

English • Spelling • Society

Personal View

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the Society, or a majority of its members.

The Author

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The Simplified Spelling Society

The aim of the Society is to bring about a reform of the spelling of English in the interests of ease of learning and economy in writing.

To this end, it:

- encourages the idea that reform is possible;
- fosters debate on reform methods;
- devises, publishes and promotes potential reform schemes;
- persuades and campaigns;
- has a role as an expert organisation on the subject;
- aims to be of benefit to future generations by introducing a consistent spelling.

TYPES AND MAGNITUDE OF ENGLISH SPELLING PROBLEMS AND THEIR SIGNIFICANCE FOR REFORM (2001)

by Masha Bell

When Masha Bell first came across English spelling at the age of 14 she found its unpredictability infuriating. That first impression has remained with her ever since. None of the other spelling systems which she learned was as unpredictable.

Before becoming a teacher in England Masha studied Philosophy and Psychology. She is married to a teacher of Economics. This combination may explain why she has been keen to find good evidence for the need to reform English spelling and the benefits which it would bring.

She regards reform as problem solving which has to be based on an analysis of costs and benefits.

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Questions Which Reformers Need To Address.

1. Which changes would bring the greatest benefits to learners?

Which ones would have a significant impact in reducing learning and teaching time?

Which ones would immediately make learning to spell English substantially easier?

2. How many changes can realistically be tackled by a single reform?

One of the major factors in any spelling reform has to be ease of implementation. With the enormous resistance to spelling reform in many sections of the English-speaking world, proposals for reforming English spelling probably need to be particularly user friendly.

The workload of teachers in the US and the UK already seems to be exceptionally heavy. Since primary teachers are bound to be at the front line of implementation it would not be helpful to burden them with cumbersome or hard-to-comprehend reform proposals.

3. Which spelling difficulties should be tackled first?

The Society held a ballot in 1999 which revealed that most members did not believe that spelling reform could address all English spelling problems. Only 11 members out of the 61 who voted believed in the possibility of a comprehensive, single-stage reform. The rest deemed it more likely that only a proportion of problems would be tackled at one time, just as has been the case in all other countries that have reformed their spelling systems during the last two centuries. (Only Turkey where reform was brought about by dictatorial decree in 1929 had a more drastic transformation.)

Even a brief glance at my results makes it clear that very few English spelling rules have no exceptions at all and that 32 vowel patterns and 27 consonant patterns have substantial numbers of exceptions. There are also the difficulties caused by haphazard consonant doubling which cut across many phonemes.. The scope for reducing spelling irregularity in English spelling is therefore enormous. So which problems should a first proper reform of English spelling address?

It seems highly unlikely that any reduction in English spelling irregularity will ever be achieved if *the basic conventions of English spelling* are not treated as *sacrosanct*. To practised readers and spellers of English any change is going to be visually disturbing at first. Getting them to accept wider application of current rules will be hard enough. Expecting them to approve meddling with any regular features of the system itself is probably unrealistic. Bringing about reductions in irregularity, while respecting well-established English spelling conventions, is probably the best that any would-be reformers can ever hope for.

Most spelling systems have imperfections. The magic 'e' convention and the convention of doubling a consonant after a short stressed vowel in multi-syllable words (e.g. late - latter, cope - copper, cute - cutter) are fairly clumsy aspects of English spelling, but if used more predictably they would still be quite manageable. Primary teachers have repeatedly assured me that having more than one spelling for sounds in identical positions is the main difficulty, not the magic 'e' itself. Learning to spell 'lane', 'late' or 'paste' would be a piece of cake if these were not contradicted by 'rain', 'eight' and 'waist'.

The system has only one serious deficiency. The short OO-sound has no clearly identifiable pattern of its own. It is spelt as in 'foot, put, would', but the letters used for spelling it are also used for spelling different sounds (loot, but, mould). It needs to be pointed out, however, that the sound occurs in just 36 common words.

It would be possible to make the spelling of the short OO-sound more predictable by simply expanding the use of the most dominant pattern for it, the OO-pattern. This would not be an ideal solution, since current unpredictability in reading would remain (good - mood), but in some accents the short and long OO-sound are both short anyway.

Existing English spelling conventions provide adequate spelling solutions for 42 of the 43 English phonemes. The 26 letters of the Roman alphabet can cater for all English spelling needs. English spelling could therefore easily be made more regular without introducing new characters or new spelling rules, or anything as outlandish as the Shavian alphabet. The two most fundamental reform questions remain:

1. Which problems should reform tackle?
2. How many problems should it try to remedy?

As soon as I became aware that English has far more spelling problems than a single reform could possibly tackle, I became inclined to look for a numerical answer to the second question. Which 5 - 7 individual changes can make the greatest number of words with divergent spelling more regular?

I see the *main priority* as one of **reducing the great number of words with irregular spellings by means of as few proposals for change as possible** (or as few instructions as possible). I know from studying psychology that humans can remember 3 instructions easily, 5 quite well, 7 far less so and anything beyond that tends to defeat them. So which 5 - 7 spelling problems are the most costly in times and effort? Which ones require most teaching and learning?

My research.

Astonishingly, there have been few attempts to get an accurate measure of the learning task which the mastery of English spelling necessitates. A team led by P.R. Hanna at Stanford University in the 1960s calculated that **around 50% of all English words have unpredictable spellings**. This result was recently confirmed by E. Carney in the UK from an analysis of 25,000 words. His Survey of English Spelling was published in 1997. My own investigations confirmed that around half of all English words have some spelling irregularity.

Presenting the results as percentages or ratios is, however, insufficient to give a clear picture of the learning burden while there exists no agreed corpus of common English vocabulary. The only way that teachers, parents and learners can really understand what needs to be learned is by seeing the lists of words with irregular spellings which students have to memorise.

Books which supposedly 'explain' the English spelling system tend to list the most common ways of spelling particular sounds. They give, for example, the 7 most usual ways of spelling the EE-sound, with a few examples of each, but without a comprehensive list of words which have to be learned. Such books on spelling almost invariably advise learners to start a notebook for writing down 'difficult' words which need special attention. I found none which provided a comprehensive list of common English words with irregular spellings and so decided to compile one myself.

My first difficulty was finding a satisfactory list of most common English words. I found several collections aimed at younger children, but each slightly different; and I found little overlap between adult vocabulary collections and those for children. I ended up building my own collection by comparing several children's dictionaries and a couple of adult vocabulary listings. I omitted word forms which can be derived in a regular way, e.g. I listed 'work' but not 'worked, working, works' as well, but I tried to include all unpredictable derivatives like 'painter, worker, sailor, visitor'. My final corpus contains 6856 words.

I then identified the basic spelling patterns for individual phonemes and all the words with spellings which diverge from each. I ended up with a list of **3456 words out of 6856 which have at least one element of unpredictability in them**. The findings are summarised by phoneme on pages 10 and 11. Those 3456 words all require the memorising of *something in addition to phonics* for their spelling. Often this is just one surplus letter (friend, doubt, active, account). Others spell a sound with letters that are not commonly used for it in English (central, system, said, some, pretty, great). A few hundred break the basic English consonant doubling rule, by *not* doubling a consonant after a short stressed vowel (lily, model, body); **418 words out of the 3456 have more**

than one unpredictable element in them (appeal - pp, ea - could be apeel; pheasant - ph, ea, s, ant - could be 'fezzent').

The 3456 words which I identified are the minimum which any reasonably competent speller has to master. They represent the learning burden which an average English-speaking school leaver would be expected to have learned. Highly educated and literate spellers will have learned many more. One can safely round that figure up and say that **for reasonable adult spelling proficiency a student of English needs to learn at least 3500 words with some element of spelling unpredictability in them.** This figure does not include any specialist or technical vocabulary, just the ordinary range of English vocabulary. By the age of 16 an English-speaking learner will have filled at least 7 little note books, each containing 500 words with exceptional or difficult spellings. Many of them will need special attention because of **one recurring spelling problem - consonant doubling.**

Consonant Doubling.

CONSONANT DOUBLING is the most difficult aspect of English spelling. The highest single category of errors committed by students in examinations or spelling tests is caused by uncertainty about consonant doubling, either omitting them or inserting them where none is required. When **to double or not to double** consonants requires more learning than any other aspect of English spelling, and is never completely mastered by most people. The question, One ... or two? makes even well-educated adults reach for the dictionary more often than any other spelling uncertainty. I would therefore like to suggest that *tackling this problem, even if not solving it entirely, should be a very high priority* for reform.

The basic idea is simple enough. Consonant doubling and the magic -e / open vowel concept are devices which were invented **to mark vowel length.** Children are taught that they must double the final consonant of a short word when adding the suffixes -ing, -ed, -en, -er, -y or -ish [sin - sinning, sinned, sinner; fat - fatten, fatter, fatty, fattish] **to keep the preceding stressed vowel short,** or to ensure that it does not become long, [dine - dinner, diner; late - latter, later]. The main problem for spellers is the lack of consistency. The 'late - latter' idea would be simple enough. Doubling letters on that principle would not be a problem if the principle was not contradicted by hundreds of words which don't follow it, e.g.:

blizzard,	bonnet,	clatter,	mellow,	muddy,	penny,	teddy,
lizard,	tonic,	lateral,	melon,	study,	many,	ready.

The rule for '**stressed, short vowels closed by a doubled consonant**' and '**long, open vowels**' becomes impossible to grasp while such contradictions exist:

clammy-came/camel;	gallery-gale/galaxy;	herring-hero/heron;
hidden-hide/hideous;	milller-miler/military;	popper-pope/proper;
planner-plane/planet;	robber-robe/robin.	

Learner Difficulties.

The difficulties which learners experience with consonant doubling derive from 6 sources:

1. **Doublings which make no phonic sense** - ('account', 'apply'). These mostly indicate now defunct Latin prefixes, e.g. *adplicare*. (160 words listed on page 5)
2. **Words which should have a doubled consonant** according to the basic rule of doubling a consonant after a short, stressed vowel in longer words (in order to keep it short), **but which fail to double**, e.g. 'coral, habit, lily' (271 words listed on page 6).

3. Words which have **unpredictable short, stressed vowels and undoubled consonants** after them, e.g. 'any, chrysalis, enamel' [should really be 'enny, crissalis, inammel] and those which should really have a different doubled consonant, e.g. 'chisel' [chizzel], 'desolate' [dezzolate] - if they obeyed basic spelling and doubling rules. There are also 19 words with unpredictable medial 'CC' instead of the usual 'CK' - [e.g. occupy] (128 words)

4. **Unpredictably and gratuitously doubled medial -LL- and final -LL, -SS, -FF and -ZZ.** These are just as often spelled singly or with other letters instead. The doublings can also serve different purposes.

- a) Shall (1) - call (12) - crawl (7); gallery (17) - galaxy (23); poll (5) - doll (2) - pole (8); (75 words)
- b) gas (1) - ass* (3) - pass *(4); fuss (3) - bus (4), [*In UK English 'ass' has a short sound and 'pass' a long one.] mattress (9) - menace / novice (17) - axis (21) - premise(6) (68 words)
- c) stiff (5)- if (1); chef (1); puff (5)- tough (5); off, scoff (2) - of (1) - cough (2); staff. ouzz (3) - quiz (2) - as (4) (31 words) with doubles, 102 without - **a total of 174 contradictions]**

5. The convention of **usually not doubling a 'V' and always decorating a final 'V' with an 'e'** leaves 54 words with unmarked short, stressed vowels (e.g. 'liver, shiver, hover) and undermines understanding of the whole concept of 'open long vowels' and 'short, stressed vowels marked by doubled consonants' (cf. din - dine - dinner / give - drive - driven).

6) 238 short words **double their final consonants on predictable patterns** but only in 17 words does this serve a useful purpose. Most serve no useful purpose:

- a) back (62); catch (23) ['tch' instead of 'chch']
- b) bell (13), bill (18) [final L is doubled consistently after 'e' and 'i']
- c) useless, neatness, tigress (6) [the suffixes -less and -ness, and some feminine nouns]
- d) battle (81) [words ending in -le double a preceding single consonant, if the preceding vowel is short and the 'e' of the '-le' ending is silent - hence: able, gabble, angle. If the final surplus '-e' were cut, the doubling would not be needed either: e.g. 'apl, batl, rufI, gagI' would serve just as well as do spellings like 'stamp, ink' or 'milk'].
- e) bristle (11) ['-stle' is more common than '-ssle', but there are 5 exceptions / alternatives as well:mussel, muscle, hassle, tassel, vessel]
- f) **The only useful category is -dge [bridge] (17) ['-dge' instead of '-gege'].**This helps to distinguish words with a short vowel from those with a long one, e.g. 'age, cage - badge, cadge'.

The other final consonant doublings above are gratuitous and distracting. They merely make it more difficult for learners to understand what the real purpose of consonant doubling in English is supposed to serve, i.e. keeping a stressed vowel in a multi-syllable word short, e.g. latter. We do not double **b, d, g, m, n, p** or **t** at the end of short words (grab, bad, bag, rum, run, shop, shot). 'Bac, cach, bel, bil, useles, neatnes, tiges ..' would all be pronounced exactly as they are now if they did not have their final consonants doubled.

The **6 sources of consonant doubling problems can be summed up as follows:**

1. 160 words which have *surplus* doubled consonants;
2. 271 which have *missing* ones;
3. 128 which have *missing* doubled letters *and other unpredictable elements* in them;
4. 72 words with *idiosyncratically doubled, selected letters* and 102 *other words which fail to double them*, for the same sound in an identical position;
5. 54 words with a *single V* between a short, stressed vowel and another vowel;
6. 221 words with *predictably but pointlessly doubled letters*.

At least

1008 words do not follow the consonant doubling principle.

These contradict nearly

1000 words which obey the principle.

I have identified 447 words which obey the basic doubling rule consistently (e.g. batter, better, bitter).

Another 500 - 550 words can be formed systematically from 233 one-syllable words by adding the suffixes -ing, -ed, -er, -en, -y or -ish [fat - fatten, fatter, fatty, fattish] (e.g. beg - begging, begged, beggar; flat - flatten, fat - fatty, fattish).

These figures explain why very few English speakers have any idea what purpose consonant doubling is supposed to serve. A rule that applies only half the time is not really a rule at all.

In UK English confusion about consonant doubling is increased further by doublings which deliberately break the rule of *not doubling before suffixes when the preceding vowel is not stressed*. The normal pattern with longer words is as: abandon - abandoning, permit - permiting. It should therefore also be 'format - formating, travel - traveling', instead of 'formatting' and 'travelling'. Those doublings break the normal rule of doubling a consonant after a short, **stressed** vowel only.

Contradictions in prefixes and suffixes like 'almost - all right', 'farewell - welcome', 'fulfil - refill' add to the confusion. Instead of doubling or not doubling a consonant by adherence to a consistent rule, learners simply have to remember which words have doubled consonants and which don't.

The simplest way to cure the problem would be to eliminate all surplus doubled letters and to introduce systematic doubling in words which clearly fail to do so. If at least the most common words followed English phonic patterns, children would have a better chance of grasping them when they first learn to read and write. There is, however, generally quite strong resistance to making words longer.

Cutting surplus doubled letters from the 160 words listed below is probably the best place to start reducing the problem. Removing them would already help to make the basic principle easier to understand.

160 words with redundant doubled consonants.

**Some words have additional irregularities.*

accommodation	appoint	attributed	correspond	jewellery*	reckless
accompany	appreciate	barricade	curriculum	llama	recommend
accomplish	apprentice	battalion	dessert	mackerel*	roller
accord	approach	cassette*	differential	marvellous	rosette*
accordion	appropriate*	caterpillar	diffusion	mattress	satellite
account	approve	chauffeur*	effect	mayonnaise*	serrated
accumulate	approximate*	cigarette*	efficient	midday	serviette*
accuse	arrange	cockatoo	effluent	necessarily	settee
accustomed	array	collage	embassy	necessary	silhouette*
add	arrest	collapse	erratic	occasion	staff
affair	arrive	collect	essential	occupation	succumb
affect	assail	collide	excellent	odd	sufficient
affection	assault	command	hello	off	suggest
afford	assemble*	commemorate	hippopotamus	offend	supply
aggravate	assert	commence	hurrah	official	support
ammunition	assign	commercial	illegible*	omelette*	suppose
anniversary	assist	commit	illiterate	opportunity	surrender
announce	associate	commodities	illuminate	oppose	surround
annoy	assort	commotion	illusion	palette*	swollen
appal	assume	communication	illustration	paraffin	tattoo
apparatus	attach	communion	immediate	parallel	terrific
apparent	attain	community	immense*	passport	tonsillitis

appeal	attempt	commuter	immortal	pastille*	torrential
appear	attend	connect	immune	personnel	traveller
appendix	attention	controlled	interrupt	possibility	trespass
applaud	attorney	correct	irregular	programme*	
apply	attract	correlation	irrigation	questionnaire*	

Words with missing doubled letters are listed below. Much as I favour making them all conform to the doubling principle, I think this needs public discussion and some testing of public opinion. **Perhaps just making all 2-syllable words conform to the doubling rule would be a good start?**

The 271 words in the table below do not mark a short stressed vowel with a doubled consonant, as one would expect.

According to the basic English consonant doubling rule this is needed in order to keep a stressed vowel in a multi-syllable word short. Roughly 1000 common English words follow this rule, (e.g. cabbage, terror, different, horrid, suffer). The spellings below prevent learners grasping the principle of consonant doubling as much as the needlessly doubled ones on the previous page.

* The asterisk marks words with variable stress.

All the consonants after a short, stressed vowel (which should really be doubled) are picked out in bold.

ability	catapult	electronic	lozenge	pedal	skeleton
abolish	category	electronics	madam	pedigree	solid
abominable	chalet	element	magnetic	pelican	spaniel
academic	charity	eligible	magnificent	penetrate	spinach
academy	cherish	eliminate	majority	peril	strategy
adequate	clarity	emerald	manage	perish	study
agony	clinical	enemy	management	petal	supersonic
aluminium	colony	energy	manager	pity	talent
amateur	comedy	epic	manual	placard	talon
America	comet	epidemic	medical	planet	tapestry
American	comic	famished	medicine	platinum	telescope
analysis	comparison	federal	melody	platypus	television
animal	competitive	finish	melon	policy	tepid
Arab	conifer	florist	memorise	politics	tetanus
arable	continue	forest	memory	polythene	therapist
arid	copy	frigate	menace	popular	thermometer
asparagus	coral	galaxy	merit	prominent	timid
astonish	credit	garage	metal	probable	tolerate
athletic	criminal	gasoline	military	produce*	tonic
atom	critic	habit	mineral	profit	topic
atomic	critical	hazard	minimal	priority	transparent
authority	criticism	helicopter	minimum	proper	treble
balance	damage	herald	minister	property	tribute
banish	decorate	heritage	minority	prosecute	triple
banister	dedicated	heron	model	protestant	tropics
battalion	delicacy	hexagonal	modern	radical	typical
benefit	deluge	hideous	modest	radish	valentine
bilious	democrats	historic	monument	rapid	valiant
body	demolish	holiday	moral	reality	valid
botany	derelict	horoscope	morality	refuge	valuable
brigand	devalue	image	nebula	refuse*	value
British	distributed	inhabit	negative	relevant	vanish
cabinet	dominant	inherent	obliterate	relic	venison
calamity	dominate	inherited	opera	remedy	ventriloquist

calendar	domino	italic	operate	robin	very
camel	dragon	lateral	opinion	salad	veteran
camera	dynamic	lemon	orange	salary	video
canopy	economic	leper	organic	salon	vinegar
capita	economical	liberal	palace	satin	vitality
capital	economics	liberty	palate	satisfy	volume
capitol	economist	lily	palette	secular	voluntary
caramel	economy	limit	panel	significance	vomit
caravan	edible	linear	panic	significant	wizard
caricature	edit	literally	parasol	sincerity	wizened
carol	educated	lizard	parish	sinister	yeti

Another 19 words would have their short, stressed vowels marked by -ck- or -dg-, if the 'packet, rocket' and 'fidget, ledger, midget' patterns were used consistently.

crocodile	<i>crocodile</i>	vacuum	<i>vackuum</i>	register	<i>redgister</i>
decade	<i>deckade</i>	exaggerate	<i>exadgerate</i>	religion	<i>relidgion</i>
decorate	<i>deckorate</i>	legend	<i>ledgend</i>	rigid	<i>ridgid</i>
document	<i>dockument</i>	legislate	<i>ledgislate</i>	tragic	<i>tradgic</i>
faculty	<i>fackulty</i>	logic	<i>lodgic</i>	vegetable	<i>vedgetable</i>
placard	<i>plackard</i>	pigeon	<i>pidgen</i>		
secular	<i>seckular</i>	regiment	<i>redgiment</i>		

Abolishing consonant doubling at the end of the [224 short words](#) which do this gratuitously would also help, but probably not quite so much. Young children find words with final -ck difficult to master (e.g. block, black, stick). They also get confused by the contradiction with 'music, fantastic, terrific'. They would learn shorter spellings like 'bloc, blac, stic' more easily. 'Music' and 'traffic' also had a redundant -k; not so long ago. They used to be spelled 'musick' and 'traffick'. They have been brought into line with 'comic, fantastic'. 'Black, block, brick' could easily be aligned with them too.

OTHER GOOD CANDIDATES FOR REFORM.

Constant doubling cuts across most consonant phonemes. Apart from the doubling problem, consonants are spelt relatively consistently. Vowel patterns have more exceptions, and 5 vowel phonemes have very large numbers of exceptions. They are listed below.

The EE-sound stands out above the rest. "Consistent spelling of the EE-sound with 'ee'" would eliminate the need to memorise how this sound is spelt in one of 426 words; 125 words spell this sound unambiguously with 'ee' already, but learners get no clue as to which words use this spelling.

The sound also occurs in 57 heterographs (e.g. feet - feat, heel - heal, team - team). This is far more than for any other sound. Heterographs epitomise English spelling unpredictability and are utterly unnecessary, as our ability to cope with over 1000 heteronyms of the 'bank', 'bar' or 'right' variety clearly show. Nobody is clamouring to have at least 5 different spellings for the 5 meanings of 'bar' (e.g. public bar, bar of soap, iron bar, called to the bar, all bar one).

301 words spell the EE-sound with one of the 5 main divergent graphemes. There are also a few utterly unpredictably ones.

The biggest group is the **136 words on the 'ea' pattern**. This pattern is particularly ripe for eliminating because it commonly spells other sounds as well (e.g. head, bear, great).

appeal	crease	heath	peak	sneak	pea
beach	creature	heathen	peal	speak	plea
beacon	deal	heave	peanut	squeak	sea
bead	dean	increase	peat	squeal	tea
beak	defeat	jeans	plead	steal	guinea-pig
beam	disease	knead	please	steam	appear
bean	dream	lead (vb)	pleat	streak	beard
beast	each	leaf	preach	stream	clear
beat	eager	league	reach	teach	dear
beaver	eagle	leak	read	teak	dreary
beneath	ease	lean	reap	team	ear
bleach	east	leap	reason	tease	fear
bleak	eat	least	release	treacle	gear
bleat	eaves	leave	repeat	treason	hear
breathe	feast	meagre	retreat	treat	near
cease	feat	meal	reveal	veal	rear
cheap	flea	mean	scream	weasel	sear
cheat	gleam	measles	seal	weave	shear
clean	glean	meat	seam	wheat	smear
colleague	grease	neat	season	wreath	spear
conceal	heal	ordeal	seat	yeast	tear*
creak	heap	peace	sheaf	zeal	weary
cream	heat	peach	sheath		

84 words spell the EE-sound on the 'e-consonant- vowel' pattern.

adhere	decent	here	medium	region	swede
adhesive	demon	hero	mere	scene	tedious
arena	equal	hyena	meteor	scheme	theme
athlete	era	imperial	metre	sequence	these
cafeteria	eve	Indonesian	millipede	sequin	torpedo
cedar	even	inferior	mysterious	series	trapeze
cereal	evil	ingredient	obedient	serum	vehicle
chameleon	experience	interference	period	severe	Venus
Chinese	exterior	intermediate	persevere	sincere	zero
comedian	extreme	Japanese	peter	species	
compete	female	legal	polythene	sphere	+ ??
complete	fever	legion	precede	stampede	theory
concrete	frequent	lenient	query	strategic	
convene	genie	lever	recent	superior	
convenient	genius	material	recess	supreme	

31 words use 'ie', 23 'i- cons'nt-vowel' pattern, 12 'ei' and 14 have assorted spellings.

achieve	pierce	antique	ravine		be
belief	priest	bikini	regime	ceiling	he
believe	relief	fatigue	sardine	conceit	me
brief	relieve	guillotine	tangerine	conceive	she
chief	shield	kiosk	trampoline	deceit	we
diesel	shriek	kiwi	trio	deceive	
field	siege	machine	unique	protein	key
fiend	thief	magazine	vaseline	receipt	ski
fierce	thieve	margarine		receive	quay
grief	tier	marine		seize	cathedral
grieve	wield	mosquito		sheikh	secret
hygiene	yield	pizza		weir	souvenir
medieval	cavalier	plasticine		weird	people

niece	chandelier	police	suite
piece	frontier	prestige	debris
pier			

Only 7 words with the EE-sound are less amenable to reform because of pronunciation differences between different countries: *chlorine, geyser, iodine, microfiche, glockenspiel, either, neither*.

Two other words - 'theology', 'theatre' - are perhaps best left alone too.

As can be seen in [the summary](#), there are another 4 problems with large numbers of exceptions to learn.

The -er and -en endings, the stressed -er- sound and the long A-sound.

The 75 '-or' endings make good candidates for bringing into line with the '-er' pattern.

actor	corridor	governor	mirror	respirator	tailor
advisor	decorator	indicator	monitor	rotor	tenor
alligator	demonstrator	interior	motor	scissors	terror
ambassador	director	inventor	navigator	senator	tractor
ancestors	doctor	investors	operator	senior	traitor
anchor	editor	junior	orator	sensors	solicitor
assessor	elevator	juror	prior	spectator	tutor
author	emperor	legislator	professor	sponsor	victor
boaconstrictor	equator	liquor	proprietor	successor	visitor
calculator	error	major	radiator	superior	warrior
castor	escalator	manor	razor	supervisor	
conductor	factor	mayor	rector	surveyor	
conveyor	gladiator	minor	refrigerator	survivor	

30 of the 33 '-ar' could also easily be '-er' instead. The last (vulgar) had better not become 'vulger'.

'Sugar' and 'vicar' both have other unpredictable elements in them, apart from their '-ar' endings.

angular	dollar	lunar	pillar	scholar	sugar
burglar	familiar	muscular	polar	secular	vicar
caterpillar	grammar	nectar	poplar	similar	vulgar
cellar	jaguar	nuclear	popular	sitar	
circular	liar	particular	radar	solar	
collar	linear	peculiar	regular	spectacular	

The 18 UK '-our' endings are already spelt '-or' in the US, but should really also have '-er' endings.

armour	favour	harbour	labour	parlour	savour
behaviour	flavour	honour	neighbour	rumour	splendour
colour	glamour	humour	odour	saviour	tumour

7 words with '-re' endings in the UK have already been made more sensible in the US.

centre	fibre	metre	sabre
theatre	ogre	kilometre	(cf. barometer)

3 words have exceptional endings: martyr, jodhpurs, chauffeur.

While the above 134 endings (US 127) which diverge from the more common '-er' pattern could easily be made to conform to it, the 42 '-ure' and 47 '-a' endings seem less amenable to reform.

42 '-ure' endings.

adventure	culture	fissure	legislature	nature	signature
agriculture	departure	fracture	leisure	picture	structure
architecture	expenditure	furniture	literature	pleasure	temperature
capture	exposure	future	manufacture	pressure	torture
caricature	failure	gesture	measure	procedure	treasure
conjure	feature	injure	miniature	puncture	venture
creature	figure	lecture	mixture	scripture	vulture

47 words have '-a' endings.

algebra	cobra	gorilla	orchestra	pupa	
area	data	idea	panda	quota	tundra
armada	dilemma	India	phenomena	replica	umbrella
Asia	drama	lava	piazza	spectra	utopia
banana	era	llama	piranha	stigma	veranda
camera	extra	militia	pizza	strata	via
capita	formula	Mongolia	pneumonia	tarantula	yoga
china	gondola	nebula	propaganda	tiara	zebra

70 words with the stressed '-er' sound of 'her', 'herb', 'herd' have 124 alternative spellings.

absurd	curl	hurl	purchase	surf	
blur	curse	hurt	purple	surface	turkey
burden	curt	hurtle	purpose	surge	turmoil
burglar	curve	lurch	purr	surgeon	turn
burgle	disturb	lurk	purse	surgery	turnip
burial	excursion	murder	return	surplus	turtle
burly	fur	murmur	slur	survey* vb	urban
burn	furnish	nasturtium	spur	Thursday	urchin
burst	further	nurse	spurn	topsy-turvy	urge
church	gurgle	nursery	spurt	turban	urn
churn	hurdle	occur	sturdy	turf	yurt

birch	circular	flirt	shirk	squirm	thirty
bird	circumstances	girder	shirt	squirt	twirl
birth	circus	girdle	sir	stir	virtually
chirp	dirt	fir	skirmish	swirl	virtue
circle	firm	girl	skirt	third	whirl
circuit	first	mirth	smirk	thirst	whir

earl	earth	rehearse	word	worse	attorney
early	heard	search	work	worship	courtesy
earn	learn	yearn	world	worst	journal
earnest	pearl	were	worm	worth	journey

The **131 exceptions to the 73 words with '-en'** endings (abdomen, open) are also numerous, but somehow less obviously reformable, perhaps because many of the words are not very common.

abandon	coupon	jettison	pigeon	season	badminton
apron	crayon	lemon	piston	sermon	chameleon
baron	crimson	lesson	poison	siphon	comparison
baton	damson	luncheon	prison	skeleton	phenomenon
bison	demon	mason	pylon	summon	bacon
carbon	dungeon	matron	python	surgeon	beacon
carton	electron	melon	reason	treason	dragon

cauldron	gallon	mutton	reckon	truncheon	flagon
common	heron	nylon	ribbon	venison	octagon
cordon	horizon	pardon	salmon	wanton	pentagon
cotton	iron	person	Saxon	weapon	wagon

Alsatian	metropolitan	Roman	veteran	gherkin	tarpaulin
amphibian	musician	rowan	woman	goblin	urchin
cardigan	ocean	ruffian		javelin	vermin
Christian	optician	slogan	aspirin	origin	
civilian	orang-utan	suburban	basin	paraffin	bargain
comedian	organ	tartan	bulletin	penguin	captain
Dalmatian	orphan	toucan	cabin	pumpkin	certain
historian	partisan	turban	catkin	raisin	fountain
hooligan	pedestrian	urban	coffin	robin	mountain
Indonesian	pelican	utopian	cousin	satin	porcelain
magician	republican	vegetarian	dolphin	sequin	villain

The **exceptional spellings for the long A-sound** are slightly less numerous, but perhaps better candidates for reform. After EE, this is the long vowel with most exceptions. It is also less problematic than long I, O OO or U because the sound occurs very infrequently before consonant blends, e.g. 'kind'. Its pronunciation is also fairly uniform throughout the English speaking world.

abstain	cocktail	maim	remain	traitor	feign
afraid	complain	main	retail	vain	neighbour
aid	contain	nails	retain	wail	reign
ail	daily	obtain	sail	wait	reindeer
aim	daisy	paid	slain	waiter	reins
ain't	detail	pail	snail	mayonnaise	skein
ascertain	detain	pain	sprain	entertainment	veil
assail	drain	plaise	stain	acquaint	vein
attain	exclaim	plain	straight	dainty	weight
available	explain	praise	strain	faint	freight
await	fail	prevail	straits	faith	break
bait	gain	proclaim	sustain	maintain	great
braid	grain	raid	tail	paint	steak
brain	hail	rail	tailor	quaint	champagne
campaign	jail	rain	trail	saint	halfpenny
chain	laid	raise	trailer	waist	fete
chilblain	maid	raisin	train	deign	dahlia
claim	mail	refrain	trainers	eight	

The most numerous divergent spellings are connected with the letter E, i.e. EE, -er, -en. It might therefore be an idea to have a reform package which includes making the **stressed short E-sound** consistent as well, although it is irregular in just **62 words**.

bread	dread	leather	treadmill	heaven	already
breadth	dreamt	meant	treasure	heavy	any
breakfast	endeavour	measure	wealth	jealous	bury
breast	feather	read*	weather	meadow	heifer
breath	head	realm	against	peasant	jeopardy
cleanliness	health	spread	every	pheasant	leopard
cleanse	heather	stealthy	friend	pleasant	many
dead	instead	sweat	leisure*	ready	
deaf	lead*	thread	said	steady	
dealt	leant	threat	says	weapon	
death	leapt	treacherous	Wednesday	zealous	

16 words above (and perhaps 'heaven' and 'heavy' too) should really gain a doubled consonant as well. Introducing this with just those words, in addition to cutting surplus doubled consonants (page 5) might be a gentle way of moving towards thoroughly consistent consonant doubling.

A reform centred on the letter E could include cutting redundant final '-e' as well (give, more, deliberate - as adjective).

SUMMARY OF RESEARCH RESULTS.

ENGLISH SOUNDS AND THEIR COMMON SPELLINGS obtained from 6856 words	Min. no. of words with those spellings	Other spelling patterns for the same sound in the same position	Min. of irregular spellings to memorise
VOWELS			

The following 5 vowel patterns require the memorising of more than 100 exceptions:

EE	sleep	125	dream, here, receive, believe, police, be, people	301 +125*
end -er	better	340	visitor 75, grammar 33, harbour 18, centre 7, odds 3	136
end -en	hasten	73	future 42, algebra 47	89
ER	her	70	abandon(68), urban(35), cabin(22), certain(7) (64 ur, 36 ir, 11 ear, 8 wor, 3 our, 1 or, 1 ere)	132 +73*
A-e	cake	338	main, break, eight, straight	124 +70*

*When the dominant pattern occurs in less than 50% of words, all spellings with that sound have to be learnt by heart

1. A	cat	466	salmon, meringue, plait	3
2. E	pet	300	head 49, said, friend	62
3. I	bit	421	system 45, pretty, women	52
4. O	pot	375	want, what 30, gone, cough	35
5. U	but	308	some 50, country 14, blood	69
6. EE*	daddy	602	monkey, coffee, holey	41
7. A-e	play	35	they 7, duvet 7, weigh 3, café, matinee, satai	20
8. I-e	bite	278	bright(18), cycle (26), kind (10), other 21 + n/either	76
	fly, sky	17	die 5, bye, buy, high 4	14
	reply, 50 -fy	60	Reading problem	
9. O-e	bone	170	coal(37), bold(24), blown(11), roll(9), mould, most	98
	go	106	blow, toe, though (42 -ow, 15 others)	58
10. OU	out	74	brown	24
	now	11	RP bough, plough, slough, thou (bow*, row*)	4
11. U-e	duty	137	beauty, feud 6, jewel 6,	21
	due	20	nuclear, nuisance	22
			few, view	
12. OO long	spoon	72	rule 18, lunar 13, soup 13, move, fruit, shrewd	57

	too	18	flew 12, blue 8, do, two,	
	to	1	through, coup, shoe, lasso	34
13. OO short	wood	15	put 15, would, woman,	
			courier	21
14. AU/AW	author, fault	44	awe, dawn 17, all 14, shawl	
	saw	13	8, salt 10, nought 2	51
	water, quarter	23		
	always	9		
15. OI	boil, oil	29	oyster	1
	toy 7, royal 5	12	buoy	1
			banana, aunt, calm, fast,	
16. AR	car	138	bath - heart, hearth,	
			sergeant	3
17. AIR	care	31	air 15, aerial, there, their,	88 UK
18. ER	unsrt. In word	70	bear,	27
	blizzard	22		
	ordinary	37	battery 25, history 12,	
			carpentry 12, luxury 6	55
			more 22, your, door, oar	
19. OR	for	188	12, board, source 15	49
20. Unstressed vowels in suffixes	believable	33	credible	17
	pertinent	137	dominant	38
	evidence	39	acceptance	20
			fuel (28), anvil (15), pistol (9)	52
and pref.	critical adj/nouns	195	divide	29
	amble vbs/2Cs	93	enquire	30
	decide	57		
	induce	73		

CONSONANTS

21. B	bun	784		0
22. CH	chip, speech	155	cello	1
23. D	dog	1010	blonde	1
24. F	film	580	photo 35, rough 8	43
			exact, exam, example,	
25. G	gap, bag	171	exaggerate	9
			10 surplus -ue (league), 5 h	
			ghost	16
	15 get, 12 gi, 1gy 28		guess, guilt (gu 13, gh 3)	16
26. J	jet, jig	18	14 gem, 4 giant, 2 gym	20
	jab, job, jug	78	spinach, sandwich	2
	cage, urge	115	majesty, subject (-ject x 8)	2
	agent, digest	71	who, whom, whose, whole	4
27. H	hand	237	chemistry 9, quay, mosque	
			11	22
28. K	kid, kettle, bleek	271	chaos 11, chlorine 8,	
			karate 4, queue 4	28
	cat, cod, cup	1022	acquaint, acquire, choir	4
	queen	78	accent 6, except 5,	
			exhaust, exhibit	13
	taxi	98	end -al, -le, -el listed under	
29. L	leg, feel, believe	1945	vowels and con. doublings	

30. M	man, sum	1128		bomb, limb 10, autumn 6	16
31. N	net	2312		knee 17, gone, -ne 10,	
32. Ng	ring	40		mnemonic, gnat 4	35
33. P	pen, cup	1220		meringue	1
34. R	rat, free	1670		hiccough	1
35. S	send, sing	138		write 21, rhubarb 6, are,	
	fence 88, force8	96		were and 22 vowel -ore	29
	agency	16		centre, city 36, science	47
	ice, face, fleece	41		sense 12, course 13, lapse	
	ancestor, decide	62		8, 2lse	35
	shop, rush, -			controversy, embassy,	
36. Sh	ship9	162		gypsy, courtesy	5
med.	mushroom	4		base, geese, house* 5	25
	station	500		consider, counsel	29
	notion, caution	21		chef; sure, moustache	12
	action, Ction	58		8 c, 7ch, 3 ss, 1 ti, 1 sci	17
	ignition	21		possible	0
	ration, national	4		ocean	1
	essential	20		coercion, diversion,	
	session	10		extension	20
	discussion, per-	2		mission, ad- com- trans- 7,	
	vicious	20		fission	3
	musician	12		passion, fashion, fascism	3
37. T	top, act, dusty	1398		commercial 14	
	separate 70 RPr	156		controversial	15
38. Th	thing, worth	142		discretion	1
39. Th	bother	61		cushion	1
40. V	end ve	120		pretentious 12, luscious	
41. W	never, ever, liver	55		2, anxious	15
42. Y	willow	216		dietitian, gentian	2
43. Z	you 16, player 15	31		debt, doubt, two, cassette	11
	unite 5			democrat, combat	2
	zip	14		the, them, this (+ 14 deriv.)	
	wise, advise	31	US 11	Reading problem	
	amuse, arose	60		ethics (TH is a reading	
	absorb(med Z)	94		problem only)	
44. Zh	vision, fusion	20		surplus 87 - Reading	
				Problem	
				jivvy, navy, skivvy	3
				when, whole	30
				xylophone	1
				prize, size, capsized	3
				seize, froze	19
				citizen, gazelle 16, possess	16
				azure, fissure, bourgeois	3

I have the word lists for all the exceptional spellings enumerated in the tables on these pages. They run to 35 pages. In this PV I have provided word lists for those irregular spellings which I have come to regard as the most worthy candidates for reform, in the light of my research results.

Conclusions.

My research findings have led me to conclude that

the following 5 changes deserve the most serious consideration:

1) Cutting surplus doubled consonants (p. 5) e.g. acomodation, acount, aply;	[160 words]
2) Consistent spelling of EE (p. 7 / 8), excepting be, he, me she, we	[296 words]
3) Consistent '-er' endings, excepting '-ure' and '-a' (p.8)	[133 words]
4) Consistent stressed 'er' (p. 9)	[124 words]
5) Consistent short E (p.9)	[62 words]
[with consistent consonant doubling in respelled words, e.g. reddy]	
In total these 5 changes would amend	775
They would also make the currently unpredictable 125 'ee' (e.g. feet) and 70 'er' (e.g. serve, term) predictable	<u>195</u>
They would therefore eliminate doubt from a total of	970 words.

29% of the currently 3456 words with unpredictable spelling would be improved by those changes.

Example Texts.

If those 5 changes were adopted, the sample SSS texts would look as follows.

The Star.

It was on the ferst day of the new yeer that the announcement was made, almost simultaneously from three observatories, that the motion of the planet Neptune, the outermost of all the planets that wheel about the Sun, had become very eratic. A retardation in its velocity had been suspected in December. Then a faint, remote speck of light was discovered in the reegion of the perterbed planet. At first this did not cause enny very great excitement. Scientific peepel, however, found the intelligence remarkable enough, eevn before it became known that the new body was rapidly growing larger and brighter, and that its motion was quite different from the orderly progress of the planets. (9 / 115 words changed).

Britten when young.

We may nowadays be chary about using the word 'geenius', but we still have a good idea what is ment by it. For example, there are great numbers of very gifted musicians who are admired but not called geeniuses. But there are others, manifestly prodigious, performing often at extraordinarily erly ages, a variety of feets so complex that the musical layman could hardly imagine, eevn with the most desperate labor, acomplishing enny of them, while eevn musicians are astonished: and we then reech for the good, handy, vague Enlightenment werd and call them geeniuses. The list includes Mozart and Mendelsohn; and, despite all the limiting judgements, it includes Benjamin Britten. (14 / 110 words changed).

Ode to a Nightingale.

My heart aches, and a drowsy numbness
pains
My sense, as though of hemlock I had drunk,
Or emptied some dull opiate to the drains
One minute past, and Lethe-wards had sunk:
'Tis not through envy of thy happy lot,

But being too happy in thine happiness,
That thou, light-winged Dryad of the trees,
In some melodious plot
Of beechen green, and shadows numberless,
Singest of summer in full-throated ease.
(1 / 70 words changed)