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USAGES OF CHINESE WRITING

For three centuries Europe has been holding forth on the advantages and disadvantages of the Chinese system of writing.

At first, judgments were positive. The abundant correspondence "à la Chine" of the missionaries inspired a number of commentaries in the early years of the 17th century and even roused the admiration of Leibnitz for a system which he considered, briefly, completely rational. At that time, the Chinese Empire was one of the most important in the world, and the number of techniques coming from the East was not negligible. But while in Europe modern science was being confirmed, China's evolution proceeded very slowly.

Two centuries later, in the 19th century, the direct confrontation between the two civilizations showed China's immense delay in scientific and technical matters during that interval, as well as its political weakness. Since then, many commentators have seen one of the causes of these "inferiorities" as the Chinese writing system. In support of their opinion, they invoke the very real difficulties involved in learning Chinese characters, which, not being within the reach of everyone, do not favor either democracy or equality of opportunity.

On another plane, writing became theoretically marginal, first in the philosophy, then in the study itself of language: modern linguistics was established as a science of the spoken word.

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For Saussure, the spoken word takes precedence over the written, which is only the "photograph" of the former; for Sapir, "Written forms are secondary symbols for spoken symbols, symbols of symbols." In this perspective, the faithful reproduction of the spoken form being the sole function of writing, that of the alphabetical type appears to be by far the best. Since then, the belief has spread—and is almost universally accepted—that the progress of civilization in any society has gone hand in hand with the adoption of an alphabet, a necessary condition for modernity.

Now, it can be undeniably established today that the use of characters did not impede either the Chinese Revolution or Japanese economic expansion and that the chances—or the risks—of an alphabet reform in China or Japan seem to be very slight.

However, we in Europe continue to see a linear progress in the history of writing, going from primitive "pictographs" to more elaborate systems of the "ideograph" type and terminating in alphabetical systems achieving the highest degree of abstraction. I will not attempt here to prove any sort of superiority of the Chinese system over our alphabets, but I will try to show that this system, contrary to alphabetical transcriptions of Chinese, is widely used, is well adapted to the development of scientific vocabularies and that the obstacles to its general use in China were not technical, but probably social and political.

ALPHABETICAL TRANSCRIPTIONS

For the Chinese language, alphabetical transcription is a marginal phenomenon. Since the beginning of our era, the Chinese have been in contact with writing systems which observe the sounds of language: Sanscrit, Tibetan, Ouighour, Mongol. As early as the 7th century phonological studies had led to an analysis of the Chinese syllable which would be able to serve as a basis for a phonetic transcription of the alphabetical type. If since that period the Chinese have not envisaged the adoption of such a system of writing—the sole attempt in this regard was made by a foreign dynasty, the Yuan (Mongol), and

was short-lived—it is not for lack of mastery of the technique but, undoubtedly, because they saw no need for it.

Since the Europeans have been in contact with China, they have created systems of alphabetical transcriptions for their own use: the first, by Matteo Ricci, dates from 1605. Because of the diversity of European languages, everyone understood Chinese in the terms of his own phonological system; there were soon more than thirty different transcriptions. In China itself, it was at first the missionaries who used such transcriptions. Then, at the beginning of this century, Chinese reformers thought that the substitution of alphabetical writing for characters would be a powerful factor in modernization.

The defenders of the Chinese system of writing were mainly traditionalists attached to a prestigious cultural heritage and those who feared that its suppression would destroy national unity. In fact, Chinese writing can transcribe dialects which are quite different from each other: a given character always has the same meaning, whatever its pronuncation in such or such a region. So it is that Chinese speaking different dialects, unable to communicate by the spoken word, easily understand each other's written words. This function of writing would become obsolete if all spoke the same language. But the promotion of a "common language" (*putonghua*) is one of the essential aims of the linguistic policy of the Chinese People's Republic.

For a long time, the defense of the Chinese system of writing was considerd reactionary, both in China and abroad. After fifty years of debate which dealt with the type of graphics to use (Latin, Cyrillic or even characters similar to the Japanese *kana*, derived from Chinese characters) and with the variety of Chinese to serve as a basis, the People's Republic in 1958 adopted a system of transcription called *pinyin*: it is used in the present article. The creation of this writing of Chinese in Latin letters (there are twenty-six) answered both long and short term objectives.

The short term objective was to give uniform pronunciation to children learning to read: *pinyin*, serving as a guide for the correct pronunciation of the characters, could have an indirect effect on the spoken language itself. This policy has been faith-

fully followed for the last nineteen years. The number of elementary texts and illustrated books for children which present a transcription in *pinyin* along with the text in characters is steadily increasing.

The long term objective does not exclude the idea that *pinyin* may one day replace characters. Opinions have been and remain divided. The specialists of the Committee for the Reform of Writing admitted in the beginning that after a transition period the general use of characters would disappear except in institutes specializing in history, archaeology or ancient literature, and would preserve in secondary schools a place analogous to Latin in European instruction. These topics completely disappeared during the Cultural Revolution, but they have been taken up again in a new column in the newspaper *Guangming ribao*, which has relaunched and continues the campaign in favor of *pinyin*. The debate still remains strongly symbolic: the stakes in the recent conflict were the return to the transcription of the title on the covers of all the important magazines; this has now been done.

However, *pinyin* is not in common use among the Chinese people. Most of them do not know it; even the children who learned it at the beginning of their schooling are forgetting it, since they have not used it since. Even those who know foreign languages never use the alphabetical transcription for their own language. One would think that the total illiterates, those who do not know the characters, would offer the least resistance. This is not the case, because in the streets, in the marketplace, in the restaurants, in offices, everything is written in characters: to know how to read and write *pinyin* serves practically no purpose in the China of today.

We cannot speak for the future. The generalization of the "common language," which is preliminary to all radical reform, has made rapid progress, mainly because of mass media and the mobility of the people. But in the schools in the dialectical zones, there are still many teachers who do not speak the common language well. Once this obstacle is removed, an authoritarian and global reform could very well result in the suppression of characters. We must ask ourselves if this would really be progress.

By "writing" I mean writing in Chinese characters: is it a question of limited diffusion, an instrument of power in the hands of a restricted elite, or a tool used by all for the most diverse purposes?

To determine what proportion of the population "knows how to read and write," we must be precise about what this means to the Chinese. With an alphabetical writing, to know how to read it is necessary and sufficient to known the twenty-six letters of the alphabet; to know, for a given language, what sounds to associate them with; and to know how they are combined. Facility and silent reading are acquired and maintained by practice. Moreover, an intelligent reading implies that the meanings of the words read are known; writing is limited in the same way. In Chinese, there is no "beginning set" comparable to our twenty-six letters. It may be said that a child of two and a half years who recognizes and traces the simple character *ren*, "man" (in two strokes) can read and write this character. But in order to read the shortest text, many more than twenty-six characters must be known. The number of characters in a text is extremely variable: it depends on the number of different words there are in the text.

Chinese words are made up of one or more syllables, each of which corresponds to a character and a meaning. For a given syllable in the language there are as many different characters as there are different meanings. For example, standard dictionaries list sixty characters for the syllable *yì* and eight characters for the syllable *bà*. Thus there are many more different characters than there are syllables.

A character is made up of strokes, segments of lines more or less extended and diversely oriented, of which the types are not numerous—a dozen. The strokes are organized in "elements of characters," or sub-patterns, some of which make up simple characters having a meaning; others are only parts of complex characters. The number of these elements is never more than several hundred: the great majority of the characters are complex, that is, they are composed of parts each of which may be recognized as a whole. If this were not the case,

and one had to understand each character by analyzing the nature, number and placement of its strokes, the effort of memorizing would be almost super-human. The number of these graphic elements is limited [1] but the number of their possible combinations is so high that we could say it is practically unlimited. Only a few of these combinations are actually realizable.

A character can only be analyzed in a graphic form. In its linguistic function it appears as a unity; it is the "minimum sign." The number of these unities cannot be precisely stated, since it varies according to periods and speakers. It is in any case greatly inferior to the number of words, since, there also, a complex articulation exists: the unity of meaning pronounced in a syllable and written in a character may be free (a monosyllabic word) or bound (a part of a word). For a given situation in the language, certain characters function on both levels, while others are always bound and thus never constitute a syntactic unity. The proportions have varied according to epochs and styles: there were more monosyllabic words in the ancient classical language (*wenyan*) than there are in modern literary language; at present there are many more monosyllabic words in popular speech than in the newspapers.

If we collated all the characters known since Chinese writing came into existence, even if we abstracted the variants we would arrive at a large figure, on the order of 80,000, it is said. But this figure has no real significance. One of the most important lexicographical works, the dictionary compiled by order of the Emperor Kangxi and completed in 1716, lists nearly 50,000 characters. It is possible that in days gone by scholars eager to succeed in the highest examinations of the mandarinate were able to assimilate this mass, but this is not pertinent to the present functioning of writing. It is paradoxical that we Occidentals derive our idea of Chinese writing from the circumstances which produced all this jumble of rare characters,

[1] A recent analysis conducted in Japan shows 250 basic components of Chinese characters. Cf. Tashiyuki Sakai, Makoto Nagao, and Hidekozu Terai, "A Description of Chinese Characters Using Sub-patterns," in *Information Processing in Japan*, 1970, X.

literary games or bureaucratic delirium rather than from the normal and daily usage of writing.

At present, the most popular dictionaries in the People's Republic define between six and nine thousand characters, a little more than six thousand for the *Student's Little Dictionary* (*Xiao Xuesheng zidian*) and eight thousand five hundred for the *Dictionary of the New China* (*Xinhua zidian*), which is considered the most official dictionary of characters and which has had many reprints.[2] The number of different characters used by a given author is still lower: less than four thousand have been verified in the first four volumes of the *Selected Works of President Mao.*

The basic standards have been set[3] at one thousand five hundred characters for peasants and two thousand for workers. At this level, people can understand the simplest popular works, but they often come across characters which they do not know and which they must learn one at a time according to their needs.

The learning of characters which transcribe unfamiliar words implies the preliminary or parallel assimilation of those words; it is much more difficult than learning characters corresponding to a known vocabulary. In the first instance, a graphic sign, a syllable and a meaning must be memorized all at the same time; in the second, it suffices to learn a graphic sign and relate it to a sound having an already known meaning. Up to a certain level, the writing competence of an individual thus largely depends on the extent of his spoken vocabulary. Beyond a certain point, there is no doubt an inversion of the process and the language can be enriched directly by reading.

We could speculate on the number of Chinese knowing how to read and write. According to Kathleen Gough[4] the level of the practice of writing in China in the periods of "high culture" would be comparable to that of Greece in 500 B.C., for which it is estimated that one-half the men and one-fifth

[2] Eight million in 1965, and there were more editions after a revised and slightly larger version appeared in June, 1971.

[3] Youguang Zhou, *Hanzi gaige gailun* (Notes on the Reform of Chinese Writing), Peking, 1961. Second ed. 1964, p. 328 ff.

[4] Jack Goody, "Implications of Literacy in Traditional China and India," in *Literacy in Traditional Societies*, Cambridge University Press, 1968.

of the women possessed this faculty. Such an assertion is unverifiable, and rather than discuss it, I prefer to remark on some of the numerous indications of diffusion which are at our disposal. They suggest that: 1) there are great differences according to periods: this diffusion has, in short, a history, with highs and lows; 2) the contrast between town and country has always been strong, and still is: we know that writing is widely diffused in the cities, whereas large numbers of peasants are illiterate. The rural areas, however, should not be thought of as "illiterate zones:" it seems that there have almost always been people knowing how to read and write even in the smallest villages.

Let us quote some facts. We know, for example, that a controversy arose in 536 B.C., when a penal code was struck in bronze, over whether it was wise to permit the people access to this code. Whatever the broader meaning of the term translated here as "people" is, it designates a larger group than that of only government scribes.[5] In the China of the Hans, around 145 B.C., the State maintained rural schools at the elementary level.[6] We also know that the "forest of pillars" set up at Lo Yang in front of the Imperial College, bearing the texts of the Classics[7] engraved on stone, attracted such crowds that the police were called to control traffic and maintain order. Later, in the 13th century, Marco Polo testified: "Everyone writes his name on the door of his house, and that of his wife and children, as well as those of his slaves and all other persons belonging to the household. It is also written how many camels he has [...]".[8]

The idea that the majority of Chinese were illiterate was confirmed by the Occidentals who were spread throughout China from the middle of the 19th century. It is true that at that time the country was in a period of decadence following two centuries of Manchu domination; the situation did not improve in

[5] In *Tso Tchouan* (Tchao, 6th year). Cf. *Tch'ouen ts'iou et Tcho Tchouan*, Chinese text with translation in French by S. Couvreur, S. J., Paris, 1914, III, p. 116 ff.

[6] Quoted by K. Gough, *op. cit.*, from Needham.

[7] Canonical books of Confucianism.

[8] Marco Polo, *La Description du Monde*, French translation by L. Hambis, Paris, 1955.

the sucessive decades, in spite of the Revolution of 1911 and the attempts at reform which followed it.

Since 1949 there has been an effort in the People's Republic to teach writing to everyone. The effort has been principally directed toward the younger generations, the object being to assure as quickly as possible the mastery of writing in characters to children. This has been realized rather rapidly in the towns,[9] where now all children go to primary school and a large proportion go on to four or six years of secondary education. In the rural areas, it seems that more than 80 percent of the children go to school, but for varying lengths of time. The majority of the peasants' children still have access only to the primary schools, which assures them a correct basis of reading and writing, providing they have occasion to practice and perfect them later on. But the "context of writing" is infinitely less dense in the country than it is in the towns.

As for illiterate adults, spectacular campaigns for learning to write have been launched, but we have no precise measurements of their effectiveness. The young have been encouraged to teach their elders; however, this endeavor could only be dircted toward aged persons disposing of their own time: the benefit was mainly symbolic, with the reversal of the traditional Confucian concept. As for the working generations, peasants who have responsibilities in their production teams, brigades or communes are sent to school for special courses which will prepare them for management and accounting.

As far as the activity of the young people is concerned, the image which was prevalent in the fifties of the little girl teaching her grandmother has been replaced by the reality of the presence in rural areas of graduates of urban secondary schools: the number of young people involved in this program during the last twenty years would have been around 60,000,000. They are the animators of all sorts of groups, where reading and writing have their part, thus creating conditions for practice among the young peasants of their generation. The recent decision no longer to send educated young people too far from their place

[9] The population of the towns is estimated at around 20 percent of the total population.

of origin may reduce the magnitude of this phenomenon in zones where there is little urbanization.

In a general way, political meetings play a considerable educative role; the participants take turns reading aloud the text to be commented upon. Thus it happened that during the Cultural Revolution the *Little Red Book* of President Mao was used as a reading text. This of course presents a problem of vocabulary: the words would be mostly those heard on the radio or in political speeches. Nonetheless, the people who have read and reread these texts have acquired a training which enables them to read and write a larger vocabulary more easily.

Can one read Chinese without being able to write it? Considering the importance of the combination of the strokes in memorizing the characters, it would seem *a priori* doubtful. Evidence suggests that at present reading is more frequent than writing, among the rank and file of the Chinese, but given the lack of systematic inquiry, the question remains open.

Writing is indispensable for bookkeeping and management. It is used in addition for *copying* political texts on the blackboard, on posters or in individual notebooks. To copy, for the Occidentals, is a dreary scholastic chore; for Chinese calligraphers it is to re-create the original work: the effect obtained by the brush on the slightly porous paper is in proportion to the time spent in executing the figure, and one could go so far as to say that to copy a beautiful calligraphy is to rediscover the rhythm and inspiration of the author. If this is no longer the question—although the posters with large characters (*dazibao*) strive for an effect on the senses of which our only equivalent is that of the orator—it is still true that copying Chinese characters is not a boring activity and is the best method for remembering them.

Another way of approaching the question of writing is to inquire into the diversity of written texts.

The content of bibliographies gives an idea of the written works considered worthy of appearing in the imperial libraries of ancient China. The History (*shi*) section comprises dynastic history, law, treatises by civil servants, geography, genealogies and archives; the Philosophy (*zi*) section, philosophers of the

different schools, philology, treatises on agriculture, strategy, astronomy and medicine. The Classics (*jing*) section contained the canonic books of Confucianism, and finally, the Anthologies (*ji*) section contained poetry, literary collections and encyclopedias.

Alongside the great imperial collections, a singular institution contributed to the preservation, organization and diffusion of texts: when a scholar had assembled a library of a certain importance, specialized or more often reflecting his own personal taste, he had it partly or entirely reproduced and thus founded a "collection" (*congshu*).

Autobiography, which is not a catalogued item but is found in many forms, often inserted in the most official documents,[10] testifies to the Chinese taste—from as early as 200 B.C.—for expressing personal feelings and individual attitudes toward life.

Plays, novels or edifying Buddhist tales, which did not have a place in official libraries, circulated in both written and oral form: thirty years ago the repertory of storytellers still included all the masterpieces of this literature, and one becomes lost in the underbrush of the written and oral variants.

We also know that the habit of writing letters was very widespread in this vast country where there was a great mobility of people, due to business or pleasure trips, flights before invaders or natural disasters and changes in administration (civil servants were not usually appointed to serve in their native provinces.)

Finally, the administrative report was a highly developed form at all levels: this bureaucratic activity was only rarely the place for personal expression, but it maintained a certain familiarity with writing throughout China.

More specifically Chinese are the written works for special circumstances, the poems or aphorisms offered and displayed on all public or private occasions. It could be said that in the decor of Chinese festivals, writing holds a place analogous to that of flowers with us. This is as true today for the launching

[10] Cf. Yves Hervouet, "L'autobiographie dans la Chine traditionelle," in *Etudes d'histoire et de littérature chinoises offertes au Professeur Jaroslaw Prusek,* Paris, 1976.

of a large ship as it was formerly for the commemorative festival of a private event.

Translation, a specific technique of writing and a vehicle of profound linguistic disturbances, has a long history in a China which was open to the West and often invaded from the North. The most essential translations were of Buddhist Scriptures—in Sanscrit, Arab or Persian texts, the edicts of Mongol or Manchu conquerors. The establishment of contact with the Occident in the 17th century (but more particularly from the beginning of the 19th) gave a considerable extension to this genre and was responsible for the creation of a host of neologisms which presented graphic and linguistic problems: these will be discussed further on in this paper. Without claiming to give a complete list, we mention the most widely-diffused works: the Holy Scriptures, Aesop's *Fables*, Montesquieu, Stuart Mill, Darwin, Balzac, de Maupassant, Dostoyevsky, Turgenev, Victor Hugo, hundreds of technical manuals, and, after 1917, Marx and Lenin.

New genres then made their appearance: drama: the novel of manners; the novella. And the modest autobiography became an intimate diary. As far as is known, this taste for autobiography has not been lost, and even if they are rarely published, except when the author is a hero, like Lei Feng,[11] innumerable diaries and memoirs are written every day in China.

Finally, the books "in three characters" or "in five characters," which are rhythmic and often illustrated texts, through which are simultaneously transmitted an encyclopedic knowledge, an organization of the world and a vocabulary, are vehicles for new contents in traditional forms. Since antiquity, the Chinese have loved to present their inventories of characters in the form of intelligible texts. Under the Emperor Xuan of the Zhou dynasty (end of the 9th-beginning of the 8th century B.C.) an attempt was made to codify the graphic system then in existence into a vocabulary of around nine thousand characters. These were arranged in a text divided into fifteen chapters; this text

[11] *Lei Feng riji*, "The Journal of Lei Feng," published for the first time in 1963. By June, 1965 more than 2,600,000 copies had been printed. New editions have recently appeared.

was officially adopted as pedagogical material.[12] The masterpiece of this genre is the *Classic of the Thousand Characters*, compiled around the 6th century A.D., which until recently was the first primer put into the hands of a child beginning to learn to write, generally at around five years of age. The thousand characters are all different and occur only once. They are arranged in verses of four rhymed syllables and treat, successively, Heaven (cosmology), Earth (natural sciences) and Man (ethics). The children recited the verses in sing-song and copied them over and over. We can imagine the conformity which would result from such an activity.

The present-day books "in three characters"[13] or "in five characters" are works of the same type, arranged in simple sentences of three or five characters. The rules of the game (the single appearance of each character) are no longer always observed and, of course, the content has changed, but the essential characteristics of the genre remain: rhythm, short and easy sequences, elementary ideas, moral connotation and, especially, the use of recitation and writing more than reading. These books are now mainly destined for the use of the peasants. I will cite as an example the *Nongshi jieqi sanzijing*, "book in three characters on agricultural seasons," published in the Zhejiang in January, 1965, where the events, work and duties which mark the twenty-four periods of the Chinese agrarian calendar are listed.

On a more elaborated level, the inventories of words which are encyclopedias and dictionaries also have a considerable diffusion. The vocabulary structures knowledge and the character is its principle unit of measurement.

SCIENTIFIC WRITINGS AND LANGUAGES

The absence of China at the time of the advent of modern science is all the more astonishing since at the end of the

[12] According to Xu Shen, the author of *Shuo wen*, an etymological dictionary published at the beginning of the second century of our era. The work he cites is lost.

[13] After the model of the *Sanzijing*, "Classic in Three Characters," of Confucian inspiration and which is no longer used.

Middle Ages the country's technical and scientific achievements were considerable.[14] According to some authors, the non-alphabetical nature of the system of writing could have been a delaying factor, indeed, a block.

This hypothesis is contradicted by the facts: first of all, by the existence of a perfectly developed Chinese scientific language, where the problems of terminology are as well resolved as they are in languages with alphabetical writing. It is not at all comparable to the difficulties which the Arab world encounters when trying to manufacture the neologisms it needs.[15]

The sciences which were established in China before its contact with the Occident—astronomy, botany, certain branches of mathematics—had created tools of terminology which have proved useful to describe modern science. Thus it is that there are very few recent neologisms in astronomy.

It is especially important to note that the principles of the systematization of the vocabulary are prior to the introduction of Western sciences: the mechanisms themselves of Chinese and its writing render it particularly suitable for producing structured vocabularies. I will give here only an idea of the way in which these creations come about in the modern era.

A foreign word may be borrowed or translated. If the term is complex in the original, the translation may either copy the structure of the source word or write the idea in question in an original way without reference to the form of the source word.

While Japanese has borrowed heavily from English, and to a lesser degree from German, Russian and French, Chinese has adopted very few words. In the oral form, in Chinese as in Japanese, a borrowed foreign word is broken up into syllables, and each syllable is adapted in such a way that it may enter the inventory of the syllables of the language. The fact that this process is quite developed in Japanese (nearly twenty percent of the presentday vocabulary) and has had only limited success

[14] Cf. Joseph Needham, *Science and Civilization in China*, Cambridge University Press, 5 Vol., 1954-1976.

[15] Cf. A. C. Mattar, "The Arabic Language and Present Conditions and Prospects for the Future of the Arabic-Speaking World," *Diogenes* No. 83 (Fall 1973).

in Chinese (less than two thousand words) is explained by the difference in graphic systems. In Chinese the borrowed word will be transcribed in as many characters as it has syllables. Now, the syllables usually have a meaning. This meaning is lost, except for particularly clever devices: the product is felt to be abnormal, exotic, and it is integrated into the language with difficulty. In Japanese, where there is a double graphic register—Chinese characters having meaning and purely phonetic symbols (the *kana*, an ensemble of fifty-one syllabic signs)—the syllables of the borrowed word may be transcribed in the latter, which eliminates all problems of a parasitical nature.

In Chinese borrowing is resorted to only when there is no other solution. The problem had already presented itself in the first centuries of our era, with Buddhist preaching. The monk Xuan Zang mentions "five cases where there is no translation": those where the Sanscrit term has a secret meaning; where it has multiple meanings; where there is no concrete reference in Chinese (for example, the *jambu* tree); where it is archaic; and where it is venerated. It is remarkable that the creative process of the Buddhist vocabulary was reproduced according to schemes which are almost identical to those of contemporary times, particularly for abstract ideas imported from a different West. In the two cases, at the first impact foreign words were accepted, articulated or disarticulated into Chinese syllables devoid of meaning: the characters which transcribed them had no relation to the meaning of the word in question. For example, *pu-luo-lie-ta-li-ya*, literally "universal-catch in a net-classify-pagoda-profit-second" for "proletariat" or *de-lu-feng*, literally "virtue-law-wind" for "telephone."

A Chinese who did not know the corresponding foreign words could not possibly guess the meaning of these sequences of syllables or characters if he heard or saw them.

Later, the ideas in question were better understood, and Chinese words were invented to designate them; most of the barbarous forms manufactured in imitation of foreign words, and which had never been assimilated, were abandoned. At the present time, "proletariat" is *wuchan jieji* (literally, property-less class) and "telephone" is *dianhua* (literally, electricity-word).

Neology by *translation* permits the obtaining of ensembles of

terms which systematically take advantage of the clarity and coherence of Chinese vocabularies.

What is meant by "coherence"? Certainly, the differences in the way the language is used are as great as those observed in France or the United States: differences in regional speech so that a speaker of one dialect cannot understand a speaker of another dialect; differences in syntax and style, not only between the style adopted in official writing and daily speech but also between scientific texts and newspaper articles. However, the ensemble of basic morphemes, represented by characters and which combine to form words and terms in Chinese, is homogeneous; they are the same ones which are used at all levels of the language and in all the styles. In short, very different buildings are constructed with the same bricks. It is this wonderful unity of the Chinese language which gives clarity to scientific vocabularies: here there is nothing similar to our Greek roots. The meaning of a word in a science of which one knows nothing cannot be guessed, but once the referrent is identified, the word is immediately familiar. One could compare *bu ke chi lun*, literally "theory (according to which) one cannot know" and "agnosticism," or even *due mian ti*, a "body with several faces" and "polyhedron."

Here I will mention only two phenomena which illustrate very well the process of composition/decomposition at work in the language, one at the level of a graphic sign, the other at the level of a complex term.

a) New characters (*xinzi*) for the needs of chemical nomenclature. Let us remember that the characters may be simple or complex and that among the ways complex characters are composed the one which gives the best result is that which associates the "root" sub-pattern of a character which may give an indication of the meaning and the "phonetic" sub-pattern, which may give an indication of the pronunciation and, at times, the meaning of the character. These etymological sub-patterns have no other functional value than that of permitting the classification of the characters in dictionaries (by roots or "keys"). But the same mechanism is at work when new characters are created.

In chemistry, Chinese has preserved the normal names for elements such as iron, gold, or silver, which were known before the introduction of modern science. These elements were each

designated by a character which had for a root, according to the case, the sub-pattern "metal," "stone," or "water." When elements were added to complete the list, each of them was also represented by a single character, which reads as a monosyllable. This monosyllable is, basically, a phonetic approximation of the first syllable of the international term.

On the graphic level, this nomenclature of elements uses only the three roots cited above, plus the one for "air:" they were chosen in terms of the state of the element in question at normal temperature: for solids the roots "metal" (metals) and "stone" (metalloids); for gases, the root "air;" and for liquids the root "water." Of course these graphic characteristics are purely etymological and the character, once it is established, functions as a non-analyzable unity.

The equivalents of our prefixes are current characters in the normal language. For example, in inorganic chemistry the anionic prefixes *duo* (much, many) for "poly-;" *gao* (high) for "per-;" or in organic chemistry, those which describe the form of the chain, *zheng* (straight, rectilinear) for "normal" and its antonym *yi* (not straight) for "iso-." The names for functions, like the names for elements, are new, specialized characters, except for *suan* "acid function," which is also the common word "acid." All are monosyllables, which permits the construction of an economical and rigorous system.[16]

Chinese chemical terminology dates, essentially, from 1932. Official standards were again published in 1953 and give the rules for going from a developed chemical formula to a Chinese nomenclatural expression and vice-versa. These standards are regularly made known and take account of international conventions. Usage, as evidenced in the works published in the People's Republic, conforms to these standards. Texts published in Chinese in Hongkong, Taiwan or in the Chinese *diaspora* do not present sensible differences with regard to this usage.

b) At the level of complex terms, the *generic morphemes* are monosyllables which, incorporated into a noun, itself mono- or disyllabic, indicate the class of the object designated by the

[16] Cf. V. and J.-Cl. Alleton, *Terminologie de la chimie en chinois moderne*, Paris-The Hague, Mouton, 1966.

noun. In everyday language, an example would be *chang*, "area, land;" in *feiji chang* or *jichang*, "airport;" *zuqiu chang*, "football field;" *yundong chang*, "sports area;" *zhanchang* "battlefield;" *tiaowu chang* or *wuchang*, "ballroom;" *duchang*, "gambling house;" *nongchang*, "farm;" *juchang* or *xichang*, "theater stage;" this same morpheme means "field" in mathematical terminology: in *biaoliang chang*, "scalar field" or *shiliang chang*, "vectoral field."

In scientific terminologies, the generic morphemes permit the identification of paradigms. For example, in chemistry the list of terms which may be followed by *ji*, "agent," may be noted.

The use of these morphemes permits a very clear organization of the vocabulary. The flexibility of the system is well illustrated by the way in which such forms are added to foreign proper nouns in order to designate exotic objects. Foreign proper nouns are not "translated," since they are, *a priori*, devoid of meaning, contrary to Chinese proper nouns which are more or less based on a meaning. Here are some examples taken from a recent dictionary: *Aisijimoren*, *Ai-si-ji-mo* for Eskimo, plus *ren*, "man;" *angelatu, an-ge-la* for "angora" plus *tu*, "rabbit;" *bakexiazhu*, *ba-ke-xia* for "Berkshire" plus *zhu*, "pig;" *bo'er-duoye, bo-er-duo* for "Bordeaux" plus *ye*, "solution" (this is the Bordeaux mixture for treating grapevines.)

As far as abstract ideas are concerned, the fact that the Chinese system of writing permits but also imposes analytical translations has enabled China to assimilate ideas coming from the West in a much more *substantial* way than would have been the case with a borrowed phonetic system.

PRACTICAL APPLICATION

Does the writing of Chinese present difficult practical problems? On what and with what is it written? At what speed can it be read and written?

One writes on everything and with everything. The brush can draw characters on bamboo, wood, silk and even on rock—poetic graffiti in celebrated landscapes—as well as it can on paper (which was invented in China in the second century of our era). The written word is treated with respect and paper

is used economically, but that does not prevent the use of writing at every turn. As for what is written on, the choice is wide. Archaic inscriptions on tortoise shell or the shoulder blades of deer, or texts in bronze, belong to antiquity, but engraving has had considerable importance for a long time: it is found on pottery, brick, stone, wood. Thanks to the technique of printing on paper, these engraved texts were easily reproduced in large numbers. In addition, xylographic printing, which requires the manufacture of special plates where the characters are in relief and inverted as on a seal, was so widespread in China in the Middle Ages that the invention of moveable characters, the first evidence of which is found in Korea about one century before Gutenberg, was considered as a relatively incidental addition.[17] Still today, impressions of high quality are made by xylograph: the order of the ink and the blank areas is carried out at the level of the stroke, the character, the entire page, while with identical mass-produced characters only a rather inert ensemble may be realized.

Of course, the fact that ancient techniques have not disappeared does not prevent the extensive use of modern techniques. The printer's cases dispose of several thousand characters, but this multiplicity which seems difficult for us to master does not present problems for the Chinese printer, who ranges his type by groups of frequency of use and according to roots. Furthermore, the adjustment of the line is facilitated by the fact that the characters are equally spaced on the page.

In contemporary China the brush is not the prerogative of the esthete. The large range of prices, the large number of shops in which brushes are sold, at least in the cities, and the number of customers in the shops would lead one to think that there is a wide use. I will mention two of them, which seem to oppose each other. First, calligraphy is the preferred public method of political expression: the posters in large characters (*dazibao*) which covered the walls during the Cultural Revolution and which still flourish in moments of crisis, are written with a brush; only long texts, which are not in large characters, are

[17] Cf. T. F. Carter, *The Invention of Printing in China and Its Spread Westward*, New York, Columbia University Press, 1925; Peking, 1941.

written with a pen. In any group, the content of the poster to be made is discussed by all, but the realization of it is left to the best calligraphers. The brush is indispensable here for technical and pragmatical reasons, as the most efficient means of communication for gaining a following. Alongside this important social function, calligraphy is also the best refuge for intellectuals in their "blank" moments. We know that the novelist Lu Xun overcame a period of depression in the twenties by copying innumerable ancient texts. Also today, when students are in a state of psychological crisis they plunge themselves for hours into exercises of calligraphy.

Although the brush is the major instrument used to give the character its canonical form, the most widespread writing instrument is the pen, either ballpoint or fountain. Chalk is also widely used, on blackboards: it is not rare to see small military units or groups of young peopple going around with their slates.

Finally, when one's hands are free and one is in a discussion with another person, if one wishes to resort to writing in order to identify a word—in the case where the oral form is ambiguous and would require a paraphrase—one traces the characters in the air, on the ground, or more often on the palm of the left hand with the index finger of the right hand. In general, the partner in the discussion *reads* this rapid sequence of gestures perfectly well. But can we still speak of writing when there is no longer a drawn character which will endure?

When the characters are drawn, reduced to their immobile form, how fast can they be read? Because of the lack of serious studies, it is difficult to compare the time required for reading alphabetical writing with that for Chinese characters: we may assume that on subjects which are familiar to the reader, the characters would have the advantage, considering that a Chinese text is always shorter and more succinct than its translation, while with new subjects there is the risk in Chinese of encountering characters which are not known and which would slow down the reader more than unknown words in an alphabetical writing he could decipher.

The speed of the writing depends on the graphic style. It is certain that writing in the "correct" style is a relatively slow

process. But in most cases where writing is by hand, the cursive is used, which is extremely rapid. The most important reform in writing in the People's Republic is the simplification of the characters. Throughout the years, all the responsible persons of the Chinese state have occupied themselves with the writing system, but there had not been such a radical reform since Qin shi Huang di (Ts'in Che Huang ti) at the end of the 3rd century, B.C. Long ago a certain number of characters in common use were simplified, in practice, but these forms were not officially accepted: they could not be used in serious texts (those listed in bibliographies) nor in administrative papers, nor, obviously, in the examinations for the mandarinate. But we have seen that in addition to this classified literature, there was an enormous number of written works, and these more or less bypassed the standards. In order to simplify official writing, and make it easier to learn, an attempt was made in the fifties to ratify a large number of these popular or learned simplifications. The project, published in 1958, consists of a table of five hundred and fifteen simplified characters and fifty-four elements of characters, which indirectly simplify all the characters in which they appear. This reform has now been effective for a sufficient number of years that the use of the old graphics has practically disappeared. That could present problems for the young who have not learned the old graphics when they have to read the ancient texts, but these have been re-edited in simplified characters. Furthermore, the large use made of the official simplifications has not prevented people finding new ones for themselves, and using them. Some are ephemeral, but the use of others is spreading. The fact that they are illegal means that there are no inventories: at the most there are examples taken from here and there and discussed in the press. Here we are aware of the contest betwen those who use and develop the system in an anarchical fashion and the State, which normalizes, prunes, and may eventually select a small part of the popular creation to be ratified. Thus it is that the publication of a new list of simplifications is impending in Peking.

CONCLUSION

The obstacles to the general spread of writing in China were not and are not inherent in the writing system itself. It is not my place here to discern among the social factors which could account for the large numbers of illiterates in certain periods the ones which were determinant: poverty, inequality, state socialism or anarchy. I believe I have shown that the linguistic properties of the system have nothing to do with it. In support of this statement, I will add the following: in Japan, where nearly two thousand Chinese characters are still in use and where there is no question of suppressing them, the rate of illiteracy is one of the lowest in the world.

It is not a question of ranking different systems of writing but of recognizing the Chinese system as *another* way that language functions.

The observation of aphasics offers a privileged means of evaluating this "otherness." Japanese aphasics have been particularly studied, since the Japanese use two registers conjointly: phonetic writing (*kana*) and Chinese writing (*kanji*). Studies conducted during the last forty years show that certain cerebral lesions bring with them a deterioration in the production and/or recognition of *kanji* and have little or no effect on *kana* and that other lesions have inverse effects.

Material on the social functions of writing in China in scarce: this question has been obscured for 150 years because of our alphabet-centered arguments, and almost as much in China as abroad. It is striking that we know more on this subject with relation to ancient China [18] than we do about contemporary periods.

It could be asked if, paradoxically, this system of writing would not be, in its effect, nearer the oral than our "phonetic" writing is. It is for the psychologists or sociologists to answer this question. I shall only note the extraordinary agreement which exists in Chinese between the oral and the written word, at the level of the organization of texts, in spite of the considerable differences in styles and registers. The written text,

[18] See note 19.

whether it be a scientific work, a novel, a political analysis or a poem, is subject to rhythm and symmetry, traits generally considered as characteristic of speech.[19]

[19] This is essentially what Granet had in mind in his fine chapter on "La Pensée Chinoise" (Marcel Granet, *La Pensée chinoise*, Paris, 1950; 1968) which he devoted to Chinese writing: when he is cited this fact is too often omitted, as though time did not exist in China.