

# Discussion on Accurate Chinese Translations of “Nephrite” and “Jadeite”

Lili Zhang and Xinqiang Yuan

**Abstract**—Upon the mineralogical researches on the jade from China in 1846 and 1863, Damour, a French mineralogist, discovered two mineral components of the jade and named them as “nephrite” and “jadeite”. Then Japanese scholars introduced his research results to Japan and translated “nephrite” and “jadeite” into Nefuraito (“Ruan Yu”) and Kōgyoku (“Ying Yu”) in Japanese according to their small difference in mohs' hardness. Then at the beginning of the 20th century, Chinese scholars cited their Japanese translations and transferred them into “Ruan Yu” and “Ying Yu” in Chinese. This makes people always mistakenly think the two names are their Chinese translations and they have been used in various formal occasions, which leads to unnecessary misunderstandings and exerts a certain negative effect on the development of China's jade industry. Looking into the original meanings of “nephrite” and “jadeite” created by Damour, author thinks it is more appropriate to translate “nephrite” and “jadeite” into “Yushan Shi” and “Yuhui Shi” in Chinese.

**Index Terms**—Nephrite, jadeite, Chinese translation, Yushan Shi, Yuhui Shi.

## I. INTRODUCTION

For many years, it is common in China to translate “nephrite” and “jadeite” into “Ruan Yu” and “Ying Yu or Jade”. However, for scholars in this field, the meanings of “nephrite” and “jadeite” cannot be absolutely expressed in Chinese characters “ruan” and “ying”. Additionally on the market, on the one hand, some non-professionals are often puzzled by “nephrite” and “jadeite” so that they believe that nephrite and jadeite refer to their hardness while some people frequently doubt why nephrite does not feel soft at all. On the other hand, since the price of jadeite and nephrite increases with years at present, there are many similar substitutes for them on the market, and in order to evade legal sanction and exploit legal loopholes, many unscrupulous merchants begin to play with words, for example, they use several names of jadeite to call all the jadeites or similar precious stones not belonging to jadeite variety as jadeite (jade) to gain more benefits, thus causing the market confusion.

To solve the problem of translation of nephrite and jadeite into Chinese, we must firstly know their origin. French mineralogist Damour coins these two words from the mineralogical perspective and names them specific to their major mineral compositions, and they just belong to a component of jade. A Japanese scholar introduces the research result of Damour to Japan and translates “nephrite”

and “jadeite” into Japanese characters “Ruan Yu” and “Ying Yu” based on small difference of their Mohs' hardness scales. This free translation apparently uses mineral names “nephrite” and “jadeite” to denominate the mono-mineral aggregate type rock (i.e. jade type) made of these two minerals, and they are accordingly easy to be confused with their referential expressions.

Therefore, it is especially important to standardize Chinese names of nephrite and jadeite. This practice plays an inestimable role in the standardized development of Chinese or even international jade culture market and it is also the purpose of research of this article.

### A. “Ruan Yu” and “Ying Yu” Are Their Japanese Translations

“Jadeite” was discovered in Mexico, the colony of Spain in Central America in the 16<sup>th</sup> century. At that time, in order to seek for profits, it was called “kidney stone” by colonists. Until the 17<sup>th</sup> century, such kind of jade flew into Europe by way of Persia, India and China. And modern westerners call it “jade”, “jadeite” or “jadeite jade”; and easterners call it “jade”, “jadeite” or “Fei Cui”. Then at the beginning of the 20<sup>th</sup> century, the understanding of western modern natural science on jade was also introduced into Japan together with western modern culture. In 1846, French mineralogist Damour [1] (Fig. 1) made a research on this mineral from China. He considered this mineral as a new mineral of Ca-Mg-Fe double-chain silicate of amphibole group and named it “nephrite” (i.e. jade nephritique). Then in 1863, he discovered another mineralogical form in this mineral, which was Na-Al single-chain silicate of pyroxene group, and then attached suffix “-ite” that represented “stone” to “jade”, it was named as “jadeite” [2]. During the researches, it has been found that the jade discovered in Mexico in the 16<sup>th</sup> century and the jade from China are of the same mineral.

Upon constant researches afterwards, Damour has confirmed the two species of jade: nephrite and jadeite. As it is recorded in Japanese scholar, Toshi Suzuki's *Records of Jade* in 1916, after The Meiji Restoration in Japan in 1868, Japanese scholars introduced Damour's research results into Japan; then according to the small difference in mohs' hardness between nephrite and jadeite, they were translated into “Ruan Yu” (Nefuraito, “ネフライト”) and “Ying Yu” (Kōgyoku, “ジェダイト”) with Chinese characters. Recorded in relevant materials, Zhang Hongzhao, pioneer of modern Geology in China directly adopted the “nephrite” and “jadeite” named by Damour in 1863 as well as the “Ruan Yu” and “Ying Yu” recorded in Toshi Suzuki's *Records of Jade* in 1916 and he cited these words in his book, *Elegance of Jade* for the first time.

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The authors are with the Gemmological Institute, China University of Geosciences (GIC), Wuhan, 430074, P.R. China (e-mail: lilili29@sina.com, yxq1014@126.com).

ANALYSE DU JADE ORIENTAL,  
réunion de cette substance à la Trémolite;  
PAR M. A. DAMOUR.

Le nom générique de jade a été donné à différentes substances minérales qui, réunissant les caractères de dureté, de ténacité, de structure compacte, ont été cependant très-peu étudiées sous le point de vue minéralogique. On a ainsi établi: le jade ascien ou axinien, le jade de Saussure, le jade néphrétique ou jade oriental. Les deux premiers, si l'on en juge par leur aspect, semblent appartenir à des roches composées; mais le jade oriental, à raison de son homogénéité constante et de l'ensemble de ses caractères, a paru aux minéralogistes constituer une espèce proprement dite, sans qu'on ait pu cependant assigner à cette espèce un rang précis dans la classification, faute de notions suffisantes sur la nature et les proportions de ses éléments. La première analyse de cette matière a été faite par M. Karsten; plus récemment, M. Rammelsberg en a donné une seconde dont les résultats ne s'accordent nullement avec ceux obtenus par M. Karsten. J'ai pensé que le jade oriental méritait d'être étudié de nouveau, et c'est dans

Fig. 1. Analyses du jade oriental (Damour, 1846).

Besides, it also could be concluded from other historical documents that their Chinese names of "Ruan Yu" and "Ying Yu" were derived from Japan. For example, all the books for gems (such as *Words to Gems* written by Kaoliyou Nishioka in 1932) during Showa Period in Japan used these names; but in China, they didn't appear in books for gems until the 1980s; recorded in *Summary for Names of the Minerals both in China and Japan* (supervised and revised by Tsui Saito, Term 1794 on Page 148) in Showa the 17<sup>th</sup> year that: "Ruan Yu" is Japanese name, "nephrite" is English name, "Bai Yu" (could be translated into "white jade" word-to-word) is ancient Chinese name and then its Chinese name is decided as "Ruan Yu".

Until now, this name is continued to be used in China. "Ruan Yu" becomes the name of tremolite jade and "Ying Yu" becomes the name of pericalite jade.

B. Are Their Japanese Translations Correct?

For this free translation, the monomineralic aggregate rocks (jades) are named after their two mineral components: nephrite and jadeite. Thus, it is easy for the two names to be confused with the jades they tend to refer to. For "nephrite", does it refer to "nephrite mineral" that constitutes ferroactinolite - actinolite - tremolite or refers to "nephrite jade" aggregated by such mineral; and for "jadeite", does it refer to "jadeite mineral", the new mineral of pericalite group or "jadeite jade" that is composed by such mineral? Therefore, it is not accurate to simply translate "nephrite" and "jadeite" into "Ruan Yu" (towards nephrite mineral) and "Ying Yu" (towards jadeite mineral).

II. "NEPHRITE" AND "JADEITE" DO NOT FORMAL CHINESE TRANSLATIONS AT PRESENT

Besides "Ying Yu" and "Ruan Yu", they also have some other Chinese translations, such as "Yao Shi", "Shen Shi", "Fei Cui" and "Hetian Yu". But either "Yao Shi" or "Shen Shi" translated by modernists does not accord with naming conventions of gems and minerals. It has two reasons: (1) deriving from the beginning of the 16<sup>th</sup> century, kidney stone

was a propaganda method used by the Spanish Conquerors to govern their colonies, so as to obtain more profits. Medical effects of kidney stone were publicized and exaggerated to expand its influence and raise its value. Obviously, this method not only made such gems sold crazily in Europe at that time, but also brought continuous fat profits to the Spanish Conquerors. Thus, "kidney stone" is only a propaganda and profit-making method of the ruling class at that time, but not a name created according to its nature. It is just a symbol of an era, not a scientific name. Therefore, it is not reasonable to translate "jadeite" and "nephrite" into "Yao Shi" or "Shen Shi" (kidney stone). (2) As jadeite and nephrite are confirmed to be minerals, it does not accord with international naming rules of minerals to translate them into "Yao Shi" or "Shen Shi" (kidney stone).

Besides, it is used for translating "jadeite" into "Fei Cui" in China. However, what is "Fei Cui" in China? As it is recorded in Chunyuan's *Sketch Book for Western Regions*, the jades in Yarkant River are "various in different colors, as white like snow, green like emerald, yellow like wax, red like cinnabar and black like ink, all of which are top grade" (Fig. 2). Then, someone has called the "jasper" of green like emerald feather in Hetian Jade as "Fei Cui". As it is recorded in Du Wan's *Yunlin Stone Spectrum*, "As top grade among Yutian (current Hetian) Jade, the glossy ones in dark green are called 'Fei Cui'." It is also recoded in *History of Song - Kingdom of Khotan* that "Since Xining period, pearl, jade, coral and 'Fei Cui' are contributed." What's more, in *History of Heilongjiang - List on Natural Products*, it also has mentioned that West Bhat (current Buxi County, Heilongjiang Province) produces Fei Cui mine. Author considers that such Fei Cui might refer to the jasper generated there. It could be concluded that the ancients sometimes just treat "Fei Cui" as green nephrite jade or jasper. This opinion is obviously not accurate as "Fei Cui" is different from green nephrite jade or jasper.

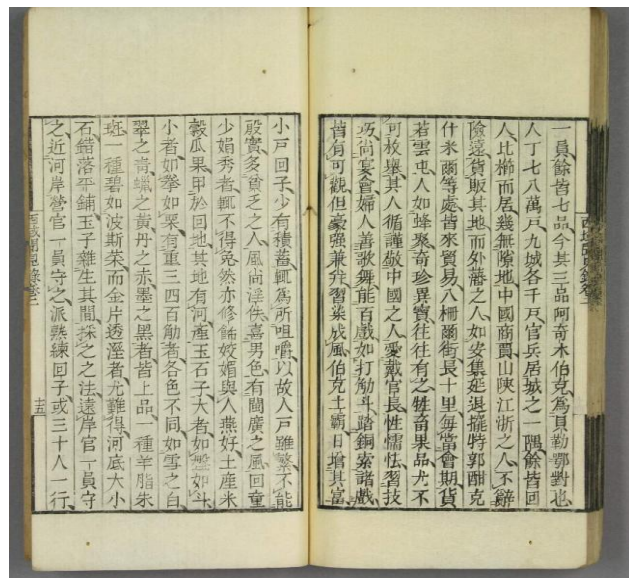


Fig. 2. Sketch book for western regions.

Therefore, translating "jadeite" into "Fei Cui" is determined by our history and culture, which has little to do with the nature of jadeite as a mineral, so that this translation is also not considered to be scientific and accurate.

### III. ANALYSIS ON ORIGINAL MEANINGS OF THE TWO WORDS CREATED BY DAMOUR

In order to analyze the accurate translations of “nephrite” and “jadeite”, it needs to know about original meanings and implications of the two words when Damour created them.

- 1) Start point: it is mineralogical researches made by Damour about the components of jade, but not gemological researches about the nature of jade. As a mineralogist, Damour has researched the jade from China and found out the two major mineral components of jade upon constant scientific experiments - “nephrite” and “jadeite”, and named them after the two components. Obviously, Damour has researched “nephrite” and “jadeite” from mineralogy, but not gemology.
- 2) “Nephrite” and “jadeite” are the names for mineral components, but not the names of jade.
- 3) Damour’s conclusion on the minerals from China is that “jade” is composed of two minerals and the two minerals form two different types of jade.

It could be concluded that Damour created the two words from mineralogy, “nephrite” and “jadeite” are the names for the major mineral components and they are only the elements that constitute jade. Therefore, it seems to take a part for the whole to simply translate “nephrite” and “jadeite” into “Ruan Yu” and “Ying Yu” (or “Fei Cui”).

### IV. DISCUSSION ON ACCURATE CHINESE TRANSLATION OF “NEPHRITE”

Author considers that it is not accurate to translate “nephrite” directly into “Ruan Yu”, reasons of which are as follows:

#### A. *From World Studies, the Nephrites That Share Similar Components with Those of China Have Been Discovered around the World During Different Periods*

- 1) Dorling and Zussman have reported a white imerinite jade that shares very similar structure, roughness and appearance with nephrite [3].
- 2) Hobbs has reported a green nephrite that could be considered as substitute of jade, components of which are close to actinolite [4].
- 3) Rimann has found out that a jade that coexists with anthophyllite asbestos generated in Paakila, Finland is almost composed all by Mg-rich anthophyllite. It is also called “nephrite” and it might be obtained upon enstatite alteration [5].
- 4) While studying the nephrites from New Zealand, Turner has found out that according to structure and composition, nephrites could be divided into aschistic nephrite, schistic nephrite and semi-nephrite, which form continuous and transitional evolutionary series together with tremolite rock of lineation and tremolite rock of schistosity [6].
- 5) Cheng Xian Yao and Xiao Li have reported a jade that is mainly composed of torendrikite and extremely similar to Fei Cui in appearance. Soviets called it “chloromelanite”. Its content of torendrikite is higher than 80%, it is in columnar crystal with hornblende cleavage, its content of aegirine is about 5% and it is in spheroid composed of

radiate fiber; its content of jadeite is about 15% and scale-like aggregates surround aegirine [7].

To sum up, for the jade composed of amphibole minerals, except nephrite, anthophyllite, smaragdite, imerinite and riebeckite are also similar to it. And nephrite also could be divided into aschistic nephrite, schistic nephrite and semi-nephrite. Therefore, it is not proper to translate “nephrite” directly into “Ruan Yu”, but “Yushan Shi” is more appropriate.

#### B. *Damour Created “Nephrite” Mainly from Mineralogy and It Is the Name for Major Mineral*

It is well-known that rock and mineral characteristics of jade and jade mineral (rock) are consistent, so that it is scientific to name the variety of jade with the name of mineral (rock) to a certain extent. While summing the gems and jades with the same major mineral (rock) up in a variety and naming the variety after the name of this major mineral (rock), the advantages include: first, the name is simplified and it avoids being confused; second, it is convenient for the establishment and operation of gem and jade appraisal organization. But the disadvantage refers that the name of mineral (rock) covers too much and blurs the boundary between gems and common minerals (rock) of gems, so that it is easy to lead that common minerals (rock) of gems are traded on the market as gems and jades.

For the above points and as it has been widely accepted by Chinese people as a convention because jade culture enjoys a history of over a thousand years in China, author considers that it is more appropriate to translate “nephrite” into “Yushan Shi”, which not only includes its mineralogical characteristics, but also includes our jade culture for thousands of years.

### V. DISCUSSION ON ACCURATE CHINESE TRANSLATION OF “JADEITE”

First, in Chinese, “jadeite” is for mineral and “Fei Cui” is for jade. In general documents about gems both in China and abroad, major mineral component of Fei Cui is jadeite, so that “jadeite”, the English name of “jadeite mineral” has always been used as English translation of “Fei Cui”. It is the same for national standards GB/T 16552-1966 Names of Gems and GB/T 16553-1966 Gem Appraisal. But Fei Cui is not equal to jadeite. Gem-quality jadeite is Fei Cui, but some colorless, stony and water-drying (bad transparency) jadeites generated from Burma cannot be called Fei Cui. With deeper researches on mineral components of Fei Cui, large amount of research data indicate that except part of cabochons, Fei Cui is generally composed of single mineral (jadeites, omphacite or chromium jadeite). While for bracelets, pendants, ornaments and part of cabochons, a little and small amount of other minerals are also included and even their major mineral is not jadeite (for example, the major mineral component of “black jade” and part of “blue jade” is jadeite), which actually exists in current Fei Cui market. Obviously, “Fei Cui” is not suitable to be the Chinese translation of “jadeite”.

Then, according to modern mineralogical researches, jadeite belongs to a mineral of sodium pyroxene group and it forms a wide range of isomorphism solid-solution series together with the minerals of Ca-Mg-Fe pyroxene group and

the minerals of Na-Ca pyroxene group, but jadeite is only an end member in these isomorphism solid-solution series. It is inferred that besides jadeite, there might also be some other pyroxene minerals in Fei Cui. Upon some newest scientific researches and discoveries, it is far more than jadeite that meets the definition of Fei Cui. For example, omphacite is the major component of “oil mass green jadeite Fei Cui”, content of which is higher than 50%. Obviously, major mineral component of Fei Cui is not just jadeite at present.

It has been found when scholar Bamba studied the chrome diopside jade named as “Hidaka Jade” discovered in Chisaka Hidaka, Hokkaido, Japan in 1980 that chrome diopside jade is mainly composed of chrome diopside with small amount of uvarovite, chromite and pectolite. It is of characterized pilotaxitic texture, strong toughness and beautiful green like nephrite and it is generated in network vein by cutting across contact zone of serpentinite and rodingite. This indicates that for the jade composed of pyroxene minerals, besides jadeite, diopside jade is also included.

Actually, early in 1922, Washington has studied some Fei Cui products from Yucatan, Mexico and Honduras in Central America and the four end elements including jadeite, diopside (small amount of ferrosilite and wollastonite are included sometimes), albite (including small amount of orthoclase) and anorthite are used to determine the lithological composition [8]. It has been found out that components of these Fei Cui vary continuously from pure tuxtlite to albite, and as the lithological composition is closer to albite, the structure is rougher. Then he has proposed to use “mayaite” to represent the series of Fei Cui that varies continuously from pure tuxtlite to albite.

Then scholar Givlenko has considered that Fei Cui belongs to ternary solid-solution series of jadeite-diopside-aegirine, but not monomineral rock only with jadeite according to mineralogical researches on Fei Cui. According to proportion of the three mineral components, he divided Fei Cui into jadeite-type (content of jadeite is not lower than 80%), diopside-jadeite (jadeite accounts for 42%~79%, diopside accounts for 10%~49%, aegirine accounts for 0.9%~11.3% and hedenbergite accounts for 0%~12.5%) and kidney stone-aegirine, the three of which are equivalent to jadeite, diopside-jadeite and chloromelanite.

According these scholars' researches, we could figure out that jadeite belongs to a mineral of sodium pyroxene group and it forms a wide range of isomorphism solid-solution series together with the minerals of Ca-Mg-Fe pyroxene group and the minerals of Na-Ca pyroxene group, but jadeite is only an end member in these isomorphism solid-solution series. It is far more than jadeite that meets the definition of Fei Cui and Fei Cui is not monomineral rock only with jadeite. Jadeite, aegirine and augite (diopside-hedenbergite series) of pyroxene minerals form a wide range of solid-solution series, which could constitute Fei Cui or jade series of various components and species.

In addition, minerals of pyroxene group belong to silicate single-chain structure and they are important rock-forming minerals. With different cations, crystal textures are different, through which pyroxene group could be divided into two subgroups, including orthorhombic system and monoclinic

system. For the gem minerals of pyroxene group: orthopyroxene subgroup includes enstatite, bronzite and hypersthene (and its variant of iron-rich hypersthene); monoclinic pyroxene subgroup includes diopside (and its variants like violane, hedenbergite, chrome diopside, diallage and green diallage), triphane (and its variants like kunzite and emerald silver pyroxene) and Fei Cui. Observing the naming rules for various mineral gems in pyroxene group, it is not difficult to find that they are named as “prefix + pyroxene”. On the other hand, considering that “jadeite” is formed as “jade+ite”, it is reasonable to be translated to “Yuhui Shi”. At the same time, using “Yuhui Shi” as Chinese translation of “jadeite” also could avoid the confusions among English translations of non-jadeites and it also accords with international naming rules for minerals.

## VI. CONCLUSIONS

Actually, “nephrite” and “jadeite” do not represent “soft” or “hard” (as their Chinese translations “Ruan Yu” could be translated into “soft jade” word-to-word and “Ying Yu” could be translated into “hard jade” word-to-word) at the beginning. This is a mistranslation made by Japanese translator by accident. Upon modern mineralogical researches in hundreds of years, it indicates that hornblende and pyroxene enjoy extremely similar and even the same mohs' hardness. Both hornblende and pyroxene are complex silicate minerals and for isomorphism, either of them has dozens of transitional species and tiny hardness differences also exist between species. Over the years, after accurately measuring hardness of different crystal faces of tremolite, geologists from Taiwan have found that along different crystal faces, different hardness also exists. Calculated with arithmetic method, average mohs' hardness of tremolite is 6.33°, which is very close to the 6.5° of jadeite.

But in Chinese, “soft” and “hard” are quite different while being used to describe hardness and they are opposites of each other. Thus, it is improper to name two jadestones that share little difference in hardness as “soft jade” and “hard jade”. Such translation exaggerates hardness difference between the two jadestones.

Considering China's jade culture and integrating academic perspective, author thinks “jadeite” should be translated into “Yuhui Shi”, polycrystalline aggregate of which could be called “Fei Cui”; and polycrystalline aggregate of “nephrite” should be translated into “Yushan Shi”. While from another point of view, in China, “Hetian Yu” and “Fei Cui” have become the inheritance and carrier of Chinese culture. From halcyon (name of a bird) to the jade it represents, it has been a long history and it has been widely accepted and accustomed by Chinese people. And they appeared much earlier than the English words “nephrite” and “jadeite” created by Damour. According to the principle that nouns and names should follow the earliest creator, Chinese characters “Yu” should correspond to “Yu” or “Yu stone” instant of “jade” in English, Chinese characters “Hetian Yu” should be translated into “Hetian Yu” not nephrite and “Fei Cui” should be translated into “Fei Cui” not jadeite, which is the respect to history and reality.

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**Lili Zhang** was born in Wuhan on October 29, 1981. She is PhD candidate. Her research interests are on gemology. She studied in Gemmological Institute, China University of Geosciences (GIC), Wuhan, 430074, P.R. China. She dedicated to the study of jadeite color field for six years, worked in the China first jade company-Jian Xin Li and taught in Jiangcheng College.