

# Translating Western Concepts by Creating New Characters: A Comparison of Japanese and Chinese Attempts

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## Abstract

Chinese characters are considered as an adaptable system, open to expansion and revision. Throughout history, the creation of new characters was one of the most important solutions to enlargements of the conceptual repertoire. Both scholars of “Dutch Learning” in Japan and missionaries active in nineteenth-century China used Chinese characters in their translations of western concepts. From a methodological point of view, Japanese scholars mostly coined compound words rendering the literal meanings of their terms of departure while translators in China, invigorated by the success of the new characters devised for chemical elements, believed that drafting new characters was more in line with the characteristics of the Chinese language. However, notwithstanding the painstaking efforts with which they were created, the new characters proposed by missionaries were eventually replaced by compound terms first used in Japanese adaptations. This paper examines the different practices and attitudes of Chinese and Japanese authors toward the creation of new characters as a method of translation. Analyzing the influence of their divergent approaches on the lexical systems of their respective languages, since Chinese has a very limited number of phonetic patterns, I conclude that it is impossible to create viable technical terminologies only by increasing new characters.

**Key words:** translation, technical term, Chinese character, missionary, W. Lobscheid, J. Fryer

## Introduction

Chinese characters comprise an adaptable writing system, open to expansion and revision. Throughout history, the creation of new characters has been one of the most important solutions to enlargements of the conceptual repertoire. Both scholars of “Dutch Learning” in Japan and missionaries active in nineteenth-century China used Chinese characters in their translations of

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Western concepts and thus had to face the problem of creating new words from characters.

From a methodological point of view, Japanese scholars mostly coined compound words that rendered literal meanings. They created translations of terms through loan translation when appropriate words from the classical lexicon could not be found, while translators in China preferred to draft new characters. This paper examines the different practices and attitudes of Chinese and Japanese authors toward the creation of new characters as a method of translation. Analyzing the influence of their divergent approaches on the lexical systems of their respective languages, I conclude that it is impossible to use a system of creating technical terminology based exclusively on increasing new characters since the Chinese language has a very limited number of phonetic patterns.

### 1 From *kiriru* (機里爾) to *sen* (腺)

Sugita Genpaku (杉田玄白), a Japanese scholar of Dutch Learning and the first Japanese to translate a work from a foreign language, translated a medical text based on the Dutch translation, *Ontleedkundige Tafelen*, of J. Kulmus's German *Anatomische Tabellen* (New Text on Anatomy, 1759). In the preface of his *Kaitai Shinsho* (1774), Sugita explains that he translated one of the terms in the text, the Dutch word, *Klier* (gland), as 機里爾 (*kiriru*), a phonetic transliteration. His rationale for the phonetic approach was “無語可当、無義可解” (“no appropriate terms could be found for translating”). In other words, there was no word that corresponded to the concept of *Klier* in traditional Chinese medicine. The 義 in the rationale Sugita gave can be interpreted in two ways: “理拋義” (principles based on meaning; that is, the intent of creation of the original word; and “概念義,” (“conceptual meanings: dictionary explanations for the exact words for all bodily organs and their functions.”) In *Chōtei kaitai shinsho* (*Revised New Text on Anatomy*, completed in 1798 by Ōtsuki Gentaku 大槻玄沢, and published in 1826), the rationale becomes “無名可充。義可取,” which means that there are no appropriate terms, but the meaning is understandable. The 義 here can only be explained as “概念義.” This implies that as time went on, scholars of Dutch Learning in Japan gained a comprehensive knowledge of glands though they had not yet found an exact translation for the term at the time.

In the revised text, Ōtsuki Gentaku was the first to use the literal translation, 濾胞 (*rohō*, filtering sac), for “gland.” Ōtsuki said, “I am afraid this term may not be exact, so I will leave it to further research.” Perhaps this shows that he was not satisfied with the term he had chosen. He was not simply being self-deprecating, for in the same text Ōtsuki had also selected the rare compound character 膾 for the translation for gland.” In traditional Chinese

dictionaries the meaning of this character is given as “the mass of flesh under the elbow or knee,” but Ōtsuki assigned it a new definition. He said that the left part of this character means “flesh,” while the right part refers to a structure consisting of a mass of cells (rendered here as 菌). After Ōtsuki, Udagawa Genshin (宇田川玄真) was the first to use the character 腺 (*sen*) in his work, *Ihan Teikō* (医範提綱, 1805). This is the first time the character 腺 was used. As Udagawa explained, he had taken the right-side of the character 泉 not only for sound (*sen*), but also for meaning, likening a gland to a fountain that gushes forth water from the ground.

When Ōtsuki Kentaku discussed his system for coining new terms, he explained that new compound terms and new characters must be created to translate a foreign language precisely. The Japanese scholars of Dutch Learning, however, did not create many new characters. They mainly created new compound terms. This was because scholars of Dutch Learning were all quite accomplished in Sinology and were thus well-versed in the study of Chinese characters. They believed that creating new characters was something only uneducated peasants might do.

## 2 Wilhelm Lobscheid: Pioneer in Creating Chinese Characters

The first translator in China to try creating new characters was the German missionary, Wilhelm Lobscheid (1822–1893). He discussed the issue of coining names for the chemical elements in the preface of his *English and Chinese Dictionary, Part IV (1869)*. He apparently believed that the character in Chinese that could best suggest the most basic notion of an element was *xing* 行, and for this reason he thought that the vast majority of names of chemical elements could easily be created by inserting a character between the left and right components of *xing*. For example:

氵+水+亍 (Shwui) = hydrogen (氢)    彳+光+亍 (Kwang) = phosphorus (磷)  
 彳+炭+亍 (Tan) = carbon (炭)    彳+绿+亍 (Luh) = chlor (氯)

Lobscheid hoped knowledge of chemistry could be popularized in China with the help of such a simple nomenclature. He wrote in the preface that he believed his nomenclature was simpler and more convenient than the methods employed by many other common chemistry books at the time. Chinese who wanted to learn chemistry to understand Western sciences could do so faster and better through use and popularization by specialists of the nomenclature.

There are a total of 49 names of chemical elements listed in the *English and Chinese Dictionary (1822–1893)*, of which 21 were newly-created characters. Besides the four mentioned above, the following are 17 such chemical terms.

Bromine	彳 + 臭 + 亅	Chau (溴)
Fluorine	彳 + 黄 + 亅	Hwang (氟)
Iodine	彳 + 蓝 + 亅	Lan (碘)
Nitrogen	彳 + 硝 + 亅	Siau (氮)
Oxygen	彳 + 养 + 亅	Yang (氧)
Potassium (Kalium)	彳 + 棚 + 亅	Kien (钾)
Selenium	彳 + 红 + 亅	Hung (硒)
Silicon	彳 + 火 / 石 + 亅	Shih (硅)
Sodium (Natrium)	彳 + 莎 / 金 + 亅	so (钠)
Strontium	彳 + 白 + 亅	Peh (锶)
Tellurium	彳 + 地 + 亅	ti (碲)
Thorium	彳 + 灰 + 亅	Hwui (钍)
Titanium	彳 + 红 + 亅	hung (钛)
Uranium	彳 + 天 + 亅	Tien (铀)
Vanadium	彳 + 皓 + 亅	Hau (钒)
Yttrium	彳 + 白 / 金 + 亅	Kin (钇)
Zirconium	彳 + 黑 + 亅	Heh (锆)

The new characters created by Lobscheid were pronounced based on the characters that were inserted between the left and right components of *xing*. Lobscheid did not provide any explanation for the principles upon which he selected the characters. Nevertheless, the principles can generally be divided into two categories based on the examples given. The first category reflects his selection of etymology of the original terms, such as the 水 *shui* (water) of 彳 + 水 + 亅, and 天 *tian* (sky) of 彳 + 天 + 亅. The second category is based on his selection of the forms of the chemical elements, properties, or colors such as 养 (form) of 彳 + 养 + 亅, or 绿 (green) of 彳 + 绿 + 亅. It should be pointed out that the percentage of the new characters in the former category is very small.

### 3 The Translations and Coining of New Words by John Fryer

In January, 1880, John Fryer, an English translator and educator (1839–1928), wrote an article in the *North China Herald* introducing his work at the Translation Department of the Jiangnan Arsenal. In the article, “An Account of the Department for the Translation of Foreign Books at the Kiangnan Arsenal, Shanghai,” he discussed the issue of translating from Western languages into Chinese as well as the creation of new terms.

In the article, Fryer refuted the viewpoint that Chinese language and writing are the most difficult for Westerners to understand.

It is generally received opinion that the Chinese language presents

extraordinary difficulties both in its acquisition by Europeans and in its use for the expression of the more exalted ideas of Western learning... this opinion is without formulation...from the time the early Jesuit missionaries commenced their compilations up to the present day no serious difficulties have been experienced by foreign translators. (p.79)

Fryer believed that terminology was the most crucial aspect of translating Western books. He pointed out that Chinese language and characters are similar to those of other countries in that they also continue to develop and change and to possess the potential to encounter new things from abroad.

Chinese, like other languages, is capable of growth. The increasing intercourse of China with Western nations is undoubtedly making vast additions to the number of words in current use. (p.79)

New Chinese terms had to be created to express new ideas or new items arising from trade or negotiation activities. If translators were tied down by the conventions concerning the old meanings of terms, they would not be able to provide interpretations for terminology not already found in Chinese dictionaries, and would never be able to translate new books. As to the methods of creating new translation terms, Fryer gave the following advice:

Coining of new terms: — Where it becomes necessary to invent a new

term there is a choice of three methods.

- (a.) Make a new character, the sound of which can be easily known from the phonetic portion, or use an existing but uncommon character, giving it a new meaning.
- (b.) Invent a descriptive term, using as few characters as possible.
- (c.) Phoneticise the foreign term, using the sounds of the Mandarin dialect, and always endeavouring to employ the same character for the same sound as far as possible, giving preference to characters most used by previous translators or compilers.

All such invented terms are to be regarded merely as provisional, and to be discarded if previously existing ones are discovered or better ones can be obtained. (p.79)

Here Fryer discussed three problems. First he expounded on the creation of new terms by coining new characters and, specifically, the naming of chemical elements. Fryer suggested two methods: the first was to take a certain common Chinese character as the phonetic element and join it with a

semantic radical to create a new character. The principle he used was to select characters with pronunciations similar to the first or second syllabic of the terms from the source language as the phonetic component. The semantic components were selected based on the description of the source terms. The examples Fryer used were 镁, 鉀, 砒, and 矽.

The second method suggested by Fryer was to reinterpret some seldom used characters for coining new terms; that is, to give new meanings to obsolete ancient characters for reuse as translating terms. The examples Fryer gave were 铂, 鉀, 砒, and 鋅, all of which can be found in ancient Chinese dictionaries. 鉀 originally meant “loricae,” while 鋅 meant “firm and strong.” Here Fryer explained the differences between creating and using characters. New characters were made according to the pictographic-phonetic method. Phonetic elements imitated the pronunciation of the source terms from the foreign language, while semantic components of the items to be translated were arranged into certain scientific categories. For instance 金 represents metals, and 石 represents nonmetals. Fryer’s principle for creating new Chinese characters was formulated when in 1869 he began translating *Wells’s Principles and Applications of Chemistry* (David A. Wells, 1858). His key principle was to “only use one character to name the chemical element.” This one-character principle resolved the inconsistency between the unique characteristics of Chinese pictographs and the names of the chemical elements. Names of chemical elements should be able to be used not only alone, but also in chemical compounds. Chinese words are normally never longer than four syllables. If the names of chemical elements were di-syllables, it would be very inconvenient to use them in chemical compounds. Fryer’s one-character principle for translating terms was far superior to the translation methods of either William A. P. Martin or J. G. Kerr.

The second problem was that of coining compound words. There are up to 1500 syllables in the Chinese language than can be differentiated semantically. The creation of new terminology necessarily depends on having polysyllabic compound words. The methods of creating compound words for translating terms can be divided into two categories: literal and free translation methods. Examples provided by Fryer were 養氣, 輕氣, 火輪船, and 風雨表, which are mostly literal translations. Literal translations were common at the time because the prevalent method of rendering translations involved collaboration between a Westerner with a spoken knowledge of Chinese, and a Chinese scholar who recorded the oral translation with a brush. The Chinese transcriber had no knowledge of the source language. Foreign oral translators had to dictate in a concrete and descriptive manner. For example, the Chinese terms for the elements oxygen and hydrogen, 養氣, and 輕氣, are free translations based on very situational, commonly understood norms,

while the Japanese translations of the same terms, 酸素 and 水素, are strictly literal translations of those elements. That oral translators used several characters to explain an object, and then used that explanation for a newly-translated term, indicates that translation terms were produced during the course of the explanation. Fryer pointed out, however, that new terms should contain “as few characters as possible.” Di-syllabic terms have the least number of characters among compound words.

The third problem is transliteration. Fryer’s suggestions can be summed up as follows: Use Mandarin pronunciation instead of dialects, and use the same Chinese character to represent a certain common pronunciation from the source language to ensure phonetic consistency.

In 1890, the Second General Conference of the Protestant Missionaries of China was held in Shanghai. At the conference, Fryer read his long article on technical terminology. In the second section of his article, “Some of the Essential Features for a System of Scientific Nomenclature for China,” Fryer discussed in detail the rules and methods of creating technical terminology. Fryer claimed that new terms ought to be translations, where possible, and not merely transliterations.

Fryer claimed that the Chinese language did not lend itself to the importation of new ideas through transliteration from the outside world, as many other languages did. Practical usage showed that free translation was more suitable to the Chinese language. As for translating techniques, Fryer pointed out the errors in Lobscheid’s *English and Chinese Dictionary*, such as 半个上帝 as the rendering of “demigod,”<sup>1</sup> and 兄弟在律法 for “someone else’s brother-in-law.” He emphasized that word-for-word translation should be avoided. He claimed that of the eighty thousand or more characters in the *K’ang Hsi Dictionary*, only about eight thousand were ever used, except on the most extraordinary occasions. Some authorized Chinese characters had become obsolete or had only a vague meaning. Fryer believed that unearthing and using such authorized, obsolete characters would be a good method for translating terms. Fryer said that the characters 鋅 and 鉀 are successful examples of this method. At the same, using ancient Chinese characters was problematic. For example, Fryer was concerned that if he used 檣 檣 for the phonetic translation of “coffee,” “some future Chinese philologist will look up their original meaning in some antiquated volume and declare they are incorrectly used; or else that some conservative patriot of the future will write an elaborate essay to prove that coffee was known to the ancient Chinese and introduced from China to Western countries in the same way that steam

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1 The translations in Lobscheid’s dictionary of 半上帝 and 半神, however, do not seem questionable.

engines and telegraphs were!”

Fryer pointed out that the best translation method was perhaps to invent an entirely new character that could not be found in any existing Chinese dictionary by using an appropriate radical and phonetic. Such terms were being used to translate some of the chemical element names that were then coming into general use. The biggest drawback of such invented characters was that they were not authorized, and that the more fastidious among the literati objected to them sometimes on that account.

In his two articles, Fryer wrote at length about how to make use of obsolete characters and how to invent new characters for making translation terms. He paid little attention to compound words, however, especially terms that came from direct loan translation. In this sense, his method of creating translation terms was quite different from that of Japanese scholars of Dutch Learning.

#### **4 Medical Terminology Developed by the China Medical Missionary Association**

The nomenclature for chemical elements was based for the most part on the method of inventing new characters. This method later became the standard in China for creating nomenclature for chemical substances, indicating that Fryer had succeeded in his approach. But such success at the same time allowed for dissemination of the mistaken notion that coining new terms is equivalent to inventing new characters. This method of creating new characters was advocated by the China Medical Missionary Association, which considered it the best method for developing medical terminology. The terminology committee of the China Medical Missionary Association held its first meeting in 1901, when it also published its first compilation of medical terminology: *First Report of the Committee on Medical Terminology*. The committee's rules for coining terminology were explained in the preface of the report.

It may be of interest to the members of the Association to give some idea of the principles which guided the Committee in its work, especially in regard to fundamental terms. The first subject which claimed attention was the names of the bones. It was thought most desirable that in the case of such a fundamental matter there should be, if possible, only one character for each bone, in order to facilitate the naming of arteries, veins, and nerves as well as muscles. After a long and exhaustive search through Williams, Giles, and Kang Hsi, for suitable characters, the following list was finally agreed upon on the principle that every long or otherwise important, bone should have the bone radical at

the side (except those of the head); the bones of the hand, should have the hand radical; and the bones of the foot, the foot radical. The bones of the head it was not thought necessary to specially indicate by the radical, though as a matter of fact most of the cranial bones have the radical.

It would be observed that in following out this system it has been necessary in some cases to take old obsolete characters and affix to them the meaning intended, without much regard to the meaning given in Kang Hsi, while in other instances liberties have been taken in the way of adding a radical to a common character in order to make it conform to the rule. It is hoped that this system will greatly aid the memory of the student and teacher in remembering the position of the bones. Little change was made in the old names of the bones of the head and face.

In naming the parts of the blood circulatory system it was decided that every character used should have the blood radical, and that each part should be represented by single character.

For instance:

Source words	Chinese characters	pronunciation	motivation	Today's translation
Auricle	竈	<i>Hsüeh</i>	a blood cave	心房
Ventricle	噴	<i>Pen</i>	blood spurter	心室
Artery	脈	<i>Mo</i>		动脉
Vein	盃	<i>Huang</i>	blood going to the heart	静脉
Capillary	微	<i>Wei</i>	minute blood vessels	毛细管

In addition, the report concluded that anatomic passages and channels such as canals and ducts should be represented by 脰, and cells by 胙 *chu*. The terminology committee thought that the translation term used in Japan for “gland,” 腺, pronounced *chuan* in Chinese, could denote a “flesh spring,” and thus the committee considered it an appropriate translation term. The committee also suggested that the term for glands without vessels could be represented by the character 欄 *hu*, meaning 核 (nucleus).

The preface also explains the rationale for the following terms:

pancreas 脛 <i>I</i> (胰 [ 腺 ])		albumin 胎 (白蛋白)
Lymph 盞 <i>Chin</i> (淋巴)		proteins 脛 <i>Cheng</i> (蛋白质)
globulin 脛 <i>Ching</i> (球蛋白)	Serum 盟 <i>Ming</i> (血清)	
Tissue 脛 <i>Wang</i> (组织)	Uterus 脛 <i>Kung</i> (子宫)	

The China Medical Missionary Association followed the rules stipulated by the terminology committee in the *First Report* for creating new

characters after the Association later studied and approved the terminology. *An English-Chinese Lexicon of Medical Terms*, published in 1908, contained many of the newly-invented characters, and in general followed the above-mentioned rules. By 1937, however, when the eighth edition of *Cousland's English-Chinese Medical Lexicon* was published, most of the terms that were comprised of newly-invented characters had been discarded and replaced by medical terminology from Japan. The efforts of the China Medical Missionary Association thus could be considered a failure. There are two reasons that could be given for this shift in methodology. First, Fryer's new characters were mostly pictographic-phonetic characters; that is, he took the first syllable of the Latin or Greek term for the chemical element for the first Chinese character, and if that syllable seemed unsuitable, he would try using the second syllable. He would then add a radical. Although he divided the terms into separate categories, he retained the original readings. The new characters invented by the China Medical Missionary Association, however, were mainly composed of pictographs with little or no emphasis on pronunciation. This approach necessitated a continual search for new characters. Secondly, and most importantly, the one-character rule of the China Medical Missionary Association was unnecessary and had ignored the direction of the development of the Chinese language. For example, when terms such as 子宫, 蛋白, and 血清 were replaced with just one new character containing forms like 宫 or 明, many homonyms were created. Dependence solely on the pronunciation of the characters (that is, oral expression), rendered it impossible to differentiate between them.

## 5 Conclusion

C. W. Mateer (1836–1908), the Chairman of the Educational Association of China, published a terminology dictionary in 1904 entitled *Technical Terms*. This dictionary could be considered the culmination of the missionaries' century-long effort to coin new terminology. C. W. Mateer wrote the following in the book's preface:

It will be observed that the list contains a considerable number of new characters not found in Chinese dictionaries. All such characters are composed of a radical and a phonetic, and are to be pronounced in accordance with the phonetic part. All the rarer elementary substances, as well as some of the common ones, are so named, also a number of technical terms, for which a single character has been urgently needed, have been so rendered. This method avoids confusion while it enriches the language, and will, we venture to predict, be more resorted to in the

future than it has been in the past.

Terms created from newly-invented characters in this dictionary are mainly in the medical or chemical fields. In retrospect, C. W. Mateer's bold prediction was not realized. Mateer said in the preface that his wife had done the majority of the editing of *Technical Terms*. Ten years later, in 1913, however, Mrs. Mateer wrote in the preface of the *New Terms for New Ideas*:

They have invented new characters for the new ideas, and one is puzzled to know how to pronounce them. Only one is given in this book 秒/生 for microbe. This is given by way of contrast. But such will scarcely become popular. Their own new terms have a distinctly oriental air about them.

Chinese intellectuals and translators were divided in their opinions on using newly-invented characters or obsolete, ancient characters to create translation terms. Liang Qichao, Huang Zunxian, and Zhang Zhidong were representative of those in favor of the method, while the linguists, Yan fu and Hu Yilu, were in the opposing camp.

From the perspective of lexicology, only compound words could increase the number of new vocabulary terms. The method of inventing new phonetic forms has gone the way of history. As phonetic forms are limited, it is impossible to succeed in formulating technological terminology simply by relying on coining more characters. These are the lessons that the missionaries have bequeathed to us.

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