

Character-building

How do writing systems such as China's deal with the twenty-first century?

Alan L. Mackay

The alphabet's place as the basis of European culture is so fundamental an assumption that in considering the role of the word — "In the beginning was the Word" — we may forget that other people have different views and that Faust countered with: "In the beginning was the deed." After all, the alphabet provides us with powerful analogies for science. Two millennia before the genetic code was broken, Epicurus observed: "The atoms come together in different order and position, like the letters which, though they are few, yet, by being placed together in different ways, produce innumerable words."

Yet the Chinese writing system — of characters that represent a word's meaning, not its sound — has survived for several millennia, to the extent that some glyphs of 3,000 years ago are still understandable today. While other systems deriving from pictographs, such as those of the ancient Middle East, succumbed to competition from alphabetic and phonetic systems, the single set of characters used throughout the empire to represent all China's many different dialects has served as a powerful unifying administrative tool.

The typewriter, the printing-press and the electric telegraph were absorbed in China with the help of some not-very-satisfactory technological fixes, and the need to use computers might have put an end to the traditional writing system. Instead, the computer has come to the rescue and Chinese characters have a new life. It is a matter of amazement to visitors from the alphabetic world that a modern civilization can be conducted with this system, which even copes with voice-recognition software. In addition to the traditional shopping streets in Beijing selling jade and silks, there is now a long street of computer shops. Even pedal rickshaws have been adapted in the district to enable purchasers to bring home the large boxes containing their new computers.

How does the Chinese writing system cope with the new concepts regularly thrown up by science, such as plutonium and the Internet? Despite many millennia without the alphabet, China was, in the early 1950s, on the point of giving up the traditional characters in favour of a phonetic alphabet to meet twentieth-century needs. In fact, although a phonetic alphabet, *Pinyin*, is now universally taught as a supplement, characters continue to be primary. Older people make mistakes with *Pinyin*, but children are

absolutely accurate. New concepts get new words and sometimes new characters.

They adapt in a way that C. P. Snow, who spoke tellingly of the growing gulf between the literary and scientific worlds, would have admired. Snow used to go around cocktail parties asking people if they could explain the Second Law of Thermodynamics. "A good many times I have been present at gatherings of people who, by the standards of traditional culture, are thought highly educated and who have with considerable gusto been expressing their incredulity at the illiteracy of scientists," he said in his 1959 Rede Lecture "The Two Cultures and the Scientific Revolution". "Once or twice I have been provoked and have asked the company how many of them could describe the Second Law of Thermodynamics. The response was cold; it was also negative."

It happens that there is an exactly corresponding test for the Chinese cultural area which also divides the literary and scientific populations. Ask your Chinese friends if they know the character shown above.

A Chinese character usually has two parts. On the left or above is the 'radical', which gives some hint of the meaning. Characters are to be found in the dictionary by looking up the radical, of which there were traditionally 214 (although the inventory has been modified), and then counting the brush strokes necessary to write the remainder. The part beside the radical is usually called the 'phonetic', and gives some guide to the pronunciation. Old components are used in new combinations.

Thus the character in the figure has the fire radical on the left and on the right it has, as phonetic, the character for 'merchant', which is pronounced *shang*. The character as a whole means entropy, and is also pronounced *shang*. I suppose that it was created by a committee and it now occurs in the international standard matrix of characters usually called GB-2312, which is known to all Chinese word processors (though not to all people). In computer systems each character is coded by two ASCII bytes or 16 bits;

The computer has come to the rescue and Chinese characters have a new electronic life.



A source of confusion: entropy.

there are some 6,000 Chinese characters plus the main alphabets in the standard font.

People remember characters by their real or imagined etymologies, so that the association of fire or energy with buying and selling is a very appropriate mnemonic for the way to write 'entropy'. In a more entropy-conscious world, if energy were to be priced according to the temperature at which it is to be delivered, people would not use electricity for space-heating.

In spite of appearing to be a stream of single characters, the Chinese language consists mainly of polysyllabic words made up of several characters. With a modern word processor, if you type in a single syllable, the program will offer you perhaps a dozen characters all pronounced in the same way. You could choose one of them, but if you continue to type successive phonetic syllables of the word or words in a phrase, there is usually a unique output of characters. Entering the phonetic *shang* brings up eleven characters, with 'entropy' as the least likely choice.

The enunciation of the phonetic *shang* by itself is thus not enough to bring up the meaning 'entropy', so a teacher has to write the character on the board or, in conversation, launch some explanation of what is being talked about. Nevertheless, at a Chinese version of C. P. Snow's cocktail parties, people can talk about whatever may be necessary, exploring each other's knowledge or ignorance, and later repair any deficiencies using the Chinese Internet. Thus the Chinese language and its writing system continually prove to be adaptable to changing requirements and have responded creatively to the challenge of electronic communication. ■

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