INTRODUCTION

ADVANTAGES of graphic Chang-Jie Input

In **alphabetical languages**, when using a computer keyboard to input a word, we type each letter composing the word and press the space bar to separate it from the following words: "**What we type is exactly what we get"**

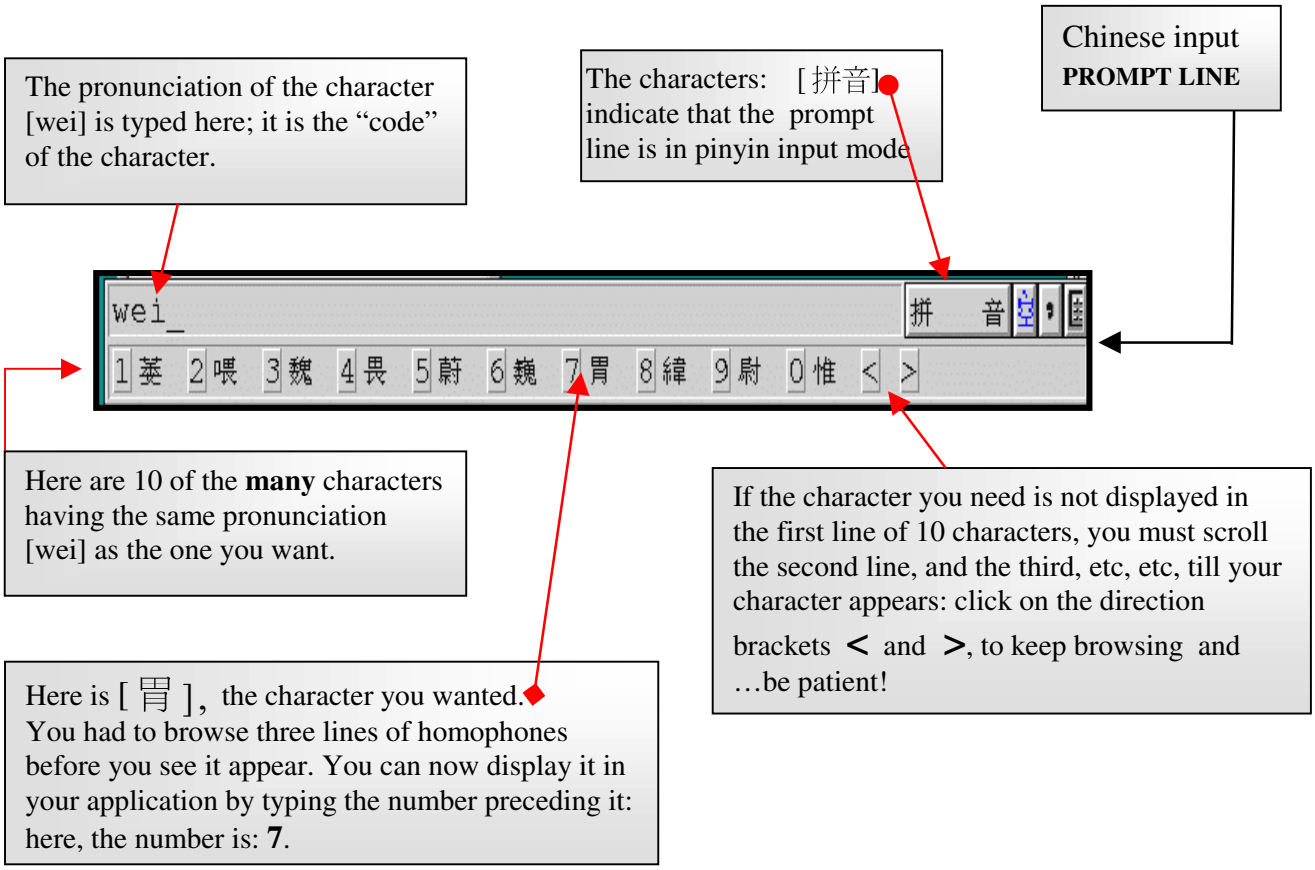
With **a graphical language** such as Chinese: **"what you type is very different from what you get".** In fact, what you type is a "**code**" that represents the character you need. To see it on your screen, you must follow the rules of the **input method** you are using.
Many kinds of input media (keyboard, voice, handwriting recognition, etc) are available, but as far as computer keyboard input is concerned, there are **two main types of methods**:

- **Phonetic** based methods, like pinyin or zhu-yin, which represent characters by ***phonetic symbols*** chosen according to the ***rules*** of transliteration of the particular ***phonetic method*** (**SECTION I**);
- **Graphic** based methods, like **Chang-jie input**, based on a breakdown of characters into ***elemental shapes*** called "***signs***", represented by **letters of the Roman alphabet** which are inputted according to a set of rules specifically designed for computer input (**SECTION II**);
- We will see that the rules of Chang-jie input apply equally to **traditional characters in the Big 5 code** and to **the Guobiao character set** (**SECTION III**).
- **Finally,** we briefly compare the two types of methods and summarize **the superiority** of Chang-jie **especially when it comes to remembering characters and to typing efficiently** (**SECTION IV**).

SECTION I: PHONETIC INPUT METHODS

With phonetic input methods, you type the **phonetic symbols** representing the **pronunciation** of the characters you want in your word processor or other application. With the **pinyin phonetic** input method, you will basically use letters of the Roman alphabet which are the **symbols** used by this phonetic method; you also will have to learn, to know and to apply the **rules of pinyin transliteration.**

For example, to get the character 胃 (meaning 'stomach' and pronounced "***wèi***"), using the pinyin input method, you will type its pronunciation: **"w e i"** on the **prompt line**[1] of your Chinese system --which must be in the pinyin mode as illustrated below.
The transliteration of the pronunciation of a character according to pinyin rules constitutes *"the code"* of the character. For the character: 胃 , "wei" is its "*code*" in the pinyin input system. Once you have typed the pinyin transliteration, the **prompt line** displays a list of characters having the same pronunciation as the one you typed. You must then browse through this list of homophones to find your character; once you have located it, you can bring it into your application by typing the number next to it, as illustrated below:



[1] The PROMPT LINE is the space dedicated, in **all** Chinese systems, to input codes and display the characters represented by the inputted code. More details are given **Appendix II**. Please refer also to your specific Chinese word processor or system manuals for details on your prompt line.

The main advantage of phonetic input is that most of the people learning Mandarin Chinese have to learn at the same time one phonetic system to know the pronunciation of characters. If you have learned **all the rules** of a phonetic system, you can use phonetic method to type Chinese characters, without needing to learn an additional input method.

◆ SERIOUS DRAWBACKS OF PHONETIC SYSTEMS USED AS INPUT METHODS:

◆ **The main problem** is that too **many** characters are homophones.

As a consequence, a phonetic transliteration like [wei] corresponds not to a specific character but to a list of all the characters that have the same pronunciation. ***This list may be very long***: the sound transliterated as "wei" in pinyin points to **130 characters**! It is not unusual that a sound includes **over 100 characters.** And the characters, as shown in the picture of the prompt line above, are displayed by rows of 10. If the character you need is located at the end of the list, you may have to browse through ten rows of characters before you find the one you want. It is not efficient and it can be quite annoying.

It is true that the irritation caused by this problem is reduced by the fact that most Chinese systems will display in the first rows the characters that are generally most commonly used. But when you want to input less common characters, you are in trouble again. Even with common characters, you often have to browse through two or three rows of characters. It is well known in computer typing schools that the main source of error when keying characters is not the input of an incorrect code, but a wrong choice when choosing the character among those displayed on the input prompt line.

To further alleviate the slowdown effect of the multiplicity of homophones, most Chinese systems have a sorting function (*Automatic Sorting*) that automatically places the character last inputted on top of the list. Such character will be in the first position on the prompt line the next time that the same phonetic code is typed.

But this can also be counter-productive because your characters keep changing places in your input line: you never know at what position they are; this hinders your speed and can lead to frequent typing errors.

- **In addition**, even if the character you need appears on the first row of characters presented in the input line, **you still have to exercise the additional decision** to choose it among the characters of the row by selecting the number assigned to it in the prompt line list. In other words, you have to strike three keys … ***a triple, or at least double step typing process***.
- **Finally**, when one has forgotten or does not know what exactly is the pronunciation of a character, obviously the phonetic method approach cannot be used. This happens quite often even with people who are very familiar with a phonetic method. Most importantly, when you want to look up characters that you do not recognize or cannot pronounce, there is no way you can get them in your electronic device with the phonetic input method.

The solution to this problem is: *a **GRAPHIC** input system!*

SECTION II: GRAPHIC INPUT METHODS

Graphic input methods base the codification of characters on their **shapes and** structural **appearance**, not on their pronunciation**.** The Chang-jie input method was the pioneer of all input methods using the normal computer keyboard, and is still the most well known graphic input method.

In the Chang-jie method, the alphabetic keys on the keyboard (that we type to form the code of a character) **represent shapes** (not phonetic symbols) that compose that character.

FOR EXAMPLE:

the key **A** represents the **shape** [日] as found in: 明

the key **B** represents the **shape** [月] as found in: 明

the key **J** represents the **shape** [十] as found in: 早

THE PRINCIPLES OF CHANG-JIE INPUT ARE EXTREMELY SIMPLE:

When you want to type a character, you must:

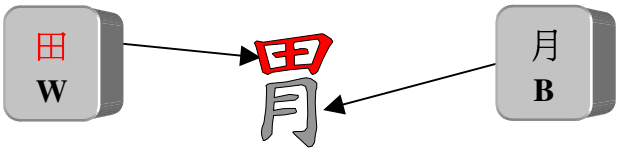
1. Recognize, within the character, what are the shapes -- defined by Chang-jie (and called "*signs*")-- that it contains, and then:

2. Type in the alphabetic keys (codes) to which those shapes (*signs*) are assigned, --following a certain order and within the numbers defined by the Chang-jie rules of selection of *signs*.

These principles are identical for TRADITIONAL and SIMPLIFIED characters.

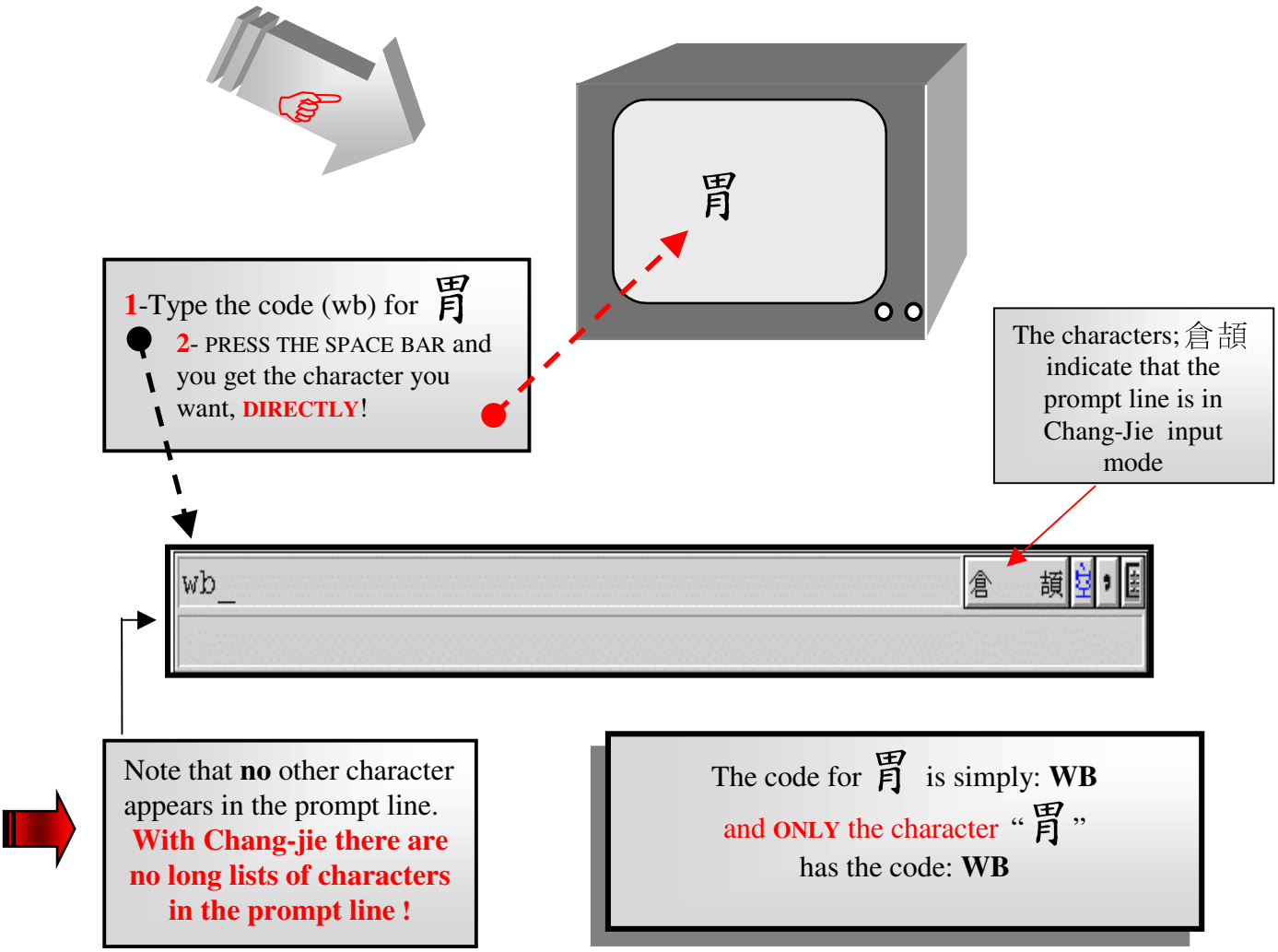
◆ To briefly illustrate the steps of this method, we use 胃 , as an example:

- First, ***spot out*** the Chang-jie *shapes* it contains. Here we have **2** *shapes:* [田] and [月]



- Then, type the keys **W** and **B** which are the codes for these two shapes.

  In doing so, you must follow the rules of order of input, which will be explained later. Here, the shapes are vertically aligned; so the input order is from top to bottom, i.e.: **WB** TYPE: **W B** in the input prompt line of your Chinese system --which must be set to the Chang-jie mode as in the figure below, and PRESS THE SPACE BAR: ⇨ you will get the character 胃 , **DIRECTLY,** on your computer screen, (as if you were typing an alphabetic word).



SECTION III: CHANGJIE & THE GUOBIAO CHARACTER SET

In 1956 and 1964, the People's Republic of China conducted a *simplification* of about 2200 common characters by reducing the number of their forming strokes. The purpose was to improve literacy and to speed up the writing process in general.

We will not enter here into the controversy of whether this linguistic mutation was beneficial or harmful. Critics say that the simplification results in a loss of unique cultural content while, on the other end, the proliferation of computers renders moot the speed gained out of the reduction of the number of strokes. This very interesting question will be discussed on the Chang-jie web site: **www.cjmember.com**

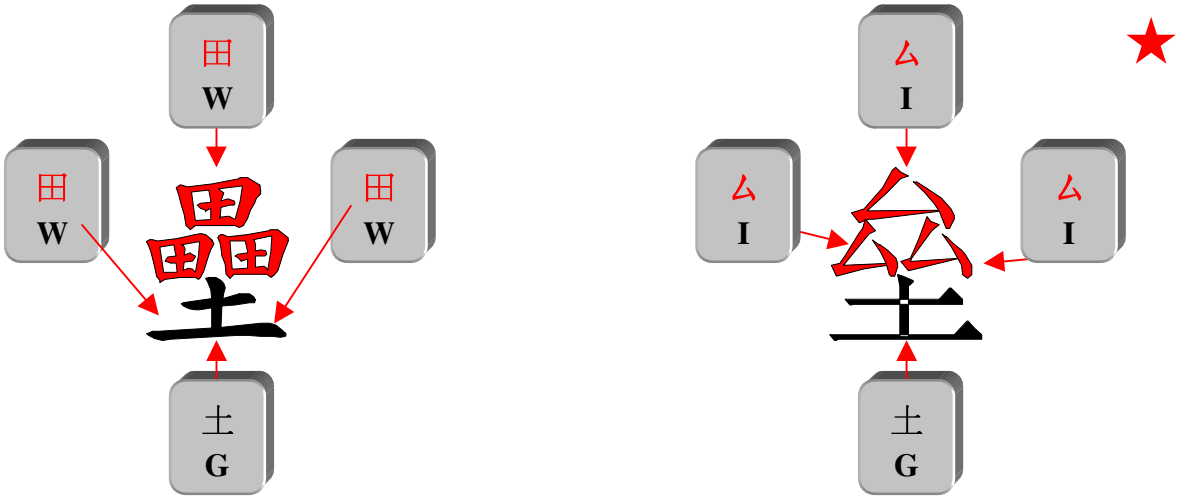
To stay within the boundaries of the subject matter of this book, we will only remind the reader that as a result of this simplification, Chinese characters have been encoded in two different coding systems in PC computers:

--the traditional set, which is encoded in the "*Big 5 code*" and comprises about 13,000 characters in their traditional form. It is used very successfully in Taiwan, Hong Kong and by most Overseas Chinese;
--the simplified set, which is encoded in the "*Guobiao code*" and comprises about 7,000 characters, among which only 2,200 characters are simplified; the other 5,000 are unchanged characters identical to the traditional ones of the Big 5 code set. The simplified set is used in the P.R.C. as the national standard, and by many students of Chinese all over the world.

What is important from the point of view of graphic computer input of Chinese characters is that, even simplified, the characters are formed **with the same basic shapes** as the traditional ones. Therefore, the Chang-jie input method, which is based on the **graphic aspect** of characters, can be used equally for both ways of writing. **The rules and the method to determine the codes are identical in principle for both simplified and traditional characters.**

This will appear clearly as we progress in the knowledge of the two elements that compose the Chang-jie input method: (a) **the shapes** (called *signs*) defined by the method to mirror the characters' forms; and (b) **the rules** for selecting the keyboard **letters** that represent those shapes (*signs*) and that will form the code of any specific character.

Let us illustrate this point with an example: we will compare the traditional form of the character 壘 (lěi, a rampart; to pile up things) with its simplified form 垒 :



TRADITIONAL FORM
CODE = W W W G
for the shapes 田田田土

SIMPLIFIED FORM
CODE = I I I G
for the shapes ムムム土

From the above illustration, even if we have not yet learned the rules of Chang-jie input, we easily recognize that such rules apply in the same way for both traditional and simplified characters. There are a few minimal variations which are all presented in this book when the need arises.

In this book, every time we present a traditional character which also has a simplified form, it will be indicated with a red star (★) and we will explain its code for the simplified form also.
Explanations for characters of the Guobiao set do not concern the users typing traditional characters in the Big 5 code environment.

In addition, **Appendix III** gives the list of the 5400 commonly used characters in their traditional form, together with the Chang-jie code. And **Appendix IV** gives the list of the 7000 characters composing the Guobiao set used in Mainland China, together with the Chang-jie code.

If the Chang-jie input principles are the same for both types of characters, the possibility to input and display Chinese on a computer has, so far, required two different internal systems of codification and of fonts (***Big 5*** for traditional, and ***Guobiao*** for simplified characters). Fortunately, this incompatibility is losing its annoying effects thanks to the increasingly common usage of the Unicode Standard. It is possible to type Chinese characters, traditional and simplified, in the same Unicode document in some programs of Microsoft Office 2000 used in conjunction with its Asian Multi-language pack. With Windows 2000 the possibility is enhanced. Similarly, Chinese enablers like Twinbridge and others have embarked on Unicode compatibility. Updated details regarding these questions will be posted in the web site: www.cjmember.com.

Knowledge of these "computer internal system" issues is not required for the comprehension of the Chang-jie input method: ***the principles and the exercises presented in this book will allow you to use Chang-jie to input Chinese characters in either their traditional or their simplified form.***

SECTION IV: SUMMARY OF CHANG-JIE ADVANTAGES

◆ THE CHANG-JIE METHOD REINFORCES *CHARACTER MEMORIZATION*

This is a great bonus for students of the Chinese language: by scrutinizing the characters in order to spot the Chang-jie predefined shapes**, you will quickly form in your mind a picture of the structure of the characters you are studying.**
To emphasize this advantage, I have included **special exercises** which focus on "***RECONSTRUCTING***" a character from the shapes of the signs forming its Chang-jie code. It is the best input method to help you remember the structure of the characters you are typing.

In addition, such memorization is also reinforced by the **meaning content**[2] of the graphic partitions (*units)* in which Chang-jie divides characters to determine their code. This *partition* is fully explained in Chapter 3.

The Chang-jie method will definitively help you improve your command of the Chinese language.

◆ KNOWLEDGE OF PRONUNCIATION OF CHARACTERS IS NOT REQUIRED FOR INPUT

You do not need to know, at all, the pronunciation of a character in order to be able to input it: you analyze the shapes of the character according to the Chang-jie rules and proceed to input the character. This is very useful for students of the Chinese language when encountering an unfamiliar character and wanting to learn its pronunciation and meaning with an electronic language dictionary.

In **Taiwan** and in **Hong Kong**, it has been noted that many users, even people who do not need to type fast, still do not choose phonetic methods for input because it is often difficult to remember the exact phonetic transliteration of characters, even if they can pronounce them correctly. They find the Chang-jie graphical approach more suitable, even though they have already learned the Pinyin or Mandarin phonetic systems during primary school time.

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[2] The meaning of the *units* is explained in the " Engineering the Basic Elements of Chinese Characters" (漢字基因工程) and in the "Dictionary of the Basic Elements of Chinese Characters" (漢字基因字典) by Mr. Chu Bangfu.
These works are not yet published but their *"beta version"* can be downloaded from Mr. Chu's web sites: www.cbflabs.com and www.cjmember.com. Anyone interested in a new approach of the Chinese language structure is welcomed to take part in the research related to the concepts developed in these works.

◆ EACH CHARACTER IS REPRESENTED BY A UNIQUE[3] CODE

This is one of the main advantages of this method.

It is a one-step typing operation identical to the one used in typing English.

That is why, in the Chang-jie input method, characters can appear **directly** in your application, as soon as you have entered the code. The character you want, **and only it**, will directly appear.

You get what you need, not what you don't want!

◆ TYPING SPEED IS MUCH FASTER

As you obtain immediately the character you want without any need to scroll through rows and rows of characters, you obviously can type much faster.
That's why Chang-jie is the input method of first choice used by professional typists in **Taiwan** and **Hong Kong**. Some professionals can type **100** characters per minute, a speed very similar to that of typing in alphabetical languages.

◆ CHANG-JIE UNIQUE ALPHABETIC CODES FACILITATE INTERCOMMUNICATION OF CHARACTERS

If you want to transmit a particular Chinese character to someone at a distance --give a Chinese address over the phone for example, it's not easy at all to describe the characters by their radicals and strokes, especially if the recipient does not know them. Indication of a character by its phonetic transliteration will point to too many homophones and will not solve the problem. But with Chang-jie, which offers unique and therefore unambiguous codes, if your recipient has a computer or electronic language dictionary at hand, he can type in the code you tell him and immediately see the needed characters!

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[3] **a)** This very special feature of **uniqueness (i.e.** each **character has its specific code)** is supported when **inputting in the Guobiao set.** See how to use this function in Section VI of Chapter 4.

b) But unfortunately the **Big 5 code** designers failed to see the importance of this feature and did not include it in their **Big 5** Chinese system, most probably because of lack of memory space. As a consequence, in the traditional code environment, against the initial design of Chang-jie, some codes represent two, very rarely three, and even more rarely four characters.

Example: the code **AA** represents 昌 and 明; the code **AMJ** represents 早 and 旰; the code **UU** represents 出, 凷, and 艸). When we type such codes, the two or three characters they represent appear together on the input line. To bring one of them on your screen you must choose the number preceding it, as with phonetic input methods. **However**, this is a far cry from the phonetic input methods where one single so called "*code*" represents **dozens** and **dozens** of characters. Multi-character representation by one code in the Chang-jie system for traditional characters remains limited to an unavoidable minimum.

◆ KNOWLEDGE OF HOW TO WRITE CHARACTERS IS NOT REQUIRED FOR INPUT.

Because Chang-jie has its own system of representation of characters --which is precisely the object of this book -- you can input a character even when you do not know how to write it by hand, i.e.: the number of strokes and the stroke order.

This can prove to be very useful when you want to research a character that you do not know well. With Chang-jie, you still can use your computer or electronic language dictionary to get the character you need and all information related to it: meaning, grammar, phrases, etc.

◆ The Chang-jie principles are simple; mastery requires some effort.

It is quite often that school children using Chang-jie can type **60/80 characters per minute.** As you can see from the preceding examples on page 4 and 5, the principles of the Chang-jie system are simple. Application is also very simple for the great majority of the characters we commonly use. But to be able to avoid as much as possible multi-character representation by one code –the hindrance of phonetic methods – the Chang-jie method needs to set certain rules which require your attention and some practice to remember them. It is worth all the effort!

As a matter of fact, most of these rules are quite intuitive and the whole method could be summarized in very a few pages, as we do at the end of the book, page 217-227:
"CHANG-JIE IN A NUT-SHELL".

The **progressive teaching approach** followed in this book will drastically minimize the effort needed to memorize the *signs* and rules of the Chang-jie input method. Because the selection of the codes of the characters is made strictly according to **logical rules** clearly explained, **there is no need for a memorization effort to remember the individual "codes" of characters.**
Once you have done the exercises contained in this book, it will be a breeze to input Chinese characters because it will quite simply have become ***a construction game!***

If this book contains more than a few dozen pages it is because:

- **for learners of the Chinese language**, we have included quantity of exercises and examples, with their phonetic pronunciation and their English meaning, so that, while learning the input method, they can also improve their knowledge of the language itself.
- **for users already fluent in the Chinese language**, especially for teachers of Chinese, we have presented many detailed and in-depth explanations, including many graphics and schemas –a plethora of material that could be used for teaching. More teaching material is available in the Chang-jie web site: **www.cjmember.com**