

In his ability to create and expand a vast repertoire of signals, communicating everything from basic, instinctive reactions to the most complex and abstract thoughts, man is set apart from his fellow animals. Like the animals, man uses gestures, expression, posture, touch and scent for communication. But man also uses languages – up to 10,000 of them, some confined to a single tribe and others, such as English, spoken world-wide.

Armed with radio, television, printing and recording techniques, man can preserve his knowledge, and – for good or ill – can inform, educate, persuade and entertain an audience of millions.

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The nature of communication

How animals and humans use all their senses to exchange information

Communication has been described as a form of social cement. It is the means by which the members of a society – whether human or animal – share their experience and knowledge and form relationships. Without good communication, social groups can disintegrate. To find out how language and different forms of communication have evolved, experts have had to analyse everyday human behaviour.

All acts of communication have a common structure, regardless of how the communicating is done – through language, gesture, code or electrical impulse. Communication involves the transfer of information from a source to a receiver, and the stages in this process are usually described as being part of a 'communication chain'.

How information is transmitted

A message first is conceived in the mind of the communicator. This is encoded into signals by way of the neurological and muscular pathways of the body and transmitted through a medium – such as air, in the case of speech. These signals are received by a second individual, who decodes them using similar mechanisms. If communication has been established, his brain interprets the signals and arrives at the original meaning of the message.

Many factors can interfere to cause a breakdown or distortion of the intelligibility of any message. Communication theorists use the term 'noise' to refer to any interference that disturbs accurate

transmission of information. Noise, in this special sense, includes any distraction such as the crackle on a telephone line, or even an unfamiliar accent. But if a message gets through successfully, then communication theorists refer to the high fidelity, or faithful reproduction, of the signal.

Communication may be direct, as in face-to-face conversation, or indirect, as by the use of telephone or computer.

However many stages are involved in an act of communication, and however sophisticated they may be, communication can only begin and end with animate beings. Falling leaves may convey the fact that autumn is approaching, and a person's clothing may transmit a great deal of information about him. But leaves and clothing only 'communicate' in a figurative sense; by themselves they have no meaning and they only acquire a meaning when a person sees them in a certain context and interprets them in a particular way.

The many kinds of communication

Any of the senses can be used in communication. Sight and sound are the most commonly used, and they provide the most developed systems of communication such as speech and writing. Communication by touch is also common, and can range from hugs and handshakes to fist fights. Smell and taste as means of communication are not as common in humans as they are in animals, but they are important to chemists and doctors for identification or diagnosis.

The study of the patterns of human communication in all its forms is known as SEMIOTICS, from the Greek word meaning 'sign'. Semiotics has developed since the 1960s as a result of the overlapping interests of linguists, psychologists and anthropologists. It is used to analyse those aspects of communication not included in traditional studies of language, especially non-verbal communication.

One branch of semiotics, kinesics, concerns 'body language' – the meanings conveyed by facial expressions and bodily gestures. Another branch, paralinguistics, analyses the noises that accompany language: laughter, hesitation sounds ('uh...', 'er...') and even silence, which can often communicate effectively. Movement and use of space can also be investigated from a communicative point of view – how near people stand to each other as friends or enemies, when and where it is acceptable to touch each other, and so on. This branch is sometimes called PROXEMICS.

Research into these aspects of communication has attempted to establish precisely how languages and cultures differ from one another in their semiotic behaviour. It is popularly thought, for example, that the 'language' of gesture is international. Some signs, such as pointing a finger to signal direction, or shaking a fist to indicate anger, are apparently universal; but most signs are not. Shaking hands, beckoning, raising the thumb in the 'thumbs up' gesture, and most other visual signals have

GESTURES AND THEIR MEANINGS

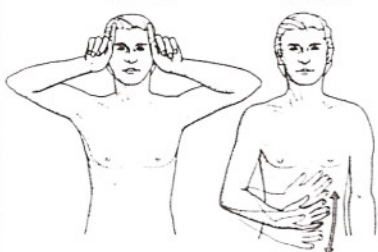
Men first communicated with each other by means of grunts, cries, facial grimaces and gestures. As spoken language developed, people continued to use signs and gestures,

and even today they use gestures to accompany or replace speech. Some signs have the same interpretation world-wide; others may have opposite meanings in different

countries. Gestures are also used to express emotions, both consciously and unconsciously, and 'body language', as it is called, is studied by psychologists.

'CATTLE'

'GOOD'



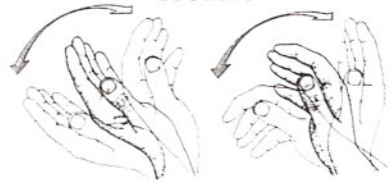
People of simple societies, such as the Aborigines of Australia, still use the sign language of their ancestors to convey information concerning survival and the basic necessities of life. Two forefingers pointing from the brow indicates 'cattle'. When an Aborigine wants to show that something is 'good', he rubs his stomach with one hand.

'I AGREE'



Arabs place their forefingers together when they want to agree or say 'yes'.

GOODBYE'



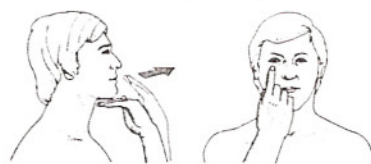
In the East beckoning is equivalent to the goodbye wave of the Western world.

'YES'



In some Mediterranean countries head-shaking, like a nod elsewhere, means 'yes'.

'I DON'T BELIEVE YOU'



Flicking hand from chin, or pulling down skin below an eye, indicates disbelief.

different meanings in different cultures.

Cultural differences also affect the non-linguistic use of sound and space. Giggling, for example, expresses an amused reaction in most countries, but in Japan it primarily denotes embarrassment. In the Middle East and Latin America, people stand closer together when they talk and face each other more directly than do Anglo-Saxons. In a transaction between an Anglo-Saxon and an Arab, for example, the Anglo-Saxon may feel that the Arab is being too forceful, while at the same time the Arab may feel that the Anglo-Saxon is being unfriendly. In the caste system in India, distance is rigidly observed: Indians of the same caste may approach each other normally, but a lower-caste Indian is expected to keep his distance from those of higher caste.

Detailed analyses of semiotic features can reveal a great deal not only about a person's meaning, but also about the structure of society as a whole. The network of gestures, postures, the ways people look at one another and other features can signal who is in charge in a group and who is subordinate, who is a friend and who is an enemy, and so on.

Communication by animals

Technical developments in sound and film recording have aided the growth of zoosemiotics, the study of communication by animals. Although they lack the power of speech, animals use every other mode of communication, such as visual display (facial expressions,

gesture and posturing), and use of taste, smell, touch and sound.

The use of sound in animal communication may originate not only from the throat, but also from other parts of the body such as the wings, legs or chest; the breast-beating of gorillas is one example of this.

Some of these sound patterns are extremely intricate, involving matters of precise timing as well as melody. An example is the sequence of calls that certain parents and young seabirds exchange as a means of mutual recognition; the two sounds are so precisely executed that the entire exchange may be completed in one-fifth of a second.

To increase their chances of survival, some birds and rodents – various species of mouse, for example – use acoustic signals that are not only short, but also extremely high in pitch. This makes the signals difficult for other species to hear and locate.

An animal's mode of communication relates to its biological needs. Scent, for example, released from the body in the form of liquids or gases, can be used to mark out a territory, attract a mate, provide an alarm signal, act as a weapon, or enable animals to recognise one another. With animals such as skunks, scent can provide a communication link over several kilometres. Visual displays perform similar functions by expressing aggression, courtship and submission. The same is true for the songs and calls of birds, apes and other animals. Sometimes the signals can be very specific, an example of which is the dance performed by the honey bee to indicate to fellow worker bees the location of a food source.

Range of signals

Despite the extraordinary diversity of animal signals, an individual species uses only a small number of signals. Even the most social of animals, the monkey, has a repertoire of fewer than 40 signals. Certain types of fishes have only 10. Studies of birds have revealed their use of between 15 and 30 signal displays. Presumably, each species has a wide-enough range of signals to enable it to adapt successfully to its particular environment. It may also be that in some cases the processing abilities of an animal's brain are too limited to permit more complex signalling systems.

There are certain similarities between animal and human communication. Both use variations in sound, such as pitch and loudness, to express basic emotions. Both use facial expressions and bodily postures. To a certain extent, communication is possible between

human beings and animals – a dog may learn to respond to a range of human sounds, and humans learn to interpret the more obvious displays of the dog, such as whimpering, growling and barking. But there is a vast gulf between the 'vocabularies' of animals, which are limited to a few dozen signals, and sophisticated human vocabularies.

Uniqueness of human language

Man has a range of signals, in the form of words, which may number hundreds of thousands. Moreover, he can increase his vocabulary at will as he learns or invents new words, whereas an animal's vocabulary is tied to the range of biological functions that each signal is adapted to fulfil.

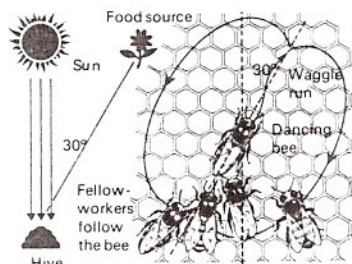
Scientists have tried to teach chimpanzees to communicate with their voices, but these attempts have failed because of the factors relating to the structure of the animals' vocal organs. Much greater progress has been made in teaching chimpanzees to communicate with their hands; for example, they have been taught to communicate messages about daily wants and events by using a form of sign language originally devised for the deaf. But despite these sometimes dramatic developments, experts are still uncertain how close chimpanzees will come towards learning a system of communication that bears comparison with human language.

There are other important differences between the vocabularies of animals and men. With the possible exception of a few who are specially trained, animals do not use their signals in an arbitrary way, divorced from the situation in which they would be instinctively used. A display expressing fear, for example, is the automatic reaction to a situation in which an animal senses danger. But an animal does not use this specific display out of context; nor does it avoid or disguise such a display in context. Animal signals do not lie, nor do they indicate anything about the past or the future.

Human language has evolved through a complex process by which sounds, which are themselves meaningless, are put together into sequences which have meaning. There is nothing resembling this in animal communication, where the basic signals are restricted in their meaning. And there is no 'grammar' which enables animals to arrange their signals in sequences to provide a different meaning. For such reasons, the phrase 'the language of animals' is something of a misnomer. There is nothing in the communication system of animals resembling the creativity and variety of human language. (See also p. 340.)

HOW BEES 'TALK'

A sophisticated form of animal communication is the waggle dance of the honey bee, performed by a foraging worker on his return to the hive to indicate discovery of a source of food.



The bee repeatedly dances a figure-of-eight. During the straight run in the middle of the figure, it vibrates its wings and wags its body to indicate the distance from food. The straight run points to the food. If the dance is on a vertical surface, the angle between the straight run and the vertical gives the horizontal angle between food and sun.

Languages of the world today

A 'lingua franca' of millions – and the tongue of a single tribe

Estimates of the number of languages spoken in the world today vary from 3,000 to 10,000. The reason for such imprecision is that in many cases it is not easy to tell when or where new languages are being born, or if old languages have ceased being used, or whether some so-called dialects are really languages in their own right.

There are still parts of the world that remain unexplored; new tribes are still being found in the Amazonian region of Brazil, in south-east Asia and in central Africa, and most of these discoveries bring to light a previously unknown language. In New Guinea alone, some 700 languages have already been identified, and still more are thought to exist. There is also evidence that more than 1,500 languages exist among the South American Indians.

Old and new languages

All over the world there are languages used by only a handful of speakers which will disappear with the death of the older members of the community. In Brazil, for example, fewer than 200 Indian languages remain of the 1,000 or so which were spoken in the last century. Similarly, the native languages of Bolivia and Venezuela have been all but destroyed by contact with European civilisation. Manx, the CELTIC language once spoken in the Isle of Man, is now considered a dead language because its last native speaker died in the 1940s.

On the other hand, some languages are being kept alive artificially. Latin is still used for certain purposes in the Roman Catholic Church. Classical Hebrew and Classical Arabic are still spoken in certain sectors of the Jewish and Muslim communities. Often, national or cultural groups attempt to revive a language, even if it has been dead for some time; CORNISH, for instance, is one language which in the 1970s has attracted such interest. But it seems that such attempts are unlikely to succeed in producing the spontaneous flow of language in daily use which marks a living language.

If observing the death of a language is difficult, deciding what constitutes the birth of a new language is usually impossible. Many generations may pass before a way of speaking becomes sufficiently divorced from its original setting to be classed as a different language. It has taken, for example, some 1,500 years for French, Spanish and Italian to evolve from Latin. 'Mixed' languages develop much more rapidly – as, for example, the rudimentary PIDGIN languages coined by English, French, Spanish and Portuguese traders and

natives in the West Indies, Africa and south-east Asia during the 18th and 19th centuries. Some of these languages developed more complex forms and came to be used as a native language, or CREOLE, by large communities. There are now over 3 million French creole speakers in Haiti.

Language and dialect

It may seem an obvious principle to follow that if two people do not understand one another, they must be speaking different languages. But this is by no means always the case. It would not be particularly easy for two countrymen from, say, the north-east and the south-west of England to hold a lengthy conversation, though they could make themselves understood to each other if they spoke carefully. Many of the so-called dialects of Chinese, such as Mandarin (spoken in the north) and Cantonese (spoken in the south), are mutually unintelligible in their spoken form. But as all the Chinese dialects use the same pictorial characters they are widely understood in their written form.

In practice, it is not easy to draw a line between dialects and languages. Dialects are normally thought of as being subdivisions of a language. By this definition, different ways of speaking English are obviously dialects of the same language. But it is not at all certain whether the variations in Chinese are dialects or separate languages.

On the other hand, the distinction between a dialect and a language can be made purely on cultural and political grounds, rather than for linguistic reasons. Although Norwegians, Swedes and Danes are able generally to understand each other, Norwegian, Swedish

and Danish are separate languages. In this case, the distinct histories and literatures of the three countries are identified by the use of different language names; therefore to *be* Danish is to speak Danish.

The importance of English

The languages that are genuinely world-wide in their influence are English, French, Spanish and, more recently, Russian. Well over 300 million people spread across the world speak English as a mother tongue, and at least 200 million use it as a second language. Russian is spoken as a native language by 130 million people, and is used as a second language by 110 million.

Among all the world's important languages the role of English is unique. The colonial expansion of Britain in former times and the dominant influence of the USA on world affairs in the present century have resulted in English becoming the most widely spoken language in the world. In many countries it acts as a 'lingua franca' or a common language. In several African countries it is the official language of administration and education. It is also the language of international business, of scientific conferences, and of all air-traffic control; for example, communications between the control tower of Moscow Airport and a Spanish pilot wishing to land there are carried out exclusively in English.

When a language comes to be so widely used, differences inevitably arise in the way it is used. The USA, Canada, Britain, Australia, New Zealand and other English-speaking areas in Asia, Africa and the West Indies have each introduced to the language unique pronunciations, sentence structures and

CREATING ARTIFICIAL LANGUAGES FOR USE BY ALL

The idea of by-passing the problem of translation by inventing a common language which could be used universally is centuries old. Over the last 100 years, especially, there have been many attempts by linguists to produce a simple language based on the better-known European languages.

The most widely known artificial language is Esperanto, which was invented by Ludwig Zamenhoff of Poland in 1887. There are now more than 100,000 speakers of Esperanto all over the world.

Other artificial languages have been less successful. Volapük was devised in 1879 by Johann Schleyer, a German bishop. Giuseppe Peano, an Italian mathematician, introduced a simplified form of Latin, called Interlingua, in 1903. Ido was devised in 1907 by a Frenchman,

Louis de Beaufront. Novial was the creation of the Danish linguist Otto Jespersen in 1928. Charles Kay Ogden produced Basic English in 1932 in an attempt to get round the irregularities and complex vocabulary of English. Basic English has a vocabulary of 850 key words, plus a few rules of grammar.

While the concept of a universal artificial language has its appeal for many, the idea has not yet won general acceptance.

Below is shown the opening phrase of the Lord's Prayer in English and in two artificial languages:

English: Our Father, which art in Heaven, hallowed be thy name.

Esperanto: Patro nia, kiu estas en la ĉielo, sankta estu via nomo.

Volapük: O Fat obas, kel binol in süls, paisaludomöz nem ola.

Death and birth of languages

Distinction between dialect and language

The role of English in the modern world

The science of linguistics

vocabularies of their own. A dictionary of English words native to Jamaica published in 1967 contains some 15,000 entries. The American-English vocabulary contains at least 50,000 words which originated in the USA.

There are many varieties of English other than those used regionally. Language usage tends to vary with a person's social class, age, education and profession. Religion, science, journalism, law and sport all use language in a specified and predictable way. A phrase like 'short, bushy-haired, 65-year-old physicist Albert Einstein said...' is more likely to have come from a popular newspaper than from a science textbook. By being able to cope with all these different usages, a reasonably educated speaker and reader might even be said to be multilingual in his own language.

When two cultures come into contact, their languages tend to influence one another, usually by borrowing words. This has frequently happened in the history of English. Nearly half the vocabulary of the English language has come from Latin or French, and words like *boutique* and *discotheque* are still being borrowed. But the reverse is also true. Almost anywhere in Europe one is likely to find the words *taxi*, *hamburger*, *juke-box*, *goal*, *sightseeing* and *OK*. Reactions to such 'Anglicisms' have been mixed. Most people do not object to the adoption of English scientific and technical terms; but they may resent the use of foreign words in place of existing native words for everyday concepts.

In the mid-1970s, for example, the French government tried to ban the use of 'franglais', which included such expressions as *le weekend* and *self-service*. Even so, many European firms have found that their products sell better if their names are in English.

The need for a world language

The increase in travel and exchange of goods, ideas and technology between different countries has produced a need for a world language. English is the most likely candidate at the moment, but it would take many years for it to achieve the status of a global language.

In the meantime, various alternative solutions have been proposed. One is that everyone should learn a second language that has been specially created for the purpose of international communication, such as Esperanto.

Another possible solution is machine translation of languages. Only a very small proportion of a language is ever translated into other languages, simply because there are not enough trained people to cope with the problems of

translation. By the use of computers, however, it is possible to translate a text from one language into another automatically. So far the process has been tried on only a few languages and it is still very crude, time-consuming and expensive. Furthermore, the translations tend to be literal and stylistically awkward.

The role of linguistic theory

Awareness of the complex variations in the structure and use of language has led to the development of a new field of study called linguistics.

Linguistics is the scientific study of languages. It attempts to describe the features of language and analyse how language – especially spoken language – is used. Three main aspects of language are of special concern to linguists. These are its sound patterns (phonetics); its structure (GRAMMAR or SYNTAX) and its meaning (SEMANTICS).

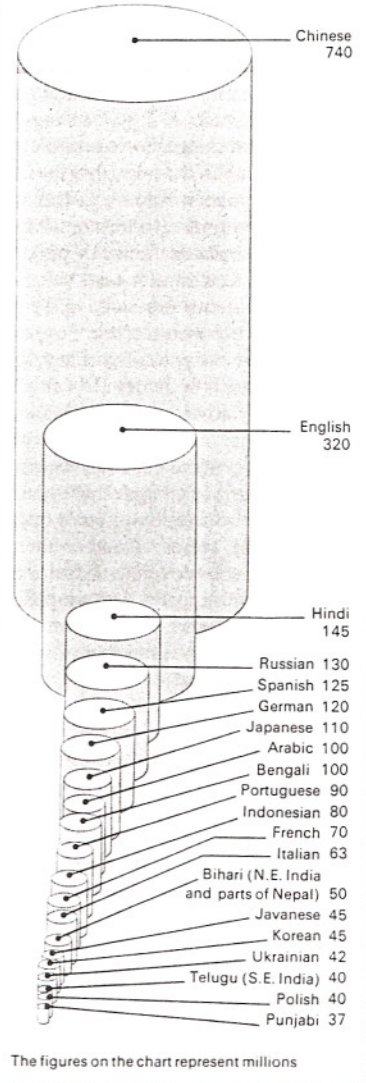
In contrast to the historical studies of language in the 19th century (see pp. 876-7), linguistics concentrates on language in its modern form. This non-historical, or synchronic, approach, pioneered at the turn of the century by the Swiss linguist Ferdinand de SAUSSURE, has revealed some interesting facts about such things as the melody and rhythm of speech. The traditional rules of grammar and their exceptions are also analysed and re-interpreted in the light of changing usage. A linguistic study of the personal pronoun system in English, for example, would reveal some unexpected usages. The personal pronoun *we* does not, as is usually supposed, always refer to the first person plural. In a sentence like 'How are we today?' it may refer either to the second person singular *you* (as in an exchange between a nurse and a patient), or to the second person plural *you* (as between a nurse and a roomful of patients). It may also refer to the third person singular *he*, or third person plural *they* (as in an exchange between two secretaries about their boss or bosses). And it may also refer to the first person singular *I* (as in the 'royal' *we*) or to the world in general (as in the editorial *we*). Identifying examples like these and explaining their underlying principles is essential to the design of effective language-teaching programmes.

Linguists also classify and relate languages according to their fundamental structural units such as basic sounds, syllables, words, phrases and sentences. This approach has also been used by anthropologists and critics to study the basic units and patterns of all forms of human activity.

In recent years, linguistics has come

THE TOP 20 LANGUAGES

Chinese is spoken as a mother-tongue by the largest number of people, but English is more widespread as it is the mother-tongue of several countries. Likewise, Spanish and Portuguese have spread beyond their countries of origin.



to the attention of a wider audience through the work of the American linguist Noam CHOMSKY. According to him, language is based on a 'deep structure', or set of kernel sentences from which all utterances can be generated. In the most general terms, Chomsky teaches that human language as a whole possesses a single basic grammar which underlies the individual grammars of different languages. This doctrine has been the object of heated controversy among linguists, psychologists and philosophers ever since Chomsky first expounded it in the mid-1950s.

The history of language

From unknown origins, the use of words evolves over the centuries

Man has for centuries speculated about the origins of the languages he uses. One traditional explanation, arising from the Bible and from Indian, Egyptian and Chinese myths, was that language was of divine origin. A belief persisted in Europe until the 19th century that HEBREW was the 'original' language; being the language of the Old Testament, it was claimed, it must be the language of God.

Many 'experiments' were carried out to try to identify the first language. Psamtik I, pharaoh of Egypt in the 7th century BC, attempted to rear two children in isolation in the hope that the first words they spoke would be in the language of their primeval ancestors. More than 2,000 years later, James IV of Scotland carried out a similar test.

The experiments produced different results. The first words of the Egyptian children were supposedly Phrygian, while the subjects of James IV's experiment were said to have spoken Hebrew.

Several other theories about the origins of language have been put forward. One common view was that speech developed from primitive man's imitation of animal noises. Another theory was that speech developed from the rhythmical noises that accompanied physical efforts, and a third view suggested that language grew out of man's instinctive emotional cries.

Comparative studies of the remains of early man, modern man and various species of ape indicate that man has been anatomically capable of speech for at least 100,000 years. Written records of language, however, go back only 5,000 years, so no direct evidence exists to suggest how language originated or what the first language was. Nor is there any evidence to indicate that the earliest languages were any simpler than later ones; for the grammar of Sumerian, the oldest known language, is as complex as that of any modern tongue.

Lessons from philology

The scientific study of language history, known as comparative PHILLOLOGY (from the Greek words *philo*, 'love', and *logos*, 'word' or 'speech'), dates from 1786, when Sir William Jones, an English judge in India, suggested that there were many links between Sanskrit, Greek and Latin. The similarities were so great that he believed these languages originated from a common, though unknown, ancestor language.

By the end of the 1800s, all the major languages had been grouped into different categories or families according to their development and relationship to

one another. These included such groups as GERMANIC, BALTO-SLAVIC and ITALIC. The Germanic family, made up of English, Dutch, German and the Scandinavian languages, was studied in particular detail in Denmark and Germany by the language scholars Rasmus Rask, Franz Bopp and Jacob GRIMM. These scholars formulated many principles to explain the ways in which the sounds, words and structures of languages change over the centuries.

The SOUND LAWS worked out by Grimm and others showed how phonetic differences arise between groups of words. One such law was that many of the *p* sounds of languages such as Latin and Greek became the *f* sounds of English and German. The Latin *piscis* becomes 'fish' in English and *Fisch* in German; the Latin *pater* becomes 'father' in English and *Vater* in German.

Linked languages

Conversely, philologists may study similarities between different languages to determine to what language family they belong. They might examine the word for 'father' in French (*père*), Spanish (*padre*) and Italian (*padre*) and conclude that all these words are probably related. Moreover, it is likely that the word for 'father' in the language from which they all originated began with a *p* and ended with an *r* sound. The word is found in the Latin *pater*. Philologists would look at many such sets of words to see if similar parallels occurred.

In this particular case, the detective

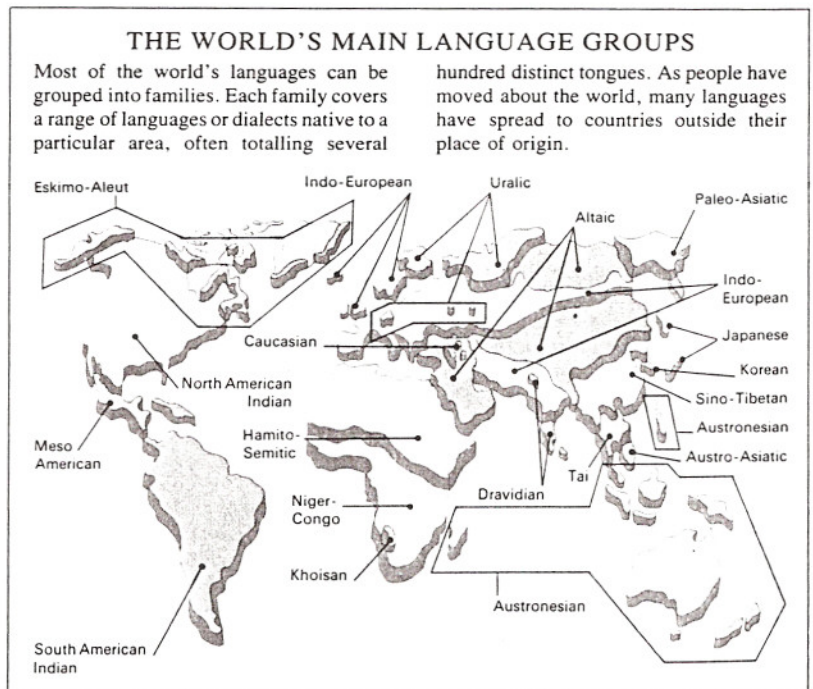
work is easily confirmed, for there is written evidence to show that all these languages descended from Latin. Some languages, however, do not fit into any of the dominant families. An example of this is BASQUE, the language spoken by more than 500,000 people in the French and Spanish Pyrénées, which seems quite unrelated to any of the languages spoken in surrounding areas.

A reconstructed 'parent'

To trace the more distant past of languages is far harder. Latin, for instance, is known to be the parent language of French, Spanish, Portuguese and Italian. But it, in turn, is known to be related to Sanskrit and Greek. All three languages must therefore have come from a single parent language, although there are no records to indicate what it was.

In such a case philologists attempt to reconstruct a parent language on the basis of knowledge about existing languages. It is suggested that most European languages are members of a single INDO-EUROPEAN family. 'Proto-Indo-European', the original language from which the Indo-European language family sprang, was probably spoken from about 2000 BC by nomadic peoples in areas between south-west Asia and south-east Europe. It is now extinct and no records of it exist, but it is possible to make reasonable guesses about its form by comparing languages about which something is known.

The word for 'brother' in a selection of Indo-European languages is: *bhrātār*

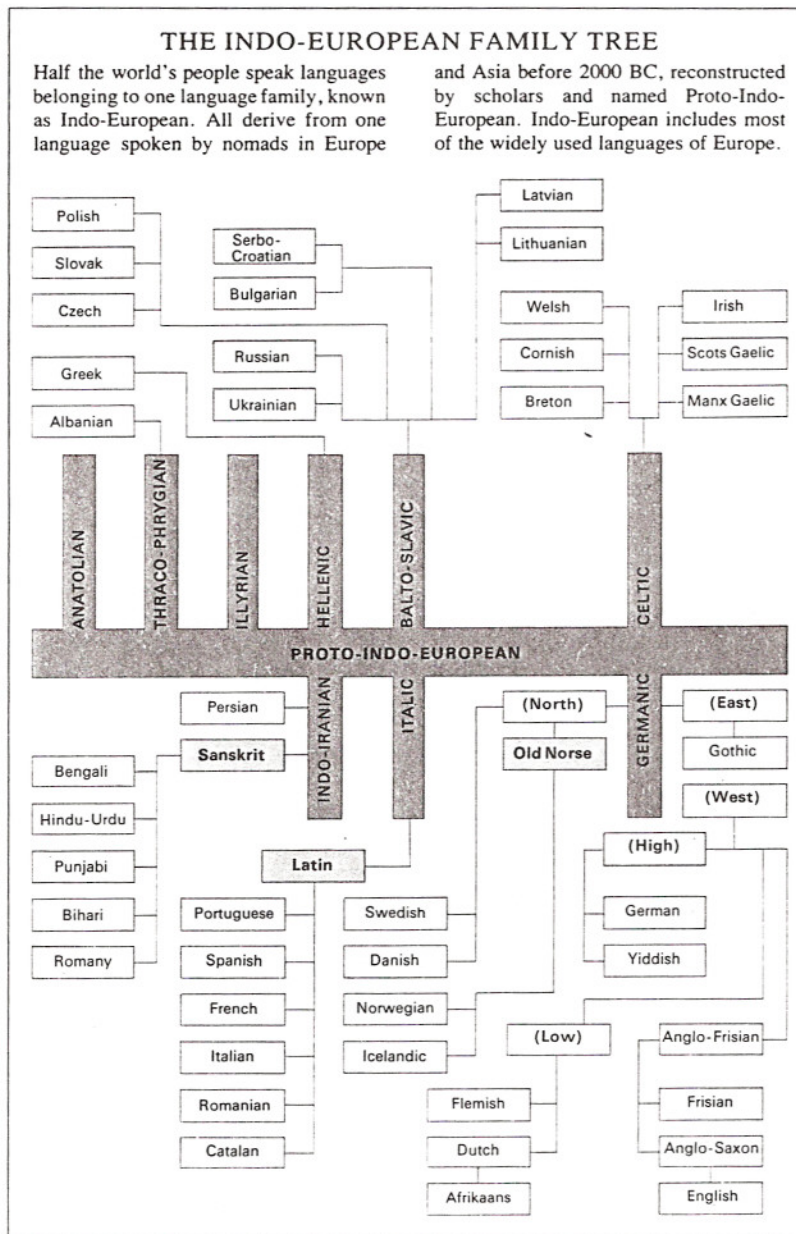


The search for the first language

Relationships between different tongues

The Indo-European family tree

How the use of language changes



of no value. Instead, a typological classification has to be made; this relates languages only on the basis of their structural similarities.

Three main types of language are distinguished by typological classification. Synthetic languages are those which, like Latin or Spanish, contain many inflections, or variations in word endings. The Latin verb, for example, has different endings to indicate person, number, voice, tense and mood, as in *amant*, 'they love', *amavit*, 'he loved', *amet*, 'that he love'. Analytic languages like Chinese or English have few or no inflections but instead use 'function' words like prepositions, pronouns and auxiliary verbs. Agglutinating languages, such as Turkish or Korean, form complex word structures to express meanings that other languages would express in separate words. In Mono, an agglutinating Indian language of California, the word *ahwhitapohti* means 'strike-it-with-a-whip-like motion'.

By using typological techniques it has been possible to suggest classifications for native languages spoken in areas where there is no written history.

How languages change

The study of languages as they evolve is known as historical or DIACHRONIC linguistics (from the Greek words *dia* 'through' and *chronos* 'time'). This is a subject concerned not only with the older states of language, but also with the processes of change currently taking place within it. It does not take sides on the debate as to what is 'correct' in language usage, but defines and explains the nature of the changes.

Language change is inevitable; language reflects culture and, as culture changes, so language follows. Vocabulary is the most obvious feature to be affected, but pronunciation and grammar also change. Disputes over matters of English usage are one of the clear signs of language change. Should one say 'controversy' or 'controverisy', 'off' or 'orff', 'spoonsful' or 'spoonfuls', 'I will' or 'I shall'? It is difficult to lay down hard and fast rules in these areas, as different social and age groups have different preferences.

The language of the next generation will always differ in some respects from that of the present generation. It is sometimes argued that language should not change, that it should remain 'pure'. But most language experts agree that such attitudes are not realistic; it is not possible to eliminate linguistic differences without first eliminating differences between people or stopping social change from one generation to the next.

(Sanskrit), *frater* (Latin), *phrater* (Greek), *broðar* (Gothic), and *broðor* (Old English). (*ð* is pronounced as 'th'.) This would lead to the suggested form **bhrater* for Proto-Indo-European, the asterisk being used to indicate that the word is a reconstructed one. Most big dictionaries provide information of this kind as part of a word's etymology – its origin and history of change.

Words change in meaning as well as in form. Over several centuries the meaning may become more specialised. The word 'meat' originally meant food in general (as in the expression 'meat and drink'), but it has come to mean only one type of food. Alternatively, the meaning of a word can become

extended. The word 'paper' originally referred only to papyrus, the writing material, but its range of meaning has widened to include objects like wall-paper, a newspaper, or a lecture.

A third type of change in the meaning of a word involves development in meaning through the use of METAPHOR, as in 'cold war' and 'black market'.

Structures of language

The most difficult problems in studying languages arise when there are no written remains from which to work. This is true of languages in most parts of the world outside Europe. Under such circumstances, the genealogical, or family tree, method of classification is

The medium of speech

How spoken words are formed and understood

The two main ways of transmitting language are speech and writing. Of these, speech is by far the more important. People learned to speak thousands of years before they learned to write. Children begin to speak as part of a natural process of development, in contrast with the conscious and artificial learning of writing. There are still many cultures – especially in South America and Africa – whose speech has never been written down.

Because it is such a natural and everyday phenomenon, the ability to speak is often taken for granted. Its true complexity becomes apparent only when new speech habits or foreign languages have to be mastered, or when the ability to communicate through language breaks down because of a speech or hearing impediment. To combat such difficulties, anyone concerned with language teaching needs to understand phonetics, which deals with the process of human sound-making.

Phonetics does not have a long history. The scientific study of speech could hardly begin until methods such as gramophone records and magnetic tape were devised to 'catch' sounds and make

sounds are received by the ear. All three branches require some knowledge of anatomy, physiology and physics.

How sound is produced

Any object that vibrates causes a sound wave to form in the surrounding medium. In the case of speech, the source of vibration is the vocal organs, and the medium through which the waves pass is air. The waves are picked up by the ear, transformed into impulses and transmitted to the brain.

Speaking begins with breathing. Air released from the lungs through the windpipe provides the source of energy for speech. The airstream is then modified in various ways to affect the final quality of the sound being produced. The vocal cords are the first to affect the airstream. These are two bands of tissue housed in the larynx behind that part of the throat commonly known as the Adam's apple. Most speech sounds depend on the vibration of the vocal cords to produce a buzzing, or voiced, sound. Without this vibration, speech becomes whispered, or voiceless. The loudness and pitch depend on how forcefully or rapidly these cords vibrate.

Further modifications, or modulations, are then introduced to the airstream. It may be released either through the mouth to produce oral sounds, or through the nose to produce nasal sounds, or through both mouth and nose simultaneously. The direction of the airstream is governed by the position of the soft palate at the back of the roof of the mouth, which raises and lowers in varying degrees. Changes in the tension and shape of the lips and pharynx – the tract linking nose, mouth and larynx – also contribute to the quality of speech.

The main source of sound variation is the tongue. Because it is so flexible, it can be positioned in many ways to alter the shape of the mouth cavity and produce sounds of different qualities. All the vowels and about half the consonants involve major movements of the tongue. The *t* sounds of English, for example, are made by the front of the tongue pressing against the ridge behind the top teeth; the *k* sounds are made by the tongue touching the back part of the palate. In pronouncing an *e* vowel, as in *me*, the tongue is bunched high in the centre of the mouth; in an *a* vowel, as in *car*, it is low down in the back of the mouth. The articulation of some sounds is easy to see or feel, especially those at the front of the mouth. Others are more difficult to pinpoint, especially those made in the throat.

The range of distinguishable sounds capable of being produced by the human

vocal apparatus is very large. To the lung-induced sounds already described must be added sounds that originate by vibratory movement in the throat or mouth. Examples are the 'click' sounds (similar to the sound of 'tsk tsk' in English) found in southern African languages such as Xhosa. As it is possible to 'tsk' disapprovingly while breathing normally, the lungs cannot be involved in the production of these sounds.

Sounds and pronunciation

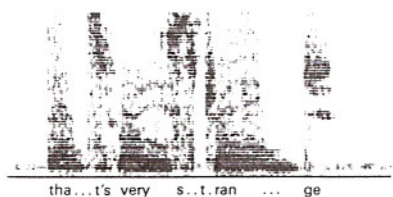
Although there are hundreds of possible sounds, the number used by any one language is much smaller.

This is partly because children learn to imitate only those language sounds they

tə 'bi:z, ɔ: nɒt
tə ,bi:z | ðæt iz
ðə kwɛstʃn.

PHONETIC ALPHABET

A line from Hamlet, 'To be, or not to be: that is the question,' as transcribed into the International Phonetic Alphabet with intonation marks.



THE SHAPES OF SOUNDS

Speech can be recorded visually on a spectrograph. This analyses sound characteristics such as frequency and intensity by marks of varying density.

permanent records of them in order to analyse their properties. Before this, there were only simplified and impressionistic – though often ingenious – accounts of speech. Joshua Steele, for example, who was an 18th-century English phonetician, tried to replay the melodies of speech on a bass viol and transcribe the results in a musical style of notation. Steele's laborious and detailed records were a pioneering stage in this field.

There are three ways of studying the sounds of speech, and consequently three branches of phonetics. Articulatory phonetics studies the production of sounds by the vocal organs. Acoustic phonetics studies their physical transmission through the air. Auditory phonetics studies the way in which

hear in their own environment. Sounds outside their native system come to be discounted or misinterpreted. By adolescence it is extremely difficult to distinguish unfamiliar sounds in foreign languages. The study of the sound system of a language is known as PHONOLOGY. Phonology identifies the types of sound, or PHONEMES, that a language uses in order to communicate different meanings. In English, *p*, *b* and *r* are used to distinguish such words as *pat*, *bat*, and *rat* from each other. But how the *r* sound of *rat* is pronounced (whether quickly, or 'stretched' into a trill) does not have any effect on the basic meaning of the word. In Spanish, however, the change from short to trilled *r* can cause a change of meaning: *pero* means 'but', whereas *perro* means 'dog'. In other words, languages may use the same basic sounds, but in different ways.

Pronunciation also involves many different ways of saying a sentence which can give it a variety of meanings. These variations are primarily due to altering the pitch, or intonation, of the voice, which can impart a wide range of nuances to speech. For example, 'She doesn't want to go' sounds like a statement if said with the pitch of the voice falling, but is more like a question or exclamation if the pitch rises. Putting

How sounds are made

Differences in pronunciation

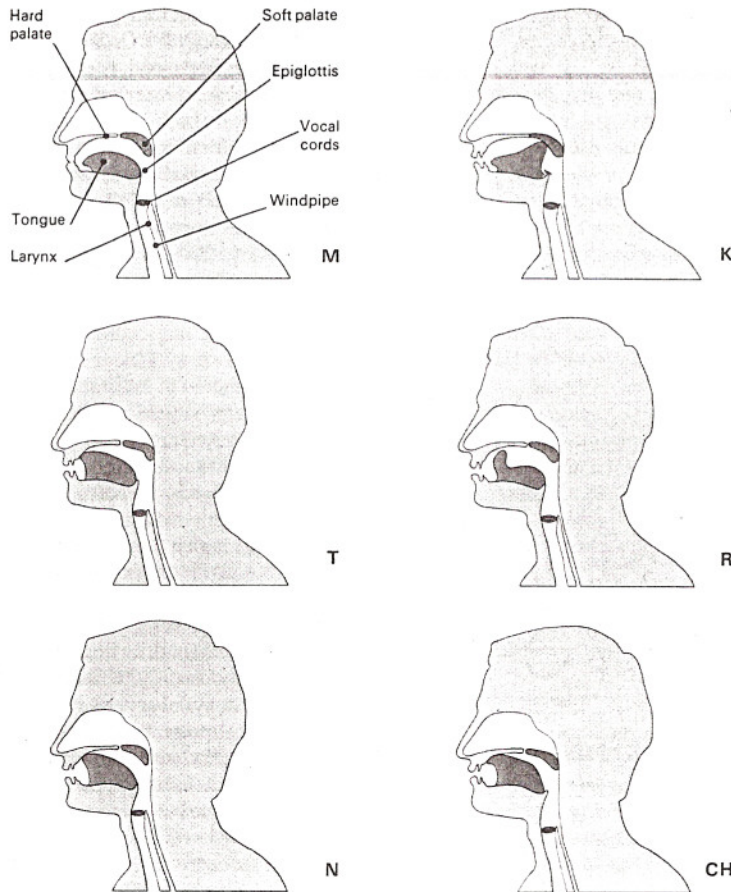
Visual recording of speech

How speech is received

HOW SOUNDS ARE MADE

Speech sounds depend on the positions of the tongue, palate, lips and teeth. For the sounds *m* and *n* the tongue is lowered, thus allowing air to escape through the nose. The sounds *t*, *ch* and *k* are made by

placing the tongue on different parts of the palate to block the flow of air. To make the sound *r*, air is forced past the tongue at a point behind the top teeth, at the front of the hard palate.



emphasis on one particular word of a sentence can also change its meaning slightly. For example, if the word 'doesn't' of the above sentence is emphasised, it implies a contradiction of a previous statement; emphasis on 'want' could suggest that although she doesn't wish to go, she *is* going because there is a duty or compulsion involved.

Putting the stress on one syllable of a word can change the meaning of the word, as when the stress on the word 'record' shifts from the first syllable (*record*, the noun) to the second (*record*, the verb). In addition, there is a wide range of modifications that can be made in the tone of voice by using the throat, nose and mouth. 'He said it huskily/silkily/harshly/dully. . .' These variations primarily express emotional nuances, but they are also an important means of signalling social information

about a person's job or his social class.

Two other aspects of pronunciation can be distinguished. A person's voice quality may reveal information about his particular personality – one may talk, for example, about a 'dominating' or 'inspiring' voice. His accent may, on the other hand, reveal where he is from or his social origins. Thus, at an international level, accent can indicate that a person is British or American; at a national level that he is northern or southern; and at a local level that he is from one particular area of a city.

Visible speech

A more direct way of representing speech than the conventional alphabet is the INTERNATIONAL PHONETIC ALPHABET, which identifies all the main sounds produced by the vocal apparatus. It is used both in the scientific study

of language, and to aid pronunciation in the study of foreign languages.

The development of special instruments has made it possible to record visually the acoustic character of speech sounds; and to enable precise measurements to be made. The most widely used machine is the sound spectrograph, which analyses speech into its component frequencies and strengths, and represents these by marks of varying density on a strip of paper. If the sound spectrograph can correlate sounds with shapes, it should in theory be possible to devise an alphabet which could represent speech in a visible way. An automatic device which could convert speech into a visual code would be of great assistance as a communication aid for the deaf, for example, but this is still only a distant possibility. There are many differences between human voices, and no one has yet built a machine capable of recognising more than a small number of words in a limited range of voices.

Another possible method for visualising speech is the voiceprint. If there are anatomical differences between people's vocal organs, then their voices are likely to sound different. In the 1960s, experiments were designed to see if it was possible to identify people by their voiceprints. The experiments met with limited success, but the possibility of error has led to caution in the use of voiceprints as legal evidence.

The ear – a delicate receiver

Speech is only half of the language-communication chain. The other half is hearing. It is estimated that the human ear can distinguish about 400,000 different sounds, but the full potential of this extremely delicate mechanism is by no means understood. The function of the ear is to change sound vibrations into nerve impulses. Sound waves enter the auricle, the visible outer part of the ear, and pass through the ear canal to the ear-drum, a membrane which turns the waves into physical vibrations. These are then conveyed to the middle ear where they are amplified by a structure of small, movable bones and transmitted to the cochlea in the inner ear. The cochlea contains fluid which alters in pressure according to the vibrations, and this, in turn, affects thousands of nerve fibres within the cochlea. The nerve fibres and related sense cells change the vibrations into electrical impulses, which the auditory nerve passes to the brain. The chain is complete; sounds have been produced, collected and transmitted, and the process of interpreting their meaning begins.

The written word

From pictures on stone tablets to the alphabets of the modern world

Without written records history becomes a set of memories, inevitably fragmented and inaccurate, and learning is restricted to the amount of knowledge that can be passed on orally from one generation to the next. The invention of writing between 4,000 and 5,000 years ago changed all this. Thereafter, rulers and their advisers could rely on the accumulated wisdom of generations, and laws, religious beliefs and rituals could be given precise and unchanging form.

Writing began as a specialist skill. The central role of religious and legal issues in early cultures meant that the ability to write or read was the province of priests and scribes; this early link between writing and religion is still reflected in the connection between the words 'script' and 'scripture'.

Because of its permanence, written language rapidly developed an authority and prestige which speech could not equal. The prestige diminished as more and more people learned to write, but the authority of the written word has not changed to this day. Police evidence has to be taken down 'in writing'; signatures are usually needed to make legal agreements binding. The power of the written language to influence large numbers of people is evident in the efforts of repressive governments throughout history to burn the writings of their opponents or, more recently, to impose censorship.

Writing has also been considered by many people to be a more authoritative form of expression than speech in the study of language. It is traditional to judge correctness of speech by the same standards of correctness as the written language. In English, for example, because the formal written language uses such a pattern as 'the man *whom* I saw', the use of *who* in such a context even in informal speech is criticised as 'bad grammar'.

Such views date back to the demands for stylistic correctness made by Greek and Roman authors. Ideas about how language should be used became particularly strong in western Europe in the 18th century, a period in which numerous grammars, dictionaries and pronunciation manuals were published.

Many of these attitudes have changed, especially since the middle of the present century, and today most linguists regard writing not as a more important form of communication than speech, but simply as different from speech in its structures and functions. The 20th century, moreover, has provided a fresh perspective, as techniques of preserving and analysing speech have developed. It has been argued among some communications

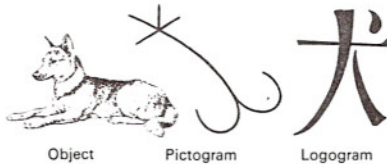
theorists, such as the Canadian Marshall McLuhan, that in the increasingly oral culture of broadcasting, telephones and tape recorders, the importance of the written language is diminishing.

The history of writing

The earliest example of writing is a form of picture writing, found on a stone tablet in Mesopotamia, dating from around 3500 BC. It was made by the Sumerians, and may have been part of a tax account.

The symbols used in the earliest picture writing, or pictography, represent recognisable objects or parts of the body. But such a system was extremely limited in what it could communicate. People, animals and solid objects were symbolised easily enough, but actions and qualities were difficult. Abstract ideas, such as 'love' or 'kinship', were the hardest to represent.

Eventually, pictorial symbols began to represent meanings of a more abstract nature – thus a drawing of a house evolved into the Chinese symbol for



FROM SYMBOL TO WORD

Pictography developed from symbols of real objects to logograms standing for words. The Chinese logogram for 'dog' no longer resembles the animal.

love. Modern picture writing as seen in road signs provides a good example of this process; for instance, a picture of a car on wavy lines representing skid marks means that the road is slippery. Such symbols, standing for concepts, are known as ideograms.

Purely ideographic writing, where the symbols are all recognisable representations of everyday features, is rare. In most cases the symbols become less like the original object, and come to stand for a word in the language as opposed to a concept. When this happens, the symbol is called a logogram. Traditional Chinese writing is logographic: the character shapes seldom retain a clear hint of the meaning, but they may contain an element which suggests how the symbol is to be pronounced.

There have been many kinds of picture writing. The Aztecs and Maya in Middle America developed systems that are still largely undeciphered. The

Sumerians used a system of pictography which came to be known as CUNEIFORM (wedge-shaped) writing. It was made up of a series of strokes scribed on to wet clay tablets by reeds. Cuneiform writing was widely used throughout the Middle East, and lasted for 3,000 years.

In Egypt, a different form of pictography known as hieroglyphic script developed around 3000 BC. The term meant 'sacred carving', and derived from its use in monument inscriptions. Ideas and sounds were both represented in the symbols, which could be written horizontally or vertically, in either direction.

The first known scripts to be written in regular lines were discovered at Knossos in Crete in 1900. Two forms of script, used by the Minoans in about 2000 BC, were discovered, and because of their appearance in lines came to be called LINEAR A AND B. Linear B was tentatively deciphered in 1952 and is believed to be a script which represents the syllables of early Greek. Linear A remains undeciphered to this day.

In picture-based writing systems, concepts were difficult to symbolise. Above all, many thousands of symbols had to be learned in order to communicate sophisticated messages. Very early in the history of writing, alternative methods developed. In one system, each symbol stood for a syllable of the spoken language. A syllabary, as it was called, was much simpler to learn than a pictographic system as it contained far fewer symbols. Syllabaries came to be widely used. The Japanese, for example, after a short period of using the Chinese system, devised a syllabic script known as *kana* about AD 800. It is still in use.

The coming of the alphabet

The syllabary was a distinct advance on earlier writing systems, but it did have one main drawback: there were still many hundreds of symbols to be learned. This problem was eliminated by the development of the alphabetic system – the simplest system of all and the one used almost universally today.

In the alphabetic system, one symbol stands not for a whole syllable but for each separate sound in a language. These symbols comprise the letters of the alphabet, from which all possible words in the language can be written. The alphabetic system made languages considerably easier to learn, especially as successive developments reduced the number of letters needed in most alphabets to between 20 and 40.

Alphabets vary in the consistency with which they represent the sounds of a language. But even the most irregular alphabets, such as Irish Gaelic, are

How writing began
 Picture-based writing systems
 The introduction of the alphabet
 Literacy and spelling reform

easier to learn than other writing systems. This was recognised by the Chinese who, in 1958, devised *pin-yin*, an alphabetic system comprising 58 distinctive sounds, as an alternative to the traditional Chinese characters which represented some 1,300 syllables. *Pin-yin* uses the same Roman alphabet as English.

The alphabet emerged around 1700 BC in the north-western Semitic lands at the eastern end of the Mediterranean. One branch of this, the Canaanite alphabet, spread westwards and was introduced into Europe by the Greeks around 1000 BC. The Greeks modified this alphabet in many ways. In particular, they standardised the direction of the written lines to read from left to right, and they added symbols for vowels.

All Western alphabets derived from the Greek alphabet. First came the Etruscan alphabet, used in Italy from about 800 BC. This led to the Latin alphabet, and the subsequent variations of it in different countries; Anglo-Saxon, for example, had to add letters to cope with sounds such as 'th', not present in Latin. In eastern Europe, **CYRILLIC**, parent alphabet of Russian, Bulgarian, Ukrainian and Serbian, was devised from the Greek alphabet in the 9th century AD by St Cyril and St Methodius.

Learning to read

According to a UNESCO survey made in 1972, approximately one out of every three adults in the world could not read or write. Under these circumstances, fresh interest has been shown in the problems of the written language and methods of teaching it.

One traditional way of teaching is the **PHONIC** method in which letters are systematically introduced in relation to individual sounds. In the **LOOK-AND-SAY** approach, words are introduced visually as whole units. There are many variations within these approaches.

The spelling irregularity of English has prompted many suggestions for dealing with the written language in a more radical way. Alternative spelling is the characteristic of Sir James Pitman's **INITIAL TEACHING ALPHABET** (i.t.a.), introduced in England in 1960 to help children to learn to read. Its status is controversial, however, and up to the late 1970s its use was limited.

A degree of reform was initiated in the 1780s by Noah WEBSTER, whose simplifications of the spelling of American English, as for instance in *color*, *program* and *center*, make up most of the differences between the spelling of English in the USA and in Britain today.

THE LETTERS OF THE ALPHABET

The relationship between the various alphabets that have existed in the Western world is evident from a comparison of modern letters with the letters that can be found in early scripts. All modern Western alphabets are derived from the Greek alphabet, and the similarity between them is striking.

But there are also clear resemblances between these alphabets and the North Semitic alphabets, the Phoenician and the Old Hebrew; and most of the differences

between modern Russian and English are explained by comparing their respective parent alphabets, the Cyrillic and the Early Latin.

The variations in the number of letters in different alphabets is due primarily to the differences in the sound systems of the languages that the alphabets were devised to reflect. For example, the letter 'w' was introduced into the Modern Roman alphabet to distinguish the sound from that represented by the letter 'v'.

Phoenician	Old Hebrew	Early Greek	Cyrillic	Classical Greek	Etruscan	Early Latin	Gothic	Modern Roman
𐤀	𐤁	Α	А	Α	Α	Λ	𐌰	A
𐤂	𐤃	Β	Б	Β	Β	Β	𐌱	B
𐤄	𐤅	Γ	Г	Γ	ϸ	<	𐌲	C
𐤆	𐤇	Δ	Д	Δ		D	𐌳	D
𐤈	𐤉	Ε	Е	Ε	Ϻ	Ε	𐌴	E
𐤊	𐤋	Φ	Ф	Φ	Ϸ	ϸ	𐌵	F
𐤌	𐤍	Γ	Г				𐌶	G
𐤎	𐤏	Η	И	Η	Ϻ	Η	𐌷	H
		Ι	И	Ι	Ι	Ι	𐌸	I
𐤐	𐤑		Ж				𐌹	J
𐤒	𐤓	Κ	К	Κ	ϸ	Κ	𐌺	K
𐤔	𐤕	Λ	Л	Λ	ϸ	Λ	𐌻	L
𐤖	𐤗	Μ	М	Μ	Ϻ	Μ	𐌼	M
𐤘	𐤙	Η	Н	Η	Ϻ	~	𐌽	N
𐤚	𐤛	Ο	О	Ο	Ο	Ο	𐌾	O
𐤜	𐤝	Π	П	Π	Γ	Γ	𐌿	P
𐤞	𐤟	Φ			Q	Q	𐍀	Q
𐤠	𐤡	Ρ	Р	Ρ	Α	Ρ	𐍁	R
𐤢	𐤣	Σ		Σ	ϸ	ϸ	𐍂	S
𐤤	𐤥	Τ	Т	Τ	†	Τ	𐍃	T
		Υ		Υ	∨	∨	𐍄	U
							𐍅	V
							𐍆	W
	×			≡		×	𐍇	X
							𐍈	Y
	И		З	Ζ			𐍉	Z

Codes and symbols

Ways of communicating without speech

People normally communicate by speaking and writing. But when the need arises, they develop other ways of transmitting thoughts. These alternatives are usually known as codes. With the exception of the use of touch-reading by the blind, most codes are based on sound or vision.

One of the first practical systems of transmitting language beyond a person's range of hearing was semaphore. This was devised in France in the early 1790s, and was based on the use of signal arms; each position of the arms stood for a different letter of the alphabet. Originally, the signal arms were placed on towers several kilometres apart, and the messages they transmitted were read by telescope. Modern semaphore signals use flags or rows of lights simulating the original mechanical arms.

Codes for letters and sounds

Codes have also been developed to assist communication by the physically handicapped. For example, Braille is a system for the blind, named after its French inventor Louis Braille (1809-52). In Braille, each letter of the alphabet is represented by an arrangement of dots, embossed on paper. The raised surface is 'read' by touch.

Various codes have been developed to help the deaf. In finger-spelling, letters of the alphabet are indicated by different finger positions. Other codes for the deaf are based on body, arm and hand movements. Some, like the American Sign Language, refer to concepts; others, like the British Paget-Gorman Sign System, refer to a mixture of concepts, words and grammatical forms.

Semaphore or finger-spelling can transmit a message as far as the eye can see. Communication over long distances is only possible if the message is relayed by regular stages. Moreover, only a few people are able to read the message at the same time; and when visibility is bad, semaphore may be useless.

These limitations were overcome with the development of electrical telegraphy in the 19th century. One of the earliest and most efficient codes was that constructed by the American Samuel Morse for use with his electric telegraph (see p. 1022). His code of dots and dashes was developed in 1838.

Later inventions, such as the TELE-PRINTER (p. 1068) invented in the late 1890s, were even more sophisticated. By the 1920s, symbols in the form of typed text were being transmitted as coded electrical pulses, and changed back into typed text at the receiver's end.

The telephone, invented by Alexander Graham Bell in 1876, did the same

for sounds, making immediate two-way conversation possible. Further progress came with 'wire-less' communication, by means of radio waves, which permitted contact with isolated parts of the world and with moving locations, such as ships and cars.

Other signalling systems

Codes based on letters or sounds can communicate only the same range of expression as the language used in speech and writing. There are, however, many other codes based not on words but on concepts. Usually called sign languages, they have little of the complexities of spoken or written language.

The earliest signalling systems represented events by some immediately recognisable sign, such as smoke signals, a blazing fire, or the sound of a horn or drum. Such signals have to be pre-arranged. For instance, when the Spanish Armada approached the south coast of England in 1588, a series of beacon fires carried the news from Plymouth to London in about 20 minutes; the fires conveyed a specific message whose meaning had been agreed upon beforehand. In much the same way it was established in Britain during the Second World War that church bells should normally be kept silent and would be rung only to signal an enemy invasion.

Many kinds of signalling systems are based on references to particular customs, beliefs or emotions. In oriental dancing and drama, for example, movement and gesture communicate a wide variety of meaning. Less complex systems are used for everyday communication by religious groups such as Cistercian monks whose members are vowed to silence. If the activity being 'discussed' is very restricted, then relatively few signals will be needed; examples are the signals used by an orchestra conductor communicating with his musicians, or those used between sportsmen on a playing field. Out of context such signs may be meaningless. In circumstances where speech is not possible, signals are a vital form of communication. Divers, for example, operate in pairs on what is called the buddy system, and communicate by signs which have become international. Different signs indicate depth, direction, time, and whether the diver is in difficulties.

Many sign languages are based on simplifications or abbreviations of ordinary language. Shorthand (also known as stenography, from Greek words meaning 'narrow writing') has been used for centuries. The most common systems used today are the Pitman

COMMON CODES

Codes which are based on the alphabet include semaphore, which has a long history in military signalling; finger-spelling; Morse, used for telegraphy; and Braille. The form of finger-spelling shown here is commonly used by deaf people, and the Braille configurations are standard in printed material for the blind. Only Morse systematically relates symbols to frequency of letter use, using the simplest signs for the most frequently used letters.

	Sema- phore	Finger- spelling	Morse	Braille
A			..	•
B			...-	••
C			•••
D			...-	•••
E			..	••
F			••••
G			...-	••••
H			••••
I			..	••
J		-	••••
K			...-	•••
L			••••
M			--	••
N			..-	•••
O			••••
P		-	••••
Q		-	••••
R			...-	•••
S			...-	•••
T			-	•••
U			...-	•••
V			••••
W			••••
X		-	••••
Y		-	••••
Z		-	••••

Semaphore, Morse and Braille

Sign languages and shorthand

International symbols

Secret codes and ciphers

method, devised by Sir Isaac Pitman in 1837 and used mainly in Britain, and the Gregg method, developed by the Irishman J. R. Gregg in 1888 and used mainly in the USA. Both methods, which use combinations of straight lines, curves and dots, have been adapted for use in several languages.

Speedwriting, a technique devised in the 1920s by an American university teacher, Emma Dearborn, uses less drastic abbreviations of the normal alphabet. The Stenotype machine, invented in 1906, prints syllables, words and phrases phonetically on paper.

Systems which replace speech form another category of code. One of the best developed systems of this kind is the whistled 'speech' of the Mazateco Indians of Mexico, who can converse on a wide range of subjects with a series of whistles of varying speeds, pitches and intensities. Similarly, the sounds produced by musical instruments can be used to replace speech. The best known example of such a code is the use of drums by tribesmen in Africa, the Americas and the Pacific Islands.

Symbolic communication

It is not difficult to devise a code to suit a particular situation, once the message to be communicated is known. Often, however, the message may be too abstract or too detailed for it to be expressed using the words of everyday language in their usual sense. The meanings have to be represented by symbols – which include figurative language, or non-linguistic devices such as gestures, sounds or colours.

Symbols can identify a man (for example Sir Winston Churchill's 'V' for Victory sign), a political movement (the swastika), a tradition (an heraldic coat of arms), a religious belief (a cross), or a status (the marks of rank on a military uniform). Colours also have symbolic value. Dark colours traditionally represent evil, while light colours signify goodness or purity. Red, perhaps because of its associations with blood and fire, often symbolises danger.

Some symbols are relatively unambiguous in their meaning – such as the raising of a person's arms over his head to indicate surrender, or the bowing of the body to indicate submission. Others, however, are more complex and have many layers of meaning. Big Ben, at the Houses of Parliament in London, for example, has come over the last 100 years to carry a rich range of symbolic meanings. As a purely physical object it is merely a giant clock chiming out the hours. But symbolically it connotes among other things, a geographical loca-

FASTER WRITING

All forms of shorthand are based on simplifications of ordinary language. Pitman's and Gregg's use symbols derived from the alphabet, while Speedwriting uses actual letters.

To be,	or	not	to be :
Gregg shorthand			
that	is	the	question
Pitman shorthand			
To be,	or	not	to be :
Pitman shorthand			
that	is	the	question
Speedwriting			

tion (London/England/Britain), a people (Londoners/Englishmen/Britons) and a tradition (the mother of parliamentary democracies/political stability).

Symbols may be restricted to individual cultures, or they may be universal, having developed similar meanings in different countries through common instinct, or else been learned through cultural contact. But unless a person is thoroughly familiar with the background of another culture, he may very well misinterpret the symbol of a foreign culture. In the West, for example, black is

identified with mourning. In the East, however, the colour of mourning is white. In North America a black cat crossing a person's path is taken to mean bad luck; in Britain it means good luck.

Secret codes

Sometimes a code may be designed to convey a message to a particular receiver, while concealing its meaning from everybody else. The science of secret and hidden communication, known as cryptography, has long been considered indispensable in matters of national security. Records of secret codes date back to 400 BC.

Cryptography has two branches – cryptography and cryptanalysis. Cryptography deals with the construction of coded messages, while cryptanalysis is concerned with breaking down secret messages to find the original 'plaintext'.

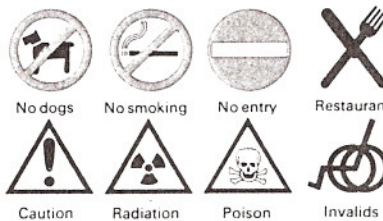
Cryptologists usually distinguish between codes and ciphers. Codes are systems of substitution in which words, phrases and sentences are replaced by other words, letters, symbols or numbers, according to an agreed system. For example, 'sunshine' may be the agreed code word for 'proceed as planned'.

In ciphers, smaller units of a text, usually groups of two or three letters, are replaced with other letters or symbols. There are two types: transposition and substitution. In transposition ciphers the letters of a message are mixed so that only the person who knows the deciphering key can rearrange the letters in their proper sequence. The sequence of words in the following list, for example, does not apparently mean anything:

- SCISSORS
- EASE
- CLING
- RETINA
- EARS
- TOES
- MALE

But when the first letter of each word is read from the top of the column to the bottom, and the last letter of each word is read from the bottom to the top, then the words *secret messages* appear.

With substitution ciphers the letters or symbols used are substitutes for the real letters of the message. A keyword – for example, 'daughter' – is written down, followed by the letters of the alphabet not appearing in the key word. Underneath is written the alphabet: DAUGHTERBCFIJKLMNOPQSVWXYZ ABCDEFGHIJKLMNOPQRSTUVWXYZ. A phrase like 'secret messages' could then be ciphered into PHUOHQ JHPPDEHP by substituting for the desired letter on the lower line the corresponding cipher letter on the upper line.



INTERNATIONAL SIGNS

The increase in foreign travel has produced a need for pictorial signs for a range of subjects which can be understood by people of any nationality.

Language in use

How styles of expression vary to meet different situations

One of the most noticeable features of language is the way its pattern varies according to the kind of person using it and the situation in which he does so. Tape recordings of a random selection of English speakers would reveal striking differences in speech. Furthermore, each speaker would display variations in his own style of language as he moved from one situation to another in the course of a day. Pronunciation, grammar and vocabulary would all vary, depending on whom the speaker was addressing and for what reason.

The functions of language

Some of the most noticeable variations in language stem from the fact that people use it for many different purposes. The primary function of language is to communicate information. But the information it communicates need not necessarily be intelligible, and the act of communication may itself be involuntary. A common example of this is the use of language as an emotional reflex. When someone hits his thumb with a hammer, he may utter something that has no communicative intent. For one thing, he may be in a room by himself. For another, the words he speaks are not used for their meanings, but only to express pain, surprise or anger.

Another example of language used without a deliberate intent to communicate is the language that children sometimes use to accompany their games. A girl bouncing a ball against a wall may chant a nonsense rhyme to help organise her game. The words need not have any specific meaning.

Unintelligible language is also common in cultures where magical incantations are used as a means of gaining power over objects or events. Certain religious rituals also retain forms of language that are partly meaningless. Many people may not know why they say certain things in a certain way – like 'amen' or 'hallelujah' – but they continue to do so because of tradition. In some religious groups it may even be desirable to produce unintelligible speech as an expression of religious feeling. This is known as 'speaking in tongues', or glossolalia, and is found mainly among Christian Pentecostal groups.

Another important use of language is to create or maintain a particular social atmosphere. Inquiries about health or comments on the weather are not generally intended to solicit accurate replies. 'How do you do?' is not answered with information about body temperature and pulse rate. 'Bless you', said to a person

who has just sneezed, no longer has any literal meaning. In cases like these, people are communicating 'social noise'. The Polish-born anthropologist Bronislaw MALINOWSKI (p. 451) called this use of language phatic communion (from the Greek word meaning 'utterance').

The social function of language may affect speech in quite radical ways. 'Baby-talk' used in addressing very young children or pets is the clearest case where pronunciation becomes exaggerated and abnormal.

In more artificial contexts, radical changes in speech may come as a result of elocution or speech-training lessons. The social pressures in some communities to use what is considered to be a prestige accent are often extremely strong. A person who finds his accent stands out from the normal often attempts to change it. Some people can do this naturally; for others, even a long period of training may have little effect.

Perhaps the most distinctive use of language is found in cases when there is an artistic purpose behind it. Poetry, in particular, is often marked by the use of linguistic patterns totally different from those used elsewhere. They may include repetition of vowels at the ends of lines to form rhymes, or repetition of consonants to form alliteration. Such patterns may help to communicate original or vivid ideas, or they may be used solely for aesthetic reasons.

Language and society

The study of the language behaviour of different groups of people – families, social classes, regional types, ethnic groupings and others – is known as sociolinguistics. The subject developed in the 1960s; as early as the 1930s, however, the Cambridge philosopher Ludwig Wittgenstein (see p. 644) had emphasised the importance of recognising that a language can be used in different ways, and that each way has its own special rules. These rules, said Wittgenstein, would have to be understood if communication within a particular context was to be intelligible and social interaction possible.

Certain styles of language are associated with distinct social situations or professional groups. A scientist, for example, to make himself understood, would have to adapt his vocabulary according to whether he was addressing a conference of fellow researchers, a young child, or the friends with whom he plays football at weekends.

Another area of research that developed in the 1960s was psycholinguistics. This is concerned with the fact that

no two people speak or write in the same way even if they share similar backgrounds. In studying these variations, psycholinguists analyse language in relation to such abilities as an individual's memory and perception.

Psycholinguistics raises, in particular, the question of whether or not it is possible to think without language. Some evidence has emerged which suggests that thought does not depend on language. Experiments with young deaf children who lack all language skills have shown that they possess the ability to work out certain intellectual problems, like pairing off objects with similar shapes. By contrast, it was argued by the American linguist and anthropologist Benjamin Lee WHORF, and others, that the words and structures of a person's language control his way of thinking and, ultimately, the whole culture to which he belongs. So the way in which we see the world is, according to Whorf, determined by language.

Whorf based his views on his investigation into the language and behaviour of various North American Indian tribes. He claimed that it was not possible to equate the meanings of words in some Amerindian languages with meanings of words in European languages. And because of differences in verb tenses (the language of the Hopi Indians of north-eastern Arizona, for example, does not distinguish between past, present and future), Whorf argued that people from the two different cultures would not be able to conceive of time in the same way.

The view that language influences culture is still commonly held, especially by those who believe that one language may be 'superior' to another in its ability to express ideas on a particular subject, because of its precision or the nuances of meaning it can convey.

But the fact that it is possible to translate successfully from one language to another suggests that language and thinking are not as interdependent as Whorf claimed. On the other hand, language does seem to be essential to facilitate thinking processes for anything other than the most simple mental operations and emotional responses.

How children learn to speak

Considering the complexity of language, it is remarkable how much of it a child learns before he reaches the age of five. Psycholinguists have advanced two main theories to try to explain how language can be acquired so quickly.

The first view, associated with the American psychologist B. F. SKINNER (p. 545), argues that language is learned by the child imitating his parents, and

Language as a means of expression

Use of language by individuals and groups

How children learn language

Dictionaries and grammars

that the learning process is reinforced when the child is rewarded for his successful efforts. There is a great deal of evidence to support this view; but there is also much that an account of this kind cannot explain. The child who says 'mouses' for 'mice', or 'go-ed' for 'gone', has not copied these words from his parents. Rather, he seems to have worked them out for himself, through a process of reasoning; as 'horses' is to 'horse', so 'mouses' must be to 'mouse'.

An alternative theory has therefore been proposed; this suggests that children may be born with an inbuilt readiness for language, which permits them to acquire certain of its structures in a

predetermined way. This view, expounded by the American linguist Noam CHOMSKY, has been used to explain why children make many of the mistakes they do when learning to speak. It also seems to be supported by some similarities in the way that children of different cultures learn to talk.

Other views on language learning have also been put forward. For instance, according to the Swiss psychologist Jean PIAGET (p. 543), development of language in a child depends on the earlier development of learning skills. Intelligence grows with the ability to connect each new experience with previous ones; without certain mental

abilities, languages will not develop.

Detailed studies of language development have shown that despite the many differences between individuals, the sounds, structures and vocabulary of a language are acquired along broadly similar lines. In pronunciation, for example, any parent knows that sounds such as those in 'mama' and 'baba' are likely to be among the first that a child uses, whereas consonants such as *r*, *l* and *th* are likely to emerge much later. In grammar, too, there are stages of development. The child begins, towards the end of the first year, with simple statements containing just one word – 'there' or 'gone'. In the second year, simple sentences are formed ('Daddy gone', 'Want teddy'). This process continues until, by the age of three, most children have learned the basic sentence patterns of the language – ('Daddy's kicking the ball', 'Where's my teddy?').

After the age of three, more complex sentence patterns are built up by using words like 'and' to link phrases together, and errors in grammar are progressively eliminated. A three-year-old's 'Him did it' becomes 'He did it' by a year or two later. There remains a number of less common grammatical and pronunciation patterns that have to be learned, and vocabulary continues to be acquired indefinitely. But most language learning is complete by the age of five.

Such stages of development are found in most children, although not all children learn language at the same rate. There are also differences in the speed at which girls and boys, and children from different social backgrounds, learn language. Girls are usually ahead of boys during the early years, but by puberty these differences generally disappear.

Failure to learn and use language properly is one of the most damaging problems a child may have to face. Language disorders include disabilities of pronunciation and hearing, and disturbed speech rhythms such as stammering. These disorders may involve a loss of the ability to use or understand the structures of language (aphasia) or a total breakdown in the ability to communicate (one of the characteristics of autism). The disorder may be restricted to speech (as with hoarseness of voice) or to writing (as with dyslexia – the inability to process written language).

Children are not the only ones to be affected by such difficulties. Adults who have suffered a stroke or brain injury, for example, are often left with communication problems. Research into these and other language problems is carried out by speech pathologists, and treatment is given by speech therapists.

DICTIONARIES AND GRAMMARS

The way a language is used is recorded in its dictionaries and grammars. Traditionally, it used to be felt that such books should prescribe correct patterns of usage only and, in so doing, attempt to preserve the linguistic features of the past. Special handbooks on style are still referred to for evidence about the 'best' usage.

More recently, however, dictionaries and grammars have become less concerned with laying down rules, and more concerned with describing a language. As well as containing information about

meaning, pronunciation, spelling and derivation, for example, dictionaries have a wide range of descriptive labels. These labels, such as 'informal', 'slang' or 'technical', point out the differences between the various usages of words.

Dictionaries do not 'fix' the language for all time, but reflect its evolution. To keep pace with the changes that occur in language usage and the frequent introduction of new words, dictionaries are constantly being revised and new editions are published periodically.

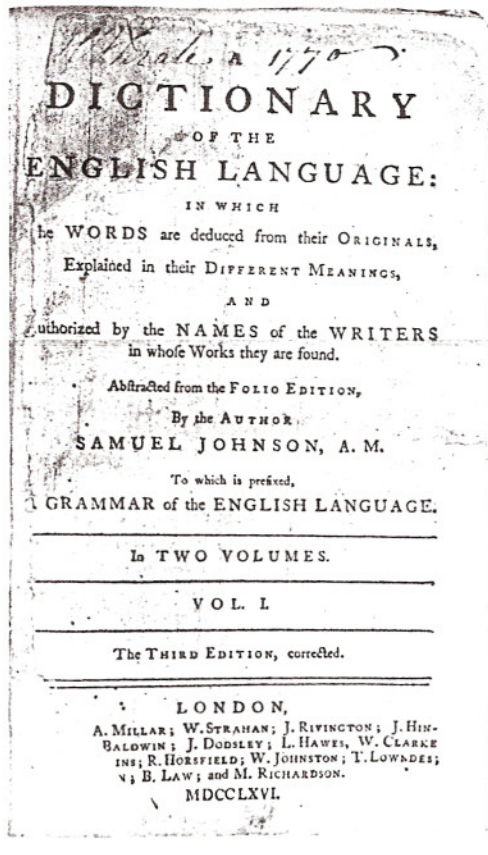


The first systematic dictionary of the English language was produced by Dr Samuel Johnson (above) and published in 1755. Some of Johnson's definitions are remarkable for the way they convey his personal opinions:

lexicographer – a writer of dictionaries; a harmless drudge, that busies himself in tracing the original, and detailing the signification of words.

oats – a grain, which in England is generally given to horses, but in Scotland supports the people.

patron – commonly a wretch who supports with insolence, and is paid well with flattery.



Mass communication

How people are informed, entertained, educated and persuaded

Mass communication occurs when a message transmitted from a source is received by a large number of people in different places. It is fundamentally different from face-to-face communication in that the size and dispersal of the audience does not allow any direct reaction, or feedback, to the source. The development of mass communication has mainly depended on technological progress during the 20th century, and its exploitation will increase as technology continues to advance.

There are three basic means, or media, of mass communication. The first is through the printed word or image, in the form of newspapers, magazines, books, microfilm and advertising. The second is through sound – primarily radio, but also records and tape recordings. Thirdly, messages can also be transmitted through a combination of sound and image, in television, film and videotape.

The rapid growth of mass communications has been particularly striking since the end of the Second World War. In the USA, for example, the number of new books published trebled in the 20 years from 1950 to 1970.

The medium whose use has increased more rapidly than any other is television. However, radio still reaches more

people than any other form of communication – there is one radio set for every five people in the world. Taking the world as a whole, however, there are great differences in the location and use of the media which averages do not reflect. In the USA, for example, virtually every home has one radio, and half the homes more than one, while in parts of Africa or Asia entire communities may have, at best, a single radio.

The functions of the media

All media, to a greater or lesser extent, inform and entertain. There are, however, less-obvious roles which the media either consciously or unconsciously play. The aim may be expressly to educate – as, for example, in school programmes. Alternatively, the intention may be to persuade – as when the media are used by advertisers or for political broadcasts.

By selecting what material is to be transmitted the media can stress the greater importance of one issue than of another. And because they provide society with its topics of everyday discussion, they are in a strong position to influence public opinion by the way in which they present the issues.

Communicating with vast audiences poses special problems, not least of which is the need to be as universally

intelligible as possible. The rapid growth of publishing in the 18th century, coupled with an increase in literacy, was a major factor in promoting the development of a single standard of spelling. On a much larger scale, the mass media today are constantly confronted with the difficulty of making any single message comprehensible to an audience with wide-ranging backgrounds, who are likely to interpret the message in a variety of ways. Many words suggest different things to different people. To the managers of industry, for example, the word 'automation' may connote efficiency and productivity; but to the workers the word may mean the threat of redundancies and unemployment.

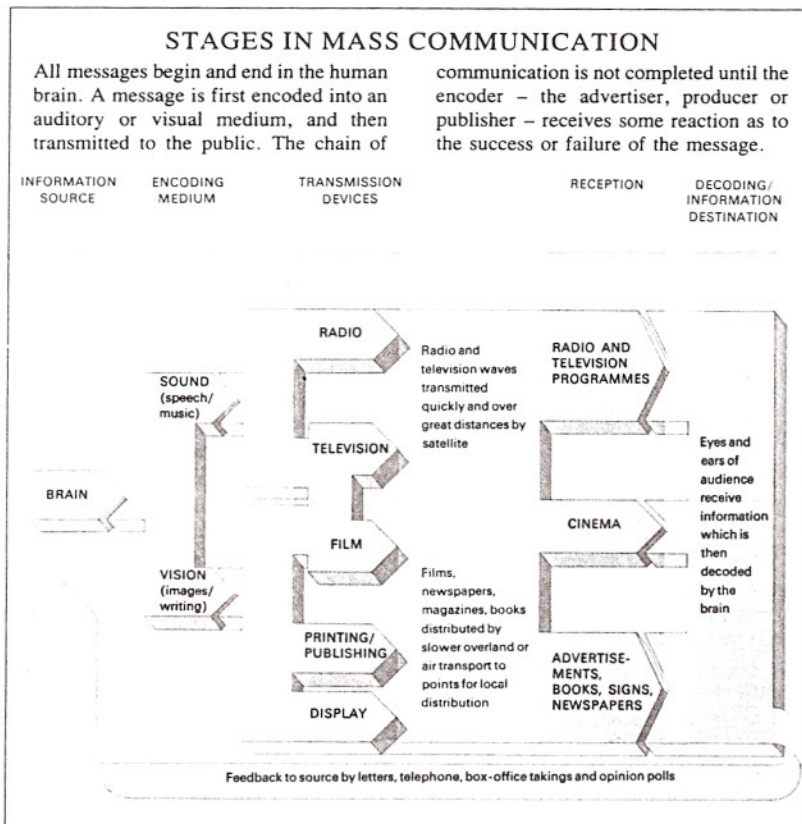
Associated with the selection and intelligibility of material is the role played by advertisers, in countries where advertisers can choose which radio or television programmes to sponsor. To ensure that their advertising reaches the largest possible audience, they naturally tend to avoid sponsoring programmes that are aimed at too high an intellectual level, or that deal with controversial issues which might offend certain sections of the audience.

Persuasion and propaganda

In recent years there has been public anxiety over the dangers that could arise over the misuse of the mass media. Many parents, for example, have become concerned about the possible effects that exposure to scenes of sex and violence on television may have on their children. Most countries now have legislation controlling the content of the media. All states, whatever their political bias, have laws forbidding certain kinds of communication such as libel, treasonable speech and obscenity – although the strictness with which these laws are implemented varies from country to country.

There is particular concern about the potential dangers of political and commercial propaganda. By the 1970s there had been a substantial increase in sanctions by governments, consumer groups and watch-dog committees from within the advertising profession against fraudulent and manipulative advertising.

Research by social scientists has indicated that, at least in the area of mass political persuasion, fears about the power of the media have been exaggerated. Experiments have shown that political propaganda on television, for example, rather than converting viewers, tends merely to reinforce any existing prejudices they may have. Furthermore, over-exposure to a message, far from conditioning an audience to believe



The role of press, radio and television

Influence of the media on public opinion

How information is stored

Wider applications of communication systems

it, invariably produces a negative reaction. This suggests that mass audiences are not nearly as vulnerable or passive as is sometimes believed.

Propaganda need not necessarily have a malign influence. As the use of communication to promote a social cause, propaganda can perform a useful function. Campaigns to arouse public interest over such issues as road safety, for example, can be beneficial.

Classifying and storing information

One result of mass communication is the sheer volume of information it produces. But this information is of no use unless properly classified and stored.

The most widely used system of classifying books is the Dewey decimal system, devised in the USA by Melvil Dewey in the 1870s. (See p. 1328.)

Problems of storage can be solved by reducing information to a more compact form. The contents of bulky newspapers and periodicals, for example, can be reproduced in miniature on microfilm or on microfiches - cards 9 cm. x 12 cm. (about 3.5 in. x 4.7 in.) on to which can be transferred the equivalent of 60 pages of a book. Alternatively, information can be coded on computer cards or on magnetic tape.

Developments in mass-communication techniques had, by the mid-1970s, brought about radical changes in education as well as in the provision of domestic information services. In Britain, for example, the British Broadcasting Corporation and the Independent Broadcasting Authority developed systems by which data on a wide range of subjects such as news, business reports and sports results can be transmitted through a television receiver fitted with a special device. The user has only to press a button to get up-to-the-minute information on his television screen.

Mass-media techniques have been used for educational purposes ever since the advent of cheaply produced printed materials. But the role of mass media in education has progressively enlarged over the years to include radio, tape recordings, film and television as a supplement to conventional methods of teaching. The Open University established in Britain in 1970 was a landmark in the use of mass media to provide people with degree-level education. The university teaches almost exclusively through national radio and television broadcasts, augmented with correspondence material and tutorials.

Closed-circuit television, a system whereby broadcasts on specialised subjects are transmitted to selected groups of people, has also made great headway.

USING THE MEDIA: HOW DIFFERENT COUNTRIES FARE

The number of television and radio sets, newspapers and books in different countries reflects their varying stages of industrial advancement. Statistics change as developing countries progress economically and educationally. The figures given below (which refer to the mid-1970s) relate closely to the income per head of each country's population, and also to its degree of literacy and the extent of its secondary-school education.

There are, however, discrepancies even in relatively advanced countries, due to such factors as censorship and mixtures of different cultures in a single country. Such variations can make world averages difficult to interpret. The minimum

standards for an adequate communications network recommended by UNESCO are 50 radio sets and 20 television sets per 1,000 people. Although world averages exceed these figures, they are attained by few individual nations.

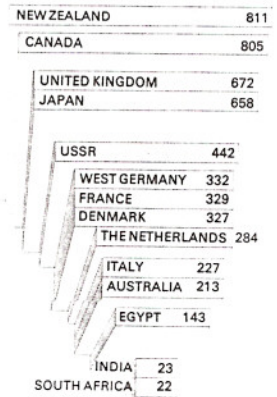
The number of people using each radio or television set, book or newspaper also varies from country to country. In developing countries, for example, one radio receiver may serve a whole community, while in Western countries there may be several sets in one family. Furthermore, the fact that there are more radio receivers than television sets in one country does not necessarily mean that radio is used more than television.

TELEVISION SETS PER 1,000 PEOPLE

USA	523
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RADIO SETS PER 1,000 PEOPLE

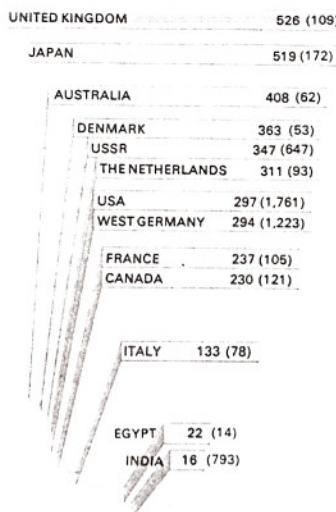
USA	1,752
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Ownership of sets is uniform throughout Europe and most developed countries.

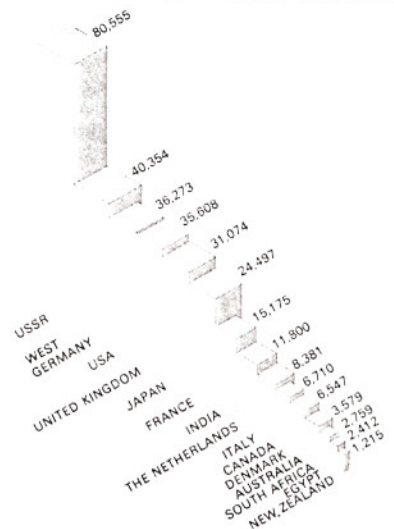
The use of several sets in a single family boosts some nations' totals.

NEWSPAPERS PER 1,000 PEOPLE



The figures in brackets show the number of separate daily newspapers produced.

NUMBER OF BOOK TITLES PUBLISHED



The number of books published in the USSR is about one-fifth of the world total.

Language and communication A-Z

accent. Features of pronunciation that identify where a person is from, regionally or socially, as for instance in a 'British', 'Australian' or 'upper-class' accent. In a more technical sense, it can refer to the emphasis which makes a particular word or syllable stand out in speech, as in the 'beats' in a line of poetry.

The term also refers to the marks used in some languages to show that one letter can have different sounds; for example, in the Spanish word *niño* the tilde accent over the *n* indicates that the pronunciation should be 'neenyó' rather than 'neeno'.

acronym. Name made up from initial letters. For example, NATO is the acronym of 'North Atlantic Treaty Organisation'.

affix. Form added before or after the root of a word to produce a new word. In English, two forms of affix are common - prefixes (as in *unwise*) and suffixes (as in *wisely*). Some South-east Asian languages also have infixes, where the form is placed inside the root instead of at the beginning or end.

Afrikaans. One of the two official languages of South Africa since 1925, the other being English. It is closely related to the south Dutch dialect, which was spoken by the original colonists in the 17th century, but has also been influenced by French, German and neighbouring BANTU languages. Afrikaans is spoken by about 4½ million people.

Albanian. An INDO-EUROPEAN language with no clear relationship to any of the other languages of that family. It is spoken by nearly 3 million people in Albania, parts of Yugoslavia, Greece and Italy. A few written records date from the 15th century, but an official alphabet was introduced only in 1909.

alliteration. Repeated use of the same initial sound (usually a consonant) in a group of words, as in 'beaded bubbles winking at the brim'. It is used primarily as a poetic device, but is also found in political slogans and newspaper headlines, where the repetition of consonants makes a phrase visually noticeable and often memorable.

alphabet. Set of graphic symbols which, either singly or in combinations, represent the sounds of a language. The characters in an alphabet each identify a consonant or a vowel. Alphabets which have different symbols for each sound are often called phonetic, or regular, alphabets. Finnish and Spanish alphabets are considered to be regular, but English is not. Different symbols in English are often used to represent the same sound as, for example, the *f* sound in 'fear', 'physics' and 'cough'. Other languages, such as Irish Gaelic, are even less regular. Attempts have been made to create regular alphabets. (See INITIAL TEACHING ALPHABET and INTERNATIONAL PHONETIC ALPHABET.)

Alphabetic writing seems to have begun around 1700 BC, in the north-western Semitic lands at the eastern end of the Mediterranean; its inventors are thought to have been either Egyptians, Phoenicians or Hittites. Four main offshoots subsequently developed. The North Semitic branch produced (1) the Canaanite alphabet, used in early Hebrew and Phoenician scripts, and (2) the Aramaic alphabet, which fathered the modern Semitic alphabets of Hebrew and

Arabic, as well as the non-Semitic scripts of Persian, Brahmin and Hindi. There was also (3) a South Semitic branch, from which the modern alphabets of Ethiopia came, and (4) a Greek branch which fathered Gothic script, Cyrillic (modern Russian) and the Etruscan alphabet. Latin, Anglo-Saxon and modern Western alphabets all derived from the Etruscan alphabet. (See pp. 880-1; also RUNES and OGHAM.)

The longest alphabet is Cambodian, which has 74 symbols; the shortest is Rotokas with 11 symbols, used in Bougainville in the Solomon Islands.

Altaic. Family of languages spoken in an area that stretches from north-east Asia to Turkey and includes the Turkic, Mongolian and Manchu-Tungus groups. It is unclear how closely related these groups are, and how close the language family as a whole is to the Uralic language group (which includes Hungarian and Finnish) with which it is sometimes linked. Between 70 and 90 million people speak an Altaic language, with the largest number (30 million) speaking Turkish.

Amerindian. Collective name given to the many families of Indian languages spoken by about 15 million people in North, Central and South America. They include Eskimo, Algonquian, Iroquoian and other languages of the diminishing tribes of Canada and the USA; the Maya language family of Central America; and the South American Indian languages which include Guarani and the Quechuan group.

antonym. Word which means the opposite of another. 'Big', for example, is the antonym of 'small', 'sweet' of 'bitter', and 'happy' of 'sad'.

Arabic. Language spoken by some 100 million people in northern Africa and South-east Asia, and the most widely used language of the Hamito-Semitic family.

Many of the dialects of Arabic are mutually unintelligible. Classical Arabic is still used as the literary and religious language of the Islamic peoples, and is the unifying medium for the various dialects.

Arabic is written from right to left, and consists of 29 consonants and 14 vowels. Arabic numerals were introduced into Europe in the 10th century, and developed into the most widely used number system in the world.

Aramaic. Family of north-west Semitic dialects which included the dialects of Palestine and Galilee spoken in the time of Christ. Aramaic was probably the language in which the Gospels were first written. The dialects disappeared under the influence of ARABIC in the Middle Ages.

Armenian. Language spoken in many dialects by about 5 million people in the Armenian republic of the USSR, Turkey, parts of Asia Minor and Europe. It is a branch of the INDO-EUROPEAN family. Written records date from the 5th century AD, and the original 38-letter alphabet is still used. Old Armenian, the classical literary language, is still used by the Armenian Church.

artificial language. A language invented to act as a common means of communication between people with different

mother-tongues. The best known artificial language is Esperanto, invented in 1887; others are Volapük (1879), Ido (1907), Interlingua (1903) and Novial (1928). Artificial languages, also called auxiliary or constructed languages, are designed to be easily learned. They are based on only the well-known linguistic patterns and words from the main European languages, and they avoid irregular forms and spellings. (See p. 874.)

In computer work, the term artificial language refers to the sets of coded instructions used to programme a computer. Two examples are *Fortran* (which stands for 'formula translation') and *Basic* (which stands for 'beginner's all-purpose symbolic instruction code').

assonance. Similarity or repetition of vowel sound between words or syllables in a phrase or sentence - as, for example, in the sentence 'A stitch in time saves nine'. Assonance is employed primarily in poetry, as, for example, in 'How at the mountain spring the same mouth sucks' from Dylan Thomas's poem 'The force through the green fuse drives the flower'. It is also used for other purposes when a dramatic effect is desired, as in advertising slogans.

audiology. Study of hearing, especially of its disorders and their treatment. Audiometry, the measurement of hearing, involves the use of such instruments as an audiometer, for measuring hearing loss. Audiograms are graphs showing the range and extent of hearing loss, measured in DECIBELS.

audio-visual aids. The supplementary teaching material used to facilitate learning. Audio-visual aids include models, diagrams and displays, as well as recent developments using tape-recording, film and television. (See also LANGUAGE LABORATORY.)

Balto-Slavic. Group of INDO-EUROPEAN languages spoken by about 300 million people, more than half of whom speak Russian. The main Baltic languages are Latvian (2 million speakers) and Lithuanian (3 million speakers). There are three branches of Slavic languages: Western (which includes Polish and Czech), Southern (including Serbo-Croatian and Bulgarian), and Eastern (including Russian and Ukrainian).

Bantu. Family of about 500 African languages spoken in eastern, central and southern Africa by over 50 million people. The main language of the family is SWAHILI, which acts as a LINGUA FRANCA throughout much of the area, but languages such as Luba, Xhosa, Zulu, Tswana and Rwanda are each spoken by around 4 million people. Several Bantu languages are characterised by a 'click' pronunciation.

Basic English. Simplified form of English devised in 1932 by Charles Kay Ogden, a British educationalist, to act as an international language. 'Basic', which stands for 'British, American, Scientific, International and Commercial', attracted a great deal of interest in the 1940s, though its appeal has since waned.

It consists of 850 words, which are used in various combinations, within a simple

accent-connotation

grammar, to stand for all the more complex words of the language. 'Put together', for example, is Basic English for 'assemble' or 'combine'.

Basque. An isolated language, not related to any other known language, spoken primarily in areas near the boundary between France and Spain. Most of its half-million speakers are bilingual, speaking either French or Spanish as well as Basque.

Bell, Alexander Graham (1847-1922). Scottish-born inventor who is best known for inventing the practical telephone (see p. 1022). His experiments in sound and other fields anticipated many later developments such as SONAR (p. 1066). Bell emigrated to North America in 1870, and lectured on vocal physiology at Boston at the age of 26. He spent a great deal of time teaching the system of elocution and visible speech for the deaf introduced by his father, Alexander Melville Bell, and founded an association for the teaching of speech to the deaf.

bilingualism. Habitual use of two languages by a speaker or a group. A person may be naturally bilingual if different languages are spoken at home, or if he lives in an area where two languages are habitually used (as in parts of Switzerland and Holland). An individual may also become bilingual through an intensive programme of language learning. Fluency in more than two languages is known as multilingualism.

Braille. System for representing letters and figures for the blind, named after the French inventor Louis Braille (1809-52), who himself was blind from the age of three. Each of the 63 characters is made up of 1 to 6 dots in various combinations. It is read by passing the fingers along paper on which the dots are embossed. A universal Braille code for English was adopted in 1932.

Breton. Celtic language, closely related to Cornish and Welsh, spoken in Brittany in north-west France by an unknown but rapidly decreasing number of people. The teaching of Breton in schools is not encouraged by the French government, but there is still a literary movement.

calligraphy. The art of writing, concerned not with the use of the written language to communicate meaning, but with the aesthetic qualities of letter shapes and styles. In some parts of the world, especially Asia, calligraphy has achieved the status of one of the main professional arts, and many highly varied and complex writing systems have developed.

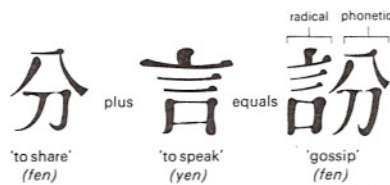
case. Form of a noun, pronoun or adjective which indicates its relationship to other words in a phrase or sentence. In inflected INDO-EUROPEAN languages, like Latin or Spanish, cases are normally marked at the end of words. Some cases of the Latin noun for 'table', for example, are *mensa* (nominative), as in 'the table is here', *mensam* (accusative), as in 'he hit the table', *mensae* (genitive), as in 'the leg of the table'. Modern English, however, has only one noun case ending - the genitive, which indicates possession as in 'boy's' or 'boys'. Other cases have been replaced by prepositions such as 'to', 'for', 'by', 'with' or 'from'.

Caucasian. Family of about 40 languages spoken by some 5 million people in the area between the Black and Caspian seas, around the Caucasian mountains. The main

language is Georgian, spoken by more than 3 million people. It is the state language of the Georgian Soviet Socialist Republic and the only Caucasian language with a long literary tradition. There are Georgian writings dating from the 5th century.

Celtic. Branch of the INDO-EUROPEAN family of languages, which originally spread across east-central Europe as far as Spain, but is now known only from the Celtic languages of the British Isles and Brittany. The two main groups are Irish (or Goidelic), which includes Irish Gaelic, Scots Gaelic and Manx, and British (or Brythonic), which includes Welsh, BRETON, CORNISH and Cumbric. Celtic inscriptions date from the 5th century, and there is an extensive medieval literature. The use of Celtic languages has declined in the 20th century, under the influence of English and French. There has, however, been a revival of interest in them as symbols of national unity and as keys to earlier periods of cultural and literary brilliance.

character. Any sign used in writing, but especially the pictorial shapes used in such languages as CHINESE. A modern Chinese character has two components: a 'radical', which indicates the general meaning of the word, and a phonetic feature, which indicates its general pronunciation.

**A CHINESE CHARACTER**

Two elements can be distinguished in the complex Chinese character for 'gossip'. However, the relationship between image and meaning is no longer immediately recognisable, as the original pictures used have been reduced to symbols over the years.

Chinese. Language with the largest number of speakers in the world, used by about 740 million people. The main member of the Sino-Tibetan family of languages, it includes numerous dialects; the most important is Mandarin, which has the oldest written tradition and is spoken throughout the north of the country. Other dialect groups are Wu, Hsiang, Kan, Cantonese and Min. These are not mutually intelligible, but they are still called 'dialects' because of the strong unifying force of the common written language.

The Chinese dialects are noted for their use of tones (different pitches) to distinguish word meanings. For example, *ba* pronounced with a high tone means 'eight', with a rising tone it means 'to pull'. Modern standard Chinese is based on the Peking dialect, and is the basis for the written language. There is also a standard Cantonese, spoken in Canton, Hong Kong and Macao.

The writing system of Chinese is based on the LOGOGRAM (see also p. 880) and consists of more than 3,000 characters. Because of its complexity there have been many attempts to substitute an alternative, alphabetic script, or a simpler set of characters. In 1958 a system known as *pin-yin* was introduced, which was made up of 58 sounds represented in romanised script, but its status is still uncertain.

Chomsky, Avram Noam (1928-). American Professor of Linguistics at the Massachusetts Institute of Technology, whose theory of language structure known as transformational-generative grammar revolutionised work in linguistics in 1957. This theory proposed that, by specifying a finite set of rules, it is possible to 'generate' all the sentences of a language, showing how they are structurally related: for example, a passive sentence like 'The ball was kicked by the full-back' can be generated by 'transforming' its active counterpart - 'The full-back kicked the ball'.

Chomsky's recent thinking in linguistics sees languages as a key means to the investigation of the human mind, and his writings on the subject have attracted a wide readership among philosophers and psychologists as well as among linguists.

He was also actively involved in politics during the period of the US involvement in Vietnam, and he has written widely on the issues raised.

code. Set of rules for translating one sign system into another, as, for example, the alphabet (which translates speech into writing) or Morse (which translates letters into dots and dashes). The purpose of a code may be simply to allow a message to be sent in a particular medium, or to promote brevity. Some codes are used to ensure the secrecy of a message. (See pp. 882-3.)

cognate. Word or language which has an established common origin with another word or language. For example, French and Spanish are cognate languages, as they have the same parent language - Latin.

collocation. Habitual association of words with each other in a language. For example, in English *spick* collocates with *span*.

communication. The sending or exchange of information between people using any of the senses, or the transfer of information from one machine to another. The scientific study of communication, known both as communication theory and INFORMATION THEORY, emerged after the Second World War when the principles on which the transmission of information depends were first formulated mathematically.

Communication theory, in its non-mathematical sense, is the name given to the study of the influence of communication upon society and the individual, and involves such diverse disciplines as linguistics, anthropology, psychology, sociology, political science, computing and art.

competence. Term introduced by the American language theorist, Noam CHOMSKY, and used primarily in linguistics to refer to a person's knowledge of his language. It embraces the system of rules which a person has mastered that enables him to produce and understand an indefinite number of sentences, and to recognise grammatical mistakes and ambiguities. (See also PERFORMANCE.)

concordance. List of all the significant words in a text, such as the Bible, or in a group of texts, such as the plays of Shakespeare. The words are arranged in alphabetical order or by subject, and indicate the places in the text where each instance of the word occurs.

connotation. Associations or implications of a word or phrase in addition to its

meaning. These may differ considerably from person to person, or from one social group to another. For example, the word 'automation' may connote efficiency to management, but redundancy to workers.

consonant. Type of speech sound, usually produced by constricting the flow of air in the vocal tract, or by the tongue, teeth or lips, so that friction can be heard.

Cornish. Celtic language of south-west England which died out at the beginning of the 19th century. Little is known of the number of speakers throughout its history. Recently, there have been attempts to revive the language.

corpus. Collection of spoken or written data gathered together for linguistic analysis.

creole. Language originating as a mixture of two or more languages, and spoken as the mother-tongue of a community. Creoles, also called 'creolised' languages, are mainly found in areas influenced by early colonists; such creolised languages are the French creoles in the West Indies and the Dutch creoles in South Africa. Some creoles, such as the French/American creole of Haiti, are spoken by many thousands of people.

cuneiform. Non-alphabetic system of writing widely used throughout the ancient world for more than 2,000 years. Each symbol was constructed out of sets of wedge-shaped strokes made in soft clay with wedge-ended pieces of reed; the name cuneiform comes from the Latin *cuneus* meaning 'wedge'. Cuneiform writing was probably invented by the Sumerians, and its use can be traced from around 5000 BC in Babylonian, Persian and Assyrian inscriptions.

cybernetics. Branch of mathematical theory that studies the nature of control systems, especially in relation to communication in and between humans and machines. The term was introduced in 1948 by Norbert Wiener, an American mathematician. (See also p. 997.)

Cyrillic. A 43-letter Slavic alphabet, based on the Greek alphabet, devised by the Greek brothers St Cyril and St Methodius in the 9th century AD. It was originally used by speakers belonging to the Eastern Orthodox religion. Cyrillic is now the script in which Russian, Bulgarian, Ukrainian and Serbian are written. The modern alphabets of these languages are much shorter than the original. Russian, for example, has only 32 letters.

decibel. In acoustics, the unit for measuring the relative loudness of sounds; 1 decibel (dB) is the least audible sound. The scale increases in units, each unit being equal to the smallest difference in loudness detectable to the ear. A sound measured at 50 dB, for example, is ten times louder than one at 40 dB. The level of sound which can induce pain is around 130 dB. Normal conversation measures 60 dB, traffic at a busy road junction is 75 dB, a vacuum cleaner is 80 dB, a jet airliner at take-off is about 140 dB, and a discotheque is 120-140 dB.

deep structure. Underlying grammatical structure of a sentence, in the theory advanced by the American linguist Noam CHOMSKY in the 1960s. The notion is primarily intended to capture the idea that many of the important relationships between the parts of a sentence are not clearly marked in the sequence of words that make up the SURFACE STRUCTURE of the sentence.

Ambiguous sentences illustrate this clearly, as for example in the sentence 'The police were ordered to stop drinking after midnight', which has one surface structure, but more than one deep structure.

diachronic. Area of linguistics that studies historical change in language. The historical study of language developed in the 19th century, and in this context is generally referred to as comparative PHILOLOGY.

dialect. Regional or social variety of a language, identified by a particular way of using words, grammar or pronunciation. Any language with a reasonably large number of speakers will develop dialects, especially if geographical barriers separate groups of people from each other, or if there are divisions of social class.

One dialect usually predominates as the official or 'standard' form of the language. In England, for example, the dialect of the south-east in Middle English times (c. 1100-c. 1500) ultimately came to be used by the educated classes in the London area, and is now loosely labelled 'The Queen's' or 'BBC' English.

The systematic study of dialect variation is known as dialectology or linguistic geography. Atlases have been produced which plot the distribution of variant forms.

dictionary. Book listing some or all of the words and idioms of a language, usually in alphabetical order, and giving information about their spelling, pronunciation, meaning and usage. Dictionaries range from comprehensive treatments (such as the *Third Webster International*, with over half a million entries) to pocket-sized publications. There are also many specialist dictionaries, devoted to subjects such as science, politics, slang, biography, historical dates, and so on.

The art or science of dictionary-making is known as lexicography. It dates from the 17th century, when the first dictionaries were constructed. Dr Johnson produced the first standard English dictionary in 1755. The *Oxford English Dictionary*, in 12 volumes plus supplements, is the standard reference work for British English. Webster's dictionaries, first published in 1828, are the guide for American English. Many large dictionaries now incorporate encyclopaedic information, following the lead of the French lexicographer Pierre Larousse, whose dictionaries appeared between 1866 and 1867.

diglossia. Term in SOCIOLINGUISTICS to describe two distinct standards of usage such as a 'high' variety for writing and formal speech and a 'low' variety for conversation.

diphthong. Vowel sound which contains two distinct qualities, as in *life* or *sound*. The emphasis may be on the first or the second element of the diphthong. A vowel sound with three such qualities, as in most people's pronunciation of *liar* (li-ah-ur) is called a triphthong.

Two-letter symbols, used to represent a single sound, as for example 'ae' in the word orthopaedic, though often called diphthongs, are in fact digraphs.

distinctive feature. Feature of sound which distinguishes one linguistic unit from another. In the study of pronunciation, the difference between the English *f* and *v* is made by the distinctive feature of vocal-cord vibration - absent in *f*, present in *v*. The features of sound may be defined in three ways: by the way the sounds are produced by the vocal organs, the way in which they are transmitted

consonant-Esperanto

through air, or the way in which they are heard by the ear. Distinctive feature theory is primarily associated with the linguist Noam CHOMSKY and his associates, though its history goes back to the 1930s.

Dravidian. Family of more than 20 languages spoken largely in southern India and Sri Lanka by well over 100 million people. The major languages in the family are Telugu (40 million), Tamil (31 million), Malayalam (17 million) and Kannada (17 million). Literature representing this language family dates back to the 3rd century BC.

Egyptian. Language spoken in the valley of the Nile from around 3000 BC until the 17th century AD; during the later period it was known as Coptic. Belonging to the HAMITO-SEMITIC family, it was originally written in HIEROGLYPHIC script. Later forms of the language, however, used different systems. Coptic, for example, was preserved in a modified form of the Greek alphabet. Arabic has replaced Egyptian in this part of North Africa.

elocution. Manner in which an individual articulates his speech. Someone with poor elocution may well mumble or speak too fast, and be difficult to understand as a result. Elocution lessons usually involve training in the art of clear and pleasant speaking, and concentration on the accent considered to be the prestige form in that country.

English. Now the mother-tongue of 320 million people, English is also the most widely used LINGUA FRANCA in the world, known to about one-sixth of the world's population.

English is a Germanic language. However, because it has proved to be remarkably receptive and adaptable, it includes many LOAN-WORDS of Latin, French and Scandinavian origin. In recent years it has also absorbed words from other European countries, introduced by European immigrants into the USA. In addition to the many urban and rural dialects spoken in the British Isles, the language has developed many international forms in accent, expression and spelling in such regions as the USA, Canada, Australia, New Zealand, South Africa and the Indian subcontinent.

The richness of English literature - and of its poetry in particular - stems in part from the fact that it has a vocabulary of unequalled range and variety: it now consists of about three-quarters of a million words, many of which are borrowed by other languages in their turn.

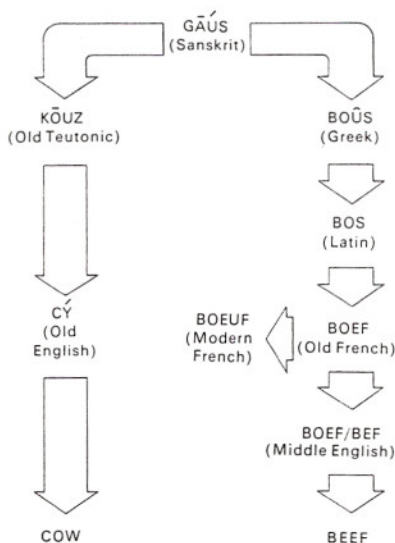
The history of the English language can be traced from the 7th century AD, when Christian missionaries introduced the Latin alphabet to transcribe the Old English dialects, collectively known as Anglo-Saxon. Anglo-Saxon was a language with a relatively large amount of INFLECTION. Much was lost between 1000 and 1200, during the transition from Old to Middle English. During this period many words of French origin were introduced into the language as a result of the Norman Conquest. The Early Modern English period dates from the 15th century. The spelling then adopted was an accurate reflection of contemporary pronunciation. Most of the irregularities of the English spelling system today can be explained by changes in pronunciation since then.

Esperanto. An artificial language

etymology-grammar

invented in 1887 by a Polish philologist, Dr L. L. Zamenhof. Esperanto has a vocabulary of over 6,000 basic ROOTS, as well as around 50,000 roots for scientific terms. There are 24 consonants and five vowels. Most words are based on roots found in European languages. The only artificial language to achieve any real success, Esperanto now has more than 100,000 users, and is particularly strong in Japan and central Europe. Its name derives from the pseudonym of its author, *Doktoro Esperanto*, 'Doctor Hopeful' in Esperanto. (See also p. 874.)

etymology. Study of the history and origins of words and phrases. Etymological dictionaries describe the various changes in sound and meaning that have affected a word since its earliest known appearance.



HOW WORDS EVOLVE

The words 'cow' and 'beef' have developed from a common origin. This diagram shows the major sound changes that were involved; a full etymological account would include how the words were used and how the meanings changed in the different Indo-European languages.

euphemism. Indirect or polite expression replacing one whose meaning is unpleasant or suggests inferiority. Examples include 'bathroom' for 'lavatory', 'pass on' for 'die', and 'refuse disposal unit' for 'dustcart'.

euphony. Sequence of sounds which is considered pleasing to the ear, as in many lines of poetry. The term is also sometimes used to refer to alterations to the pronunciation of a word which make it easier to say – reducing 'twelfths' to 'twelths', for example – though this process is more usually called elision.

feedback. Signals which tell a communicator how successful the transmission of his message has been, and thus influence the way in which he makes subsequent transmissions. Facial expressions or applause are examples of feedback from an audience.

In phonetics (see p. 878), the term refers to the ways in which a speaker is aware of his own speech, especially by hearing himself or feeling the movement of his vocal organs

('kinaesthetic' feedback). The term has other technical senses in engineering.

figure of speech. Use of language whereby the literal, everyday meaning of a word is emphasised or extended by its association with another word, with which it need not have any apparent connection; for example, 'a bitter blow' and 'stubborn as a mule'. The most common figures of speech are the SIMILE, the METAPHOR and HYPERBOLE. The literature of Rome and Greece paid particular attention to the use of figures of speech as an indication of stylistic excellence, and the classification used then has influenced English literary analysis throughout its history. Some of the more complex figures tend to be restricted to writing, but everyday English uses many figures of speech as a means of varying emphasis and making conversation more vivid and interesting. Personification – the attribution of human qualities to an abstract or inanimate object – is commonly heard; as, for example, when someone calls a ship or car 'she'.

Finn-Ugric. The larger branch of the Uralic family of languages, spoken by around 23 million people across northern and central Asia and parts of Europe. Finnish, Estonian and Lapp are the main representatives of the Finnic group. The most widely spoken language in the Ugric group is Hungarian.

Fowler, Henry Watson (1858-1933). English author of books on style and usage, of which the best known is his *Dictionary of Modern English Usage* (1926). He also wrote *The King's English* (1906) with his brother Frank. Fowler has been viewed by many as an authority on points of PUNCTUATION, SYNTAX, pronunciation or VOCABULARY. However, his purist attempts to prescribe certain forms of usage as correct, while condemning others as incorrect, has been much criticised by modern language experts.

French. Mother-tongue of about 80 million people, and the official language of more than 20 countries. More than 45 million people speak it in France, more than 5 million in Canada, more than 4 million in Belgium, and about 1 million in Switzerland and the USA.

French is in origin a Romance language. Standard French is based on the dialect of the Paris area, and has developed since the 16th century. There are several major dialects, of which Provençal, from the southern part of France, is the best known; CREOLE forms of the language are also well-developed in several parts of the world, such as Haiti.

Since its establishment in the 17th century, the Académie Française has kept a watchful eye on the purity of the French language. But since the Second World War, French has absorbed a considerable number of English and American words. French established itself as the language of diplomacy in the 17th century, and still occupies a strong position in the worlds of the arts and of gastronomy. It has been a major influence on other languages, especially English, and is still the most widely taught foreign language in British schools.

Many thousands of LOAN-WORDS have entered English, and the process still continues: examples include *coup de grace*, *chic*, *restaurant* and *café*.

fricative. A type of speech sound produced by forcing air through a narrowed vocal tract so that friction is audible – for example, when pronouncing the letters *f*, *h*, *s*, *v* and *z* in

English. Fricative sounds are the commonest class of CONSONANT.

Gaelic. Usual name for the CELTIC languages of Ireland, Scotland and the Isle of Man. From about the 10th century AD there is evidence of a distinction between Scottish Gaelic (occasionally called Scottish, and until recently Erse) and Irish Gaelic (or Irish).

In Scotland there were still more than 80,000 Gaelic speakers in the 1960s, mainly in the Hebridean islands. Many emigrated to Cape Breton Island in Nova Scotia in the 18th century, and there were still more than 3,000 Gaelic speakers there in the 1960s. The main literature of Scottish Gaelic emerged in the poetry of the 18th century, although a standard written language did not develop until after the translation of the Bible in 1801; many of its myths and stories are shared by Irish Gaelic speakers.

German. Language of Germany and Austria, and one of the official languages of Switzerland. It is spoken by some 120 million people, and is used by many more as a second language. The two main varieties are known as 'Low' German (spoken in the northern lowlands) and 'High' German (spoken in the southern highlands, and the basis of the standard written language).

The modern German language can be traced from Old High German dialects, which were used in central Europe until around 1100, through Middle High German, covering the 12th to the 16th centuries. A dialect development of High German is YIDDISH.

Germanic. Branch of the INDO-EUROPEAN family of languages, including languages spoken by more than 500 million people. Germanic languages are usually classified into three groups: the Western branch, which includes German, Dutch and English; the Northern branch, including Danish, Swedish and Norwegian; and the now extinct Eastern branch that included GOTHIC, from which it is chiefly known.

glottochronology. Technique devised by American linguists in the 1950s to establish the rate at which languages change over time. By comparing the degree of similarity with which different languages use a set of 'core' words (using a method known as lexicostatistics), it is possible to suggest how closely these languages are related, and how much time has elapsed since they separated from a point of common origin. The technique has not been entirely successful, because of difficulties in deciding what constitutes a 'core' vocabulary, and because of variations in the rates at which languages change.

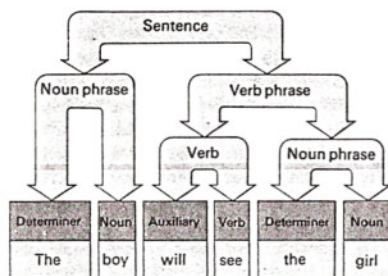
Gothic. Extinct East Germanic language spoken by the Goths, mainly in southern Europe, and known from records dating from the 4th century AD.

The Gothic alphabet was invented by Bishop Wulfila, who translated the Bible into Gothic. The principal dialects died out in the 6th or 7th centuries, but there is some evidence of the survival of Gothic in the Crimea until the 16th century. The black-letter script version of the Latin alphabet often referred to as Gothic has no historical connection with the Gothic language.

grammar. Analysis of the ways in which words, and their component parts, are brought together to form sentences and sentence sequences. Traditionally, grammar has

been divided into MORPHOLOGY (the study of word structure) and SYNTAX (the study of sentence structure). The rules of grammar define the correct usage of the language in both speech and writing.

The study of grammar has always held a central place in linguistics; several schools of thought attempt to define and analyse grammatical structure by such principles as those of 'generative' and 'structural' grammar. (See CHOMSKY.)



GENERATIVE GRAMMAR

Sentence structure is seen in layers. The first shows division into noun and verb phrases, or subject and predicate. The second layer shows a complex verb phrase with both a verb and another noun phrase. The third breaks down all three phrases.

graphics. Study of the shape, size and colour of the letters and symbols used in written language, and their sequence and layout. Commercial interest in graphic design is considerable, as for example in advertising or the devising of trade-marks, as well as in publishing, television and films.

In LINGUISTICS the field is sometimes referred to as graphetics, an area of study which analyses the 'mark-making' abilities of man, the forms used in the world's writing systems, and the relationships between them.

graphology. Term which refers both to the writing system of a language – its alphabet, spelling rules and punctuation – and to the analysis of character through the study of a person's handwriting. Experts in handwriting analysis claim that deductions can be drawn from such features as the size, slant and embellishment of the letters. The validity of these claims has been questioned, and the subject remains controversial.

Greek. An INDO-EUROPEAN language spoken mainly in Greece by about 8½ million people. Its history dates from the 14th century BC. There are four main historical periods: Ancient and Classical Greek, from the 14th to the 4th century BC; Hellenistic (or Koine) Greek, which lasted until the 4th century AD; Byzantine Greek, until the 15th century; and Modern Greek.

The Greek alphabet, which contains 24 letters, dates from around 1000 BC, and is the ancestor of all modern European alphabets; the term alphabet is derived from the first two letters of the Greek alphabet, *alpha* and *beta*.

Grimm, Jacob (1785-1863). German scholar whose pioneering work on the history of the GERMANIC family of languages was a major influence on 19th-century PHILOLOGY. He is well known for his *German Grammar* (1819-37), and his description of the way in which Germanic consonants had altered from earlier INDO-EUROPEAN languages came to be known as Grimm's law.

Grimm was also a noted mythologist and collaborated with his brother Wilhelm in the writing of *Grimm's Fairy Tales*.

Hamito-Semitic. Family of languages, also known as Afro-Asiatic, spoken mainly in North Africa and the Middle East by more than 175 million people. Its main branches are Semitic, Egyptian, Berber, Cushitic and Chadic, and the most widely spoken languages are Arabic, Hebrew and Hausa.

Hebrew. Semitic language of the Old Testament, and the official language of the modern state of Israel. In its Classical (or Biblical) form, it was spoken in Palestine until about the 3rd century BC, when it was replaced by ARAMAIC. It continued to be used for literary and religious purposes, however, thus providing the basis for the revival of spoken Hebrew in the late 19th century. The Hebrew alphabet of 22 letters is written from right to left.

Hellenic. Branch of the INDO-EUROPEAN family of languages, the only representative of which is Greek. It is, therefore, often simply referred to as Greek.

hieroglyphics. Writing system which employs picture-characters or hieroglyphs (from the Greek for 'sacred carving') to represent words, ideas or sounds. It originally referred to the writings made on Egyptian monuments from around 6000 BC, but is now used also to describe similar systems of writing, such as those of the Aztecs and the Maya of Middle America, some of which remain undeciphered.

Egyptian hieroglyphs were not deciphered until 1822, when the Frenchman Jean Champollion solved the riddle of the Rosetta Stone, a slab inscribed with Egyptian hieroglyphs repeated in ancient Greek. The earliest Egyptian hieroglyphs originally represented names and events only, with an occasional commentary; later other subjects were covered, such as mathematics.

Hindi. Indo-Aryan language spoken by about 135 million people in the Indian subcontinent. It is the most widely spoken language in India and enjoys national status, though not all ethnic groups accept this. It has two main dialects, Eastern and Western, and is written in a script derived from SANSKRIT.

Hittite. Extinct INDO-EUROPEAN language, named after the Hittites, whose powerful empire flourished in the Near East around 1400 BC. It is preserved in several thousand CUNEIFORM tablets, the oldest of which (around 1650 BC) provide the earliest evidence of Indo-European.

holophrase. A word which can function as a complete sentence by itself – for example, 'Help!' The term is used particularly in connection with studies of language development in children of 12-18 months, since most utterances at that age are holophrastic – for example, 'There!' 'Daddy!' 'Gone!'.

hyperbole. Figure of speech in which a phrase or statement is deliberately exaggerated in order to provide special emphasis or a dramatic effect – for example, 'I'm so hungry I could eat a horse'. It is frequently used in literary sagas and love poetry, but is also encountered in such areas as advertising, political pronouncements and the telling of jokes or tall stories.

Icelandic. GERMANIC language, closely

graphics-inflection

related to Norwegian and the other Scandinavian languages, and now the national language of Iceland. It was brought to Iceland from Norway in the 9th century. Old Icelandic (also called Old Norse) produced a considerable literature in poetry and prose, the best known of which are the Icelandic sagas and folk-tales.

ideogram. Pictorial symbol used in a writing system to represent an entity or an idea – for example, a pin figure representing a human being. Ideograms are also called ideographs. Several early writing systems such as CUNEIFORM and Egyptian HIEROGLYPHICS used ideograms (see p. 880); they are also used in Chinese. (See also LOGOGRAM.)

idiolect. Way in which an individual speaker systematically uses language. No two people use and understand their language in exactly the same way, and it is the idiosyncratic selection of sounds, grammar and vocabulary which constitutes a person's idiolect. A group of idiolects sharing common features (related to social class, region, etc.) form a DIALECT; all mutually intelligible idiolects constitute a LANGUAGE.

idiom. Colloquial style of speech or turn of phrase, sometimes restricted to a particular area or community, the meaning of which need not necessarily be taken literally. The expression 'It's raining cats and dogs', for example, has nothing to do with cats or dogs. Nor need an idiom necessarily follow the normal rules of grammar. Idioms are often specific to a particular language, and cannot be translated.

imagery. Range of devices whereby explicit use is made of images to express ideas. Imagery is particularly suited to a subtle, allusive form of expression such as poetry. The main forms of imagery are METAPHOR and SIMILE, but the complex imagery of a poem may make use of several images interwoven to produce a subtle and evocative effect, as in the opening lines of T. S. Eliot's 'The Waste Land': 'April is the cruellest month, breeding/Lilacs out of the dead land . . .'

Indo-European. Main language family of Europe and southern Asia, with an estimated 2,000 million speakers throughout the world. Its main branches are Anatolian, Armenian, Balto-Slavic, Celtic, Germanic, Greek, Indo-Iranian, Italic, Tocharian and Thracio-Phrygian, along with several other languages preserved only in fragments.

The recorded history of Indo-European dates back about 3,500 years. Philologists have been able to reconstruct something of the character of Proto-Indo-European, the supposed parent language from which all the above groups have been derived. (See PROTOLANGUAGE.)

Indo-Iranian. Branch of the INDO-EUROPEAN family of languages, spoken by more than 500 million people. It comprises two sub-groups: the larger of these, Indo-Aryan, is spoken mainly in India, Pakistan, Bangladesh, Nepal and Sri Lanka, and includes HINDI, Urdu, Bengali and Punjabi; the Iranian group is found mainly in Iran, Afghanistan, parts of Pakistan and the southern USSR, and includes Persian and Kurdish.

inflection. Changes in the form of a word which indicate grammatical functions such as the marking of tense, number or gender: for example, boy, boys; walk, walking, walked. Languages with many inflectional endings

information theory—language laboratory

are called inflecting languages. One such language is Latin, which has six forms for each tense of a verb; for instance, *amo, amas, amat, amamus, amatis, amant* are all present-tense forms (first, second and third person singular and plural) of the verb 'to love'. Among modern languages, German is a highly inflected language, whereas English is not.

Information theory. The mathematical study of the way in which messages and signals are stored, processed and transmitted. In particular, it is concerned with ways of quantifying the 'commodity' which is being transmitted, namely information, viewed solely as a physical entity and paying no attention to the meaning of the message it is carrying.

The subject was developed by an American mathematician, C. E. Shannon, in 1948, and is of both theoretical and applied interest. Because of the costs involved in sending messages by such methods as telephone and satellite, it is of considerable commercial importance to know how much information can be carried by a channel (in other words, what its capacity is), how fast it can be sent, and how interference (or noise) can be eliminated. (See also COMMUNICATION.)

Initial teaching alphabet (i.t.a.). An alphabet invented by Sir James Pitman (1901-) to make learning to read English easier. Its 44 characters, all lower case, include 14 symbols not used in the Roman alphabet. These were introduced to make a consistent relationship between sounds and letters. Since 1960, children in about 10% of British primary schools have been introduced

a	apple	ɑ	arm	æ	angel
au	author	b	bed	c	cat
ch	chair	d	doll	œ	eel
e	egg	f	finger	g	girl
h	hat	ie	tie	i	ink
j	jam	k	kitten	l	lion
m	man	n	nest	ɪ	king
œ	toe	o	on	ω	book
ω	food	ou	out	oi	oil
p	pig	r	red	ɹ	bird
s	soap	ʃ	ship	z	treasure
t	tree	th	three	ʒ	mother
ue	due	u	up	v	van
w	window	wh	wheel	y	yellow
z	zoo	ɿ	is		

INITIAL TEACHING ALPHABET

Distinctive features of i.t.a. are the new symbols for the main vowels and diphthongs, and for the fricative sounds 'th' and 'sh'. The symbol for 's' in the word is clearly shows its relationship with the 'z' of zoo, with which it is phonetically identical.

to reading through the use of i.t.a., changing later to the conventional spelling. The educational claims of i.t.a., however, remain controversial.

International Phonetic Alphabet. System devised to transcribe the PRONUNCIATION of speech sounds accurately, which avoids the ambiguity and inconsistency of written language. Every distinguishable sound is given its own symbol, Greek characters and other symbols being used to supplement the letter of the modern Roman alphabet (see p. 881). A wide range of special marks is used to indicate variations in length and quality of sounds. Developed by the French phonetician Paul Passy and others for the International Phonetic Association in 1886, the alphabet is widely used in scientific studies of pronunciation.

Intonation. Change in the pitch or melody of the voice, used to communicate meaning. For example, the change from a falling to a rising tone can convert a statement - 'He's coming' - into a question - 'He's coming?'. Intonation is used to express the mood and intention of the speaker: depending on the intonation, a statement like 'Get out' may be threatening or humorous.

Irish. The form of GAELIC spoken in Ireland. A CELTIC language, its history can be traced back to the 5th century AD. Soon afterwards, Christian missionaries introduced the Latin alphabet and an extensive early literature of sagas, poetry and religious prose has been preserved.

Ireland was almost solely Gaelic-speaking until the 17th century, but with the spread of English and the effects of emigration caused by the great famine in 1845-6, the language declined sharply.

In the present century, particularly since political independence in 1922, efforts have been made to revive the Irish language; it is one of the official national languages of the Republic of Ireland (the other being English), and it is essential for holders of certain government posts. However, a census taken in 1961 recorded a total of only 716,000 Irish speakers out of a population of 2,815,000. Only 50,000 of them, mostly in western Ireland, used Irish as a first language. A standard written language has developed since the 1940s, which means that more people read Irish than can speak it.

Isogloss. Line used in dialect atlases to mark the geographical boundaries between people using two variants of linguistic form (such as *I am* and *I be*), and thus between two DIALECTS.

Isoglosses may frequently coincide with geographical features, such as a mountain range or river which may have interfered with the flow of communication between communities, so allowing differences to develop. Alternatively, they may reflect social barriers between class groupings.

Italic. An INDO-EUROPEAN group of languages spoken in parts of northern and central Italy during the first millennium BC, and including Latin, Faliscan, Osco-Umbrian and Venetic. With the exception of Latin, only fragments of these languages survive, mainly in inscriptions and tablets.

The word 'italic' also describes a printing type introduced in 1501 by the Italian Aldus Manutius, in which letters slope towards the right. He designed the type to save space in Latin texts.

Jakobson, Roman (1896-). One of the most influential modern linguists. His career began in Moscow and Czechoslovakia, where he helped to found the Prague school of structural linguistics in the 1920s (see STRUCTURALISM). The political situation of the late 1930s forced him to emigrate and since 1941 he has held university posts in the USA. Jakobson's writings cover most branches of linguistics, as well as specialised studies of Slavic languages. He has also studied the relationship between linguistics and other areas, such as literature, children's language and difficulties in learning language.

Japanese. Language spoken by over 104 million people in Japan and a further 2 million in other parts of the world, especially Brazil, Korea and the USA. Its relationship with other languages is uncertain, but it is possibly related to both Korean and the ALTAIC languages.

The modern Japanese language writing system, known as *kana*, involves two forms of syllabic script, each of 112 symbols. They developed in the 9th century AD as a modified and simplified form of Chinese character writing. The principal words in Japanese still use Chinese characters, modified by *hirakana* symbols to mark grammar and punctuation. The angular *katakana* symbols are used for special purposes such as writing foreign words and official documents.

Jespersen, Otto (1860-1943). Danish linguist, whose writings covered phonetics, general linguistics, English grammar, the history of English and language teaching. His major work, *Modern English Grammar*, was published in seven volumes between 1909 and 1949.

Jones, Daniel (1881-1967). The most influential phonetician of the 20th century, and Professor of Phonetics at London University from 1921 to 1949. Jones was the author of several works on general phonetics and English, including the *English Pronouncing Dictionary*.

kinesics. The study of the ways in which facial expressions and body movements, such as raising the eyebrows or waving the arms, are used for purposes of communication. Also known as body language, as is PROXEMICS.

language. The principal means of human communication, used in speech and writing and employing a vocabulary and a sentence structure. Every language has three main components: its grammar, its semantics (concerned with meaning), and its transmission systems (pronunciation for speech and orthography, or spelling, for writing). A language may refer to the linguistic patterns of an entire community (as in the 'English language'), or of an individual (as in 'Shakespeare's language'), or to a particular expression or mode of speech (as in 'bad language'). The scientific study of language is known as LINGUISTICS.

language family. Group of languages all of which are descended from one parent language. For example French, Spanish and Italian are all Romance languages, sharing common parentage in Latin.

language laboratory. The specially equipped classroom used in the teaching of foreign languages. It has a set of booths each

equipped with recording and play-back instruments capable of being monitored at a central console. The technique gives students practice in listening to foreign languages and responding instantly in the same tongue.

Latin. Principal language of the ITALIC group, and parent language of the Romance family. The oldest texts date from the 6th century BC. The language spread rapidly, following the expansion of the Roman Empire, and developed several dialect forms. A popular style known as Vulgar Latin developed out of spoken Classical Latin in the 3rd century AD; it was used in St Jerome's translation of the Bible.

During the Middle Ages, Latin was the dominant language of education, scholarship and literature throughout Europe. It remained an essential part of English education until the middle of this century, and has had considerable influence on the style of English prose and poetry.

Latin is still used for medical and scientific classification. It remains the official language of the Roman Catholic Church, though popular knowledge of it has become less widespread since the introduction of the vernacular into the liturgy in the early 1960s.

lexicography. The principles and practice of making a DICTIONARY: the word comes from the Greek *lexis* meaning 'a word'. A dictionary is sometimes called a lexicon. (See p. 885.)

Linear A and B. Names given to two scripts discovered at the end of the 19th century on tablets in Crete. The scripts were so named because their characters were made up of straight lines, rather than being HIEROGLYPHICS, or picture-characters.

Linear A was probably used around 1700-1600 BC; it is not known what language it represents, and it remains undeciphered. Linear B is a syllabic script devised between about 1450 and 1100 BC for writing Mycenaean Greek; examples have been found at Knossos, Pylos and Mycenae. It was deciphered in 1952 by Michael Ventris, a British architect.

lingua franca. An auxiliary language used between groups of people who speak different languages. English is the world's most common *lingua franca*, followed by French; in certain parts of the world other languages are dominant. Swahili, for example, is the *lingua franca* in East Africa. The various types of CREOLE and PIDGIN derived from attempts to develop a *lingua franca* in parts of the world where other means of communication were impossible.

linguistics. Scientific study of human language, which aims to establish the facts about the nature and use of the world's languages, and ultimately to propose general principles to explain their unity and diversity. In the course of its development during this century, the subject has produced many specialised fields of study - phonetics (see pp. 878-9), GRAMMAR and SEMANTICS being the most widely recognised.

Current trends in linguistics have been greatly influenced by the work of the American linguist Noam CHOMSKY, who sees language as a means of investigating the mind. Interdisciplinary studies have been developed to investigate the relationships between linguistics and anthropology, psychology and sociology. Applied linguistics is concerned with the application of linguistic ideas to techniques of foreign-language teaching.

lip-reading. Method of understanding speech by interpreting the movements of the speaker's face, especially his lips. It is of great assistance to deaf people, but its value is limited because many sounds, such as *h*, *k* and *s*, do not require visibly distinct positions of the lips or facial features.

literacy. Ability to read and write in a language. Literacy is a broad and ill-defined skill, ranging from a limited awareness of certain features of a written language (such as certain signs, or one's signature), through a sufficiently adequate command to meet everyday practical needs ('functional literacy') to total visual fluency. Despite several national and international educational programmes, it has been estimated that more than one-third of the world's population is still functionally illiterate.

loan-word. Word borrowed from a foreign language which then comes to be commonly used in the language by which it is adopted. English, for example, has many thousands of loan-words from Latin, Greek, French, Italian and Scandinavian, in addition to its native Anglo-Saxon vocabulary. These loan-words include *restaurant* from the French, *piano* from Italian and *skirt* from Old Norse.

logogram. Sign or character standing for a word - for example, &, £, %, 5, +. Several of the world's writing systems - such as Chinese - are basically logographic, although other features (phonetic markers, for example) are usually involved in such systems to facilitate their learning and use. (See p. 880.)

look-and-say. An approach to the teaching of reading whereby children are taught to recognise the visual shape of whole words. This method is an alternative to PHONIC methods, in which words are analysed into their component letters and sounds.

machine translation. The use of a computer to translate language. The process is also known as automatic or mechanical translation. The urgent demand for rapid translation in science and technology has been the main motivation for the development of machine translation, particularly between English and Russian. Some progress has been made, but a great deal of human editing is still necessary to make machine translations acceptable, especially in literary works.

McLuhan, Herbert Marshall (1911-). Canadian Professor of English at the University of Toronto, whose views on the nature and role of the communications media in society received widespread publicity in the 1960s. His best-known aphorism, 'the medium is the message', refers to the profound influence that the media (television in particular) are having on the development of contemporary thinking and culture.

Manx. The GAELIC language of the Isle of Man. At the beginning of this century, Manx was spoken by about 5,000 people, but the last people to speak Manx as their mother-tongue died in the late 1940s. The laws of the island are still recorded in Manx.

mass media. Means of communication by which a message can be communicated to the widest possible audience. The most effective of the mass media are the press, radio and television.

medium. The substance or means through which a message or impression is conveyed to the senses. In the most general

Latin-newspaper

sense, air is the natural medium for speech. More specifically, print is the medium of the writer, paint the medium of an artist and film the medium of a film director.

metalinguage. Any technical language used when talking about a specific area of experience or expertise. Metalanguages such as those of mathematics or linguistics may not be intelligible to the non-specialist.

metaphor. A figure of speech in which two normally unrelated words or ideas are brought together for special emphasis - as, for example, in the phrases 'poker face', and 'sharp practice'. Metaphors are commonly used for vivid, dramatic effect in poetry. Frequent use over a long period may cause originally vivid metaphors to lose their freshness and become trite - for example 'green with envy', and 'the salt of the earth'.

metre. Organised rhythm of a line of poetry or, more generally, the principle of versification that underlies a poem. Types of metre vary from that used in Classical Latin - where syllables were made prominent by virtue of their length - to that of modern English, where the relative loudness of syllables creates the reader's awareness of metre. Various types of poetic line are identified by their metre. For example, the 'iambic pentameter' is a line containing ten syllables organised into five groups of two, each of which has the stress pattern 'weak-strong' (˘) as in 'Thē cūrfēw tōlls thē kñiell ōf pārtīng dāy'.

morpheme. Smallest meaningful unit in the GRAMMAR of a language. A word such as 'denationalise', for instance, can be broken down into its component morphemes *de-*, *-nation-*, *-al-*, and *-ise*. It is usual to classify morphemes into two types, 'free' and 'bound'. Free morphemes can stand alone as words (for example, *nation*); bound morphemes (for example, *de-*, *-ise*) can be used only when attached to a free morpheme.

morphology. The branch of LINGUISTICS which studies the structure of words. Words are analysed into their component elements (MORPHEMES), and principles of word-formation are established for the classification of different languages - for example, the use of inflections, as in Latin, or of long compound words as in German.

Morse code. System of signalling invented in 1838 by Samuel F. B. Morse for wire telegraphy. His system of dots and dashes representing numbers and the letters of the alphabet is still used in radiotelegraphy. (See p. 882.)

multilingualism. The ability of an individual to use several languages fluently. The term 'multilingual' also applies to communities such as Switzerland, East Africa and India, in which several languages are spoken.

newspaper. Publication, usually appearing daily or - as in the case of Sunday or local papers - weekly, which provides information and comment on news and current affairs. There are over 8,000 newspapers in the world, nearly a quarter of which are published in the USA. In Europe newspapers have appeared regularly since the 17th century.

A distinction is often made between the 'popular' and the 'quality' press. The popular press was introduced in Britain by Lord Northcliffe and others towards the end of the 19th century; they realised that the Education Act of 1870 and generally improved levels of

Niger-Congo-pictography

literacy had created a vast new potential readership, and that their newspapers could be subsidised – and the cover price reduced – by attracting display advertisements from manufacturers anxious to sell mass-produced products to this new market.

In the USA newspapers were controlled by political parties until 1835, when James Gordon Bennett founded the first independent newspaper. This was the forerunner of popular newspapers, aimed mainly at the large immigrant population. The popular press was characterised by sensationalism and idealism, and in 1883 a vigorous campaigning style of journalism was introduced by Joseph Pulitzer. William Randolph Hearst raised this 'new journalism' to fresh heights with scare headlines, plenty of pictures, comic strips and bold campaigns: it was a comic-picture series called 'The Yellow Kid' that gave these newspapers the name of 'yellow press'. In the competition for circulation there were some casualties, but eventually a more serious journalism re-established itself, although some of the techniques of the yellow press became permanent and widespread.

Sales of popular newspapers probably reached their peak in the 1960s; circulations have generally declined in recent years – rising costs, particularly of paper, have increased prices, while people increasingly look to television for news, current affairs and entertainment.

Niger-Congo. Family of languages spoken throughout Central and West Africa by nearly 200 million people. The 1,000 or so languages in this family are classified into six main groups, the largest of which is the Benue-Congo group, with over 500 languages. Main languages within the family include Yoruba, Fulani and Igbo. Another major language of the family is SWAHILI, which is used as a LINGUA FRANCA throughout East Africa.

non-verbal communication. Communication by means other than language, particularly by visual and tactile signalling, such as facial expressions and bodily gestures. INTONATION, rhythm and tone of voice are sometimes aspects of non-verbal communication, since they can communicate meanings independent of words.

Ogham. System of alphabetic writing in which straight strokes are placed at varying angles in relation to a central line. The 20-letter alphabet was used for IRISH and Pictish, and has been found in over 500 short inscriptions on stone monuments in Southern Ireland and Wales. The system dates from around the 4th century AD.

onomastics. Study of names, especially personal names but often including toponymy – the study of place-names. Onomastics includes the historical derivation of a name, its original meaning and trends in its use (for example, those factors which have affected the popularity of forenames).

onomatopoeia. Use of word or phrase whose sound reflects the sounds of the real world – for example, *cuckoo*, *hiss*, *murmur*, *splash*. When the sounds are felt to indicate particular qualities or emotions, the effect is generally referred to as sound symbolism – for example, the use of *sl-* to suggest unpleasantness, as in *slimy*, *sly*, *slush*. Languages do not contain many onomatopoeic words, and those which do occur are only

partial reflections of nature; thus dogs in English may go 'bow-wow', but in French the sound is represented as 'oua-oua'.

oracy. Ability to speak and comprehend a language. The term was coined, on the analogy with literacy (which is concerned with the ability to read and write), to suggest the need for teachers of the mother-tongue to focus their attention on the problems facing children whose fluency and comprehension of spoken language is inadequate.

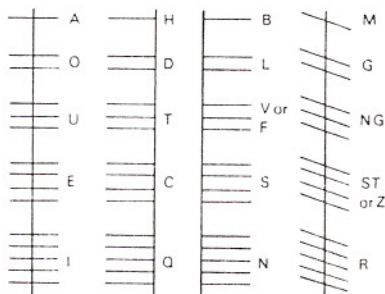
paralanguage and paralinguistics.

Tones of voice which help to communicate meaning (for example, a sneering, dominant or persuasive tone of voice); and those noises, such as groans, laughter, etc., which accompany speech. These features are called paralinguistic ('similar to language') because they are not as central to the understanding of a message as are the words themselves. However, paralanguage can sometimes be the major factor in arriving at an interpretation of someone's meaning – 'It wasn't what he said, but the way he said it'.

parsing. Analysis of the grammatical structure of a sentence or word, and the subsequent labelling of its component parts as, for example, article, noun, adverbial clause. As an educational procedure, this method is now generally criticised on the grounds that it does little to help the child to develop a more sensitive and fluent command of his mother-tongue. It was, however, a widely used technique employed in schools in the first half of this century.

parts of speech. A classification of words developed by the Greek grammarians – and especially the Stoics – on the basis of their similarities of form or function. Eight classes are traditionally recognised in English: noun, verb, adjective, adverb, conjunction, preposition, pronoun and interjection. Some systems add other categories (for example, article), while others operate with fewer. Several of the traditional categories have been criticised as intolerably vague, such as 'the noun is the name of a person, place or thing', in which it is difficult to find a place for 'abstract nouns' such as *beauty* or *information*. It is also difficult to compare parts of speech across different languages.

performance. Term introduced by the American linguist Noam CHOMSKY in the 1960s to describe the actual use of language in particular situations – speaking, listening,



OGHAM SCRIPT

The five vowels and 15 consonant symbols of Ogham script were notched or drawn around the corners of objects such as stone monuments. Not many inscriptions have survived in legible form, mainly because the objects were subject to erosion by weathering.

reading or writing. Performance is therefore easily affected by personal and transient factors, such as limitations of memory, attention or perception. For example, we may forget what we wanted to say, or run out of breath while saying it. We can recognise these limitations, however, and would not consider them to form part of the rules of the language. Performance, and its related term, COMPETENCE, have achieved widespread use in contemporary linguistics.

philology. Historical study of languages, particularly as practised by scholars in 19th-century Europe. It is often called comparative philology because of its emphasis on comparing different languages to determine their relationships and origins. It is limited to the analysis of written texts, which preserve the evidence of a language's changing form and usages. It is less studied nowadays, since LINGUISTICS concentrates more on analysis of speech, as well as dealing with those languages which have no recorded history. Contemporary study of the principles of language change is usually referred to as DIACHRONIC linguistics.

phoneme. Smallest unit in the sound system of a language capable of indicating contrasts in meaning. For example, the word *bit* contains three phonemes – *b*, *i* and *t* – by changing any one of which it may be possible to create a different word, such as *pit*, *bet* and *bin*.

phonetic language. Popular term for a language whose writing system reflects – in an absolutely regular and consistent manner – the way it sounds when spoken: a particular sound is always spelled the same way. Languages such as Spanish and Finnish come close to this, whereas English contains many irregularities. For example, words ending in *-ough* (*plough*, *through*, *rough*, *cough*, *though*, etc.) are pronounced in a variety of different ways, while none of the English vowels is pronounced in a consistent manner; and an identical sound may be spelled in different ways – for example, *f* and *ph*.

phonetic transcription. System for notating all possible speech sounds, on the principle that each distinct sound should be represented by its own symbol or distinguishing mark. As a result, additional symbols have to be added to the conventional letters of the alphabet. The most widely used system is the INTERNATIONAL PHONETIC ALPHABET. (See also p. 880.)

phonics. An approach to the teaching of reading which insists on letters being introduced in relation to the sounds of the language in a consistent and graded way. A child is taught to recognise the component sounds of a word – for example, 'pen-cil' and then to reassemble it as a whole. Phonic methods are opposed to those – such as LOOK-AND-SAY – which place more emphasis on recognising the word as a whole and less on individual sound-letter correspondences. But no system can totally avoid introducing phonic methods for analysing words sooner or later.

phonology. Branch of LINGUISTICS which studies the properties of the sound systems of languages – the ways in which vowels, consonants, syllables, intonation patterns and other sound effects characteristic of particular languages are organised for the communication of meaning.

pictography. Picture-writing in which each object or item of information is given a separate picture or drawing. The earliest form

of written communication, pictographs, had several limitations – in particular, it was impossible for them to convey abstract ideas (such as 'loyalty') – and they were in time replaced by IDEOGRAMS and LOGOGRAMS; which are still used in, for example, Chinese. Pictographs painted on rocks are known as petroglyphs; those carved on rocks are known as petrographs.

pidgin. A simplified language which incorporates elements from different languages – for example, English and Chinese – which have been brought together for a particular purpose, such as trading. Pidgins are particularly found in those parts of the world which have been influenced by European colonial expansion and trade – such as South-east Asia, the south Pacific and parts of Africa – where there was no LINGUA FRANCA shared by both natives and European traders and settlers. Pidgins have their own rules of grammar, pronunciation and vocabulary, but these are much less complex than those of the parent languages. Such works as the Bible have been translated into pidgin.

pitch. Relative height – rather than loudness – of a sound: as in a 'high-pitched voice' or a 'low-pitched drone'. In speech, pitch depends primarily on the speed at which the vocal cords are vibrated. In languages, the systematic use of pitch to communicate meaning – for example, raising the pitch of the voice to express fear or surprise – is referred to as tone or INTONATION.

place-names. The history of a language is often preserved in its place-names. To analyse such names into their parts shows not only their original meaning, but also reflects the social history of their time. In Britain, the various stages of Roman and Danish invasions are preserved clearly in the names of the settlements they founded.

The usual form to mark a Roman place-name is *-chester*, in its various modern spellings. This comes from the Latin word *castra* meaning 'military camp', but it came to be used by the English for any group of buildings of Roman origin (as in Chesterfield, Manchester, Worcester, Lancaster). In this example, the Anglo-Saxon equivalent was *-burh*, which led to many names ending in *-burgh*, *-bury* and *-borough*.

The presence of the Danes is illustrated in over 600 names ending in *-by* (as in Grimsby, Rugby), which meant 'farm' or 'small town'. There are also some 300 names ending in *-thorpe* (as in Scunthorpe), which meant 'village', and a similar number ending in *-thwaite*, which meant 'isolated piece of land'. Most of these names (which originate from Old Norse) appear along the eastern side of the country, and show the areas of greatest penetration by the invaders.

The majority of the remaining names in England are of Anglo-Saxon origin. They display such suffixes as *-ing*, meaning 'son' or 'tribe', as in Reading which probably meant 'the group of Raeda – the red'. Another common suffix is *-ham* (meaning 'home') and *-ton* (meaning 'fenced-off place', later 'town', and usually spelled *-ton*). Preston, for instance, was 'the place where priests lived'.

Many of these names have been used all over the English-speaking world, but the majority of place-names in America or Australia, for example, derive from other sources. Names of famous people, natural descriptions of places and translations of local aboriginal or Indian names (as in Kentucky,

which originated in the Iroquois words for 'grassland') are more widely used.

plosive. Term in phonetics for a type of CONSONANT sound created when the air is totally blocked at some point in the mouth, and then suddenly released. In English the plosive, or stop, consonants are *b, d, g, k, p* and *t*. A type of plosive called a glottal stop may be heard in many dialects, as in the Cockney omission of *t* in 'bottle'.

pronunciation. Way in which an individual speaker or class of speakers articulates words, vowels and syllables. Although people may have been taught the 'correct' pronunciation of particular words, their pronunciation is influenced by class and origin: for example, an Australian may pronounce the *a* in 'mate' very differently from the way an American would.

prosody. Rhythmic use of sound in speech, especially in poetry (see METRE), where the term is often used to describe the study of versification – the principles according to which verses are made. In a more general sense, the prosodic features of a language include any variations in sound effect which cannot be analysed as vowels or consonants, such as changes in pitch, loudness and speed of utterance.

protolanguage. Language which is thought to be, or known to be, the ancestor of a particular language or family of languages. Protolanguages are usually hypothetical reconstructions by philologists, who analyse the written evidence of existing languages and deduce the characteristics of the protolanguage from this. Thus, Proto-Indo-European is held to be the ancestor of languages as far apart as English and Urdu. In some cases, however, a protolanguage may itself be recorded – for example, Latin, the ancestor of the modern Romance family, which includes French, Italian and Spanish.

proverb. Widely known, succinct, rhythmic saying which expresses an everyday idea in a memorable and vivid way – for example, 'Too many cooks spoil the broth', 'A bird in the hand is worth two in the bush', 'All that glitters is not gold'. Proverbial traditions can be traced back as far as 2500 BC, though the origins of individual proverbs are usually unknown. One of the earliest collections is the Old Testament Book of Proverbs.

proxemics. Study of human communication as expressed by the posture of the body, the movement of the eyes, and the ways in which people position themselves with regard to each other – for example, turning one's back on someone one dislikes, or clapping the hands in front of one to express humility. The American anthropologist Edward T. Hall referred to proxemics as the 'silent language'. It is also known as body language, as is KINESICS.

psycholinguistics. Field of study developed in the 1960s which focuses on the points of contact between psychology and LINGUISTICS, and on those factors which condition the individual's ability to use and respond to language. Of particular interest is the way in which language and thought are related, but other important areas of research include the learning of language by children and the perception and processing of thought by the brain.

Quechua. Group of languages from the Andes whose history dates back at least to the

Inca Empire of the 15th century. There are still about 5 million speakers, mainly in Peru and Ecuador, but the numbers are diminishing under the influence of Spanish.

radio. Form of communication which depends on the transmission and reception of electromagnetic waves through the air. Practical radio was invented in 1895, when Guglielmo Marconi first transmitted a Morse message by radio telegraphy. Radio is generally thought of in terms of a formal broadcast by, for example, a politician or entertainer to a passive audience; however, short-wave radio is also – and increasingly – used as a two-way means of communication between members of a particular group, such as the police, taxi-drivers, soldiers and doctors.

The social, cultural and political importance of radio was quickly recognised, and its potential as a form of both instruction and entertainment is by no means exhausted. Politicians and propagandists were quick to make use of radio – for example, the American President Franklin D. Roosevelt's 'Fire-side Chats', the broadcasting of Hitler's speeches, and BBC broadcasts to occupied Europe during the Second World War – and it remains of paramount importance as a means of cultural and political influence. Radio sets were a familiar feature of European and US homes by the 1930s, and the development of cheap, portable transistor sets in the 1960s has meant that there is now one radio receiver for every five people in the world.

Experiments in the 'language' of radio (for example, the use of sound effects and voice contrasts) are continuing. In many countries, the state has a monopoly of radio (and television) broadcasting. The British Broadcasting Corporation was established on that basis in 1922 – but several commercial radio stations, financed by advertising, have been established in recent years. In the USA commercial radio has become the norm, and there are nearly 4,000 stations.

Many other applications of radio waves have been developed, such as radio astronomy and radar.

register. Variety of language recognisable as having a specific social use – for example, the language of advertising, religion, science or law. In order to be classified as a register there must be clear formal markers, such as the use of 'thou' in several kinds of religious English, or the complex syntax and phraseology of legal language.

rhetoric. Study of the principles which determine the success of communications whether written or spoken. The subject was developed in Greece in about the 5th century BC as a training in the art of public speaking, and later became an essential part of educational discipline, involving the formal studies of figures of speech, types of argument, etc. This traditional, literary interpretation of the term is reflected in the common – and often derogatory – use of the word 'rhetorical' to mean 'elevated' or 'not everyday language' (for example, 'empty rhetoric', 'a politician's rhetoric', 'a rhetorical device'). In recent years its meaning has been extended to include all uses of language and the contexts in which successful communication takes place.

rhyme. The use of similar or identical sounds, particularly – though by no means exclusively – as line-endings in poetry. The

rhythm-slang

most familiar kind of rhyme is that in which both vowel and consonant sounds are shared by both rhyming words – for example, 'hand' and 'sand' – but much use is made of half-rhymes such as 'sand' and 'wind' or 'merry' and 'marry', and internal rhymes within rather than at the end of a line of verse. The function of rhyme is both to please the ear and provide a formal structure for a poem: particular forms of poem, such as the sonnet, the villanelle and the limerick, have formal rhyme structures. Rhyme is by no means essential to poetry. Much of Shakespeare's work, for example, is written in unrhymed blank verse. But rhymed poetry is generally easier to remember (and is, therefore, often used by advertisers and the inventors of slogans). Most children are introduced to literature through nursery rhymes.

rhythm. Perceived pattern of emphasis in both spoken and written language, which is interpreted as METRE at its most regular (in poetry, for example). Pitch, loudness and duration may all be used as the basis of a language's rhythm, and languages may be classified into various types in terms of their characteristic rhythms. For example, French and Spanish have rapid, staccato rhythms, compared with the more measured alternations of weak and strong stresses in English and German. The rhythmical contrast of accented and unaccented syllables is fundamental to poetry; individual writers (and speakers) will use the rhythms of the language in different ways.

root. That part of a word which constitutes its basic meaning after the removal of any AFFIX – for example, 'engine' and 'engineer'. In historical studies of language, a root is the original form from which subsequent words were derived – for example, the word 'crutch' comes, through Old English, from a Germanic root, *kruk*, meaning 'bend'.

RP. Usual abbreviation for 'received pronunciation', that ACCENT of British English which is geographically neutral and – since the last century – has been associated with those members of the middle and upper classes who received a public-school education. It is also known as a 'BBC' accent. In recent years, RP has been influenced by the urban accents of industrial England, so that mixed accents, involving elements of RP and regional speech, are increasingly heard.

rule. Statement in linguistics which describes a principle of language construction in grammar, pronunciation or vocabulary – for example, the rule that in English adjectives go before nouns. In the traditional grammars, many rules were prescriptive, stating what ought to be the case in linguistic usage rather than describing what actually occurred. For example, 'sentences should not end with prepositions' is – as this sentence indicates – not always adhered to. Recent linguistic research has paid increased attention to the possibility of establishing an abstract system of rules underlying the SURFACE STRUCTURE of language.

runes. The runic alphabet is preserved in some 4,000 inscriptions in northern Europe (especially Britain, Scandinavia and Iceland) dating from around the 3rd century AD. Its origin is unclear, though the possible influence of the Etruscan, Greek and Latin alphabets can be shown. The alphabet is sometimes known as the 'futhork', from the names of the first six letters of the earliest 24-letter script.

Russian. Also known as 'Great Russian', this language is spoken by over 130 million people as a mother-tongue, and by a similar number as a second language. It is the main official language of the USSR, and is widely taught in countries under Soviet influence. Russian is the main member of the East Slavic family of Indo-European. There are three main dialect areas – northern, southern and central; modern literary Russian is based on the dialect of Moscow. 'Old Russian' was in use until the 16th century. The modern language has been greatly influenced by borrowings from other European languages. Russian is the main language to use the CYRILLIC alphabet.

Sanskrit. The old Indo-Aryan language, which was revered both as a sacred language and as the classical literary language of the Hindus. Sanskrit means 'cultivated' or 'refined'. Vedic Sanskrit was used from around 1500 to 200 BC, and Classical Sanskrit from around 500 BC to AD 1000. The work of the Indian grammarian Pāṇini, who standardised the language in the 5th century BC, is still highly regarded for the technical linguistic skills it displays.

Sapir, Edward (1884-1939). American anthropologist known primarily for his studies of North American Indian languages and his views on the relationship between language and culture – in particular, that man can only perceive the world through the medium of the language he has learned. His most influential book, *Language*, was published in 1921.

Saussure, Ferdinand de (1857-1913). Swiss linguist who was one of the founders of modern LINGUISTICS, known especially for his view of language as a structured system, seen in the social context of its time. This view subsequently influenced the growth of STRUCTURALISM in linguistics. His influence as a teacher was very great, and his most influential work, his *Course in General Linguistics*, was in fact a reconstruction by two of his students, based on lecture notes and published posthumously in France in 1916.

semantics. Study of meaning in language. Sometimes known as semasiology or semiology (see SEMIOTICS), the subject includes two distinct traditions of enquiry, the philosophical and the linguistic. The first of these investigates the relationship between words and the phenomena in the real world which they describe (known as referents), and considers the conditions under which statements can be said to be true or false and the factors which affect the interpretation of language as used. The linguistic tradition includes the historical study of the meanings of words (ETYMOLOGY), the compilation of dictionaries (LEXICOGRAPHY), the analysis of the structural relationships between sets of words, or lexical items, and the links between semantics and other fields of linguistic enquiry, especially SYNTAX and STYLISTICS.

semaphore. Any system of visual signalling which uses movable arms, flags or signals. First developed by Claude Chappe in France in 1794 – he used rotating arms fixed to a post – semaphore systems are widely used in such areas as ship-to-ship communication and rail or air-traffic control.

semiotics. Study of signs or symbols, sometimes known as semiology. The term was first used by the English philosopher

John Locke in the 17th century, and was fundamental to the thinking of the 19th-century American philosopher Charles Peirce. The American semanticist Charles Morris suggested in 1938 three main subdivisions of the subject, corresponding to three branches of spoken or written language – namely, SYNTAX, SEMANTICS and pragmatics (how people use language). More recently, semiotics has come to be defined as the study of patterned human communication in all its forms, thus including LINGUISTICS as well as, for example, signs, codes and body movements. In the 1960s and 1970s semiotics was applied to studies of how various art forms, such as dance, drama, film, sculpture and painting, communicate meaning, as well as to other areas such as zoosemiotics, the study of animal communication.

shorthand. Any system which enables speech to be written down rapidly by using abbreviations or symbols to represent sounds and words. The best-known systems are those of Pitman and Gregg. The process of taking and reading shorthand is often called stenography. The fastest shorthand writers can attain speeds of over 200 words a minute.

sign language. Communication system in which body movement, primarily of the hands, is used for the expression of meaning. The most widely known sign languages are those used by the deaf, which include systems which closely approximate to real language (such as the Piaget-Gorman System, used in parts of Britain) as well as those such as the American Sign Language, which indicate entire concepts. Other complex sign systems include those used by American Indian tribes. Less complex are the sign systems used by various professions such as deep-sea diving, air-traffic control, road-traffic direction and radio and television production.

signal. Form of communication, usually pre-arranged or anticipated, which indicates that a situation has changed or that a particular event is about to occur; for example, a conductor raising his baton announces that the music is about to begin. Signals range from the very simple – such as a spontaneous shout – to complex systems of contrasts which have to be learned in order to be understood, such as the Morse code.

simile. Figure of speech in which an object or activity is compared in a vivid and usually exaggerated way with another – to which it generally has no other similarity – for reasons of emphasis or clarification. Similes can be recognised by their use of such words as 'like' and 'as' – for example, 'he was as strong as an ox' or 'I jumped like a scalded cat'. Extremely imaginative and vivid similes can be found in literature, and particularly in poetry – producing the extended or 'epic' simile (associated with such authors as Homer and Milton) when developed at length.

slang. Vivid and often irreverent non-standard language used in informal speech – for example, to 'kick the bucket' (to die), 'grub' or 'nosh' (food). Although grammatical constructions and pronunciations can also be 'slangy', the term applies especially to VOCABULARY. New slang words are continually being introduced and old words given new meanings, adding a fresh, lively dimension to the use of language. Topical events such as wars and revolutions often generate a fresh crop of slang words: for example, a 'bolshie' person – one who is not willing

to co-operate – stems from 'bolshhevik'. Many regional variations may not be intelligible to the outsider (for example, Cockney rhyming slang or Australian 'strine'). Although many slang words are absorbed into standard English in due course, the widespread use of slang in a colloquial context has often led to its being criticised as an uneducated, impolite, unclear or lazy form of speech. Its use is generally avoided in formal spoken contexts, such as a parliamentary speech, and in writing. In a more restricted sense, however, slang may be encountered on more formal occasions, since social or occupational groups often develop their own slangs to facilitate communication among their members and provide a sense of identity – for example, in the legal, military or sporting professions.

sociolinguistics. Branch of LINGUISTICS which studies the relationship between linguistic and social variations – that is, the ways in which language is used by different social groupings. In its broadest sense, it covers the correlation between language patterns and ethnic groups, as the terms ethnolinguistics and anthropological linguistics suggest. But sociolinguistics also studies how more particular features of society, such as class, social role and personality type, influence the use of language. For example, the various social and personal pressures which lead an individual to address another by his formal title (Mr Smith), his second name (Smith), his first name (John) or an intimate form (Johnnie, Smithie) is the kind of sociolinguistic topic which may be peculiarly complex to investigate.

sound law. Term used in historical studies of language to describe any principle which is thought to govern the way in which sounds change their quality at different periods in the history of a language. For example, consonant sounds similar to *p* in Indo-European developed into sounds which were similar to *f* in the Germanic languages (see p. 876). The regularity of this and associated developments led 19th-century philologists to talk in terms of 'laws' governing such changes.

speech act. Term used in LINGUISTICS and philosophy to describe language in terms of its social function and the reasons for its use – for example, to question, deride or command. The function of language depends on the context in which it is used, and a statement may have a different – or additional – meaning to that conveyed by its structure alone. An example of the contrast between function and structure is the teacher's statement, 'There's a piece of chalk on the floor, Smith', which is structurally a grammatical statement, but functionally a command.

speech community. Group of people identifiable by a common language. A community is sometimes equivalent to a country – for example, the Hungarian speech community is largely identifiable with Hungary as a political entity – but very often it is not. English, while constituting a speech community, is not restricted to a single country.

standard language. The DIALECT used in a SPEECH COMMUNITY, on which 'correct' grammatical usage, spelling, pronunciation and other factors are based. Standard language usually emerges as the written form of the language, thus reinforcing its status as the norm against which other variations should be compared, and is used as the medium of

education, law, etc. Standard English is popularly known as 'the Queen's (or King's) English' – hence such phrases as 'He can hardly speak the Queen's English'. Standard English is descended from the Middle English dialect of the London area, standard French from the dialect of the Paris area.

stress. Degree of intensity or loudness with which a syllable is pronounced. Changing the stress of a syllable can sometimes alter the meaning of a word – changing, for example, a noun (an 'imprint') into a verb (to 'imprint'). There is some disagreement about where the stress should be laid in certain words ('controversy' or 'controvercy'). Stress is closely connected with the RHYTHM of a language and, together with INTONATION, constitutes the most important feature of its SUPRASEGMENTAL patterns of sound.

structuralism. Analysis of the underlying networks of relationships characteristic of human institutions and behaviour. Structuralists believe that activities as diverse as dancing, politics, courtship, business, religion – and even eating a meal – are performed according to formal rituals based on certain general principles. The elaborate and formalised ritual of a court of law provides an obvious example, but less rigidly structured manifestations of behaviour – including, for example, the layout of a newspaper or the arrangement of a room – can be analysed in structuralist terms. In language the aim of structuralism is to show the network of formal and semantic relationships which connect sounds, words and phrases. The French anthropologist Claude Lévi-Strauss was among the first to develop this general application of structuralism, which he derived from the structuralist view of language found in LINGUISTICS. Linguistic structuralism itself was originated by the Swiss linguist Ferdinand de SAUSSURE, and was later developed by the Prague school of linguistics under the influence of the Russian scholar N. Trubetsky (1890-1938) and Roman JAKOBSON. Its main expression is to be found in the American methods of linguistic analysis developed principally between 1930 and 1950, and associated with the work of Leonard Bloomfield (1887-1949).

stylistics. Branch of LINGUISTICS which studies the different uses people make of their language, and tries to establish principles to explain this variability and techniques for analysing it. The study of literary style is a particularly important aspect of the subject, but the linguistic usages and idiosyncracies of particular social groups or professions (such as scientists, lawyers or jazz musicians) are also of considerable interest.

suprasegmental. Term denoting linguistic effects in speech which cannot be identified as single segments – in other words, with particular vowels or consonants – but which embrace a series of sounds. The main suprasegmental features are STRESS and INTONATION, but any 'tone of voice' would be included (for example, a harsh, imploring or querulous tone of voice).

surface structure. The immediately apparent structure of a sentence, according to Noam CHOMSKY's theory of generative grammar. As such, it is considered to be of less importance than the analysis of DEEP STRUCTURE, since it is not a reliable guide to all the grammatical relationships contained in a sentence. For example, in the sentences 'John is easy to please' and 'John is eager to

please', the surface structures are identical, yet they fail to indicate that 'John' is the 'deep' (or 'logical') object of the first sentence, but the subject of the second.

Swahili. The most widespread BANTU language, spoken by around 15 million people, mainly in Kenya and Tanzania (where it is the national language). Its importance is far greater than this figure suggests, since it is a LINGUA FRANCA in East Africa. A literary form, in Arabic script, dates from the early 18th century; the language has in fact been influenced by Arabic.

Sweet, Henry (1845-1912). British phonetician and language scholar, who pioneered work in several areas of grammar and philology. He may have been the prototype for George Bernard Shaw's Professor Henry Higgins.

syllabary. A non-alphabetic writing system in which each sign stands for a syllable – either a vowel or a combination of a vowel and a consonant. Early Greek, Linear B and Japanese are examples of syllabic scripts. Syllabaries are an improvement on such writing systems as those which use LOGOGRAMS, but lack the economy and flexibility of the ALPHABET.

symbol. Device which represents an object, event or idea, often communicating a deep cultural or personal meaning: for example, mourning is symbolised in the West by the wearing of black, Christianity by the Cross, bravery by a lion, and the USA by the figure of Uncle Sam. Much use is made of symbols in literature, since symbolic objects or figures – such as Hercules or a rose – can be used to stand for and introduce a wide range of ideas and associations. Symbolism, a 19th-century literary movement originating in France, has had an enormous influence on the poetry of this century. Symbols are widely used by, among others, advertisers and politicians: for example, Churchill's 'V-sign'. More specifically, symbols include any mark which represents a feature of a language such as a sound, letter or word – for example, the symbols of mathematics (+, =, – and so on) and of PHONETIC TRANSCRIPTION.

synchronic. Form of language study in which a language is analysed as it exists at a given point in time, irrespective of its history or anticipated future development. The synchronic study of language was originated by Ferdinand de SAUSSURE as a reaction against the 19th-century emphasis on DIACHRONIC linguistic enquiry, in which languages were studied from an almost exclusively historical point of view. Most modern linguistic research is synchronic in aim.

synonym. Word identical in meaning to another. Very few words are totally synonymous, and some lexicologists doubt if it is possible to find two words which are equivalent in every single nuance of meaning. However, synonyms exist for most everyday purposes – for example; 'That shop has an excellent choice/selection of books'.

syntax. Study of the principles and techniques of sentence formation and sequence. The subject includes such matters as the study of word order, the analysis of phrase and clause structure, and the relationship between sentences and sentence parts (dividing a sentence for example, into subject and object).

television. Since the invention of television in 1926 by John Logie Baird, the

thesaurus—Yiddish

industry has grown enormously in size, quality and range of applications. There were nearly 300 million television sets in use throughout the world in the mid-1970s. New areas of application for the medium are being developed. These include the use of video-cassette recording systems for home use (which enable the private individual – or teacher or businessman – to show his own films through a television set), the videotelephone, cable television for the broadcasting of programmes about local issues, and closed-circuit television in education, medicine, shops and factories.

Material is either broadcast 'live' – that is, events are broadcast at the same time as they are filmed – or in a pre-recorded form. Television's scope is extremely broad, ranging from the mounting of major dramatic productions and educational programmes (as in Britain's Open University) to the routine coverage of daily news and current affairs. The development of satellite communications has made it possible to broadcast instantaneous pictures from any part of the world – adding weight to the prophecy by Marshall McLuhan that the world is becoming an 'electronic village'. Much debate has taken place concerning the showing of scenes of sex and violence on television, and their influence on children in particular. Concern has also been expressed about the passivity of television-watching as a form of entertainment.

thesaurus. Collection of words, sayings and expressions arranged according to subject matter, and used in order to find the exact word needed in a particular context or the SYNONYM of a particular word. The best-known collection of synonyms in English is Peter Mark Roget's *Thesaurus*, first published in 1852 but revised many times since then. A thesaurus is quite different from a DICTIONARY: anyone using a dictionary knows the word but needs to find out more about its meaning, spelling or use; a thesaurus is used when the meaning is understood, but the person needs to find the most appropriate word from those available.

tone-language. A language in which words, while remaining identical in vowel and consonant structure, acquire different meanings when spoken at different pitches (high, low, falling, level, rising, and so on). Many African and Asian languages – such as Chinese – are characterised by their use of tones. Tones should be distinguished from a language's INTONATION, which is a melodic contour affecting whole sentences, and not the meaning of individual words.

transcription. Term used in phonetics (see p. 878) to describe any system for notating the sounds of speech, such as the INTERNATIONAL PHONETIC ALPHABET. There are several kinds of transcription. Depending on the degree of detail in the sounds being transcribed, they may be 'broad' (containing relatively little detail) or 'narrow' (containing the maximum amount of phonetic information). In a more general sense, transcription means the copying out in writing of, for example, a speech or television play.

translation. To translate is to establish the equivalent meaning of the words and constructions of one language in those of another – not always their exact meanings. Given the various nuances of meaning a word has in a particular language, the distinctive rhythm and resonance of the language itself, it is unlikely that perfect translation is possible.

Shades of meaning and beauty of expression will be lost in the process of translation. This applies particularly to poetry, which many believe to be virtually untranslatable. However, perfectly acceptable translations of literary works such as plays and novels have been made, without which most readers would be unable to read the masterpieces of other languages. Nevertheless, the great bulk of the world's written output remains untranslated. There are several different kinds of translation, ranging from literal 'word-for-word' translations to freer 'sentence-for-sentence' ones.

transliteration. Representing the words of one language in the writing system of another. Transliteration is widely used in teaching foreign languages, since an unfamiliar alphabet or spelling system can be transliterated into their English equivalents.

U and non-U. Terms introduced into popular discussion of language in Britain in the 1950s by Professor Alan Ross, and popularised by the novelist Nancy Mitford. U stood for 'upper-class', and the division of words into U (acceptable to the upper class) and non-U (their vulgar equivalents) both reflected and reinforced the ways in which English class differences are illustrated by the use of language. For example, to describe the midday meal as 'lunch' was considered U, but to call it 'dinner' was non-U. Examples quoted ranged from the anachronistic ('looking-glass' was U, 'mirror' non-U) to the contentious and even divisive ('lavatory' was U, 'toilet' non-U; 'what?' was U, 'pardon?' non-U).

variety. Style of language which is related to a particular activity or social situation. For example, traditional religious English is a variety since it contains several linguistic features which are now used almost exclusively in a religious context, such as the use of 'thou', the vocative 'O', and words such as 'vouchsafe'.

vernacular. The native language or dialect of a SPEECH COMMUNITY, as distinct from any standard or foreign language which may have been imposed on it from outside. For example, the use of English in Australia contrasts with the vernaculars of the indigenous Aborigines, and the dialect of 'Standard English' with the vernacular dialects of the major English cities.

vocabulary. Stock of words, or lexical items, which a language has available for the expression of meaning: sometimes referred to as its lexicon. The size of a language's vocabulary is always changing, as new words are introduced, old words die and the meanings of words change. Just as some languages – such as English – have wider vocabularies than others, so some individuals have more words at their disposal than others. Vocabulary can be studied in a DICTIONARY and a THESAURUS, and forms a part of SEMANTICS.

vocal organs. All those parts of the body which contribute to the production of human speech sounds – especially the lips, tongue, teeth, palate, pharynx, larynx, nose and lungs.

voice quality. The particular characteristics of a human voice which enable people to recognise the speaker, or identify him as being in a particular physical or

psychological state – suffering from a cold, for example, or in a state of shock.

voiceprint. Also known as a voicegraph, a voiceprint is produced by a device which analyses speech sounds and presents their main features visually, so that the individual characteristics of a voice can be identified and contrasted with those of other voices. Voiceprints have been compared with fingerprints, and have occasionally been introduced into court-rooms as evidence of identification, especially in the USA. However, their use is extremely controversial, as it is possible to alter the voice to produce a very different-looking voiceprint.

vowel. Those speech sounds – represented by the letters *a*, *e*, *i*, *o* and *u* – which can form a syllable, either by themselves or in conjunction with a CONSONANT. Vowels can be classified according to the position of the tongue and the shape of the lips when speaking – whether the tongue is at the front or the back of the mouth (*bin* as opposed to *barn*), high or low (*bin* as opposed to *ben*), whether the lips are rounded or unrounded (*bin* as opposed to *boon*). Unlike consonants, vowels lack audible friction when sounded.

Webster, Noah (1758-1843). American lexicographer and man of letters, remembered mainly for his *American Dictionary of the English Language* (1828), which continues to be edited and updated today. He also contributed widely to studies of English spelling and grammar, always emphasising the distinctive American usage and spelling.

Welsh. A CELTIC language spoken primarily in Wales by about half a million people, and by several thousand in Patagonia, where 150 Welsh people settled in 1865. There is a considerable medieval Welsh literature, especially bardic poetry. The translation of the Bible into Welsh, in 1588, was a major influence on the development of the standard language. Despite revivals in the 18th and 19th centuries, Welsh has been declining under the influence of English. However, an unprecedented revival has taken place during this century, helped by the growth of Welsh nationalism and a fear that the language was in danger of dying out altogether. The official status of Welsh in administration, education and law improved considerably in the 1960s.

Whorf, Benjamin Lee (1897-1941). American linguist whose studies of American Indian languages led him to develop a theory that the ways in which people perceive the world are conditioned by the language they use. This is generally known as the 'Whorfian hypothesis'. (See p. 884.)

Wiener, Norbert (1894-1964). American mathematician and founder of the science of CYBERNETICS (see also p. 997), the theoretical study of control mechanisms. His book *Cybernetics* – which was published in 1948 – is sub-titled 'Control and Communication in the Animal and the Machine'.

Yiddish. Colloquial language of central and east European Jews, which developed from High German, perhaps as early as the 9th century. Written in the HEBREW alphabet, the language has developed a rich literature, especially since the 19th century. In its spoken form, it is widely used as a Jewish vernacular throughout Europe and the USA.