness of their ludicrous utterances."

3. *Is Spelling Reform coming to us gradually without us realising it?*
Since the 1950's changes towards clarity and simplicity in the mechanics of spelling have been made where fullstops, apostrophes, inverted commas (quotes), hyphens, and capitals are concerned.

Spacing now performs the function of punctuation in addresses and qualifications after a person's name. Fullstops and commas are omitted. (Robert Brown, BA, MP)

Abreviated words omit the fullstops after the final letter if that is the same as the letter in the full form. (Gk for Greek)

The apostrophe is less used and has disappeared from 'bus and 'cello (bus and cello), and in plurals where there is no clear notion of possession (Girls School). Teachers' Training College became Teacher Training College in the late 1940's and in 1964, College of Education. We now have Earls Court., St. Davids, Selfridges.

We say 'quotes' instead of 'quotation marks' or 'inverted commas'. They were not used by Shakespeare or in the King James Bible. Are they really necessary?

Hyphens are essential in such phrases as 'will-o-the- wisp' or 'happy-go-lucky' but previously hyphened place names have dispensed with them (Kingston upon Thames, Stratford upon Avon).

Current custom prefers lowercase letters if there is uncertainty as to which to use, thus there is simplicity of print.

New words are continually being added to our vocabulary.

These reforms have come about almost unnoticed. In Australia (1975) Harry Lindgren's spelling reform (SR 1) using no new characters was introduced. Here in the first stage of Spelling Reform the short *e* sound was simplified. In all words containing this sound the group of letters used was replaced by a single *e*, e.g. br*ea*d becomes br*e*d; fr*ie*nd – fr*e*nd; l*eo*pard – l*e*pard; s*ai*d – s*e*d, etc. By simplifying one sound at a time the change is so gradual that very few inconveniences will be felt.

4. *If traditional spelling is continued, is help needed for a simpler introduction to this complex system?* In 1913, Bradley in his paper "On the Relations between Spoken and Written Language, with special reference to English," stated,

> "It is not the sole function of writing   to represent sounds. Writing can directly express meaning, in that for most experienced readers words have an ideographic rather than a phonetic value. We do not, in fact, read by sound. . . Traditional spelling is essential for the preservation of association of words, and for speedy communication of ideas. However, there is no doubt that those unphonetic features of our spelling which have their practical value for the educated adult, do add enormously to the difficulty of learning to read and write. The waste of time in education caused by the want of consistent relation between written and spoken word is a serious evil which urgently calls for a remedy."

It was to be 50 years before Sir James Pitman introduced a remedy, namely i.t.a., into British schools. This is the best thing that has happened so far to simplifying the task of teaching children to read.

5. *If it were decided to introduce spelling reform, which type of alphabet would be best for this country*? This is a decision which would be made, by a responsible body of knowledgeable people, taking into consideration all the advantages, disadvantages, and observations I have listed, and selecting the type of alphabet best suited to the needs of the world at the time in question.

The alphabets I have studied appear to fall into four categories. (see **Appendix II, Comparison of alphabets**)
> 1. A medium for teaching beginners to read and write, and designed specifically to facilitate the transfer to traditional orthography. (i.t.a.)
> 2. A new system of regularised spelling using the present 26 letter alphabet without the addition of new characters. (New Spelling, Wurld Inglish, and Consistent Spelling).
> 3. A new system of regularised spelling using some of the 26 letters of our present alphabet singly or as digraphs, with a few additional characters. (simpl speling).
> 4. A new system with sufficient augmentation of the Roman letters to achieve highly consistent matching of sounds and letters with one symbol to each given sound, and no double or treble letter combinations used as at present. (Readspell, Torskript).. Or in addition,
> 5. A compromise between traditional orthography and total reform. (Lindgren's SR 1, and Wijk's Regularized Inglish).

6. *What then is to be the future of our unsystematic spelling? Must we suffer indefinitely?*
> "When once the public mind is prepared to accept reform in principle, and the government is stirred up to action, it is clear there will have to be some official enquiry into the best method of reform."

Echoing these words of William Archer in an interview in the *Daily Chronicle* (November 1911), it was felt at the First International Conference of the Simplified Spelling Society that although representation had been made to Parliament by the Society in the past, and to the Bullock Committee, nothing positive would be done in this country without definite proof of a successful alphabet – one which could be brought into use with the minimum effect on the public.

Perhaps it will be considered after the future trials that such an alphabet is among those I have mentioned, and a gradual and unobtrusive transfer to its use will be employed in this country, learning too from any problems which may arise during the Australian Spelling Reform. But in making a decision about Spelling Reform the main consideration must be the welfare of future generations of readers and writers, not our own, as we can finish our lives using the traditional print.

Until then phonologists and linguists will continue to search for one standard pattern of written English with Kingsley Read's (1975) words echoing in their minds:
> "The time for endless and often petty-fogging research is over. The need is for CONTROLLED TESTING, FORWARD THINKING, and ACTION!"

Appendix I

(1) *Different sounds for the same letter:*
a c*a*t b*a*by c*a*ll c*a*lf w*a*nt m*a*ny err*a*nd im*a*ging *a*bout
e b*e* b*e*d pr*e*tty s*e*argeant D*e*rby ov*e*r
o w*o*man w*o*men f*o*r *o*ther n*o* *o*live d*o* lab*o*ur d*o*wn
u *u*p *u*se p*u*t b*u*t r*u*le b*u*sy r*u*le b*u*sy b*u*ry q*u*ite

(2) *Different groups of letters for the same sound:*
sh   oce*a*n *sh*ip herba*ceo*us *ch*ef stan*ch*ion ca*ch*ou
       fu*chs*ia spe*ci*al vi*ci*ous *psh*aw exem*pt*ion *s*ugar
       fa*sc*ist sene*sch*al cu*sh*ion schotti*sche* con*sci*ence
       con*sci*ous pen*si*on *sj*ambok i*ss*ue mi*ssi*on sa*t*iate,
       tortoi*sesh*ell na*t*ion cau*tio*us lu*x*ury fle*xi*on an*xi*ous
ə   *a*bout th*e* moth*e*r capt*ai*n page*a*nt nuis*a*nce lunch*eo*n
       spe*ci*al reg*io*n err*a*nd cupb*oa*rd

(3) *Silent letters:*
a, de*a*d*, b,* dou*b*t*, c,* ba*c*k*, d,* a*d*just*, e,* hav*e*,*f,* sta*ff*,
g, rei*g*n*, h,* *h*onor*, i,* rece*i*ve*, j,* ha*j*ji*, k,* *k*now*, 1,* ta*l*k,
m, *m*nemonic*, n,* condem*n*, *o,* j*o*urnal*, p,* *p*sychology,
q, lac*qu*er*, r,* car*r*y*, s,* i*s*land*, t,* wa*t*ch*, u,* b*u*ild*, v,* nav*v*y,
w, *w*ho*, x,* billet-dou*x*, *y,* play*e*d. *z,* pu*z*zle.

Appendix II

Comparison of Alphabet Symbols

Wurld Inglish	i.t.a.	TORSKRIPT	Consistent Spelling	Readspel	simpl speling
A a	a	A	A a/ae	a	a
B b	b	B b	B b	b	b
- --	c	- -	- -	.	.
D d	d	D	D d	d	d
E e	e	E e	E e/+dbl	e	e
F f	f	F f	F f	f	f
G g	g	G g	G g	g	g
H h	h	H h	H h	h	h
I i	i	I	I i/y	i	i
J j	j	J j	J j	j	j
K k	k	K k	K k	k	k
L l	l	L l	L l	L	l
M m	m	M m	M m	m	m
N n	n	N n	N n	n	n
O o	o	O o	O o/+dbl	o	o
P p	p	P p	P p	p	p
- -	-	- -	- -	-	-
R r	r	R r	R r	r	r
S s	s	S s	S s	s	s
T t	t	T t	T t	t	t
U u	u	U u	U u/+dbl	u	u
V v	v	V v	V v	v	v
W w	w	W w	W w	w	w
- -	-	- -	- x	-	-
Y y	y	Y y	Y y	y	y
Z z	z	Z z	Z z	z	z
- -	z	- -	- -	-	-
ch	ch	ų ų	-ch	ch	c
sh	sh	Σ ʃ	sh	sh	sc
th	th	D ð	C c	th	ð
th	th	ꞗ ꞗ	th	th	θ
wh	wh	hw	hw	wh	hw

Comments
Wurld Inglish, New Spelling, Torskript, and Consistent Spelling all keep the capital letters.

i.t a. retains *c* to keep the similarity with traditional orthography and uses *or* and *au* as these are sounded differently in some countries.

Consistent.Spelling uses *X* for the *ks* sound and *q* for the neutral vowel sound.

In simpl speling, one symbol represents more than one sound, e.g. (h*i*t, *y*ear) and *a* (a, h*a*t, p*a*ss)

In Consistent Spelling and simpl speling, both *oo* (book) and *w* (wet), are represented by *w*.

New Spelling differs from Wurld Inglish in that W.I. adds diacritical marks to th (them) and th (thin) in place of N.S. *dh* and *th*. Also N.S. uses *oo* and *uu* as in *good fuud* whereas W.I. uses them as *guud food*.

Torskript and simpl speling use ð for the *th* sound in (them) and Consistent Spelling uses *c* for that sound.

The authors of these systems are:
New Spelling: Walter Ripman and William Archer
Wurld Inglish: Herbert S. Wilkinson
i.t.a.: Sir James Pitman
Torskript:. Victor P. Paulsen
Consistent Spelling: Dr. Walter Gassner
Readspel: Kingsley Read
simpl speling: Edward Smith

Appendix III

The way to spelling reform – a brief history of spelling reform over seven centuries.
[#1 should be a square, #2 should be a circle with a dot in the middle.]

13th century An Augustine Canon named ORM distinguished short vowels from long by doubling the succeeding consonants, or when not feasible, by marking the short vowels with a superimposed breve.

1476 WILLIAM CAXTON deliberately adopted certain spellings in the interests of consistency and uniformity.

1568 Sir THOMAS SMITH proposed an extended set of symbols (Alphabetum Angelicum), with 34 characters.

1569 JOHN HART used diacritical marks to distinguish vowel sounds and devised new symbols for consonants.

- WILLIAM BULLOKAR used numerous marks both above and below letters to assist readers. He suggested that vowels should have marks to indicate length and quality; vowels should be doubled for long sounds e.g. *oo*, and that some silent letters (e, b, i, o) should disappear.

1530-1611 RICHARD MULCASTER recommended no change in the existing 24 letters (*j* and *v* were still included under *i* and *u*). Mulcaster's influence was considerable and he listed the first rules of spelling.

1621 ALEXANDER GILL thought spelling should be phonetic but made allowance for derivation, difference of meaning, accepted usage and dialect.

1634 CHARLES BUTLER was particularly keen on single characters or the ligature for the existing double or doubled symbols, but he was completely unphonetic.

1640 SIMON DAINE was interested in letter names and referred to the changing pronunciation of the time with its relationship to spelling.

1644 RICHARD HODGES highlighted homophones. He disliked unnecessary double consonants and was concerned about the different sounds of vowels in different words. He used diacritic marks and separated syllables by a hyphen.

1668 JOHN WILKINS was concerned with word confusion. He had 450 characters in his system.

1768 Dr BENJAMIN FRANKLIN dispensed with c, j, q, w, x, y and added 6 new characters, but he relied on digraphs and for a long vowel he doubled the short vowels.

- Dr. WILLIAM THORNTON aimed at one symbol for each spoken sound and included ∫ for sh, #1 for *aw,* and #2 for wh.

1840 Sir ISAAC PITMAN. In his *Phonography in Writing by Sound, being a New and Natural System of Shorthand,* the signs and symbols were consistently phonetically and emphasised the anomalies of English spelling. In Pitman's Shorthand we have a phonetic spelling that for consistency and accuracy, has stood the test of time.

1866 Dr. EDWIN LEIGH invented Fonotypy and carried out experiments in it and with an alphabet that indicated all sounds and silent letters without respelling.

1908 PITMAN's enthusiasm and inventiveness encouraged the formation of the *Simplified Spelling Society.*

1912 ROBERT BRIDGES (Poet Laureate) belonged to the *Society for Pure English.* He removed mute letters, e.g. *hav, liv, coud,* etc.

1914 Miss McCALLUM successfully taught a reading system based on the 'International Phonetic Alphabet', at a school in Cowdenbeath.

1856–1950 GEORGE BERNARD SHAW was interested "in the introduction of a new English alphabet containing between 40 and 50 new letters to be used and taught concurrently with the old alphabet until one or the other proves the fitter to survive,"

In his own writings he dropped the *u* in *our* endings and apostrophes in noun possessives, and abbreviated words and phrases. After his death part of his estate was used for the alphabet scheme in which in

1962 *Androcles and the Lion* was published.

The 'Shaw Contest Alphabet' was of 40 letters and 8 digraphs. Shaw provided money in his will for the inauguration of a "British alphabet of at least 40 letters" to be devised by a qualified phonetician.

1949 Dr. MONT FOLLICK, Labour M.P. for Loughborough introduced a private members' *Spelling Reform Bill* into the House of Commons, seconded by Sir JAMES PITMAN. The Bill was defeated in a small house by a vote of 84 to 87.

Since the formation of the Simplified Spelling Society there have been 16 attempts to simplify the teaching of English by a variety of methods, notably:

WORDS IN COLOUR (Gattegno, 1940)
COLOR STORY READING (Jones, 1965)
DIACRITICAL MARKING SYSTEM (Fry, 1966)

Thirteen new alphabets have been formulated including:
NEW SPELLING (Simplified Spelling Society, 1948)
REGULARIZED INGLISH (Wijk, 1958)
i.t.a. (Pitman, 1961)
The SHAW CONTEST ALPHABET (composit of 4 winners, 1962.)
MALONE SINGLE-SOUND ALPHABET (1962)
TORSKRIPT (Paulsen, 1963)
SENSUBLE SPELLING (Jamieson, 1973)
WURLD INGLISH (Wilkinson, 1970)
These have all received a certain amount of publicity.

At the First International Conference of the Simplified Spelling Society (London, 1975), it was decided that trials should be organised at some future date when Phonetic Alphabets should be compared for usefulness in teaching English, and the evidence set before the Government with a suggestion of Spelling Reform.

The alphabets offered for the trials were nos. 2 through 7 listed above in **Appendix II**.

-o0o-

4. A Spelling Reform Step, by Frank T. du Feu

In an interesting personal letter to me from Frank T. du Feu, received last summer (undated), he proposed what he believed to be, ". . . the biggest change in Eurospelling that I have made for more than ten years."

The change he proposed was for the elimination of the unneeded 'w' in words commonly spelt with the *unstressed 'ow'.* Thus 'arrow' would be spelt, 'arro', which would be comparable to our usual spelling of words like: *alto, banjo, buffalo, canto, cargo, ditto, domino,* and *dynamo* – none of which appear to suffer from the missing 'w.'

Mr. du Feu provided a list of about 70 words to demonstrate the lojic of his proposal, which I append here:

EURO spelt without the w.	*EURO simplified omitting w*
alto	arro, barro
banjo	bello, billo
buf falo	boro, bungalo
canto, cargo	burro, callo
ditto, domino	elbo, fallo
dynamo, eko	follo(er), furro
embargo, foeto	gallo(es), hallo
haelo, heero	harro, hollo
innuendo, limbo	marro, medo
martello, motto	mello, minno
neegro, piano	motto, narro
portico, potaeto	pillo, sallo
raedio, saego	shado, shallo
soelo, stucco	sorro, sparro
tango, tempo	swallo, tallo
tobacco, veeto	wido(er), willo
volcaeno, zeero	windo, winno
wallo	yello

Mr. du Feu was careful to point out that several compound words should not be included in this deletion of the unsounded 'w', such as
'rain + bow', which should remain 'rainbow.'
'oever + flow', which should remain 'oeverflow.'

To such modifications, I would reluctantly subscribe, which could be given a simpl rule: (if eny is needed), the final 'long-o' phoneem be spelt with a singl 'o' rather than 'ow'; the latter being reserved for such words with a different sound, such as: bow-wow, how now brown cow, hibrow, and hay-mow.

Harvie Barnard

-o0o-

5. Some Proposed Principles for Simplifying English Orthography, by John R. Beech, Ph.D.*

*Dept. of Psychology, New Univ. of Ulster, Coleraine, N. Ireland.
Presented at the 1979 Conf. on Reading & Spelling, Nene College.

The English language is exceedingly difficult to learn to read because of a spelling structure which is very complicated and which is not altogether consistent., Consequently, when a child trys to learn to read, it would be a grave mistake for him to draw generalizations and rules about how a symbol might be pronounced, for before too long he is likely to encounter another word which contradicts the rules. To save space, I will not go any further into the reasons why we should reform our spelling system. Instead, I will begin immediately with three main criteria which should be considered in adopting a new spelling system.

Criteria for Reform

1. Obviously the main criteria is that it should enable children to learn to read much faster and more easily. This also implies that most children who would not have been able, to read the traditional system should now be able to read the new system. This criterion is probably fulfilled by most suggested spelling reform schemes and is the easiest to satisfy.

2. The next criterion is very important from the point of view of achieving reform: would the public be able to read the new system easily? The agonizing aspect of this point is that it runs counter to criterion 1. if I were to propose a law about the relation between these two criteria, it might run: the less rules of spelling one proposes (e.g. a system like WES), the more unlike traditional spelling text becomes; conversely, the more rules one proposes, the more one's text becomes like traditional spelling. Consequently a system that has the least rules would be the one in which each symbol or combination of symbols represents only one phoneme (i.e. the sound of a letter) but which also would be the least readable from the point of view of the public. A compromise has to be achieved in which these two opposing aims are delicately counterbalanced.

3. The third criterion would be that it should be reasonably easy to spell within the new system from the point of view of both the layman already familiar with traditional spelling and the child learning to read. One major reason for proposing this criterion is that a great deal of time is wasted by children having to learn literally thousands of spellings. Just take the long-e sound. This sound is represented by several different spellings: *ea, ee, e, ie, e-e, eo, ey. ei,* and so, although the learner knows that the long-e sound in a particular word could have a range of spellings, he has to decide which is the particular correct spelling for that word. Consequently he has to memorize a large proportion of the spellings of the words with the long-e sound. Furthermore, it is unlikely that the public will want to change to a spelling system which is overcomplicated or to one which is so compromised that one has to learn a large number of exceptions.

Proposed guidelines for regularizing English spelling

In devising a spelling scheme one should bear in mind the likely disruption to English text brought about by any spelling reform. The first guideline therefore is designed to minimize disruption:

1. One would examine the way words are presently spelt and where several symbols or combinations of symbols represent the same sound, adopt the rule most frequently used. However, in English spelling, it is sometimes the case that the type of spelling is contingent on the position of the sound in the word. For example, the spelling *ou* represents the *ow* sound (as in 'house') most frequently in the middle of a word, but *ow* represents the same sound at the end of the word. Consequently, *the most frequent spelling for a particular position* should be employed. This first principle ensures that disruption is reasonably minimal. It also means that symbol combinations which are not particularly phonetic should be retained, e.g. *-tion* at the end of a word and *qu* at the beginning or middle of a word. However, if the rule occurs for too few a number of words, even though it is the most frequent one, the rule is not necessarily applied. This is in order to cut down on the total number of rules that have to be learned. For example, in my own scheme to be described later, I have opted not to retain *gu* for the *gw* sound as the complication of learning that spelling rule out-weighs the number of words with that sound combination. To conclude this first principle: the aim here is that there is only one spelling for a particular sound and that that particular spelling, if so imposed, will prove to be the least disruptive when the new text is compared to the same text in traditional spelling.

The advantages of least disruption are two-fold. Firstly, the public would probably be more willing to change to a system which is similar to the present one, and secondly, children taught in the new system would still be able to read books in the old spelling if necessary, without it appearing to be completely different.

2. If it were at all possible, that is, in circumstances in which it would not be too disruptive, a spelling combination should be as simple as possible in order to aid the learner. To illustrate with the author's scheme to be described later, if *u-e* is used to represent the *ue* sound (e.g. 'tune'), it would be more straightforward to learn if the *ue* sound is also represented at the end of the word by *u* rather than by *ew,* even though *ew* is presently used the most frequently at the end of the word. Thus instead of 'new', the spelling would be *nu*.

3. This next principle has a two-fold purpose to make spelling both more efficient and easier. While marking exam scripts for my course in Cognitive Psychology this June, I made a note of a sample of the student's spelling errors. The most common error was with the double consonant. Here are some examples: chanel, sylable, interpretted, aggreed, etc. Therefore the double consonant should be abolished, except in a few cases (e.g. midday).

4. Subtle distinctions in sounds should be ignored. For instance, some spelling reform systems seek to distinguish the *th* sound in 'theory' from that in 'these.' These distinctions would place a burden on learners, especially those with difficulties such as poor auditory discrimination (Yule, personal communication). Sometimes traditional spelling makes a half hearted attempt at differentiating one sound from another. For instance, the s and z sounds are largely undifferentiated (e.g. the 's' in 'is' and in 'result' should be spelt with a 'z'). Also, it is difficult to differentiate the s from the x sound in plurals.

My solution in this case would be that the letter 's' would conveniently represent both categories of sound, except at the beginning of the word.

5. We should aim to arrive at a situation in which, given the rules of spelling, anyone could correctly generate the spelling of a new word given that (a) he knows how it is pronounced formally (and this is a problem even with the most phonetic system); (b) he has mastered the set of spelling rules for that system. In situations in which there are ambiguities, the devisors of a new spelling scheme would fall back on asking ordinary people to generate new words, having previously instructed them in the new spelling scheme, and the form of spelling which would be adopted would be the most frequently used form for each word. Alternately, or in addition, if a word can be spelt in more than one way, then each version might be acceptable.

6. If spelling reform takes place, it should be done simultaneously by all English speaking nations. This next point is perhaps debatable, but bearing in mind the dominant role of English in the communication of science and in other Spheres, the spelling and punctuation structure should be as standard as possible across nations. This will be a problem with the different pronunciation between English and American. There is also a problem of different regional accents. However, traditional spelling has tolerated these differences remarkably well, so a new spelling scheme should try not to aggravate the problem. One example of how well present spelling copes with English versus American pronunciations is that the '-ew' ending represents the *ue* and *oo* sounds, enabling Americans to pronounce 'new' as noo and the British to pronounce it as *nue.*

I have devised a spelling scheme based on the above principles and there now follows a very brief description of the scheme as it might be presented to the *British* layman (the layman would actually receive an expanded version). A list of rules for reading could be constructed along similar lines. Comments on and analyses of the scheme will follow afterwards.

A brief summary of the spelling rules of the new scheme
In this scheme, spelling is based on the sound of words as pronounced in formal speech. So here are some of the words which change in a straightforward manner in the new schemer *bred, hart, cigaret, giv, hav, ar, gon, involv, twelv, carv, frend, bilding.* Most words in the English language may be spelt unambiguously from the rules given below:

General Rules
1. Most silent letters are abolished or substituted, e.g. *thum* instead of 'thumb,' *parm* instead of 'palm.' Most double consonants are abolished, e.g. *bel* (*'bell'*), *comunity.* But note that only a few cases in words like *midday, cannot, withhold,* etc. is the double consonant 'retained as these are really two words joined together.

2. Ten words which should be spelt rather differently in the new scheme are kept the same as in traditional spelling. These can be memorized by learning the following somewhat gruesome rhyme which incorporates all the ten words (which are italicized):

I was one of the ones who was there who tride *to* pul out *all your* hair.

The consonant sounds. The consonants are spelt exactly as before with the following qualifications:

1. *The i sound.-* i represents the i sound in all cases, *e.g. jam, chant* (*'change'), jigantic, etc,.*

2. *The k sound:* the *k* sound is always represented by *c*, so *k* is abolished.

3. *The qu sound:* As in traditional spelling, *qu* represents the *qu* (or *kw*) sound, e.g. *quality, liquid, equater,* etc.

4. *The s sound. s* represents the *s* sound in all cases, e.g. *les (*'less'), *chans (*'chance'), *stand, sit,* etc.

5. *The z sound:* z represents the z sound only at the beginning of a word, e.g. zip, otherwise s represents the z sound in all other positions, e.g. *visual, jas* ('jazz'), etc.;

6. *The ex sound:* the *ex* sound (and the *gz* sound as in 'exact') at the beginning of a word continues to be spelt *ex,* e.g. *exclame, exempt,* (except for 'Xmas' and 'X-ray'), as is the case in traditional spelling. Similarly, *x* is employed in the same way as in traditional spelling for other positions in the word, e.g. *mix, ax, conexion,* (conection is an alternative spelling).

The vowel sounds. The simple single vowels *(a, e, i, o, u)* are spelt exactly the same as in traditional spelling (e.g. *flag, bet, thin, spot, thug)* but other vowel sounds are spelt as follows:

1.* The *long a sound* is represented by *a-e* (e.g. *mate, vane*) except at the end of a word where it is represented by *ay*, e.g. (*day, say, thay* (they').

2. The *long a plus r sound* is represented by *air,* e.g. *fairy, mair,* ('mayor' and 'mare'), *scairs* ('scarce' and 'scares'). But note: *layer, servayer ('surveyor'),* player.

3. The *ar sound* is only differentiated from the *intermediate a sound* if necessary, for instance, these words are spelt with *ar: card, farm, harm, carm* but these words are not spelt with *ar: casal* ('castle'), *bath, gras, cast, last.* In other words, for Southern English speakers, the *ar* sound in front of the hissing ending is pronounced with the intermediate *a* (e.g. 'grass' is pronounced *grahss*), but is spelt with an 'a' in the new scheme. For other English speakers, this vowel sound is pronounced as *a* in *cat* and is spelt, accordingly (e.g. *gras).*

4. The *long e sound* is represented by *ea,* e.g. *meal, sleap.* In the case in which the *e* in the word, as spelt in the new scheme, has more than one letter between itself and the end of the word, it is spelt just as *e*, e.g. *experiens* ('experience'), *feld* ('field'), *equal, secret.* However, when the word ends in *ch, st* or *th, ea* is still used: e.g. *'teach, east, teath.* In the case of the word ending in the *long e sound,* this is spelt as *e*, e.g. *me, be, ne* (knee'), *fe, ple,* ('plea'), *we, he, she, tre* ('tree).

5.* The *long i sound* is represented by *i-e* in the middle of the word, eg. *tribe, nite,* and is represented by y at end of a word, e.g. *by, scy* ('sky').

6.* The *long o sound* is represented by *o-e*, e.g. *throte, gote, rote, throne, those, coxe* ('coax'), and by *o* at the end of the word, e.g. *solo*, *helo, belo, bo, tho, so, go.*

7. The *oi sound* is represented by *oi*, e.g. *coin, emploiment, groin,* and by *oy* at the end of a word, e.g. *boy, coy, toy*, etc.

8. The *oo digraph* continues to represent the two different sounds in words such as *brood, booc,* ('book'). Here are some examples: *boo, doo, zoo, groo, scroo, troo, bloo, rood, tooc, looc, hooc, etc.*

9. The *awe sound* (or *'or' sound* in Rec'd Standard) is represented by *or*, e.g. *horl* ('hall' and 'haul'), *story, for* ('for' and 'four'), *por* ('pore, 'poor', 'pour'), *orltogether, orlso.*

10. The diphthongal *intermediate vowel plus long oo sound* is represented by *ou* in the middle of a word and by *ow* at the end, e.g. *hous, proud, cow, sow.* Note the following: *pouer, touer, ouer* (power', 'tower', 'our', respectively).

11.* The *long u sound* is represented by *u-e*, e.g. *fume, use, huge,* except at the end of the word where it is spelt *u*, e.g. *nu, lu* ('new', 'few'), *valu, continu, retina.*

*Note that in the silent *e* rule, when the vowel (*a, i, o,* or *u)* is separated from the end *e* by more than one consonant, the vowel is left unqualified, e.g. *utensal ('utensil'), human, ulogy* ('eulogy') *criterion, blind, child, sical* ('cycle'), *stranj, broch* ('brooch'), *tost, most, loth, etc.*

Word Endings
1. The *-er, -or and -ar endings:* many words are pronounced as a slurred *er* at the end even though they are presently spelt '*-ar'* or '*-er.*' These are all spelt *er* in the new scheme, *e.g. tracter, raser* ('razor').
2. Words ending in the *l sound:* these words are all spelt *l* at the end, e.g. *pil, fil, lul, butiful,* etc. But note that when there is a slurred vowel sound between the last consonant before *l* and *l* itself, this slurred vowel is always spelt with an *a.* Here are some examples to illustrate: *pepal* ('people'), *reliabal, viabal, prinsipal, political,* etc. Note that the silent e rule continues as before, e.g. *pole, role, gole, pile, mule,* etc.
3. The *-sion, -tion, -zion* and *-ion* endings: the *-tion* ending represents the *shun, zhun* and *chun* sounds, e.g. *pention ration, divition, fution, question.* The *xion* ending can represent the *exshun* sound, e.g. *conexion, sexion,* but these words may alternatively be spelt *collection* and *section,* respectively.
4. The *-y ending:* this continues to represent both the *short i* and *long ie* sounds at the end of words, e.g. *sily, scy* ('sky').
5. *Other endings:* these are spelt as in traditional spelling, e.g. *ed, er, ing, ist,* etc., e.g. *sealed, oner* ('owner' and 'honour'), *sealing* ('ceiling' and 'sealing'), *sicling* ('cycling'), *tacing* ('tacking' and 'taking'). As in traditional spelling, the final *e* of the root word should be dropped when adding an ending beginning with a vowel, but the *e* should be kept before a consonant, e.g. *drive, driving, driven, live, lived, lively, liven, living,* etc. Note the change in the -*y* ending: *spy, spied, try, tried,* etc. The rules for plurals are the same as in traditional spelling, *e.g. booc-boocs, lady-ladies, hero-heroes;* and for plurals of words with a hissing ending: *gas-gases, wish-wishes, church-churches, fox-foxes,* etc. Other endings have been described when necessary under the heading "Vowels" listed above.

An example of some text in the new scheme is given in Appendix 1. The scheme was devised keeping the proposed principles in mind and using Wijk (1959), the spelling counts of Dewey (1970) which were of some limited use, and my own spelling counts on a modest scale from ordinary text. The pronunciations are based on Hornby (1978), which has both English and American pronunciations and is prepared with foreigners in mind.

Comments on the new scheme
General comments. The application of the "most frequent spelling" rule means that '*s*' represents the *z* sound except at the beginning of a word. In Dewey's corpus of 364,381 sampled words, out of 11,089 occurences of the *z* sound, only 247 were spelt '*z*' whereas 10,695 were spelt '*s*'. However, to clarify the beginning of a word – an important part for the learner – *z* is used for the *z* sound. In the case of the *h* sound, out of 10,010 occurences, 6403 were spelt '*c*' compared to 1,854 which were spelt as '*k*', so *c* represents the *k* sound in all cases in the new scheme and '*c*' is no longer used for any other sound. In the case of the *j* sound, an exception to the "most frequent spelling" rule was made because there were only 1,582 instances of the sound and although 948 were spelt with a '*g*', it was considered that in view

of the infrequency of this sound, it would not be too disruptive to spell it as *j*. Furthermore, unlike the *s* and *z* sounds, *i* and *g* are not so similar to each other so it should be easier for the beginning reader to differentiate one from the other. On the other hand, with the *s* and *z* sounds, it can be difficult to distinguish one sound from the other, especially for those people with poor auditory discrimination, as mentioned previously. It might be noted that the *sion* and *zion* endings are not differentiated for much the same reasoning and are both spelt *tion*.

There was a problem with the *ea* and *oa* endings in that there seemed to be much variability in the way these words ended. The eventual decision to represent these sounds by just *e* and *o*, respectively, was based on several considerations. Firstly, some very high frequency words end this way. Secondly, this spelling is the most economical and is an abbreviation for the other common alternatives, and thirdly, the layman can easily guess how they are supposed to be pronounced. The *ue* sound ending as in 'few', continue', etc. is represented by *ew* 199 times and by *ue* 45 times according to Dewey. It was decided that these occasions were sufficiently few to warrant spelling this sound with *u* alone so as to make spelling easier for learners, rather than spelling it with *ew* which looks rather different from *u* elsewhere in the word. Furthermore, this means that words ending in the three long vowels *e, o,* and *u* all follow the same rule and end the word with their respective single vowel. This should be an aid to learning the system.

As has been noted previously, the spelling combination *gu* which usually represents the *gw* sound, as in 'language, languish', etc. has not been adopted because the rule applies to too small a set of words. The same applies to the *ue* sound at the beginning of a word which is sometimes spelt as 'eu' as in 'eulogy' etc. Again, the set of words here is far too small for this rule to be worthy of adoption. For the same kind of reasons, it was decided to change the 'le' ending, which is common after a consonant in traditional spelling, to *al* because the 'le' ending is not very frequent (684 occurences in Dewey's corpus), although it is more frequent than the 'al' ending. A further reason for this was that *e* on the end of a word is already serving the functions of (a) making a vowel long in sound (e.g. *cote)* and (b) making a long *e* sound (e.g. *she).* Adding the third function of a silent, non-functional *e* as in the 'le' ending would have produced an added complication for the beginning reader.

Slurred sounds
The slurred vowel sound (the schwa), which is the seventh most frequently occurring phoneme out of 41 (see Dewey 1970, Table 3), and the second most frequent vowel sound, has presented something of a problem. In traditional spelling, the schwa vowel presents quite a spelling problem as Dewey lists 23 graphemic representations for it! Dewey found that the schwa sound is represented, in order of frequency, by 'a' which accounts for 5602 occurrences, by 'e' which occurs 5027 times, by 'o' which occurs 2901 times, and by 'u' which occurs 369 times. There is a total of 15,024 occurences of the schwa sound, or 4.1% of Dewey's corpus of phonemes. My solution has been aimed at tampering as little as possible with existing spelling because I found in practice that changing the schwa vowel would be moderately disruptive. Therefore for the endings '-er', '-ed', and '-at' which are often slurred (and 'er' in the middle of a word), these are left exactly as they are at present except that words which end in '-le' (e.g. principle') are changed to an -al ending (e.g. *prinsipat, pepal,* etc.). The remaining slurred vowel sounds are spelt exactly as they are in traditional spelling, for instance, here are some words spelt in the new scheme: *seven, student, hundred, dificult,* etc. The main advantage of this

scheme is that the layman familiar with traditional spelling does not have to keep deciding whether a sound is sufficiently slurred for it to be spelt with a uniform schwa vowel such as 'a' or 'e'. Unfortunately it means that the child learning to spell will have to learn the different spellings for these words. But in relation to the enormous reduction in the overall spelling problems, this should be a minor burden and it should present no problem in reading. Note that there are still many vowel sounds which will be spelt phonetically in the new scheme, e.g. *imerged, bineath, devotion, marcit, etc.,* because they are clearly pronounced differently from the vowels presently used to represent them.

The homograph problem.
Inevitably, the new system creates more homographs (i.e. words with the same spelling but different meanings, such as *air* for 'air' and 'heir') than previously because traditional spelling occasionally tries to differentiate between words of the same sound but of different meaning. But this creation of more homographs is seen as a major strength by the author because one major spelling burden for children is learning how to spell the different homonyms. The particularly difficult homonyms to learn tend to be the more abstract ones, for instance, 'their' and 'there', 'to' and 'too', etc. So if people were able to spell homonyms the same (e.g. 'some' and 'sum' both become *sum*) then a major spelling difficulty would be eliminated. Furthermore, a reading problem would not be created due to increased ambiguity because the context of the running words should aid identification. The spoken homophone is not normally difficult to identify, and to put the problem into context, there are now a few hundred homophones which are differentiated by their spelling (e.g. 'grate' and 'great'), but there are thousands of words with different meanings but with the same sound and spelling. Here are a few examples from Dewey (1971) with the number of meanings of each word in brackets: 'bay' (5), 'fair' (3), 'right' (3), 'sound' (3), 'spring' (3), etc. There is another group of homographs in which the words are spelt the same in traditional spelling but sounded differently. Many of these now become differentiated in the new spelling scheme e.g. 'bow' (*bo, bow*), 'row' (ro, row), 'read' (*read, red*), 'live' (*liv, live*), 'tear' (*tair, tear*), 'wound' *(woond, wound).*

The ten words retained in old spelling
In the new scheme, ten common words remain the same because if they were changed, the spellings would be changed too drastically and this would not smooth the transition from the traditional spelling to the new scheme. This is important from the point of view of the layman reading the scheme for the first time – there should be as much similarity as possible between the two schemes or he may give up straight away. This idea is not new – for instance, Zachrisson (1932) in his spelling scheme "Anglic" left 43 words unchanged. In the new scheme, the ten words are incorporated into a rhyme to facilitate memorization so learning these exceptions would present only a minor problem for the layman. For the beginning reader, these exceptions would be minute in relation to what the beginning reader today has to face. The ten words are derived from the word frequency count of Kucera and Francis (1967) based on a million words. Here are the words with their frequency rank included in brackets: *the* (1), *of* (2), *to* (4), *was* (9), *I* (20), *one* (32), *you* (33), *all* (36), *there* (38), *who* (46). Note that the following words spelt here in traditional spelling would now have the same core spelling as the previous ten words: 'into', 'two', 'too', 'towards'('together', 'today', etc.), 'whom', 'whose'. These words would be spelt: *into, to, to, towards (together, today* etc.), *there, whom, whos,* respectively. These words are all derivatives of the three words *who, there and* to, and as a further memory aid, the following sentence might help:

Whos plase is *there* car going *into today?*

However, derivatives of some of the rest of the remaining ten words will be spelt phonetically, e.g. 'once' (*wuns*), 'aye' (*ie*), 'eye' (*ie*), 'altogether' (*orltogether),* 'although' *(orltho),* 'also' (orlso), 'ewe' (yoo).

Advantages

There are several advantages to the new scheme, as will be seen mainly in the next sections. However, at this point it might be noted that the almost universal application of the silent *e* rule will make the learning of the new scheme easy for the layman; he doesn't need to learn a vowel combination for each long vowel sound, except for the *long e* and *air* sounds. As for the beginning reader, the fact that long vowels in polysyllable words are not specified (e.g. the *u* in *utensal)* may not be a problem because in the early reading stages, mainly monosyllabic words are learned. By the time the longer words are being learned, the pronunciation problems will have been reduced. A similar kind of advantage of the scheme, mentioned earlier, is that three long vowel sounds all follow the same rule at the end of the word by being represented by the single vowel letter (e.g. *she, blo,* and *nu*). This is a rule which intuitively makes sense and is simple to apply. This rule cannot be applied to the other two vowels 'a' and 'i' because these two vowel sounds occur in both long and short forms at the end of a word whereas the other three vowels do not (e.g. dat*a*, pl*a*y, pit*y*, sl*y*). Another advantage of the scheme is that like traditional orthography, it attempts to minimize the differences between British and American pronunciations. For instance, in the new scheme, the *ar* sound is spelt 'ar' only when strictly necessary, for instance, *lard, bark,* and *hard;* but in words such as *casal* and *gras*, the 'ar' spelling is not used.

Analyses on the new scheme

Reading the new scheme

For the child or foreigner learning to read this scheme, there would be the problem that several symbols represent more than one sound. For instance, 'i' in the middle or at the beginning of a word could represent the short or long *i* sound. In fact, there are nine symbols or symbol combinations (out of 56 including the vowels in certain positions) which represent more than one sound: 'a' (in certain positions can represent *short a, long a,* or *ar*), 's' (represents *s* or *z*), 'oo' (represents two different sounds as in *look* and *aloof*), 'th' (represents the two different sounds as in *that* and *thesis*), the four remaining vowels 'e', 'i', 'o' and 'u' which can represent their respective long and short sounds (e.g. *e*qual, m*e*ntion, s*i*tuation, cr*i*terion, etc.), and finally, at the end of the word, 'y' represents both the long and short *i*.

However, an analysis of specimen texts containing 1,345 words (used by Wijk and others) was undergone to discover whether a reader, given a knowledge of the words in the English language, could mistake any words for words of a different sound. Out of this sample, only seven examples were found, which represents 0% of the sample. This is a negligible amount. It should be added that none of these alternatives would have been remotely appropriate in the context of the passage. The seven words were: *fiting,* ('fighting', 'fitting'), *halo* ('halo', 'hallow'), cors ('cause', 'course'), *fase* ('face', 'phase').- occurred twice, *raped* ('raped', 'wrapped'), grase ('graze', 'grace'). This lack of a one-to-one relationship between a symbol and a phoneme is *far* less than in traditional spelling. These ambiguities are retained because in some cases, a change would produce considerable disruptions to the text when comparing the new scheme with traditional spelling (e.g. changing all *z* sounds from 's' to 'z'). In some cases it would mean that extra symbols would have to be put in to clarify a sound (e.g. exp*ea*riens instead of

exp*eriens*); this would be cumbersome and inefficient. Furthermore, our traditional spelling system has exactly the same ambiguities and many, many more besides. As for the foreign learner who would like the spelling structure to enable him to know *completely* how to pronounce a word, a good textbook giving him guides to the ambiguous pronunciations in his early stages of learning should serve this purpose.

In order to gauge the degree of disturbance in the text from the point of view of the layman who is used to traditional orthography and is trying to read the new spelling, the same text of 1,345 words was examined. It was found that 69% of the words in the text remained unchanged, which is quite good. Then the first 1,000 more frequent words were examined from the count of over one million words by Kucera and Francis (1967). This sample of 1,000 words represents 68% of the sampled million words, correcting for the omission of non-words and proper names, and so it represents a good proportion of vocabulary. In this sample, 48% of the words remained unchanged. This reduction is mainly because in the new spelling scheme, ten very frequent words remained unchanged and in ordinary text these occur with sufficient frequency to inflate the proportion of words unaffected by a change in spelling scheme. The words that were changed were scored according to how many letters of the word in traditional spelling were deleted as part of the transition to the new spelling. The purpose of this scoring was to ascertain the amount of context that would remain unchanged under the new scheme. A preliminary analysis revealed that 84% of the words in the sample of 1,000 remain unchanged or had only one letter deleted as a result of the change. Table 1 shows the % of words in the sample as a function of the % of deletion. This table reveals that it is comparatively rare to have over 40% of the word deleted.

Table 1
The % of the 1,000 most frequent words from Kucera and Francis (1967) as a function of the % of letters deleted by changing from traditional to new spelling.

% of letters deleted	1%-20%	21%-40%	41%-60%	61%-80%	*81%-100%*
% of word	27%	19%	4%	1%	0%

The average % of a word deleted, if a part was deleted, was 25%, the standard deviation was 12.9%. The average word length was 6.1 letters for words that had to be changed, and 5.1 letters for words that remained unchanged. An examination of frequency distributions according to length showed that the most frequent word length (i.e. the mode) was four letters for the unchanged words and five letters for the words that were changed. Furthermore, for all word lengths under five letters, more words were unchanged than changed; conversely, for all word lengths from 5 to 11 letters, there were more words changed than unchanged.

Spelling in the new scheme
The question to pose here is: how many rules would the beginning reader (i.e. child or foreigner) have to learn before he could spell most words in the English language without difficulty. In order to obtain an objective measure, the new scheme was considered in terms of the number of simple propositional statements that would have to be learned. Also, all words which are exceptions to the scheme (e.g. *I, was, one,* etc.) count as one statement each. To illustrate, the rules concerning the z sound may be expressed by the following statements:

1. The *z* sound at the beginning of a word is spelt *z*.
2. The *z* sound is spelt as *s* except at the beginning of the word.

So this would count as two statements covering the *z* sound. Altogether, it was estimated that the beginner would need to learn about at least 97 propositions. This included 22 propositions for consonants and 32 for vowels. The task for the layman familiar with traditional orthography was a total of 72 propositions which included 8 propositions for consonants and 32 for vowels. However in this case, these propositions were in the main highly familiar to the reader as they constituted the most frequent spelling rules in traditional spelling. The words retained in their traditional spelling were estimated to be 20, which included the ten common words and most of their derivatives. In the case of the beginner, all the individual spellings of the schwa sounds would have to be learned; by contrast, the layman would already know these spellings. The author and his wife found the system easy to learn, but clearly an experiment is needed to find out how quickly the system can be mastered by others. An analysis was undertaken to work out the economy of spelling in the new scheme. It was found that in the 1,000 most frequent words, when the spelling was changed, the word length was reduced by 14%. The mean length of the traditionally spelt word to be changed was 6.0 letters, and this was reduced to 5.2 letters when the word was spelt in the new form. To put this another way, on average, words that had to be changed were six letters in length and they lost one letter when changed. Further analyses on the spelling economy of the scheme are described in the last section of this paper.

Comparisons with other spelling schemes

Here are very brief descriptions of some major schemes: *World English Spelling (WES).* This is from the Simplified Spelling Assoc. and is an almost completely phonetic spelling system which is very similar to i.t.a. except that it uses the Roman alphabet. Here is an example: ". . . or eni naeshon soe konseevd and soe dedikaeted, kan long enduer." Spelling in WES is quite straightforward to learn but it is very different in appearance from traditional spelling. For instance, translation into Lincoln's address only leaves 41% of words unchanged. But the system would probably be just as useful as i.t.a. as a spelling medium to start children reading.

Anglic. Proposed by Prof. Zachrisson (1932) is again a phonetic system like WES and in fact, the above sample text for WES would be identical in Anglic. But the main difference is that 43 common words are allowed to remain unchanged in Anglic.

Wijk's *Regularized English (Regularized Inglish).* This is a good system from the point of view of minimal disruption from old spelling to new. The advantage of this scheme is that it retains most of the rules of traditional spelling and also creates some new rules so that, given that one knows these rules, one has a very good idea about how a word should be pronounced. This is obviously a big advantage for the foreigner learning English. The major criticism of the scheme is that it tolerates to a large extent, the wide range of spellings for each sound. Consequently, learning how to spell in the scheme is complicated and similarly the foreign reader would have to learn a large number of rules before he would have mastered how to pronounce all words. A minor criticism of the scheme is that subtle sound distinctions are differentiated by different spellings which probably would be difficult to learn for people used to traditional spelling and for those with poor auditory discrimination. Here is a sample of Wijk's spelling: ". . or eny nation so conceevd and so dedicated, can long endure."

Yule's spelling scheme. This is again a good system from the view point that a scheme should not be too disruptive compared to the old spelling system. Unlike the previous schemes, this is not a fixed scheme but suggests a series of minor reforms of spelling over time which should take place until a more nearly phonetic system is reached. The ideas for the early stages have a lot to offer and at a certain stage of development, come close in appearance to the scheme presented in this paper, as can be seen in the following example: ". . . eny nation so conseevd and so dedicated can long enduer." The differences between it and my scheme are that this version of Yule's scheme involves the eventual abolition of the silent e rule, omission of unstressed schwa letters, the use of 'k' instead of 'c' under certain conditions, 'ee' instead of 'ea' and the possibility of a limited number of distinctions for homonyms with other minor differences. There is also a tolerance of roughly the same common words spelt in traditional spellings. Valerie Yule kindly translated Lincoln's address for me into her scheme and 71% of the words remained unchanged.

The author's scheme. To summarize this scheme; it attempts to disturb traditional spelling as little as possible by adopting the most frequent spelling rules and by using as few spelling rules as possible. Thus, each sound can be spelt by only one type of spelling (unlike Wijk's scheme). Ten common words, incorporated into a rhyme, are left unchanged. The advantages of the scheme are that it is one of the best in terms of minimal disturbance from traditional to new spelling *and* it is relatively simple to learn to spell. Here is a sample of the scheme: ". . . or eny nation so conseaved and so dedicated can long endure."

Some comparisons across the scheme

Disruption. Table 5 illustrates the % of words that remain unchanged in the sampled texts of 1,345 words. The % from Yule and WES were not available. WES would probably be slightly worse than Anglic in terms of the amount of disruption.

Table 5: *The percentages of words which remain unchanged in sampled text for three schemes.*

Wijk's	Beech's	Anglic
71%	69%	58%

Titles, proper names and non-words were not included in this analysis. So the author's scheme is almost as good as Wijk's and Yule's in terms of minimal disruption produced by changing to a new scheme. This disruption criterion is by far the most important criterion in assessing a spelling scheme because the layman is going to be reluctant to give up his well-established reading habits to transfer to a system which is too different from what he is used to seeing.

Number of spelling rules. Figure 1 is a rough schematic representation of the number of rules of spelling that would have to be learned by a child learning each new scheme. It can be seen that Wijk's scheme would produce the greatest amount of difficulties.

Figure 1: Schematic diagram of the number of rules that would have to be learned by the layman to master each scheme.

Minimum number of rules   *Present number of rules*

```
|                                                              |
_____
WES              Anglic  Beech                   Wijk
i.t.a.                   Yule
```

It should be noted that the line should be ten (or more) times its length between Beech and Wijk to be truly representational.

Ambiguities in reading. Figure 2 is a rough schematic representation of the number of ambiguities which might be encountered in reading each scheme. For instance, in the author's scheme, 's' in a word might be pronounced *s* or *z*. It can be seen that most of the schemes are almost perfect in this regard but Yule's and Beech's do not, for instance, disambiguate the two sounds represented by 'th.' On the other hand, it could be argued that the other schemes overspecify sounds and that these schemes may slightly confuse the child with hearing difficulties.

Figure 2: Schematic diagram to the extent to which a letter or combination of letters represent one phoneme in the different spelling schemes.

Complete phoneme to   *Ambiguities to the same*
grapheme correspondence   *extent as in traditional*
i.e. no ambiguities.   *spelling*

```
|                                                              |
_____
  WES          Wijk         Yule
i.t.a                       Beech
  Anglic
```

Ambiguities in writing. Figure 3 shows the amount of ambiguities which might be encountered in writing each scheme. Because Wijk has several ways of spelling each long vowel sound, it poses problems on the learner's memory just like traditional spelling.

Figure 3: Schematic diagram of the extent to which a sound is represented by one grapheme (letter or combination of letters.)

Complete grapheme to   *Ambiguities to the same*
phoneme correspondence   *extent as in trad. spell.*

```
|                                                              |
_____
WES          Anglic        Yule
i.t.a.                              Beech   Wijk
```

Economy. The economy of a spelling system refers to the % of extra or fewer letters that have to be used in the system. A system using more letters than previously probably has less ambiguity when the words are read, but it can be more cumbersome to write and consequently may be more unpopular with the layman. A system employing fewer letters may have more ambiguity, but it is more efficient to

write, and this could be a factor greatly favoured by the public. Figure 4 is a schematic diagram of how the various systems would compare in terms of their respective efficiencies. Yule's scheme is similar to the author's in terms of efficiency.

Figure 4: Schematic diagram of how many extra or fewer letters are used in the various spelling schemes. The % are based on Lincoln's Gettysburg address.

Extra letters required	*Present spelling system*			Fewer letters required
Wijk	T.O.	WES	Anglic	Beech – 4.6%
+1.8%	0%	-1.4%	-2.3%	Yule – 4.5%

The efficiency of Beech's system for the whole sampled text of 1,345 words was a reduction of 4.1% letters and on the 1,000 most frequent words, there was a reduction of 8.1% of letters overall. Another advantage of efficiency in any reading scheme is that it implies a financial saving and, using the kind of calculation employed by Dewey (1971), an efficiency of 5% would mean a saving of 50 million dollars out of one billion dollars of writing and printing costs.

Conclusion

An author of a spelling system is perhaps not in the position to give an unbiased appraisal of his and other systems. However it does seem to me that the new system presented in this paper, or one that is similar in approach, has .sufficient advantages to be put forward as a candidate for a spelling reform that is both likely to be accepted by the public and is likely to put an end to much of the misery which children are subjected to when trying to learn to read.

Acknowledgements

References

Dewey, G. *Relative frequency of English spellings.* Teachers College Press, New York, 1970.
Dewey, G. *English spelling: Roadblock to reading.* Teachers College Press, New York, 1971.
Hornby, A.S. *Oxford student's dictionary of current English.* Oxford Univ. Press, 1978.
Kucera, H. and Francis, W.N. *Computational analysis of present-day American English.* Brown. Univ. Press, Providence, R. I., 1967.
Wijk, A. *Regularized English-Regularized Inglish*. Almqvist and Wiksell, Stockholm, Sweden, 1959.
Yule, V. 'Let us be practical about spelling reform.' *Spelling Progress Bulletin,* 1979, v.19, no.1, pp7-9.
Zachrisson, R.E. *Anglic, an international language, with a survey of English spelling reform.* W. Heffner & Sons, 1932.

Appendix 1

Lincoln's Gettysburg Address in the author's new scheme

Forscor and seven years ago ouer fathers brort forth on this continent a nu nation, conseaved in liberty, and dedicated to the proposition that all men ar created equal.

Now we ar engajed in a grate sivil wor, testing wether that nation, or eny nation so conseaved and so dedicated can long endure. We ar met on a grate batle-feld of that wor. We hav cum to dedicate a portion of that feld as a final resting plase for those who hear gave there lives that that nation mite liv. It is orltogether fiting and proper that we shood doo this.

But in a larjer sens, we cannot dedicate – we cannot consicrate – we cannot halo – this ground. The brave men, living and ded, who strugled hear, hav consecrated it far abuv ouer poor power to ad or ditract. The world wil lital note, nor long rimember wot we say hear, but it can never forget wot thay did hear. It is for us, the living, rather to be dedicated hear to the unfinished werc wich thay who fort hear hav thus far so nobly advansed. It is rather for us to be dedicated to the grate tasc rimaning before us – that from theas onored ded we tace increased divotion to that cors for wich thay gave the last ful mesure of divotion; that we hear hyly risolv that theas ded shal not hav died in vane; that this nation, under God, shal hav a nu berth of fredom; and that guvement of the pepal, by the pepal, for the pepal, shal not perish from the erth.

Appendix 2

Reciting the alphabet

The alphabet as it is presently recited would be misleading to the child in the case of the letters 'c' and 'g'; these are pronounced *see* and *jee*, respectively and so do not represent their actual sounds in the new scheme. Therefore these would be changed to *ce* (sounding like 'key') and *ge* (hard g). The letter *k* (pronounced *cay*) would be retained so that children could read the old spelling if necessary. Here are the pronunciations of the alphabet spelt in the new scheme: ae, be, ce, de, ea, ef, ge, ach, ic, jay, kay, el, em, en, oe, pe, pe, ar, es, te, yoo, dubal-yoo, ex, wy, zed.

Note that *kay* would be the only word spelt with a *k* in the whole of the new scheme.

However, if the alphabet is going to be changed in its pronunciation, it might be a good idea to make further changes so that all names of the letters incorporated the sound of the letter in their pronunciation. In the traditional alphabet, 'h', 'q', and 'w' do not contain the pronunciation of the letters they represent. I would suggest that the following pronunciations of these letters would not destroy the rhythm of reciting the alphabet: *hay, que* (pronounced 'kwee') and *wed.* So a phonetic alphabet, in the sense that the name of each letter is contained in the pronunciation of the letter, would sound as follows spelt in the new scheme: ae, be, ce, de, ea, ef, ge, hay, ie, jay, kay, el, em, en, oe, pe, que, ar, es, te, yoo, ve, wed, ex, wy, zed.

Or spelt in traditional spelling: ay, bee, kee, dee, ee, ef, gee, hay, ie, jay, kay, el, em, en, oe, pe, kwee, ar, es, tee, yoo, vee, wed, ex, why, zed.

As a footnote this new alphabet is called 'abece' (pronounced 'aibeekee').

-o0o-

6. In Defence of Conservatism in English Orthography, by Philip T. Smith, Ph.D.*

*Dept. of Psychology, Univ. of Stirling, Scotland.

The argument in this paper is that spelling systems that carry more than purely phonemic information are better suited to the requirements of fluent adult readers, and that different systems of spelling can induce different reading strategies in young readers, these reading strategies perhaps not being best adapted for fluent reading. Accordingly we can draw the conclusions that there are advantages to the use of current English orthography.

Consider first a problem that I want to argue has many parallels with the problem of designing writing systems, namely the problem of designing mathematical systems of notation. It is often the case that the gap between the way a mathematical idea is written down and the way it is spoken is quite large. For example: $\frac{1}{2}(x+2)^2=20$, which is spoken (in my dialect) as "half x plus two, all squared equals twenty." Note that although the symbol "2" appears four times, it is spoken in a different way on each occasion, and that some symbols (the brackets) affect not so much the way each element is spoken in isolation, but the way they are grouped together: $\frac{1}{2}(x+2)^2$ and $(\frac{1}{2}x+2)^2$ are spoken with a different rhythm. Now this notation undoubtedly poses problems for the learner, and any mathematic s teacher will be able to tell you of pupils who confuse $\frac{1}{2}(x+2)^2$ and $(\frac{1}{2}x+2)^2$, and, more fundamentally, even of some pupils who confuse "multiplying by 2" with "raising to the power 2". Despite this state of affairs, there is no great pressure to reform algebraic notation comparable with the pressure to reform English orthography. This is because algebraic notation is a particularly successful way of expressing a variety of concepts (multiplication, division, raising to a power, etc.) and this is crucial when algebraic problems of any complexity are attempted: a notation that translated directly into words would leave most of the essential concepts more obscure. When "reforms" have occurred in mathematical notation (the replacement of Roman by Arabic numerals, the preference for Leibniz's rather than Newton's notation for the differential calculus) they have always been in the direction of making *thinking* easier, not necessarily of making *speaking* easier.

Consider now the case of alphabetic systems and the problems of reading and writing. Some recently invented orthographies are not strictly phonemic (Faroese orthography, invented by a linguist in the 19th century, contains morphemic information (O'Neil, 1972)) and, as we shall see later, even the best shorthand systems, which are the subject of quite frequent reforms, contain much that is not phonemic or phonetic. However, most alphabetic orthographies have begun by coding only phonemic information, yet in the course of time, largely because the rate of change of spelling is slower than the rate of change of speech, the spelling system has become related to the speech system only in a rather indirect way. Most notoriously this is the case with English spelling, where the writing of vowels is more closely related to the way these vowels were pronounced in pre-Tudor English, and where over the centuries many foreign words have been absorbed into the language, with their pronunciation being adjusted but their original spelling being retained.

Now we argue that just as systems of algebraic notation achieve distinct advantages through distancing themselves from the pronunciation of the propositions they express, so an alphabetic system that expresses linguistic information in an abstract way has advantages over a system that seeks to express only the phonemic form of language. In discussing the optimal design for a writing system, we need feel no more constrained by the observation that alphabets were originally designed to express sounds than a mathematician should worry that geometry was originally developed to measure the areas of fields.

In what ways can alphabets code linguistic information abstractly? First note that even a phonemic system is itself an abstraction. In my dialect, for example, /p/ of *pun* is pronounced with aspiration [pʰʌn], but the /p/ of *spun* is pronounced without aspiration [spʌn]. In writing both these sounds with the same letter *p*, a writing system is making an abstraction, deciding which distinct phonetic items should be classed together. The reason why such a convention is entirely acceptable is that it is entirely regular and hence predictable: all my word initial /p/'s are aspirated, all /p/'s in the consonant cluster /sp/ are unaspirated. So provided I have a writing system that marks word boundaries, I can always derive the pronunciation of /p/ by rule. This type of observation is given by linguists such as Chomsky and Halle (1968) the status of a fundamental principle: what can be derived by rule need not be marked in an orthography. For example, there exist pairs of words in English that differ only in the location of primary stress *(a súrvey* (noun), *to survéy* (verb)) but it is unnecessary to indicate stress in the orthography, according to Chomsky and Halle, because stress location in English is derivable by rule; similarly the vowel alternations in word pairs such as *divine-divinity, serene-serenity* are rule governed and need not be marked. While we lose information in failing to mark these distinctions in sound patterns, we gain by being able to have similar visual forms representing related ideas (the noun and verb forms of *survey,* obviously related ideas, are written the same; the related pair *divine-divinity* have more letters in common than they have sounds in common).

Now I want to emphasise that this paper is far from being a full endorsement of Chomsky and Halle's position. Much of their phonology, it seems to me, is highly implausible at a psychological level, and I am grateful to Valerie Yule (1978) for pointing out the large numbers of exceptions there are to their rules when we first look at the sort of high frequency words that a beginning reader is first exposed to. But I think Chomsky and Halle's essential insight – that an abstract writing system has the power to express important linguistic relations that are missing from a more directly phonemic spelling – should not be ignored by spelling reformers. I now give several examples where the conservatism of English orthography has produced features that could help a fluent reader.

(1) *Word stress.* The location of primary stress in polysyllabic words in English is not easily predicted, since it depends on several phonemic, morphemic and syntactic factors, and stress is unmarked directly in English orthography. However stress placement is rule-governed, and we have shown in a series of studies (Baker and Smith, 1976; Smith and Baker, 1976; Groat, 1979) that English speakers know quite a lot about these rules, to the extent that when subjects read aloud written nonsense words embedded in normal English sentences, the location of stress is affected by such factors as whether the final vowel in

the word is tense, whether the word ends in two consonants, and whether the word is a noun or a verb. These skills are present even in seven-year-old children.

One feature of stress assignment is that it can sometimes be predicted more directly from the written form of the word than from the phonemic form. For example, three-syllable nouns with lax vowels take stress on the first syllable if the second vowel is immediately followed by one consonant *(cínema, cátapult),* but stress is placed on the second syllable if the second vowel is immediately followed by two consonants *(veránda, fiásco).* Some words are apparent exceptions to this rule: *umbrélla, regátta,* where only one consonant follows the second vowel in the spoken form of the word. These exceptions are neatly handled with reference to the written form of the word: *umbrella* has two 'visual' consonants following the second vowel, putting it in the same class as *veranda.* Similarly, while two-syllable nouns with final lax vowels take stress on the first syllable(*tém*pest, *búcket*) some exceptions such as *giráffe* and *grotésque* can be accounted f or with reference to an underlying three-syllable form, like *veránda,* from which the third syllable is deleted: although we do not hear this third syllable, its presence is still signaled in the written form by the silent final e. Our experiments have shown that readers do take account of double consonants and silent final e's in pronouncing nonsense words, and we can conclude that such conventions will help a reader in handling unfamiliar words whose pronunciation he might be uncertain about.

(2) *Effects of spelling system on reading strategies.* One issue, which has received little attention in studies of spelling systems, concerns the influence of the type of information contained in a spelling system on the way a child or adult carries out fluent reading. The novice reader has to move from a strategy of laboriously reading aloud all the words he comes across to a strategy of 'reading for meaning' which can be many times faster than natural speech and where any conversion of a word into its full spoken form might actually interfere with efficient reading. It seems to me there is a possibility that if, say, a child is brought up on a highly phonemic alphabet, his attitude to reading and his reading strategies might over-emphasise the phonemic aspects of reading, to the detriment of the lexical and semantic aspects. In this respect, a more abstract system might encourage the child to look beyond simple grapheme-phoneme correspondences.

To be fair, I do not think that such effects, if they exist, will be very large, but given one of our major educational aims is to teach people to read fluently and with comprehension, I think in our research we should be paying more attention to the effects of teaching methods, spelling systems, reading materials, etc. on the reading abilities of children who should be achieving reasonable fluency (15-year-olds, say) rather than concentrating only on the first few years of learning to read.

In our own research, we have one small piece of evidence bearing on this. Groat (1979) looked at the use of stress assignment rules by two groups of seven-year-old children. One group had used traditional orthography throughout the schooling. The second group had been taught to read with the (more phonemic) initial teaching alphabet, but had recently transferred to traditional orthography. Groat found that the two groups performed in similar ways (in particular, both groups had a sophisticated appreciation of the complexities of English stress assignment rules) but in one respect i.t.a. children

were different. Recall that, according to some linguists, words like *giraffe* and *grotesque* have an underlying three-syllable form (like *veranda*) which leads to the final form of the word having stress on the second syllable when the third syllable is deleted. Now children taught with i.t.a. operate just in this fashion – a nonsense noun such as *gevespe* is quite likely to be treated either as a three-syllable word or as a two-syllable word with stress on the second syllable, whereas children taught only with traditional orthography appear to ignore the final *e* in *gevespe,* treating it as a normal two-syllable noun with stress on the first syllable (like *tempest).* So children taught with a more phonemic alphabet have a different strategy for analyzing the stress patterns of long words, though of course we do not know whether this habit persists into adult life or is, as I suspect, merely a temporary strategy in the transition from i.t.a. to traditional orthography.

(3) *The three-letter rule.* Albrow (1972) has pointed out that content words in English must be spelt with at least three letters, thus there are many words with apparently redundant consonant doubling or silent final e's (e.g. *inn, bee, bye, sow, two, ore,* contrast with *in, be, by, so, to,* or). I believe this has some significant implications for reading. Recent studies of eye-movements during reading have shown that word-length plays an important part in the way readers scan a text. For example, McConkie and Rayner (1973) have developed an ingenious computer-controlled display of text which allows them to change the text while the subject is in the process of reading it.

Performance is measured by fixation duration (how long the subject needs to spend looking at each part of the text: the longer the fixation, the less efficient the performance). Now if changes are made in the text more than 12 letters ahead of where the subject is currently looking, his performance is unaffected; if changes are made less than 8 letters ahead of where he is looking, his performance is disrupted; but, significantly, if changes are made between 8 and 12 letters ahead, performance is not disrupted if the changes preserve the shape, length and initial and final letters. If a sentence reads:

      The cat is near the back.

and the subject is looking at the word is, we could change *back* to *book* or *bank* without disrupting performance, but changing *back* to *sack* (initial letter change) or *back* to brook (length change) would disrupt performance. This means that information about word length and shape is being processed by the skilled reader well ahead of actual word identification (words cannot be accurately identified when they are 8 to 12 letters from fixation). Moreover studies by O'Regan (1979) have shown that readers are able to control their eye-movement patterns in such a way as to avoid what are normally uninformative parts of the text occupied by short function words. Accordingly it seems that the skilled reader can be guided to the most informative parts of the text by peripheral cues to do with word shape and word length, and this process is facilitated by the three-letter rule which distinguishes two-letter function words from three-letter content words.

In this respect, note also that it is an advantage for an orthography to distinguish homophones by words of different shape or length (e.g. *threw, through; seen, scene).*

(4) *Preservation of morphemic information.* It is a simple observation that syntactically organized text is easier to read than totally disorganized text. It is not even necessary that the text makes sense:

syntactic organization by itself helps reading, as Lewis Carroll was well aware ("Twas brillig, and the slithy toves did gyre and gimble in the wabe..."). Note that Carroll creates syntactic organization by the judicious use of function words *(the, did)* and the use of certain bound morphemes (-y, -s). Now I argue that those features of current orthography that help us to identify morphemes are making a significant contribution to the ease with which we can extract syntactic structure, and thus these features should be preserved. More formal evidence than Lewis Carroll is available, e.g. Epstein (1961) who showed that nonsense syntactically organized in the manner of Jabberwocky was easier to learn than unorganized nonsense. There are two ways that preservation of morphemes can help organization. First it can help indicate whether a word consists of a single unbound morpheme or an unbound morpheme plus a bound morpheme (so we distinguish the homophones *band* and *banned, please* and *pleas);* second, morphemes that *sound* different in different environments still look the same (e.g. -*s* in cat*s* and dog*s*, -*ed* in walk*ed*, climb*ed*, float*ed).*

Evidence that a reader's information-seeking strategies are strongly influenced by certain bound morphemes and function words comes from work I have been doing using letter cancellation (Smith and Groat, 1979; Smith, Pattison and Groat, in preparation). Subjects (university students) are required to read a text while at the same time cancelling all the e's that they notice in the text. Artificial though this technique may sound, it does not seem to disrupt reading greatly, and it has the merit of telling us exactly what parts of a text a subject notices in making a detailed analysis. Results show that thee in the definite article *the,* and the *e* in the bound morphemes -*ed* frequently fail to be cancelled, and this failure rate is strongly dependent on such variables as the difficulty and coherence of the text, and whether the subject had been instructed to attend to the meaning of the text or not. Moreover there are large sequential effects whereby these sorts of *e* are especially likely to be missed in particular (syntactically defined) parts of the text. For these reasons we call the *e*'s in *the* and -*ed* syntactic *e*'s, in contrast with the other *e*'s, which we call lexical *e*'s and which show small sequential effects and little sensitivity to manipulation of text structure. This dissociation of syntactic and lexical *e*'s suggests to us that readers are using words in the text in two different ways: content words (containing lexical *e*'s) are read in much the same way as words in isolation, their meaning and, if necessary, their pronunciation being looked up in some central dictionary in the brain; but certain function words and bound morphemes (containing syntactic *e*'s) are not analysed in such detail, being used rather to guide the reader through the text, and for this purpose their invariant form is crucial.

(5) *Semantic information in spelling.* Semantic information in the spelling of a word, over and above the morphemic information, can appear in English in four ways: (1) Many words are introduced into English from other languages with their non-English spellings retained: *spaghetti, Pavlov* (the latter being a straight transliteration from the Russian alphabet). (2) Sometimes an English letter is used unconventionally to represent a non-English sound in a loan word: *Iraq, Qatar.* (3) A substantial number of words have been invented with non-English (usually Latin or Greek) components: *psychology, architecture, chromium, cholestrol.* (4) Sometimes particular misspellings have become accepted, presumably because they seemed particularly apposite: *ghastly, ghost, ghoul.*

These processes have some relevant implications for reading: we can guess that *spaghetti* comes from

Italy because of its characteristic Italian spelling; the non-English spelling of *Pavlov* ('native' English words cannot end in a *v*) indicates his Slavonic origin; likewise the non-English *q* in *Iraq* and Qatar indicates an Arabic origin; the hard *ch* in *psychology, architecture,* etc. often indicates a recently invented word (based on Greek) and hence such spellings are likely to indicate words of scientific or technological origin; and *ghastly, ghost, ghoul* can be seen to be semantically related, thanks to a slip by William Caxton.

To be honest, we do not know how important these semantic cues are for the reader and the speller: certainly educated adults, when asked about the meaning of an unfamiliar word will often use its spelling as a clue to its meaning, and certainly there is plenty of evidence in the psychological literature that the meanings of words can be assessed directly by the reader without recourse to the full phonemic form of the words, but I am inclined to think that the *purely semantic information available* directly from English spelling is present *too sporadically to make a substantial contribution to normal reading.* But this is no argument for removing all traces of such information from spelling, rather we should be looking to exploit and systematize such information as is present (it is, for example, unfortunate that *Tchaikovsky and Chekhov,* are not spelt in British English with the same initial letters, when a systematic transliteration of Russian to English would require this).

Shorthand Systems. Finally I want briefly to discuss shorthand systems. These systems provide further examples of writing systems that demonstrate the advantages of going beyond strictly graphemic-phonemic correspondences. Shorthand systems are interesting because they are reformed quite frequently, there are several systems competing for students, and there is a strong pressure for them to achieve a well-defined criterion, namely to permit rapid and error-free transcription of speech. In short, there are just the sort of pressures, largely missing from traditional orthographies, that should lead to the development of efficient systems.

We have reviewed English shorthand systems recently (Smith and Patterson, to appear). Our conclusion is that their relation to speech is just as abstract as traditional orthography. For example, consider Pitman New Era, one of the fastest and one of the most phonemic systems. There exist in Pitman New Era, abstract phonological conventions like voicing neutralization (*ass* and *as, prices* and *prizes*, *Confucian* and *confusion,* would constitute pairs of homographs), rules that operate differently within a word and at the ends of words *(sleep* and *asleep, honest* and *honesty,* would be written in fundamentally different ways, because abbreviations for clusters such as *sl-* and *-st* are only available when these occur at the beginning or end of a word) and several abbreviatory devices ignore syllable structure (*spring* and *separate* would begin with an abbreviation for *spr-*, despite the fact that in one case *spr-* stands for a true consonant cluster and in the other case for two syllables from which the vowels have been deleted). The moral is that rapid writing systems need not stay close to phonemic detail to be efficient. Psychological studies of shadowing (repeating back a message at the same time as listening to it) make much the same point (Marslen-Wilson, 1975): a wide range of linguistic information (morphemic, lexical, semantic) is computed by a listener with remarkably short latency), and there is no evidence that all information must be fully represented in phonemic form before we can start to understand it. Hence there is no reason why an efficient writing system should dwell

exclusively on phonemic detail.

Conclusion. Let me first deal with one objection to the arguments I have been putting forward. It is unnecessary, it is claimed, to distinguish homophones (*know, no*), to preserve morphemes (*walked, climbed, floated*) or to have a three-letter rule to aid in discrimination of function and content words (*or, ore*) because context will almost always allow us to resolve any ambiguities. First, let me remark that the use of "context" is very much a two-edged weapon: we could equally well invoke context to justify all sorts of non-Phonemic reforms, such as dropping nearly all the vowels as semitic orthographies do. Second, writing typically provides less context than speech: when I say, *The sun's rays meet* or *The sons raise meat,* it is likely that a gesture I make, or perhaps the rhythm of the sentence will give some hint to the meaning, and these contexts are absent on the printed page. Third, and most important, fluent reading is faster than speech, and needs all the help it can get to be efficient: one reason nobody pushes for vowel deletion as a spelling reform (think of all the space that would save) is that although intelligibility would scarcely be affected, the removal of useful supportive information would probably reduce the reading rate considerably. Let us put as much information into spelling as the reader can usefully handle.

Looking back over my arguments, and having listened to some of the papers at the Northampton conference of the Simplified Spelling Society, what should I recommend about spelling reform? First, I would be against deleting the second *l* from *umbrella* or the *e* from *giraffe,* since they help with the correct assignment of stress; I would be against dropping the *h* from *spaghetti,* and against using *k* to stand for *ch* in *psychology* or for *q* in *Iraq,* since useful information is given. However with these examples I acknowledge my position is elitist: these conventions help good readers squeeze a little more information out of difficult or low frequency words. It seems to me an open empirical question whether these slight advantages out-weigh the disadvantages for less able readers.

However there are some reforms that I would much more confidently oppose, because they affect processes that are involved in some of the most central parts of reading. May I re-emphasise that efficient reading depends on much more than accurate phonemics, and that word shape, word length and morphemic structure are important guides for rapid reading. With this perspective, I would be against destroying morphemic invariance *(-s, -ed,* etc.), against dropping redundant letters in three-letter content words (*add, axe, egg,* etc.) and against destroying different spellings for homophones (*gate, gait*). On the other hand, preserving the close visual similarity of *divine* and *divinity* is probably less important (the words will begin with the same letters and have roughly the same shape no matter how we spell the second vowel).

I return to my point that spelling should contain as much information as the reader and speller can usefully handle. It seems to me beyond dispute that much of this information should be phonemic, and that in the early stages of reading, the phonemic aspects of spelling need to be stressed. But if we want to develop an orthography that does justice to the richness of the English language and permits fluent and intelligent reading and writing, we should take great care to incorporate into any reformed orthography information that refers to deeper levels of linguistic knowledge.

References

Albrow, K. H. (1972) *The English writing system: notes towards a description.* London: Longmans.

Baker, R. G. and Smith, P. T. (1976) "A psycholinguistic study of English stress assignment rules," *Language and Speech, 19,* 9-27.

Chomsky, N. and Halle, M. (1968) *The sound patterns of English.* New York: Harper and Row.

Epstein, W. A. (1961) "The influence of syntactic structure on learning," *American journal of Psychology,* 74, 80-85.

Groat, A. (1979) "The use of English stress assignment rules by children taught either with traditional orthography or with the initial teaching alphabet." *Journal of experimental child psychology,* 27, 395-409.

McConkie, G. W. and Rayner, K. (1973) "An on-line computer technique for studying reading: identifying the perceptual span." *NRC 22nd,* 119-136%

Marsien-Wilson, W. D. (1975) "Sentence perception as an interactive parallel process." *Science, 189,* 226-228.

O'Neill, W. (1972) "Our collective phonological illusions: young and old." In Kavanagh, J. F. and Mattingly, I. G. *(Eds.) Language by ear and by* eye. Cambridge, Mass.: M.I.T. Press.

O'Regan, K. (1979) "Moment-to-moment control of eye saccades as a function of textual parameters in reading." In Kolers, P., Wroistad, M. and Bouma, H. (Eds.) *Processing of Visible Language, 1.* New York: Plenum Press.

Smith, P. T. and Baker, R. G. (1976) "The influence of 'English spelling patterns on pronunciation." *Journal of Verbal Learning and Verbal Behavior, 15,* 267-285.

Smith, P. T. and Groat, A. (1979) "Spelling patterns, letter cancellation and the processing of text." In Kolers, P., Wrolstad, M. and Bouma, H. (Eds.) *Processing of Visible Language 1.* New York: Plenum Press.

Smith, P. T. and Pattison, H. (to appear) "The structure of writing systems as evidence for the psychological processes involved in perception." To appear in *Processing of Visible Language 2.*

Smith, P. T., Pattison, H. and Groat, A. (in preparation) "A model for reading, based on evidence from a letter cancellation task."

Yule, V. (1978) "Is there evidence for Chomsky's interpretation of English *spelling? "Spelling Progress Bulletin,* 18, 4, 10-12.

-o0o-

7. Spelling reform and the psychological reality of English spelling rules, by Robert G. Baker.*

*Dep't of Electronics, Univ. of Southampton, England.

Introduction

The starting point of this research was not a zeal for spelling reform. It was rather an attempt to gather psychological evidence for some of the counter-reformist arguments put forward by transformational and structural linguists in recent years (notably Chomsky and Halle, 1968; Albrow 1972). Table I provides some examples of English spelling conventions. These examples illustrate some of the main points made in favour of the traditional spelling system. It is not only claimed to be more regular than is generally supposed (see especially the examples on the "phonotactic level" in Table 1, where spelling conventions are seen to be regularly determined by phonological context), but also to be capable of carrying information on a number of different linguistic levels, albeit at the expense of failing to provide a straightforward representation of English phonemes. Such an analysis suggests that English is not and is *not intended* to be a phonemic orthography, but rather a "mixed-level" orthography.

If we look at the spelling systems of other languages, we see that they each have over time and in interaction with the spoken language, come to represent selected structural aspects of language on various linguistic levels.

Table 1, *Higher order regularities of English spelling*

Graphemic level	give freeze	(English words do not end in v or z)
Phonotactic level	fetch vs peach	(/tʃ/ is represented by tch when preceded by a lax vowel, ch when preceded by a tense vowel)
	wan wash vs wag	a is pronounced /ɔ/ when preceded by w, except when followed by a velar stop)
Morphemic level	walked warned waited	(past tense morpheme is regularly represented by -ed in spite of phonemic alternations)
	cats dogs horses	(noun plural morpheme is represented by -s in spite of phonemic alterations)
Syntactic level	please vs pleas raise vs rays goose vs zoos	(only plural nouns and 3rd person singular verbs regularly end in -s)
	at vs add in vs inn	('Content' words always have more than 2 letters)
Semantic leveI	seam vs seem	(Homophones are regularly kept distinct in spelling)
	sign vs signal	(Derivationally related words are regularly similar in spelling in spite of phonemic differentiation)

Thus Chinese generally represents lexical items by single ideographic symbols, although many of these symbols can also be broken down into subcomponents, some of which are phonological in nature (Gleitman and Rozin, 1977). Many familiar European orthographies such as Spanish operate almost entirely on the phonemic level. German appears to have a slightly mixed orthography in which morpho-phonemes are represented by single symbols, e.g.

Bun*d* /bun*t*/ "Federation"
Bun*de* /bun*də*/ "Federations"

and initial capital letters are used as syntactic form class markers (all nouns begin with capital letters). Japanese has three quite separate orthographic components used in parallel: an ideography similar to that of Chinese; and two syllabaries, one for native syllables, representing mainly grammatical morphemes, and one for foreign loan-words.

While English is similarly a mixed orthography, the different components are not as clearly delineated as they are in Japanese, but rather merge into one another. Furthermore, higher-order regularities such as those shown in Table I appear to be somewhat haphazardly distributed. Indeed, a full description of English orthography has not yet appeared. It is therefore not surprising that children have difficulty mastering the system, and educational failure is, of course the trump card held by those who advocate reform. It has been argued (Chomsky, 1970) that the reason for educational failure may be precisely the fact that English spelling is not generally taught as a mixed-level system, but rather as a faulty phonemic representation.

In the research to be reported, it was decided in the first instance to sidestep the educational issue and to focus on the extent to which English spelling makes sense to people who have already acquired spelling competence. Are the higher-order regularities apparent to literate adults who nevertheless have had no training in linguistics? Are they highly valued or merely doggedly tolerated?

Evidence has been presented at this conference (Smith, 1979) that people can and do use such types of linguistic information when placed in the experimental situation – or, it might be argued, when necessary. Therefore, an attempt was made to find a more direct way of tapping peoples' knowledge about how English spelling works (or fails to work). One obvious method would be to simply ask ordinary people to carry out their own spelling reforms of English words.

Spelling reform and the spelling reform task

The history of spelling reform in English-speaking countries clearly indicates that the rationalization of our spelling system is no simple matter. There appear to be almost as many suggested reformed systems as there are pleas for reform. This difficulty may be partly inherent in the structure of the English language. As J. R. Firth pointed out 45 years ago: "the main argument against phonetic spelling . . . (is that) . . . it removes phonetic ambiguity and creates other functional ambiguities" (Firth, 1935)

It has been argued (Yule, 1978) that, in quantitative terms, the higher order regularities discussed above can hardly be called regularities, since in many cases there are more instances of rule-breaking than of rule-following. This is not at issue here. What is at issue is whether any of these non-phonemic orthographic patterns are synchronically well-motivated. If so, the onus is on the spelling reformer to justify the necessary loss of linguistic information entailed by a phonemic orthography.

Another difficulty is simply that of doing linguistics. Different spelling reformers will come up with different phonemic analyses. It has not even been agreed among linguists precisely how many

phonemes are contained in the English repertoire. This is not surprising since the status of the concept, "phoneme," is by no means firmly established (Twaddell, 1958; Chomsky, 1964; Prieto, 1969). Is it a physically identifiable unit in the acoustic signal, a psychological construct abstracted or idealized from the acoustic signal or the articulatory complex, or an illusion induced by over-familiarity with linear alphabetic writing systems? Even if a repertoire of English phonemes and a policy of reform by phonemicization could be agreed upon, the problems would not be solved. We must also agree on the "domain" of phonemicization. For example, we may wish a "word" to be defined in the spelling system (e.g. bound by spaces) and phonemicization to be restricted to "words" as if pronounced in isolation. On the other hand, those who are unwilling to make assumptions about syntactic/semantic units may wish the orthography to take account of phonological processes obtaining across word boundaries, e.g. the assimilation in:

> I*n* Southampton I*m* Portsmouth I*ng* Cambridge.

Examination of the proliferation of proposals for spelling reform reveals many different approaches to the resolution of such problems and to the treatment of higher-order regularities. Thus the initial teaching alphabet preserves, in the name of concessions to traditional orthography, for the sake of an easy transfer, a large number of lexical derivational relationships in spite of phonemic differentiation (e.g. kwe*st*, kwe*sti*on). On the other hand, i.t.a. is determined to differentiate the phonemes θ and ð, although, if syntactic considerations are allowed, the rules for their distribution are so straightforward that they may be treated as allophones of a single phoneme (e.g. "th"). [1]

It is the author's view that of all the possible solutions for reformed English spelling, those will succeed which are most in tune with the man-in-the-street's notions of how spelling should work. It was therefore decided to ask people to act as amateur spelling reformers. In analysing the results, it would be assumed that those spelling conventions which the subjects changed would be less psychologically real than the reformed versions which replaced them, and that those conventions left unchanged had comparative psychological integrity.

Twenty-three university undergraduates were presented with a list of 111 words. The students were all literate, moderately good spellers, but with no formal phonetic or linguistic training. The words in the lists were not intended to be a representative sample of written English but were representative of the kinds of higher-order orthographic regularities exemplified in Table 1. Each student was asked in the first place to give every word a rating on a five-point scale, according to how "rationally" the words were thought to be spelt. The definition of the term "rationally" was left to the students. They were then asked to provide a "more rational" spelling for those words which were not considered to be completely rational. The full instructions and rating scale are shown below (Table 2).

Table 2, *Instructions for spelling reform task*
I would like you to try and imagine that you have been employed as an Arbitrator for a government-sponsored "Committee for the reform of English spelling", i.e. your job is to find the best way of spelling, English words.
Assumption: English spelling is, at least in part, an irrational and inadequate system for representing spoken English. You may not personally agree with this assumption. Do you?
(Answer YES or NO on the dotted line)   . . . .

Please look at each of the words below in turn. First of all give the word a score from 1 to 5 according to how "rationally" you think it is spelt. If you think the traditional spelling is the best possible, give it a 5; if you think it leaves much to be desired, give it a 1. Scores of 2, 3, and 4 will be intermediate points on the scale. (Try and use as many points on the scale as possible.)

Then, if you have given the word a score of less than 5, try to suggest a possible "more rational" alternative spelling. In some cases you may not be able to think of one (then leave a blank).

Try to work consistently through the list and try not to miss any words out. You may at any time refer back to words you have already dealt with, but, if you make any alterations in your "reformed" spellings, please make it quite clear what you have done by crossing out the altered form with one line. *Examples:* night= 3, nite. tough= 2, ~~tuf~~ tuff

The number of words rated less than perfect differed greatly from student to student (from 17 out of 111 to 100 out of 111) although all the students considered that English spelling was at least in part an inadequate and irrational system for representing spoken English. In order to gain some idea of how the rating scale was being used, the average "rationality rating" for each word was computed and then correlated with an objective measure of the word's spelling regularity. This measure was derived from a frequency count of sound to spelling correspondences (Hanna et al, 1965). Thus if the sound /s/ is represented by "ss" in 442 out of 6326 occasions sampled, a score of 442/6336 for /s/="ss" was given. Scores for all phoneme-grapheme correspondences in each word were summed and divided by the number of phoneme-grapheme correspondences in the word in order to provide an average regularity score. The correlation between regularity scores and average rationality ratings was positive and highly statistically significant (Spearman's rho=0.44, n=111, p< 0.001). Thus words which are rated as highly rational were also highly regular and we may infer that the students were making meaningful judgements about the words' spellings.

The reformed spellings were analysed primarily in terms of the extent to which they maintained or destroyed the higher-order regularities. Table 3 shows the extent of rule preservation for the different types of regularities in Table 1. The average rationality ratings in, Table 3 cannot be considered to relate directly to the spelling conventions of interest since the ratings are applied to whole words. In general, however, those word types which are highly rated also show preservation of higher-order regularities.

Two results stand out particularly from the percentages of rule-preservation. The use of syntactic final "-e" after "s" to indicate single nouns is not highly valued (29.3% preservation). On the other hand, use of "s" for phonemic /z/ in plural nouns, i.e. preservation of morphemic "s" plural in spite of phonemic variation is highly valued (87.9% preservation). In the majority of other cases, rule-preservation is close to 50% and it is difficult to draw practical conclusions for the benefit of spelling reformers.

However, the overall data may be examined in a different way. We may ask to what extent there is agreement between students on particular reformed spellings. In fact, for 42 out of the 111 words (36%) there was exact agreement on the reformed version between at least one third (> 8 out of 23) of students. While this result is not world-shattering, it is likely that such "popular" spellings represent forms of high psychological plausibility and spelling reformers would do well to take cognizance of them. Examples of such reforms are "apeer" (for "appear", 8/23), "oger" (for "ogre", 13/23), "peech" (for "peach", 19/23).

Conclusions and recommendations from the spelling reform task
'The above selection of results from a single study is not offered as a definitive guide for spelling reformers. The subjects and words which were sampled were far from representative. It is however suggested that larger scale empirical studies of popular attitudes towards spelling adequacy would

provide valuable insights into the pragmatics of spelling reform. It could be that every elegant creation by linguistically or educationally sophisticated spelling reformers is bound to fail when transferred from the study or the committee room to the market place or the classroom. Or more important, will any of these creations ever get as far as the market place or classroom? On the other hand, if some degree of popular consensus on the substance of rational spelling could be achieved, then the popular view of spelling reformers as ineffectual cranks would accordingly be diminished. It may be argued that a "democratically" achieved spelling reform would not necessarily be the best to work in practice, but would merely reflect a collection of mass prejudices. On the other hand, it can be counter-argued that a reform, once adopted, will be modified and optimized by usage; but it must first be adopted! People may accept, at least for a while, what they *think* they want.

Table 3
Average rationality ratings and proportion of occasions when higher order regularities are preserved in spelling reform task

Rule level	Spelling	Average rationality rating	% of occasions rule is preserved
Graphemic	give *not* giv	3.71	42.7
	freeze *not* freez	4.29	67.8
Phonotactic	fetch *not* fech	4.18	66.7
	wash *not* vosh	4.01	52.2
Morphemic	walked not walkt	3.22	60.9
	dogs *not* dogz	4.71	87.9
Syntactic	goose *not* goos	3.78	29.3
	add *not* ad	3.53	52.2
Semantic	'g' retained in sign and signal	3.53	46.1
	seem and seam differentiated	3.80	57.2

A further problem concerning data from the spelling reform task is that the man-in-the-street may have traditional spelling so deeply ingrained in his mind that he cannot took beyond it. How can he be objective? However, the question remains as to *how* deeply engrained different aspects of the spelling system are. Surely, those aspects which are most deeply ingrained will be most resistant to change. It is as well to know what these obstacles to reform will be. Furthermore, those most resistant spelling conventions are no doubt those which made most sense to the child as he/she was learning to use the system, and they are most likely to make most sense to him as an adult.

Children's use and understanding of spelling rules

It would be valuable to be able to trace the development of spelling rule knowledge in children. Accordingly a number of simplified pilot versions of the spelling reform task were tried out with young children (6-8 years), but without much success. In general, young children do not seem prepared to discuss the pros and cons of less or more rational spelling conventions. This may reflect cognitive immaturity or an unwillingness to question the authority of English spelling. For these children, a word is either spelt right or wrong and there is no ground for debate.

Since these young children were unable or unwilling to manipulate correct spellings, it was decided to examine their attitudes towards incorrect spellings. A diagnostic spelling test (Peters, 1970) was administered to two classes of primary school children, a Primary 3 class (n = 16) and a Primary 5 class

(n = 29). The children's errors were analysed and related to test data on their reading ages made available by their teachers. After completing the spelling test, each child was given a structured interview centered on the errors he/she made in the test. The children were asked to try and explain their particular difficulties with the words and to talk, about why they thought they had made these particular errors. This approach provided considerable insights into the children's approaches to spelling and to the testing situation. The results of this study are reported in greater detail elsewhere (Smith et al, 1979), but some general points will be made here.

Table 4, *reasons given for spelling errors made by* primary *school children*

Class of explanation	Example	Frequency of occurrence: Primary 3	Primary 5	Total
(Un)familiarity	"I don't know that word"	37	44	81
Perception	"It looks OK my way"	29	46	75
Test situation	"I'd have got it right if I'd had more time"	25	36	61
Difficulty	"It's a hard word"	18	35	53
Performance	"My pen slipped"	14	16	30
Rule	"I got mixed up about the rule"	0	22	22
Phonic strategy	"I tried sounding it out"	2	10	12
Bad speller self image	"I'm just careless"	0	4	4

In Table 4, the classes of explanation are given in the overall order of frequency in which they occurred. Two of these classes are particularly relevant to this discussion of English orthography; the use of a phonic strategy and the use of rules. It is noteworthy that the phonic strategy explanation is not particularly frequent. This may be either because it is such a useful strategy that it does not generally lead to errors (see McBride, 1977) or because the children do not often consciously use it as a strategy. Also noteworthy is the status of "rules" in this situation. Only the older class of children referred to rules at all. This may merely reflect the stage they had reached in their reading and spelling schemes. In the Primary 5 class, the rule explanation was used in three different ways. Sometimes it was used quite appropriately, for example, "I forgot the doubling rule" (for "spining" = "spinning"), sometimes apparently quite inappropriately, e.g. "I don't know the rule" (for "svicetoin" ="satisfaction"), and some times appropriately but erroneously, e.g. "I spelt it like that because it's got 'high' in it" (for "hight"). This last example is evidence of the false overextension of a higher-order lexical derivational relationship rule. The children who offered rule explanations inappropriately and/or incorrectly were predominantly in the lower third of the reading/spelling ability range in their class. Furthermore, for these children and for these children only, the rule explanation was always associated with the difficulty explanation. It appears that children with lesser reading/spelling ability will resort to rules but are likely to be led astray by them.

Overall, this study did not provide much evidence for or against the psychological reality of *particular* spelling rules in young children. There were occasions on which statements such as "e usually has an 'a' next to it(for "neaver" = "never") were made, but these were too sporadic to be given much weight in the main analysis. This study has, however, given a clearer picture of the child's general approach to spelling and a framework for further research. ne kinds of explanations given by children to account for their own failures in spelling tests could be of use to teachers in assessing their teaching procedures and in evaluating the testing situation. Tests always take place in a context. In particular, different children will not be equally familiar with the words they are asked to spell. They may have experience in spelling a word, or they may have only encountered it in reading, or they may not know the word at all. One Primary 3 child made a further distinction between having spelt a word on his own initiative and

having copied its spelling as part of an exercise. These different degrees of experience are likely to be associated with different types of spelling error. Furthermore, the effects of imposing time constraints on a rest will differ from child to child. The explanations classed as "Perception" will relate to those classifications of spelling errors made in terms of information encoding (e.g. Avakian-Whitaker and Whitaker, 1973) and may help to validate such classifications.

Self-characterizations as a "careless speller" are fortunately rare in this group of children. The dangers of allowing a child to continue with the notion that he/she is a bad or careless speller have been pointed out (Peters, 1967). Members of this society will of course be amongst the first to stress the role that English orthography plays in generating spelling difficulties and to press the more urgently for reform. In the meantime, however, we would do well to explore ways of putting across the complexities of our spelling system, taking into consideration the child's own expectations and intuitions about the task. Such explorations will in turn guide spelling reformers towards the most highly motivated and usable alternative system.

References

Albrow, K. H. (1972) *The English Writing System, notes towards a description.* London: Longmans.
Avakian-Whitaker, H. and Whitaker, H. A. (1973) "The spelling errors of children with communication disorders: a preliminary classification." *Linguistics,* 115, p.103-118.
Chomsky, C. (1970) "Reading, writing and phonology." *Harvard Educational Review,* 40, 2 p.287-309.
Chomsky , N. (1964) *Current Issues in Linguistic Theory.* The Hague: Mouton.
Chomsky, N. and Halle, M. (1968) *The Sound Pattern of English.* New York: Harper & Row.
Firth, J. R. (1935) "The technique of semantics." *Transactions of the Philological Society,* p.36-72.
Gleitman L. R. and Rozin, P. (1977) "The structure and acquisition of reading." in A.S. Reber & D.L. Scarborough: *Towards a Psychology of Reading.* Hillsdale, N. J. Lawrence Erlbaum.
Hanna, P. R., Hanna, J. S., Hodges, R. E., & Rudorf, E. H., Jr. (1966) *Phoneme-grapheme correspondences as cues to spelling improvement.* Washington, D.C.: U.S. Government Printing Office.
McBride, J. F. (1977) *Phonics in the teaching of reading.* Paper presented to the Reading Assoc. of Ireland.
Peters, M. L. (1967) *Spelling: caught or taught.* London: Routledge & Kegan Paul.
Peters, M. L. (1970) *Success in Spelling.* Cambridge: Institute of Education.
Prieto, L. J. (1969) "La découverte du phonème: Interprétation epistemologique." *La Pens*ée, 148, p.35-53.
Smith, P. T. (1979) *In defence of conservatism in English spelling.* Paper presented at SSS Conference, Northampton.
Smith, P. T., Baker, R. G. and Groat, A. (1979) *Spelling as a source of information about children's linguistic knowledge.* Paper presented at "Beyond Description in Child Language Research," Nijmegen, Holland.
Twaddell, W.F.(1958) "On defining the phoneme," in M. Joos. *Readings in Linguistic 1.* New York: American Council of Learned Societies.
Yule, V. (1978) "Is there evidence for Chomsky's interpretation of English spelling?" *Spelling Progress Bulletin* 18, 4, p.10-12.

[1] Note:

1. th= ð in word-medial position and in initial position in function words, (e.g. this, there, etc.) but not in content words (e.g. thin, theme, etc.)

2. th= θ elsewhere.

The exceptions are the set of minimal pairs, "wreath, wreathe, sooth, soothe, etc" Here it is noteworthy that the *orthographic* representations place the voiced alternant in non-final position in the word, thus conforming to rule 1.)