Modernity and English as a national language

Dick Leith and David Graddol with contributions by Liz Jackson

3.1 Introduction

This chapter describes some key developments in the English language from the end of the fifteenth century to the nineteenth century. It was during this period that English became standardised, and much of this chapter is taken up with consideration of how the idea of a 'standard' form of English, which could serve as a 'national' language of first England, then Britain, arose.

As in previous chapters, we examine here both changing linguistic characteristics and the wider social context within which English developed. That context was by any account remarkable. The sixteenth and seventeenth centuries form the period of English known as 'early modern'. It was the time in which Shakespeare, Dryden and Pepys lived, creating what many people today still regard as the 'great works' of English literature. It was also the era when Europe, as a whole, developed a radically new political and economic form, that of autonomous nation states each with a 'national' language.

During this period the English language was first taken overseas, to the new colonies in the Americas and Asia. In other words, just as it became a national language it became an international one as well. We focus in this chapter, however, on the development of English in England. Chapter 4 examines the expansion of English beyond England – to other parts of the British Isles and overseas.

3.2 Modernity and the rise of a national language

It was not only the language which became 'modern' during the period we discuss in this chapter, but the whole of European society. England, like many other parts of Europe, can in many ways be said to have made the transition from a medieval to a modern society during the sixteenth and seventeenth centuries, and that process was both complex and traumatic. For some – those who enjoyed the new wealth and intellectual liberation brought about by the growth of a market economy and the breaking away from the authoritarian dogmas of the Catholic church – it was a period of great excitement and opportunity. For many, such as the peasants who lost access to the land which provided them with a living, it was an oppressive period of poverty and social problems.

Modernity, in the sense that has come to be used by cultural theorists today, is both a state of mind and an economic and social condition. As a state of

mind, it implies an intellectual outlook based on self-knowledge and rational argument rather than subservience to dogma or belief in magic. As a social condition, modernity implies particular forms of social relation based on forms of capitalism. Whether or not modernity is itself a transient condition is a moot point. In recent decades the political and economic structure of Europe has been undergoing another transformation, one which may prove to be as radical as that in the early modern period.

Modernity, as we use the term in this chapter, thus refers to ideas about social identity and language that are associated with wider intellectual, political and religious developments in Europe, particularly during the period 1500–1900. Modernity, in this sense, has also been experienced in other parts of the world where European culture was a major influence in social and economic development – most notably North America. In many ways, modernity can be regarded as a defining characteristic of 'the West'.

The Renaissance

The origins of this period of social upheaval lie in the intellectual movement that came to be known as the Renaissance or the 'revival of learning'. Starting in Italy in the fifteenth century and gradually spreading across Europe, the Renaissance was a time when scholars rediscovered the works of 'classical' scholars of Greek and Roman times. The invention of printing made it possible for these works to be distributed widely and read by a greater range of people than would otherwise have been possible, and one result was a rapid growth in translations of classics into local languages. The concept of a 'national language' originated in the European Renaissance. Contemporary attitudes to national languages were confused: it was *politically* necessary to defend them, but they were widely felt to be inferior to classical Greek and Latin. Also, language was seen by many Renaissance thinkers as an instrument to be shaped to suit the 'national' purpose.

The growth of capitalism

As international trade grew, so did banking and other financial services such as stock exchanges. For instance, Henry VIII of England (1509–1547) borrowed one million pounds on the Antwerp market in the last four years of his reign. With the growth of capitalism, new social class relations began to take shape. England, for example, was a major wool exporter but now began to manufacture and export cloth rather than the raw material. When the medieval 'guilds' controlled the supply of labour in the large towns, many merchants moved their operations to rural areas, where it was easy to find people willing to undertake spinning and weaving in their own cottages for low wages. Increasingly, merchants centralised production in 'manufactories' where workers could be supervised and where the complex division of labour could be managed. In the same way that the physical landscape of England was transformed when open land was enclosed by landlords for sheep rearing, so

the social landscape took on a new shape as peasants increasingly became hired labourers and factory workers.

The growth of a market economy caused prices to rise throughout Europe. In Britain, basic commodities such as cereals and clothing are known to have quadrupled in price by 1600, while average wages only doubled. Entrepreneurs engaged in the new trade and industries became rich, but those on fixed incomes suffered and poverty emerged as a major social problem. Thus, one of the key features of the age was the restructuring of English society along lines of social class. As we discuss below, during the following centuries there arose new attitudes towards 'social correctness' and forms of English that indicated a speaker's social position.

The Reformation

The Reformation is the name given to the breaking away from the Roman Catholic faith and from the institutional authority of the Roman Catholic church in many parts of northern Europe. Throughout the period covered by Chapter 2, societies in western Europe owed allegiance to the Roman Catholic church, under the central authority of the Pope. By the sixteenth century, however, many of the tenets of the Catholic faith were being challenged by people who favoured a less elaborate form of worship based on individual faith, and who came to be called Protestants. Although originally a matter of religious doctrine, the challenge was championed by certain European leaders whose ambition was to set up states independent of the Pope's authority. In the early 1530s, Henry VIII declared himself (rather than the Pope) head of the English church.

The rise of humanist science

The Reformation led to a generally freer climate with regard to the pursuit of analytical studies involving the natural world. Scholars everywhere became more prepared to regard aspects of the human condition as the products of humans rather than of God. Language was one of many fields of scholarship which benefited from this 'humanist' enterprise, as scholars began to write treatises on language, construct grammars of English and compile dictionaries.

A remarkable expansion of knowledge occurred during the early modern period, partly as a result of European exploration of the world (most notably the Americas), and partly as a result of the sudden growth in scientific research. Indeed, the early modern period of English stretches from Copernicus's calculation in the early 1500s, that the sun rather than the earth was the centre of the solar system, to Isaac Newton's investigations into the properties of gravity and light. This was the period in which science in its modern sense emerged: the idea that knowledge resulted from the 'proof' of hypotheses based on careful experimentation and empirical observation. The discussion of such discoveries required a vast number of new words, and

the new forms of reasoning and argument required innovation in the grammatical resources of English.

Puritanism

For some influential English people the reforms of the church instituted after Henry VIII's break with Roman Catholicism did not go far enough. These people favoured an even 'purer' form of worship, and they came to be known as Puritans. Their vested interest in the idea of an essentially 'English' church led some towards the study of Anglo-Saxon culture, which they celebrated as a golden age of freedom and equality disrupted by the 'Norman yoke' (see Chapter 2, Section 2.6). Many Puritans championed English over Latin, and favoured a 'plain' English purged of Latinate eloquence.

It is hardly surprising, then, that many Puritan scholars were involved in the study of Old English manuscripts. They also took an interest in English dialects. For example John Ray (Figure 3.1), a famous botanist, published in 1674 his collection of dialect words as an aspect of a locality's 'natural history'. Dialects were of interest to some Puritans because of their association with the Old English rather than Latinate component of the English vocabulary. But dialects have wider relevance too. In the course of the seventeenth century, several different Puritan sects emerged, drawing support from the entire social spectrum. Ordinary Puritans would have spoken regional dialects. So the Puritan perspective on language, with a grasp of history and a wide social base, created the possibility for an understanding of English as a 'national' language capable of uniting *all* English people in the eyes of God.

Many Puritans were drawn to the details of science, which in the seventeenth century were not opposed to those of religion, as they were later to become in the minds of many. Indeed, for Puritans, the scientist worked to the greater glory of God by helping to reveal to humanity the beauty and sophistication of the created universe – of which language was a part.

By the 1640s, Puritanism had become highly political. The growing power of the monarchy had been challenged by Parliament and, during the Civil War that followed, Puritans played an active role on the parliamentary side. Hostilities started in 1642 and, after numerous battles, Charles I was defeated in 1645. The king was executed in 1649 and a 'commonwealth' was declared. During this period, pamphlets circulated by certain Puritan sects argued not only that the king was a tyrant like the Norman conquerors, but that ownership of any kind of property, including land, was morally wrong. These radical arguments did not prevail among the wealthier parliamentarians, and although the arguments themselves survived (see Alexander, 1982), the sects which upheld them were increasingly marginalised. The monarchy was restored in 1660.

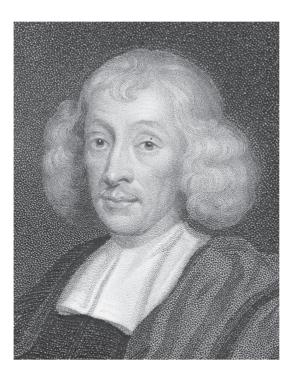


Figure 3.1 John Ray, English naturalist (1627–1705). His major three-volume work on botany, *Historia Plantarum*, covered 18,600 species and established taxonomic distinctions still drawn upon today. He also adopted a systematic approach to the study of language. (Science Photo Library)

The process of standardisation

The period in which Modern English arose was thus characterised by interconnected and fundamental changes in the structure of society. The key linguistic process associated with these social changes is **standardisation**: English was transformed from a vernacular language into one with a standardised variety that could be identified with England as a nation state.

A **standard language** is one that provides agreed norms of usage, usually codified in dictionaries and grammars, for a wide range of institutional purposes such as education, government and science. Sociolinguists tend to use the term '**Standard English**' to denote the primarily written, especially printed, usage of educated people.

In standardisation, there are four main processes (which may happen simultaneously):

- Selection: an existing language variety is identified as the basis. The variety selected is usually that of the most powerful or socially influential social or ethnic group.
- *Elaboration*: ensuring that the new language can be used for a wide range of functions. This may involve the extension of linguistic resources: for example, new specialised vocabulary or even new grammatical structures.

- *Codification*: reduction of internal variability in the selected variety, and the establishment of norms of grammatical usage and vocabulary. Since standard languages are rooted in written forms, standardisation often also involves the establishment of a standard spelling for words.
- *Implementation*: the standard language must be given currency by making texts available in it, by encouraging users to develop a loyalty and pride in it and by discouraging the use of alternative language varieties within official domains.

Standardisation thus has two main dimensions: as the sociolinguist Einar Haugen puts it, its goals are 'minimal variation in form, maximal variation in function' (Haugen, 1972, p. 107).

A number of languages have been turned into standard, national languages in the twentieth century as the result of deliberate policy and **language planning**: for example, Swahili in Tanzania and Tok Pisin in Papua New Guinea. Standardisation in English, however, was only partly a deliberate process. It resulted from a combination of social and economic conditions, though, as we will see, it was helped along by the activities of a large number of people. It is also important to note that standardisation in English has been only partly achieved. Indeed, Milroy and Milroy (1985, p. 24) suggest that no 'spoken language can ever be fully standardized'. Standard English remains something of an ideal, an imaginary form of English that is often rhetorically appealed to but never clearly identified. Standardisation is thus not simply a linguistic fact but an ongoing process and an ideological struggle.

Focusing

Sociolinguists have studied how reduction in variation in form (Haugen's first dimension) arises in speech communities without formal intervention by governments or language planners. Le Page and Tabouret-Keller (1985, p. 187) proposed a phenomenon that they call **focusing**. A focused linguistic community is one in which there is a strong sense of norms. There are four key 'agencies' of focusing:

- 1 Close daily interaction in the community.
- 2 The mechanisms of an education system.
- 3 A sense of common cause or group loyalty, perhaps due to the perception of a common threat.
- 4 The presence of a powerful model, such as the usage of a leader, a poet, a prestige group or a set of religious scriptures.

The concept of focusing is applied in the course of the discussion of standardisation in English that follows.

3.3 Selection: Caxton and the consequences of printing

Caxton did not invent printing but he was the first to bring the new technology to Britain (Figure 3.2), where it played a crucial role in the development of Standard English.

nobles and vollapnes amto his feole forto ferne. ntfele daves y Baturne Began thus to floure a was rr. pere of age and fie broter .rl. Dranue their fater By a fekence that he had dyed and deptide out of this more leuvest his worf Defa endowed largely of possessione. his with was nopous and fozoufull to Defa his mife. why che aufity fer to were out of mefur and his fonce and toughtire alfo ther did his obleque reverently in habonoput of grete and Bittir forow the obseque doon ther wepping and forow pet during refa fam that Tptan fer eldeft fone pres tended, to faue and eniope the fuceffion of his fader The on a day called for der some Saturne worth Tpe tan and other of the Contre and there referced a faid onto them that fer pong fone Baturne fold fuccete and hive the ferrtages of fer huf bond, Tytan ferna the wolf of five moder redublid five forow and au fib firm to were drete plente of teeris and knelpor to fore his moter humbly and Tayou in the wyle Moter pampetit infortunate whan pe woff that my riable patromonpe Beput fromme And that naturell me ought to have by ryght Thold be gruen fro me and pat Beaufe p v amnot fo well formedy of membres as my Broter fatozneps which forow is to mepaf frng noyous pe wil putte from me my fortune and Burthe whiche pe may not do by lawfull refon pam pour first sone pe faue nozpfffideme wpth pfubstace of your blood as your chyld benin your bely.ir.mo nether Alfo pam fe that firft dwelling andenhabited your fempupy chambers None to fore me toke there ony feaf yng whan y toke that the pe gaf me your due

Figure 3.2 The first book ever printed in English was *The History of Troy*, translated from the French and printed by Caxton in 1473. The black-letter typeface copied the style of gothic handwriting common in the Protestant countries of northern Europe. (John Rylands University Library of Manchester)

ACTIVITY 3.1

Reading A 'Caxton on dialects' is taken from a book by the linguists Roy Harris and Talbot Taylor called *Landmarks in Linguistic Thought* (which immediately gives you the authors' perspective on Caxton's significance).

Read this piece, then reread it, noting what the authors have to say about the problems posed by the lack of a fixed form for English and the solution Caxton adopted.

Comment

The problems facing all European printers including Caxton were that regional dialects proliferated, linguistic change was rapid, and there was a relative lack of conventionalised spellings and authoritative sources. Caxton solved this dilemma for England by default – by printing the dialect of the south-east Midlands.

You might have wondered about the authors' interpretation of Caxton's story reproduced at the beginning of the reading. Theirs is actually the most usual interpretation. The story is seen as authoritative evidence of linguistic disorder (and therefore justifying the argument that English was in need of standardisation). But you may have felt that too much fuss has been made about the eggs example. After all, aren't there plenty of similar examples of 'non-communication' in English today despite the process of standardisation that has since occurred?

One conclusion we could draw is that all Caxton is doing is highlighting the fact that language — any language — is variable, and that this at times causes problems for users. But we could also see Caxton as manipulating this example to suit his commercial interests. His argument that the English and their language were as variable as the effects of the moon makes a fanciful appeal, perhaps, to the idea of a readership united by a single characteristic. And the kinds of people able and interested enough to buy printed books were the newly literate middle class, who would be precisely the ones to identify with the mercer's sense of linguistic put-down.

There are also some points to add in relation to the introduction of printing technology and its cultural significance. Caxton certainly helped to familiarise people with the east Midlands dialect by establishing that dialect as the medium of print: using *l* rather than *ic(h)*, for instance, or *home* rather than *hame*. One consequence of this was that other dialects tended no longer to be printed. So a printed norm based on usage in only one part of the territory became the 'national' norm too. Caxton effectively accomplished the first stage of standardisation by selecting one variety.

By the way, Harris and Taylor refer to 'the dialect of London and the South-East' (in the last paragraph in Reading A), acknowledging changing

notions of regional boundaries, whereas many sources refer to this same variety as the 'East Midlands' dialect taken as including London. Crystal (2004, pp. 201–2) explains that the earlier Mercian dialect area developed into two distinct regions; that termed 'East Midlands' can be viewed as particularly significant, including as it does a 'triangle' of special influence traceable between Oxford, Cambridge and London.

3.4 Elaboration

As Harris and Taylor say in Reading A, language during the Renaissance period generally became the object of attention and debate. There is plenty of evidence to show that, for the first time in its history, English was evaluated as a medium of serious communication, and its forms and structures scrutinised. There were many who considered English still unsuitable for literary or scholarly use, areas of life in which Latin and Greek were regarded as the perfect instruments. But there arose among a group of English authors the idea that the English language could be *made* more perfect, that it could be turned into as 'eloquent' a language as classical Latin. 'Eloquence' was a concept first associated with the ancient Greeks. Eloquence made a language more persuasive, and persuasion was central to the Greek ideal of the democratic city states such as Athens. The concept was important to the Romans too, who applied it to the writing of literature as well as public speaking.

One linguistic dimension of eloquence was *copiousness*: the language needed enough words to represent every idea. In fact, it needed more than this; in order to prevent repetition of the same word, a variety of synonyms were needed to provide stylistic variation. This could be achieved either by greatly increasing the word stock or by increasing what was called 'significancy' – the ability of words to mean more than one thing (**polysemy**). At the sentence level, eloquence also required the use of rhetorical structures, such as 'antithesis' in which oppositions are carefully balanced against each other. How, then, could English be made more eloquent so that it could take over from Latin in the writing of poetry and literature, and so that a 'national' literature could be created which expressed the emerging cultural identity of England? There were three principal solutions:

- The lexicon was extended. It is estimated that during the period 1500–1700 over 30,000 new words were added to the English vocabulary. The process reached its peak in the early 1600s when, on average, over 300 new words were recorded each year (see Figure 3.3).
- Existing words acquired more meanings (see Figure 3.4), thus increasing significancy.
- At the level of the sentence, eloquence was achieved by imitating the rhetorical structures of Latin. An example is the quotation from Ascham in Reading A, which illustrates the antithetical style.

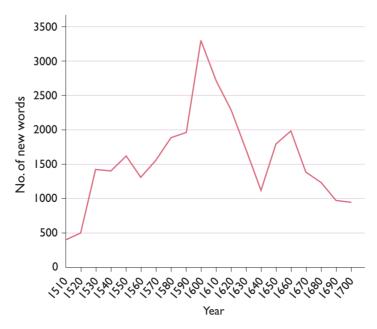


Figure 3.3 Changes in the English vocabulary 1500–1700 (adapted from Görlach, 1991, p. 137)

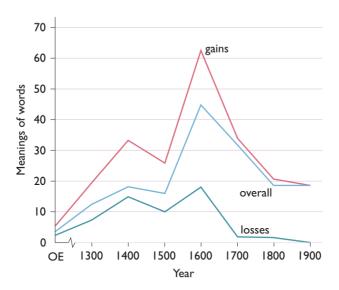


Figure 3.4 Growth in the multiple meanings of words in early modern English: the accretion and obsolescence of independent senses of eight polysemous words: *draught*, *form*, *sense*, *set*, *stock*, *trade*, *train*, *wit* (adapted from Görlach, 1991, p. 199)

By the end of the sixteenth century a new and flourishing English literary tradition had arisen and many literary men thought that English, through the works of writers such as Spenser and Shakespeare, had achieved literary greatness. In 1592 the writer Thomas Nashe, for instance, credited the 'Poets

of our time' with having: cleansed our language from barbarisme and made the vulgar sort here in London ... to aspire to a richer puritie of speech' (quoted in Bailey, 1992, p. 37).

During the following century, however, the Protestant spirit of intellectual independence encouraged a rapid growth in scientific discovery and further elaboration of English was needed. Given the prominence of scientific English today it may seem surprising that no one really knew *how* to write science in English before the seventeenth century.

Why science came to be written in English

As was noted in Section 3.2, the European Renaissance is sometimes called the 'revival of learning', a time of renewed interest in the 'lost knowledge' of classical times. At the same time, however, scholars also began to test and extend this knowledge. The emergent nation states of Europe developed competitive interests in world exploration and the development of trade. Such expansion, which was to take the English language west to America and east to India, was supported by scientific developments such as the discovery of magnetism (and hence the invention of the compass), improvements in cartography and – perhaps the most important scientific revolution of them all – the new theories of astronomy and the movement of the earth in relation to the planets and stars developed by Copernicus (1473–1543).

A study of how Copernican theory gradually came to be accepted across Europe would illustrate how closely entwined were the various strands of the Renaissance process. Copernicus was one of the first generation of scholars who were able to publish and circulate their ideas to a wide audience by means of the printed book. The printing trade itself had an economic interest in translating such works into the national languages - in England there were many potential purchasers who did not understand Latin. But the spread of Copernican ideas was not welcomed by the Catholic church. Indeed, the whole project of humanist science - based on the intellectual independence of the scientists, free to test ideas empirically and by rational argument – was potentially subversive of the authority of the church, the transnational institution which had for so many centuries been the focus of learning in Europe. When Galileo dared to admit that he believed in Copernican theory, the Pope issued anti-Copernican edicts restraining Italian scientists from publishing or teaching theories which appeared to contradict the biblical account of the cosmos. The church effectively stifled the new science in Italy.

In England the eleven years of Puritan government which followed the Civil War may have helped to produce an intellectual climate of democracy, anti-authoritarianism and independence of mind, in which a distinctively British form of science – stressing the importance of empirical method, simplicity, utility and attention to detail – arose.

The Royal Society

England was one of the first countries where scientists adopted and publicised Copernican ideas with enthusiasm. Some of these scholars, including two with interests in language – John Wallis and John Wilkins – helped found the Royal Society in 1660 in order to promote empirical scientific research.

John Wallis

In 1653, one of the last of the Renaissance scholars, John Wallis (Figure 3.5), published a grammar of English, *Grammatica Linguae Anglicanae*, which is widely regarded as 'a very important landmark in the history of phonetics and English grammar' (Kemp, 1972, p. 1). The book was one of the last of the scholarly treatises to be written in Latin. Wallis was a controversial figure who became prominent in many fields. He was the inventor of the mathematical sign for infinity, developed a considerable reputation during the English Civil War for his ability to decipher secret messages, and was involved in a system for teaching the deaf. His contemporary, John Aubrey, said:

To give him his due prayse he hath exceedingly well deserved of the commonwealth of learning, perhaps no mathematical writer so much. Tis certain that he is a person of real worth, and may stand with much glory upon his own basis, needing not to be beholding to any man for fame, of which he is so extremely greedy, that he steals flowers from others to adorne his own cap.

(quoted in Kemp, 1972, p. 15)



Figure 3.5 John Wallis (1616–1703)

In his preface to the 1699 edition of his grammar, Wallis (1699, pp. xxiv–vi) wrote:

... many people want to learn our language, but foreigners often complain that it is so difficult that they cannot easily acquire it. Even some of our own countrymen, surprising though it may seem, have the foolish notion that the structure of our language is somehow complex and over-involved, and scarcely obeys any grammatical laws. Would-be learners and would-be teachers usually approach it in such a muddled way that the inevitable result is a great deal of boredom and difficulty. My purpose in taking it upon myself to write this book is to remedy this unfortunate situation. I aim to describe the language, which is very simple in essence, in brief rules, so that it will be easier for foreigners to learn, and English people will get a better insight into the true structure of their native tongue.

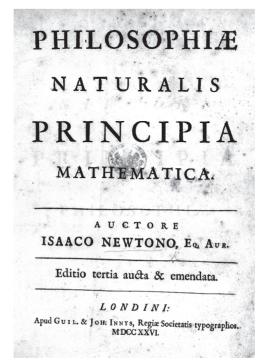
I am well aware that others before me have made the attempt at one time or another and have produced worth-while contributions ...

None of them, however, in my opinion, used the method which is best suited to the task. They all forced English too rigidly into the mould of Latin (a mistake which nearly everyone makes in descriptions of other modern languages too), giving many useless rules about the cases, genders and declensions of nouns, the tenses, moods and conjugations of verbs, the government of nouns and verbs, and other things of that kind, which have no bearing on our language, and which confuse and obscure matters instead of elucidating them.

(Wallis, 1699, pp. xxiv-vi, in Kemp, 1972, pp. 107, 109, 111).

Across Europe, similar academies and societies arose, creating new national traditions of science. The scholars of many of these countries, such as France, Italy and Spain, published in their national languages. But those countries which found themselves on the periphery of the great expansion in scientific learning were faced with a difficult choice: if they wished to ensure that their own scholarly institutions were able to exchange knowledge internationally, then they were forced to adopt one of the international languages of science. This helps to explain why Latin persisted as a lingua franca alongside national languages for some time. The use of an international language, however, cut off the fledgling scientific institutions from their own national audiences, inhibiting the diffusion of the new learning among their populations. Some countries, such as Sweden, adopted a bilingual policy: two scientific academies were founded at the start of the eighteenth century, one of which used Latin as its official language, the other Swedish. The language dilemmas that faced such countries then continue to face them today, but now English stands in the place of Latin.

In the initial stages of the scientific revolution most publications in the national languages were popular works, encyclopedias, educational textbooks and translations. Original science was not done in English until the second half of the seventeenth century. For example, Newton published his mathematical treatise known as the *Principia* in Latin, but published his later work on the property of light – *Opticks* – in English (Figure 3.6).



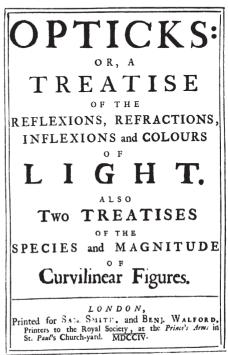


Figure 3.6 In the interval between the publication of Newton's *Principia Mathematica* (first published 1667; the title page from the third amended edition of 1726 is shown here) and his *Opticks* (1704), original science came to be written in English. (*left:* British Library)

There were several reasons why original science continued to be written in Latin. The first was simply a matter of audience. Latin was suitable for an international audience of scholars, whereas English reached a socially wider but more local audience. Hence popular science was written in English.

A second reason for writing in Latin may, perversely, have been a concern for secrecy. Open publication had dangers in that it put into the public domain preliminary ideas which had not yet been fully exploited by their 'author'. This growing concern about intellectual property rights was a feature of the period – it reflected both the humanist notion of the individual, rational scientist who invents and discovers through private intellectual labour, and the growing connection between original science and commercial exploitation. There was something of a social distinction between 'scholars and gentlemen' who understood Latin, and men of trade who lacked a classical education.

And in the mid seventeenth century it was common practice for mathematicians to keep their discoveries and proofs secret by writing them in cipher, or in obscure languages, or in private messages deposited in a sealed box with the Royal Society. Some scientists might have felt more comfortable with Latin precisely because its audience, though international, was becoming increasingly socially restricted. Medicine and surgery clung the most keenly to Latin as an 'insider language'.

But a third reason why the writing of original science in English was delayed may have been to do with the linguistic inadequacy of English in the early modern period. English was not well equipped to deal with scientific argument. First, it lacked the necessary technical vocabulary. Second, and in some ways more interestingly, it lacked the grammatical resources required to represent the world in an objective and impersonal way, and to discuss the relations, such as cause and effect, that might hold between complex and hypothetical entities.

Fortunately, several members of the Royal Society possessed an interest in language and became engaged in various linguistic projects. One, the most ambitious, was to create a new, universal language which would incorporate the new scientific taxonomies in its vocabulary structure, permit logical argument, and be politically and religiously neutral. Perhaps the best known of these enterprises was the 'Real Character' of John Wilkins.

The Royal Society played with the idea of forming a committee which would act as a lead body in establishing new forms of English, like the language academies of other European countries. In 1664 the society voted that there be a committee for improving the English language. Although this proposal came to little, the society's members did a great deal to foster the publication of science in English and to encourage the development of a suitable writing style. Many members of the Royal Society also published monographs in English. One of the first was by Robert Hooke, the society's first curator of experiments, who described experiments with microscopes in *Micrographia* (Hooke, 1961 [1665]; see Figure 3.7). This work is largely narrative in style, based on a transcript of oral demonstrations and lectures.

In 1665 a new scientific journal, *Philosophical Transactions*, was inaugurated (Figure 3.8). This was perhaps the first international English language scientific journal and it encouraged the development of a new genre of scientific writing, that of short, focused accounts of particular experiments. One historian suggests that foreign scholars frequently complained about the use of English for the *Philosophical Transactions*, 'being clumsy in the English language' (Hunter, 1989, p. 250).

The seventeenth century was thus a formative period in the establishment of scientific English. In the following century much of this momentum was lost as German established itself as the leading European language of science. It is estimated that by the end of the eighteenth century, 401 German scientific journals had been established as opposed to 96 in France and 50 in England

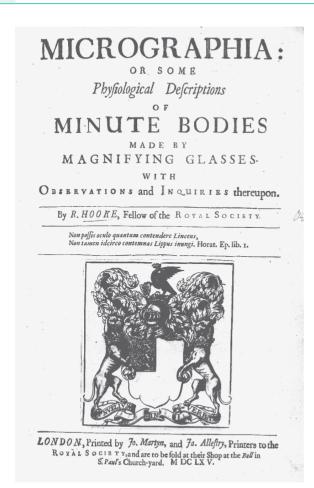


Figure 3.7 Hooke's *Micrographia* was one of the first scientific treatises written in English. (British Library)

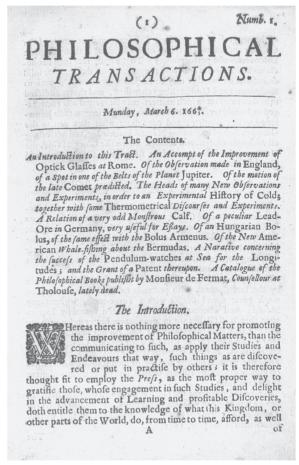


Figure 3.8 Philosophical Transactions, volume 1, number 1, was possibly the first international journal written in English. (Cambridge University Library)

(Houghton, 1975, p. 19). However, in the nineteenth century, scientific English again enjoyed substantial lexical growth as the Industrial Revolution created the need for new technical vocabulary and new, specialised, professional societies were instituted to promote and publish in the new disciplines.

The creation of scientific English

We have claimed that the English language had to be made capable for scientific discourse, a project which was to take at least 300 years. The creation of scientific English was a part of a wider Renaissance project of elaborating the English language so that it could be used in a wide range of communicative domains. One of the first arenas to benefit had been literary language. However, the highly ornate style that had become common in literary discourse was not regarded as suitable for precise, unambiguous description

and clear logical argument. An early history by one of the founding members of the Royal Society, Thomas Sprat, indicates something of the Puritan aversion to the 'eloquence' of the times. '*Eloquence*,' he said, 'ought to be banish'd out of all *civil Societies*, as a thing fatal to Peace and good Manners' (Sprat, 1959 [1667], p. 111, original emphasis). He suggested that the society had:

... been most vigorous in putting in execution, the only remedy that can be found for this *extravagance*: and that has been, a constant Resolution to reject all amplifications, digressions, and swellings of style: to return back to the primitive purity, and shortness, when men deliver'd so many *things*, almost in an equal number of *words*. They have exacted from all their members, a close, naked, natural way of speaking; positive expressions; clear senses; a native easiness: bringing all things as near the Mathematical plainness, as they can: and preferring the language of Artizans, Countrymen, and Merchants, before that, of Wits, or Scholars.

(Sprat, 1959 [1667], p. 113, original emphasis)

It is worth noting that the motivation for neologising (coining new words or expressions) in science was rather different from that in literary genres. Whereas literary English sought synonyms in order to provide alternative forms of expression (eloquence), science required a precise and standardised language in which, ideally, there were only as many words as referents (i.e. things, processes, etc. referred to).

Terminology

One of the pressing linguistic needs of the new scientific community lay in terminology. This lack was felt keenly by the early translators of classical works. In this situation any translator is faced with several choices:

- The Latin term can be 'borrowed' in its entirety into English, adapted to English morphology.
- The Latin word can be translated element for element into English (what is technically known as a 'calque').
- A new English word can be invented.
- An existing word can have its meaning extended so that it acquires a specialised, technical, as well as everyday sense.

All these techniques were used to develop scientific English, but by far the commonest was the first: the simple adoption of the Latin term. One of the earliest attempts to render a technical discussion into the English language is a Middle English work by Chaucer drawing on a Latin work, *Compositio et Operatio Astrolabii*, by the eighth-century Arabian astronomer, Meeahala. In many ways it was no more than an instruction manual, though one written for a young boy – possibly Chaucer's own son – who had not yet learnt Latin. In the first part of this treatise on the *Astrolabe (I.1)*, Chaucer takes care to introduce a number of terms taken from Latin, such as 'altitude': 'Thyn astrolabie hath a ring to putten on the thombe of the right hond in taking the

height of thinges. And tak kep, for from henes forthward I wol clepen [call] the heighte of any thing that is taken by the rewle 'the altitude', withoute moo wordes' (Chaucer, *c.*1391, in Robinson, 1966, p. 546).

Chaucer's willingness to borrow from Latin was in contrast to the Old English period, when the vocabulary of English was still almost entirely Germanic in origin and the calque was a more popular strategy. For example, the Old English scholar Aelfric translated the grammatical term *praepositio* as *foresetnys*, a term which was later replaced by a Latin loan: the *Oxford English Dictionary* (OED) attributes *prepisicion* to Wycliffe in 1388.

Not all the science that was translated into English originated from European scholars. As Chaucer's work shows, both Muslim science and the science of ancient Greece were important in the medieval world. Several of the words to be translated from Latin were thus already loans from Arabic or Greek. Examples of Arabic terms from astronomy include *azimuth*, *zenith*, *nadir*; from mathematics, *algebra*, *cipher*, *zero* and – from the name of a Muslim mathematician, al-Khwarizmi – *algorithm*; from alchemy, *alcohol*, *alkali*. From Greek came many terms in geometry, such as *diagonal*, *hypotenuse*, *pentagon*, *polynomial*.

In the second half of the seventeenth century, English scientists were themselves increasingly responsible for discoveries and inventions. As the horizons of knowledge expanded, particularly in botany, geography and chemistry, new forms of classification and nomenclature arose. There were so many new things to be described and new concepts to be communicated that the vocabulary of English again needed to be enhanced in a systematic manner.

Latin, for several reasons, remained an important resource for neologisms in this period. One was that new concepts were invented by the discoverers and theorists – the leading-edge scholars who were familiar with Latin and found in its inflectional system a production morphology for the creation of adjectives and nouns (particularly those based on the name of the discoverer). But the use of Latinate neologisms also provided something close to shared vocabulary among scientists in different countries. The national languages thus provided a matrix into which a common technical vocabulary could be inserted, just as today many languages have adopted a common technical vocabulary based on English.

The liberal incorporation of Latin words into English texts, however, was not without its problems. One of the purposes of publishing works in English was to make them available, for both educational and commercial reasons, to a wider national audience. But the use of so many strange and foreign words could have the effect of making them inaccessible.

Grammar

One form of neologism is the extension in the use of an existing word to a new word class. For example, a noun can be used as a verb, or a verb as a noun. Shakespeare frequently made nouns behave as verbs. For example, in

Shakespeare's play, King Lear describes his daughter Cordelia (Act 1, Scene 1) as 'Unfriended, new-adopted to our hate, /Dower'd with our curse, and stranger'd with our oath'. Renaissance science seems to have encouraged the transformation of verbs to nouns. Such changes are not just stylistic: whether an idea is presented in language as a 'process' (verb) or a 'thing' (noun) may be important. Shakespeare was a dramatist and no doubt wished to portray the world as consisting of happenings. The project of humanist science can, at one level, be regarded as one which imposed order on the fluid experience of the world: a reconceptualisation of the world as consisting of 'things', of objects of study. The language of Shakespeare and the language of science thus provide alternative modes of construing the world.

In a study of scientific language from Newton's *Opticks* to the present day, Halliday (1993) schematically describes the evolution of scientific discourse and its mode of representing the world in the following way. He suggests that the preferred grammatical format for describing physical phenomena was originally in the form of:

a happens; so x happens

Gradually, through the centuries, there is a movement towards the form:

happening a is the cause of happening x

In the first grammatical structure, events are described by means of a verb in a conventional narrative form. In the later structure these events have become expressed through nominal (i.e. noun) forms. These noun phrases grow in length and complexity, whereas verbal forms become fewer.

The linguistic sleight of hand by which events and processes are represented in language as states or things (i.e. as nouns or noun phrases), Halliday calls 'grammatical metaphor'. Such language not only allows the natural world to be objectified but also enables the scientist to develop a complex, and at times abstract, argument. It allows, for example, a complex phenomenon to be 'packaged' linguistically as one element in a clause so that the whole can be positioned within an unfolding argument. It is a feature of English grammar that noun phrases can be extended in this way whereas verb phrases cannot. In the following extract from *Electricity and Magnetisim* (1675), by Robert Boyle (a founding member of the Royal Society), the author uses four noun phrases in the second sentence: 'the modification of motion in the internal parts', 'the Emanations of the Amber', 'the degree of it', and 'the Attraction':

[I]t has been observ'd, that Amber, & c. warm'd by the fire, does not attract so vigorously, as if it acquire an equal degree of heat by being chaf'd or rub'd: So that the modification of motion in the internal parts, and in the Emanations of the Amber, may, as well as the degree of it, contribute to the Attraction.

In such constructions the verb does not describe a process in the world but rather proposes a relationship *between* such processes, either causative or logical. Thus scientific discourse typically uses verbs to express logical relations and argument, and nouns to represent entities and processes in the world. Halliday suggests that this is how Renaissance scientists came to be able to conduct the new science, which brought together experimental method with theoretical interpretation, in English, since 'up to that point, doing and thinking remain as separate moments in the cultural dynamic: in "science" the two are brought together' (Halliday, 1993, p. 67).

It was not until the late nineteenth century that realist scientific discourse could be said to have been perfected. By then it had become common for scientists to avoid the use of the first person (*I*) even when describing experimental method. Newton, in contrast, began his account of Experiment 1 in the *Opticks*: 'I took a black oblong stiff paper ... this paper I view'd through a prism of solid glass'. The world as construed by scientific English had, by the start of the twentieth century, achieved complete objectivity: it existed 'out there' independently of the agency or examination of the scientist.

There are, however, linguistic costs attached to such grammatical structures, as Halliday points out. In English the verb phrase provides the richest mechanism for describing relationships between entities. Hence the use of long nominal expressions means that the precise relations between entities *within the phrase* cannot be made explicit. Halliday identifies some of the ambiguities in one text as follows:

What is *lung cancer death rates*: how quickly lungs die from cancer, how many people die from cancer of the lung, or how quickly people die if they have it? What is *increased smoking*: more people smoke, or people smoke more? What is *are associated with*: caused by (you die because you smoke), or cause (you smoke because you are – perhaps afraid of – dying)? We may have rejected all but the 'right' interpretation without thinking – but only because we know what it is on about already.

(Halliday, 1993, p. 68)

Hence scientific English often requires a certain knowledge and understanding of the subject matter: it may be better at high-level, abstract argument than at low-level, explicit description.

3.5 Codification

During the sixteenth century, English became the object of serious academic study by people with practical interests who were responding to the political, cultural and religious controversies of their times (as seen in the previous section). One such practical interest arose because English had now become a language taught in school (see item 2 in the list of focusing agencies in Section 3.2).

One of the first grammars in English was William Lily's *A Shorte Introduction of Grammar*. Although known as 'Lily's Grammar', the book was actually compiled from various sources after his death in 1523 (see Figure 3.9). This was one of the first books in English to become 'authorised' by King Henry VIII – it remained the 'national grammar' for several centuries and versions of it were used in English schools until the nineteenth century. Although written in English it was essentially a grammar of Latin, but it provided the basic introduction to grammar that all the English writers of the early modern period, including Shakespeare, Spenser and Ben Jonson, were brought up on. As one editor has commented, 'This was the introduction to the classics of Rome for those who were to create the classics of England' (Flynn, in Lily, 1945 [1542], p. xi).

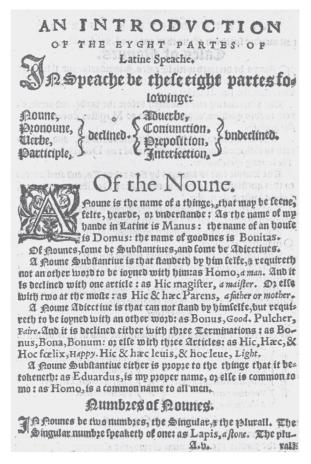


Figure 3.9 A page from Lily's A *Shorte Introduction of Grammar*, published in 1542, which established grammatical terminology in English. The book is also interesting typographically: black-letter type, which had largely been replaced in English books by roman type, is retained here for English. Latin words are set in roman type and English translations in italic. (Folger Shakespeare Library)

The grammatical analysis described by Lily was already an ancient one. The earliest Greek grammar, written by Dionysius Thrax in approximately 100 BC, identified eight 'parts of speech'. Since grammar was considered a universal structure which, like rhetoric, could be applied to any language, this number of parts of speech was sought in other languages, such as Latin (by Donatus in the fourth century AD) and then later in English. Lily therefore established not only an English terminology for grammatical ideas but also a grammatical analysis of English, closely modelled on that of Latin. Thus began a tradition of writing grammars of English that followed Latin models, a tradition that was not entirely broken until the nineteenth century.

The first grammar to attempt a description of the English language in English was Bullokar's *Bref Grammar for English*, published in 1586. One of its purposes, like those of Lily's Grammar, was educational – to 'rationalise' English spelling, vocabulary and grammar. In this respect, its conception of grammar differed from that of modern linguistics. In fact, *grammar* for Bullokar meant the 'art of writing', its meaning in ancient Greek (Bullokar, 1977 [1586]). This conception dominated European thinking about grammar until well past Bullokar's time, and has had vital implications for education and the processes of standardisation, as we will see. Such a grammar served more than an educational purpose, however: it could be seen as symbolic of the dignity of English by other Europeans. The writing of grammars for European languages had become politically expedient by Bullokar's time and any European state desiring autonomy needed to have its own grammar of the so-called national language.

During the eighteenth century a hierarchical view of language was developed by many observers in the social and cultural context of a literate middle class, based partly in the London coffee houses (Figure 3.10). Here language, politics and the history of literature were discussed, and essays on these subjects were published in several newly established periodicals. It was in this context that the word 'standard' seems first to have been applied to issues of language. Significantly, however, its most common meaning seems to have been 'level of excellence'. The OED (Simpson and Weiner, 1989) quoted a writer from 1711 asserting that the Greeks 'brought their beautiful and comprehensive Language to a just Standard'. Also significant is the continued association of the word with the classical languages, and the fact that it denoted a standard of *literary* correctness or excellence. In the following year, however, the clergyman and writer Jonathan Swift applied the term to English. He wanted to refine the language 'to a certain standard' (Crowley, 1989, p. 93).

Swift and other commentators like him were very concerned to protect English against the charge of 'barbarism'. The way to do this was to 'fix' the language so that it no longer varied and changed. One mechanism was to emulate states such as France and Italy and set up an academy to regulate usage. But the idea, most famously proposed by Swift himself in 1712, came



Figure 3.10 An eighteenth-century coffee house (Mary Evans Picture Library)

to nothing. Another course was to write a definitive dictionary, of the kind attempted by Dr Samuel Johnson in 1755, which we discuss below.

The desire for linguistic order did not arise simply from a desire to emulate the classical languages. Writers such as Swift were anxious to preserve the *political* order: for these writers the fixing of the language was to help safeguard what Swift called the 'civil or religious constitution'. As Dr Johnson wrote some forty years later: 'tongues, like governments, have a natural tendency to degenerate: we have long preserved our constitution, let us make some struggles for our languages' (2006 [1755], paragraph 91).

Let's now consider these points in relation to one of the most influential books in the history of English, Johnson's *A Dictionary of the English Language* (see Figure 3.11).

ACTIVITY 3.2

Allow about 30 minutes

Bearing in mind Johnson's words about the struggle for the language, read the five extracts from the 'Preface' to his *Dictionary* given in Figure 3.11. As you read, consider the questions below.

- What are the problems Johnson sees in writing a dictionary of English? What help, if any, was available to him?
- What kind of English usage does he include, and what does he exclude?
- What 'story' of language seems to guide him? And what does he have to say about change in language?
- What are his views on translation and academies?

When I took the first survey of my undertaking, I sound our speech copious without order, and energetick without rules: wherever I turned my view, there was perplexity to be disentangled, and confusion to be regulated; choice was to be made out of boundless variety, without any established principle of selection; adulterations were to be detected, without a settled test of purity; and modes of expression to be rejected or received, without the suffrages of any writers of classical reputation or acknowledged authority.

Having therefore no affishance but from general grammar, I applied myself to the perusal of our writers; and noting whatever might be of use to ascertain or illustrate any word or phrase, accumulated in time the materials of a dictionary, which, by degrees, I reduced to method, establishing to myself, in the progress of the work, such rules as experience and analogy suggested to me; experience, which practice and observation were continually increasing; and analogy, which, though in some words obscure, was evident in others.

So far have I been from any care to grace my pages with modern decorations, that I have studiously endeavoured to collect examples and authorities from the writers before the restoration, whose works I regard as the wells of English undefiled, as the pure sources of genuine diction. Our language, for almost a century, has, by the concurrence of many causes, been gradually departing from its original Teutonick character, and deviating towards a Gallick structure and phraseology, from which it ought to be our endeavour to recal it, by making our ancient volumes the ground-work of stile, admitting among the additions of later times, only such as may supply real deficiencies, such as are readily adopted by the genius of our tongue, and incorporate easily with our native idioms.

But as every language has a time of rudeness antecedent to perfection, as well as of false refinement and declension, I have been cautious lest my zeal for antiquity might drive me into times too remote, and croud my book with words now no longer understood. I have fixed Sidney's work for the boundary, beyond which I make sew excursions. From the authours which rose in the time of Elizabeth, a speech might be formed adequate to all the purposes of use and elegance. If the language of theology were extracted from Hooker and the translation of the Bible; the terms of natural knowledge from Bacon; the phrases of policy, war, and navigation from Raleigh; the dialect of poetry and siction from Spenser and Sidney; and the diction of common life from Shakespeare, sew ideas would be lost to mankind, for want of English words, in which they might be expressed.

- Nor are all words which are not found in the vocabulary, to be lamented as omissions. Of the laborious and mercantile part of the people, the diction is in a great measure casual and mutable; many of their terms are formed for some temporary or local convenience, and though current at certain times and places, are in others utterly unknown. This sugitive cant, which is always in a state of increase or decay, cannot be regarded as any part of the durable materials of a language, and therefore must be suffered to perish with other things unworthy of preservation.
- Total and sudden transformations of a language seldom happen; conquests and migrations are now very rare: but there are other causes of change, which, though slow in their operation, and invisible in their progress, are perhaps as much superiour to human resistance, as the revolutions of the sky, or intumescence of the tide. Commerce, however necessary, however lucrative, as it depraves the manners, corrupts the language; they that have frequent intercourse with strangers, to whom they endeavour to accommodate themselves, must in time learn a mingled dialect, like the jargon which serves the trasfickers on the Mediterranean and Indian coasts. This will not always be confined to the exchange, the warehouse, or the port, but will be communicated by degrees to other ranks of the people, and be at last incorporated with the current speech.

The great pest of speech is frequency of translation. No book was ever turned from one language into another, without imparting something of its native idiom; this is the most mischievous and comprehensive innovation; single words may enter by thousands, and the fabrick of the tongue continue the same, but new phraseology changes much at once; it alters not the single stones of the building, but the order of the columns. If an academy should be established for the cultivation of our stile, which I, who can never wish to see dependance multiplied, hope the spirit of English liberty will hinder or destroy, let them, instead of compiling grammars and dictionaries, endeavour, with all their influence, to stop the licence of translatours, whose idleness and ignorance, if it be suffered to proceed, will reduce us to babble a dialect of France.

Figure 3.11 Extracts from the 'Preface' to Dr Johnson's Dictionary, taken from the fourth edition of 1773

Comment

From the first extract we get a glimpse of Johnson's classicising desire for perfection in language; English has no 'settled test of purity'. To make matters worse, there was nothing except 'general grammar' to help him. Almost all the dictionaries available to Johnson were specialist ones: lists of so-called hard words (adoptions from Latin and Greek), bilingual dictionaries and so on. So he had to scrutinise the work of writers. The second extract tells us that he favours the writing, not of the present but of the past, notably of the late sixteenth or seventeenth centuries. This was a golden age for Johnson, from which the language had degenerated, partly because of influence from French ('Gallick'); but note that his remark about a 'time of rudeness antecedent to perfection' suggests yet another linguistic story: that a language may first gestate and then blossom. We can call this a cyclical view of language. But we find that Johnson refers only to writing of a certain kind: literature, by which he meant writing such as theology (Hooker) and scripture (the Bible), or scientific and governmental works (Bacon and Raleigh), as well as literature in the narrower sense more commonly used today. The third extract shows that he excludes the (presumably spoken) usage of the 'laborious [working] and mercantile part of the people' on the grounds that this usage does not last. Mercantile matters are also singled out in the fourth extract: it is 'commerce', rather than 'conquests and migrations', that 'corrupts' English; and in the final extract he also blames translation. His opposition to an academy is based on a notion of 'liberty' that he sees as essentially English (as opposed to the fanatical adherence to tyrannical laws, seen as an attribute of the French).

The doctrine of correctness

Johnson's *Dictionary* was followed by several 'grammars' of English which recommended certain grammatical usages as 'correct'. For instance, the cumulative negative construction such as the one in the Caedmon text (in Chapter 2, Section 2.4) – *Ne con ic noht singan* ('Not know I not (how) to sing') – was deemed illogical, therefore incorrect. It contained two negative particles, *ne* and *noht*, which in accordance with the laws of algebra must

cancel each other out. So, according to this logic, the correct (modern) form ought to be I don't know how to sing, with just one negative particle (n't).

These arguments, a further aspect of the eighteenth-century discourse of standardisation, were sometimes given a divine justification. In an earlier section we discussed the idea that everything in nature was an expression of God's order. If the way a society is organised – its 'constitution', to use Johnson's word – can be claimed as part of nature, then it, too, reflects God's will. The 'genius' of English – to quote Johnson again (2006 [1755], paragraph 61) – reflected the English way of life, and part of this genius was its grammar. To deviate from correct grammar, then, was to displease God. The grammarian Robert Lowth, who was to become a bishop, and for whom the English translation of the Bible was the 'best standard of our language', thought that correct grammar was next to godliness. His grammar, first published in 1762, ran to twenty-two editions in thirty years (Lowth, 1968 [1762]).

The doctrine of correctness was also applied to pronunciation in the form of pronouncing dictionaries. A very famous one was John Walker's A Critical Pronouncing Dictionary of 1791, which prefixed word meanings by the 'Rules of Pronouncing' (Walker, 1968 [1791], titlepage). Walker acknowledged the range of dialectal pronunciations throughout England and gave 'rules to be observed by the natives of Scotland, Ireland and London, for avoiding their respective peculiarities' (1968 [1791], titlepage). He gave particular attention to Londoners, 'who, as they are the models of pronunciation to the distant provinces, ought to be the more scrupulously correct (1968 [1791], p. xii)'. His 'Fourth Fault' of Cockney, the lower class dialect of London, was 'Not sounding h where it ought to be sounded, and inversely. Thus we not infrequently hear, especially among children, heart pronounced art, and arm, harm. (p. xiii)' He ends this discussion by saying that 'the vulgar pronunciation of London, though not half so erroneous as that of Scotland, Ireland or any of the provinces, is, to a person of correct taste, a thousand times more offensive and disgusting' (p. xiv).

Modern linguists would characterise Walker's tone here as **prescriptive**: he is telling people how he feels they should speak. It seems likely, however, that pronouncing words like *arm* with initial /h/ arise precisely because some speakers have been made to feel anxious about 'correct' pronunciation. If they do not customarily pronounce initial /h/ (there is evidence for /h/-less pronunciation as far back as the Middles Ages; see Milroy, 1992), they will not know which words (e.g. *heart*) are supposed to have it, and which do not (e.g. *hour*). So they hypercorrect, by adding initial /h/ to any word that starts with a vowel.

The Oxford English Dictionary

In the nineteenth century the codification of English was continued by those scholars involved in compiling the OED, widely seen as the finest achievement of the philological method and as a work of the greatest

authority. One of their concerns was the issue of what constituted the national language: questions about what to include and how to present information were considered in great detail by members of the Philological Society who prompted the dictionary. In a Proposal of 1858 there were five main points:

It should be exhaustive.

All English books should be admitted as authorities.

There should be a chronological limit as to the earliest texts from which quotations would be drawn.

It should chart the history of each word, its form and senses.

It should show the origins of each word and its relationships with words in other (related) languages.

The criterion of exhaustiveness (the first point) was, in the end, sacrificed by decisions such as to exclude much technical vocabulary and to make dialect vocabulary a separate project. In 1873 the English Dialect Society was set up specifically to compile a dialect dictionary, which was published in 1898. The final decision to focus on one variety of English at the expense of the others – an issue central to this chapter – is summed up in this sentence from the Proposal: 'As soon as a standard language has been formed, which in England was the case after the Reformation, the lexicographer is bound to deal with that alone'. For the compilers of the dictionary this meant in practice the 'standard literary' language. Why this limitation? Why such a forceful word as 'bound'?

During the nineteenth century, English literature had become the object of academic study. There were political reasons for this. By appealing to a shared literary past, so the argument went, the growing gulf between the urbanised working class and the social groups above them could be bridged. Tony Crowley argues that the OED reflected the era's preoccupation with nationalism and he quotes one contemporary commentator who wrote that the study of 'native literature' from past to present was the 'true ground and foundation of patriotism' (Crowley, 1989, p. 123). One problem, however, was that the records demonstrating this literary past were scattered and incompletely understood. It was necessary for scholars to find the texts in the first place, explicate their language and then publish them. The dictionary depended on this research, which was helped by the formation of the Early English Text Society in 1864 and by numerous other specialist societies such as the New Shakespeare Society, established in 1873.

As regards the third point of the Proposal, it was originally intended to go no further back than the emergence of an 'English type of language', which was supposed to date from about 1250. Some language scholars at this time argued that since Old English was 'unintelligible' to the modern reader, the new dictionary should avoid quoting words from the Anglo-Saxon period. On the other hand, there was to be no chronological limit as far as the *origins* of words were concerned (the fifth point). The idea was to take a word back as

far as it could go, even to the reconstructed 'Old Teutonic' originally spoken by the Germanic ancestors of the Anglo-Saxons. In this respect the historical boundaries between English and other languages were blurred.

So the new dictionary was to be primarily historical: it was to show where the English vocabulary came from, how it had changed over the centuries and how the meanings of words had changed. One of the problems with seeing words from the perspective of origins is that we tend to assume that a word has an 'essence' located in its oldest meaning and form. So the history of any word's meaning is in danger of becoming a story of *decline* from a golden age.

3.6 Implementation

In the sixteenth century the new technology of printing played a central role in making texts available in the dialect of the south-east Midlands, the variety Caxton had selected. Printing made it possible for books to be distributed widely and read by a greater range of people than would otherwise have been possible, the first process of implementation introduced earlier in the context of the Renaissance. It also made it possible for identical material to be read *simultaneously* by people throughout an entire territory. This became especially true when newspapers were first introduced during the eighteenth century. Print therefore assisted the first of the focusing agencies listed in Section 3.2: 'daily interaction'. Print can therefore be seen as instrumental in *creating* images of a 'national' community. Without it, it is difficult to imagine the existence of distinct nations in the modern sense.

Among the wider readership available to Caxton and his successors were the new merchant classes who had money to buy books but, by and large, did not have the kind of education which enabled them to read Latin. This is one reason why the development of printing stimulated a rapid growth in translations of important texts into English and specifically into the variety of English selected for print. Probably the most influential translation was that of the Bible into English, first carried out in 1526. A slightly later translation, together with the Book of Common Prayer in 1549, became the focus of the service in the new Church of England, breaking the long association between Christianity and Latin. The English Bible – which could now be widely disseminated in print – became an important focusing agency in itself (see item 4 in the list in Section 3.2) and its publication has often been regarded as a decisive moment in the creation of Standard English. The Authorized Version of the Bible published in 1611 was, by the eighteenth century, regarded by some as a kind of 'classical' variety of English, representing a golden age of usage.

The political significance of translation seems to have been grasped by the post-Reformation monarchy as a means of asserting its authority. The Catholic church had its own body of laws in Latin, a language that was

incomprehensible to most people in England. To translate these laws into English could be a symbolic challenge to papal authority and Henry VIII was probably behind the translation of many legal texts. Ancient governmental statutes in Latin (such as the Magna Carta of 1215) were also translated, helping to give the impression of a distinctively English, as opposed to international, law. The effects of the Reformation, then, were to focus on English as opposed to Latin and other European languages, and to establish the selected variety in the official domains of religion and the law, making possible the second process of implementation which we noted earlier owed much to the influence of Puritanism.

It was also after the Reformation that English writers developed a stronger loyalty and pride in the English language. Two important results of Henry VIII's action in declaring himself head of the English church were a radical change in the status of the clergy and an enormous growth in the power of the monarchy. A third result was religious conflict and persecution that lasted for generations, giving rise to a definition of 'Englishness' that was Protestant, upright, industrious and defensive towards the outside world. In terms of the agencies of focusing, this defensiveness can be related to the sense of an external threat which stimulates feelings of a common cause (see item 3 in the list of focusing agencies in Section 3.2). The language of England, with its regional diversity and Anglo-Saxon past, became the object of antiquarian study. This was helped in the late 1530s by Henry's closure of the (Catholic) monasteries – institutions that housed many of the manuscripts on which our knowledge of Old English depends and which then became more generally available.

A later example of growth in loyalty and pride occurred in the nineteenth century, particularly in its second half, when many British people felt a sense of national identity and confidence as never before: the British colonies in India and elsewhere became incorporated into the British empire under Queen Victoria; British technological invention led the world; and private enterprises and corporations were creating wealth which might benefit all sectors of society. During this period a large number of national institutions and societies were established (i.e. public bodies outside the control of central government) which helped to consolidate and regulate national culture and science in a manner that was, by now, typically British. One such society was the Philological Society which, as we noted earlier, initiated the compilation of the OED.

The third aspect of implementation is discouraging the use of alternative language varieties in official domains. We have seen how the translation of Latin texts established the selected variety in the domains of religion and the law, but what of the growing number of texts that were being written in English? Which variety was suitable for them? Activity 3.3 looks at part of the debate about the variety to be used, and the varieties to be discouraged, in another domain: literature.

ACTIVITY 3.3

Allow 15–20 minutes

Read the following extract through fairly quickly.

But after a speach is fully fashioned to the common vnderflanding, & accepted by confent of a whole countrey & natio, it is called a language, & receaueth none allowed alteration, but by extraordinary occasions by little & little, as it were insensibly bringing in of many corruptios that creepe along with the time: ... Then when I fay language, I meane the speach wherein the Poet or maker writeth be it Greek or Latine, or as our case is the vulgar English, & when it is peculiar vnto a countrey it is called the mother speach of that people: ... fo is ours at this day the Norman English. Before the Conquest of the Normans it was the Anglesaxon, and before that the British, which as some will, is at this day, the Walsh, or as others affirme the Cornish.... This part in our maker or Poet must be heedyly looked vnto, that it be naturall, pure, and the most vsuall of all his countrey: and for the same purpose rather that which is spoken in the kings Court, or in the good townes and Cities within the land, then in the marches and frontiers, or in port townes, where straungers haunt for traffike fake, or yet in Vniuersities where Schollers vse much peeuish affectation of words out of the primatiue languages, or finally, in any vplandish village or corner of a Realme, where is no refort but of poore rufticall or vnciuill people: neither shall he follow the speach of a craftes man or carter, or other of the inferiour fort, though he be inhabitant or bred in the best towne and Citie in this Realme, for fuch persons doe abuse good speaches by strange accents or ill shapen soundes, and falle ortographie. But he shall follow generally the better brought vp fort, ... men ciuill and graciously behauoured and bred ... neither shall he take the termes of Northern-men, fuch as they vse in dayly talke, whether they be noble men or gentlemen, or of their best clarkes all is a matter: nor in effect any speach vsed beyond the/river of Trent, though no man can deny but that theirs is the purer English Saxon at this day, yet it is not fo Courtly nor fo currant as our Southerne English is, no more is the far Westerne mas speach: ye shall therfore take the vsuall speach of the Court, and that of London and the shires lying about London within lx. myles, and not much aboue.

Figure 3.12 An extract from *The Arte of English Poesie*, published in 1858 and attributed to George Puttenham (1936 [1589], pp. 144–5)

The extract in Figure 3.12 comes from *The Arte of English Poesie*, first published in 1589. It discusses the variety of English to be used by poets (or 'makers'). You probably found the language of this extract easier than any of the texts so far, but you may have had problems recognising certain words because many spelling conventions (the use of u and v, for instance, as in *vnciuill* (uncivil) are similar to those mentioned at the end of Chapter 2. And in three words – $nati\bar{o}$, $corrupti\bar{o}$ and $m\bar{a}s$ (man's) – the n is indicated by a line above the preceding vowel.

Now reread the extract. We don't expect you to understand every word, but we do expect that you'll find it a lot easier the second time. As you reread it, think about the following questions.

- What are the main points that Puttenham makes in this section?
- Puttenham uses the words 'language' and 'speech'. What does he seem to mean by them? Can you think of a modern word to characterise what Puttenham calls 'language'?

Puttenham is discussing which *kind* of English is appropriate for poets (or 'makers') to use. The most eloquent variety, he argues, will not be found in ports or remote villages, nor on the northern or western peripheries, but within a radius of sixty miles ('lx.myles') around London. But this geographical dimension is complicated by other factors, both occupational (avoid the 'affectation' of university scholars and the speech of craftsmen) and social (look at the usage of the gentry at court).

Historians of English have generally argued that this extract is evidence for the existence of a Standard English when Puttenham was writing. The passage shows clearly that dialect speech is a sign of social status, and that the upper-class usage of the London area was considered prestigious. But there are problems with using the term Standard English here. The *written* norm that Puttenham says even non-Londoners use is not the same as a spoken one, and a spoken norm may be a matter of vocabulary, grammar or (perhaps) pronunciation. Puttenham lumps these together: at one point he is discussing accent, 'ill shapen soundes', at another, vocabulary. And what are we to make of his description of south-eastern courtly language as 'naturall, pure, and the most vsuall'? As the usage of a tiny minority, it can hardly be the most 'usual' of the country.

These apparent confusions are not so surprising if we remember that Puttenham was not writing a sociolinguistic description of sixteenth-century English but a manual for *poets*. He was seeking favour at the royal court by recommending that poets should use the language of courtiers. In so doing, he introduced a crucial association between ideas about the 'best' English usage and social exclusiveness. As we shall see, this association has remained an issue ever since. He was also clearly discouraging the use of any variety other than one corresponding closely to the one selected by Caxton.

Finally, we look briefly at a fourth domain of implementation: education. In the eighteenth century, a distinction was made between polite and vulgar which effectively disparaged all popular, dialectal speech. Words such as 'offensive' and 'disgusting' (as used by Walker to describe Cockney speech; see above, 'The doctrine of correctness') were commonplace at this time. Such views were reinforced by the increase in educational provision during the nineteenth century. The wealthy were able to send their sons to the new fee-paying 'public schools' which promoted a highly focused form of pronunciation later known as Received Pronunciation (RP) - discussed in depth in Chapter 5. Linguistic correctness became a most important mark of education and it was at this time that the term 'Standard English' first came to be used, increasingly so in connection with spoken as well as written English. When compulsory state education was introduced in the 1870s, one of its aims was the teaching of 'Standard English' at the expense of local dialects, which were severely discouraged. This 'national' education policy was applied in all parts of Britain; the local speech of Scotland, for example, was regarded as a dialect of English (an alternative view of its status is explored in Chapter 4).

3.7 Dialect speech and the discourse of democracy

Most of this chapter has been concerned with the development of a standard variety of English. In this last section we want to look at some of the social and intellectual movements which helped to create an opposing force – towards regional rather than national pride and the celebration of dialect rather than standard speech.

There was an opposing attitude towards English dialects which saw them as the authentic source of English culture and language, unadulterated by the social effects of industrialisation and urban living. During the 1760s, writers had drawn attention to the 'popular' traditions of verse that had existed in medieval times, or that had since coexisted with the literature of the 'polite'. This stimulated interest in the idea of literature of, and for, the common people, an interest culminating in the poet Wordworth's famous preface to his *Lyrical Ballads* in 1802. These poems were not aimed at satisfying the taste of the 'polite' reader; instead they celebrated the 'rustic life' of ordinary people, whose feelings were supposedly untainted by social vanity. Above all, though not written in the dialect of Wordworth's Cumberland home, they purported to use the very language of ordinary people. Wordworth's sentiments were possible because a reaction to the discourse of standardisation had taken place.

From the 1840s onwards, there emerged a flourishing literature in dialect in various parts of industrialised northern England (Joyce, 1991). Significantly, this literature was both printed and sold by local publishers. Many of the dialect writers were workers and they were often self-educated in the new textile

factories of Lancashire and Yorkshire. By the 1850s, industrial cities such as Manchester had their own local newspapers, and were fiercely proud of their manufacturing traditions. Much of the literature reflects a regional 'patriotism', with a strong antipathy towards the south-east of England.

This tradition of writing lasted well into the twentieth century. Below is an extract from a poem, *In Praise o' Lancashire*, published in 1923. It celebrates the working people of Lancashire who, unlike the *chirpin* cockneys of London, have made their county the *engine-heause* ('house') of Britain. As well as fighting for their country they have also fought for 'freedom', by agitating for representation in Parliament and by building trade unions. The poem embodies a working-class conception of manliness and ends with a celebration of the dialect as an expression of solidarity.

So give us th' good owd dialect, [old]
That warms eaur hearts an' whums, [our, homes]
That sawders us together, [solders]
An' that cheeans us to eaur chums. [chains]
It may be rough-and-ready stuff,
An' noan so fal-lal smart, [not, highfalutin]
But it's full o' good an' gumption, [vigour]
And it's gradely good at th' heart! [properly]

(Clark, 1923, quoted in Joyce, 1991, pp. 291–2)

Dialects were now being seen by some scholars as making a significant contribution to the language. Max Müller, Professor of Comparative Philology at Oxford University in the mid nineteenth century had advocated paying them proper attention, but this was generally seen in terms of what they preserved from the archaic past. Systematic dialect scholars such as A.J. Ellis (1890) and Walter Skeat (1962 [1912]) perceived that traditional dialects could be fading in the light of more widespread education and better communications. However, Skeat was particularly enlightened in realising that this could mean, not the absolute extinction of dialect but rather the emergence of new varieties: 'it is no more possible to do away with them than it is possible to suppress the waves of the sea' (Skeat, 1962 [1912], p. 2).

A final point about dialect in the nineteenth and beginning of the twentieth centuries is that it was understood to be essentially rural. But one reason for rural depopulation was the rise of manufacturing industry – the so-called Industrial Revolution – which forced people to move from the countryside to work in factories in towns and cities. This 'working class', as these people had come to be called, were often seen by the class above them as a threat. In fact, some observers even saw them as barbarians, with all the accumulated meanings of that term: outsiders, destroyers of 'culture', cruel, little better than savages. This was especially the case with the poor of London. In 1902 the sociologist C.F.G. Masterman, in a book appropriately entitled *From the Abyss*,

wrote of their 'bizarre and barbaric revelry' (quoted in Crowley, 1989, p. 217). The London poor were regarded by many middle-class people as 'inarticulate', so the term 'dialect' was considered too good for them. Even today, urban working-class speech – often regarded simply as 'bad English' – continues to be the image of unacceptability for many people. It was only from about the middle of the twentieth century that the term 'dialect' came to be used by language scholars to include the local speech of towns and cities. This was a significant innovation, making it more difficult to dismiss dialect as merely obsolescent.

3.8 Conclusion

We have tried to show that during the so-called 'modern' period, English has been developed as the language of an autonomous state, and that it has been seen as expressive of English nationality. But we have also tried to show that the concept of the national language is problematic. On the one hand, it can be seen as *inclusive*, although this raises the issue of where the boundaries of the language actually are (as in the case of Scots, discussed in Chapter 4); on the other hand, it can be seen as *exclusive*, based on the usage of an elite located in the south-east of England. It is the second meaning that is associated with the term 'Standard English'.

We have examined the sociolinguistic processes that have led to standardisation and we have suggested that the history of English during the entire modern period may be explored in relation to the concept of *focusing*. We have looked at the way the introduction of printing promoted close interaction in the national community, at the growth of national pride and a sense of a common cause, at the effects of the introduction of universal education and at different 'powerful models' (classical, literary, biblical, the usage of a prestigious social grouping) which influenced thinking about English at various times. Some of these models, as in the debates about the meaning of Standard English, appear to pull in different directions. Finally, we have shown that there were opposing tendencies, such as regional pride and interest in local dialects. The existence of such competing forces – which some scholars have called 'centripetal' (pulling in to the centre) and 'centrifugal' (tending to pull away from the centre and fragment) – is one reason why a single, homogeneous variety of English will never be achieved.

READING A: Caxton on dialects

R. Harris and T.J. Taylor (Roy Harris is Emeritus Professor of General Linguistics at the University of Oxford and Talbot J. Taylor is L.G.T. Cooley Professor of English and Linguistics, College of William and Mary, Virginia.)

Source: Harris, R. and Taylor, T.J. (1989) *Landmarks in Linguistic Thought: The Western Tradition from Socrates to Saussure*, Vol. 1, London, Routledge, pp. 86–90.

And certaynly our language now vsed varyeth ferre from that whiche was vsed and spoken whan I was borne. For we Englysshe men ben borne vnder the domynacyon of the mone, whiche is neuer stedfaste but euer wauerynge, wexynge one season, and waneth and dyscreaseth another season. And that comyn Englysshe that is spoken in one shyre varyeth from a nother. In so moche that in my dayes happened that certayn marchauntes ... wente to lande for to refreshe them; And one of theym. ... axed for mete; and specyally he axyd after eggys: And the goode wyf answerde, that she coude not speke no Frenshe. And the marchaunt was angry, for he also coude speke no Frenshe, but wolde haue hadde egges, and she vnderstode hym not. And thenne at laste a nother sayd that he wolde haue eyren: then the good wyf sayd that she vnderstod hym wel. Loo, what sholde a man in thyse dayes now wryte, egges or eyren. Certaynly it is harde to playse eueryman by cause of dyuersite and chaunge of langage.

([Prologue to *Enevdos*], William Caxton, 1490)

The linguistic mentality of modern Europe is one in which English, French, German, Spanish, Portuguese, Italian, Dutch, etc. are all recognized as established national languages. Each has its own literature, history and grammar. Each is backed by the authority of an independent state. Each is the official medium of communication for all legal and constitutional purposes within certain political frontiers. This state of affairs, which Europeans nowadays take for granted, and which leads them to treat languages as national badges of affiliation, came into being only at the Renaissance. Throughout the Middle Ages, linguistic thought in Europe had been moulded by the intellectual predominance of the two great languages of antiquity. Greek, although few could read it and even fewer speak it, was identified with the primary sources of European culture: it was the language of Homer, of Plato, of Aristotle, of Demosthenes. Latin, on the other hand, was the international working language of European education and administration: it was the language of law, of government, of the universities and of the Church. The eventual end of the long reign of Greek and Latin, together with

the accompanying rise in status of the local European vernaculars, marked a most important watershed in the history of the Western linguistic tradition.

William Caxton (c. 1422–1491), the first English printer, translated and published a number of French works, including the *Eneydos*, from his Prologue to which the above excerpt is taken. The fact that Latin is a moribund language and European culture no longer has a genuine *lingua franca* presents Caxton, as printer and publisher, with an opportunity but at the same time with a difficult linguistic choice.

For any writer of the 15th and 16th centuries, the only viable alternative to writing in Latin was to write in one or other of the current European vernaculars. But half a century after Caxton English writers were still apologizing for writing in English. For example, Roger Ascham, in his treatise on archery (1545) thinks it necessary to explain as follows:

... And as for ye Latin or Greke tonge, euery thyng is so excellently done in them, that none can do better. In the Englysh tonge contrary, euery thinge in a maner so meanly, both for the matter and handelynge, that no man can do worse

(Toxophilus Dedication)

The question of the 'inferiority' of the vernacular languages was a much laboured Renaissance debating point. But a much more mundane, practical problem was foremost in the mind of the first English printer. What most worried Caxton was the fact that English, unlike Latin, had no recognized common usage. It varied considerably from one part of the country to another, causing practical difficulties of everyday communication, as Caxton's anecdote about the merchant who wanted eggs illustrates. To put this problem in its historical perspective one must remember that when Chaucer, whose works were among those which Caxton printed, wrote *The Canterbury Tales* a hundred years earlier, the language of government in London was still officially French. ... the century in which Caxton set up the first printing press in Westminster (c. 1476) was the first century in which the English language in England was no longer in competition with French.

Although Caxton specifically addresses the problem of linguistic variation in English, and offers the quaint explanation that the English are destined to linguistic vacillation because they are born under the sign of the moon, he would have been unobservant not to notice in the course of his long residence on the Continent that 15th-century French was no more uniform than 15th-century English. Every country in Europe was a linguistic patchwork of dialects, and would remain so for many generations after Caxton's death. But Caxton's observation is of historical significance because, for the first time, this is seen as a problem.

The lack of uniformity in English usage posed in fact more than one problem for Caxton. In a country where some people say *egges* but others say *eyren*,

and those who say one do not understand those who say the other, it is a problem for any publisher who wishes to sell books to as many people as possible to know which among the conflicting dialects will be most widely understood. But even if that problem is soluble, there is a further question to be faced; namely, how to spell the dialect you have chosen to print, given that there is no accepted assignment of letters of the alphabet to the various competing dialectal pronunciations. These difficulties are further complicated if, as Caxton recognizes, the dialects themselves are caught up in a process of change. ...

He ... observes that English had undergone considerable modifications during his own lifetime. Perhaps his awareness of those changes was enhanced by the fact that he had spent much of his earlier career as a merchant and diplomat abroad and was struck by the disparity when he eventually returned to the country of his birth. Finally, it must be borne in mind that the problems relating to English usage which Caxton faced could not be solved by consulting dictionaries or grammars of the English language, because in Caxton's day English, unlike Latin, had no dictionaries or grammars.

The uncertainties of linguistic usage which Caxton found himself wrestling with were in certain respects by no means new. From antiquity onwards, scholars had recognized that vacillations might arise because of linguistic clashes between (i) different *dialects*, (ii) different *orthographies*, and (iii) different *generations*. The dialect problem, the orthographical problem, and the problem of linguistic change arise from conditions which are endemic in every literate society once it reaches a certain size and phase of development. What was novel about Caxton's dilemma (although not unique to Caxton's particular case) was that these old problems were brought into much sharper focus than ever before by the invention of printing.

Printing was the technological foundation of the European Renaissance, and the most radical innovation in human communication since the invention of writing. Caxton is a man caught at the crossroads of history in more senses than one. He is trying to introduce and popularize a new technology which is destined to revolutionize the availability of information in civilized society. The political and educational consequences of this new technology will be profound. But this profoundly important initiative is being undertaken in the most linguistically adverse circumstances possible. For what has just broken down is the universal linguistic viability of Latin; and in England there is no comparably stable language to take its place. Printing is a communications technology which demands uniformity: and in Caxton's England, to say nothing of the rest of Europe, there was none.

Printing is the classic case of a technical innovation which necessitates rethinking basic assumptions about society; and in this particular instance about society's linguistic organization. Caxton's historical problem as England's first printer arose from the fact that he was committed to a technology which did not make it possible, as it had been when every readable document was

laboriously hand-copied, to make individual alterations to individual copies. Printing means mass replication. It also means replication at great speed (relative to the speed of producing hand-written copies). These two factors – exact mechanical replication and speed of production – combine to afford unprecedented marketing possibilities for the product. They also combine to expand potential readership out of all (previous) recognition. But these possibilities are thwarted if the linguistic condition of society is such that linguistic fragmentation (for whatever reason) is valued above uniformity. One of the paradoxes of the Renaissance is that 'Caxton's problem' would never have arisen if printing had been invented two hundred years earlier. For then Latin would still have reigned unchallenged as the official language of Europe.

In Caxton's remarks we see no indication of a realization that he himself, and the technology he was introducing, were to play a key role in solving the problem of linguistic diversity which he so clearly perceived. By deciding, for better or for worse, to adopt the dialect of London and the South-East as the English for his books, Caxton took a decisive step forward in establishing that particular variety as 'the English language'. In retrospect, Caxton seems to have forged history's answer to his own question.

Notes

The Prologue to Caxton's translation of *Eneydos* is reprinted in W.A. Craigie, *The critique of pure English from Caxton to Smollett* (Oxford: Clarendon Press, Society for Pure English Tract LXV, 1946), and also in W.F.Bolton, *The English language* (Cambridge: Cambridge University Press, 1966).

Acknowledgements

The extracts acknowledged below appear Chapter 3 (Modernity and English as a national language by Dick Leith and David Graddol with contributions by Liz Jackson) in Changing English, first published 2007 by Routledge in association with the Open University. Copyright © The Open University.

Special Restrictions – this chapter must only be viewed intact and in context only in order to benefit fully from the critique provided by the authors. Acknowledgements to rightsowners must be preserved and remain with chapter at all times:

Third party rightsowners relevant to this chapter:

Text

Page 111: Joyce, P. (1991) Visions of the People, Cambridge University Press; pages 113-116: Harris R, and Taylor, T.J. © 1989. Landmarks in Linguistic Thought: From Socrates to Saussure.

Figures

Page 83: Science Photo Library; Page 85: The History of Troy, Le Fevre, Raduz folio 16r, John Rylands University Library of Manchester; Page 90: Science Photo Library; Pages 92 and 94: Newton, I. (3rd edition, 1726), Philosophiae Naturalis Principia Mathematica 8703F8 T. P. 9071036, British Library and Hooke, R. 1665, Micrographia: Or some physiological descriptions of minute bodies made by magnifying glasses with observations and inquiries thereupon 435e19 T.P 8972506, British Library; Page 94: Syndics of Cambridge University Library; Page 99: STC 15614, An Introduction of the Eyght Parts of Latine Speache, folio A5R, The Folger Shakespeare Library; Page 101: Mary Evans Picture Library.