

Theoretical Certainty : The Qian–Jia Rationalism¹

FENG Shengli, The Chinese University of Hong Kong/Beijing Language and Culture University

Translated by HUANG Qiuyue, Proofread by HU Zuoyou

Abstract: In the 16th century, western science made a great leap. Meanwhile, in China, the development of textual criticism (including scholars Gu Yanwu 1613-1682, Dai Zhen 1724-1777, Duan Yucai 1735-1815, Wang Niansun 1744-1832) also facilitated the development of scientific factors (Hu Shi 1967)². This paper argues that Qian-Jia scholars' work represented a new era of traditional research that the value of scholarships and intellectual work (starting from Gu Yanwu 1613-1682, Dai Zhen 1724-1777, Duan Yucai 1735-1815, Wang Niansun 1744-1832, etc.) is essentially based on what they created and believed, overtly or overtly, the principle of logic certainty — a newly developed indigenous rationalism in the Chinese intellectual history.

Key words: Qian-Jia logical certainty; rationalism; deduction; axiomatic thought

1. The Scientificity of Language Analysis

The issue of Qian-Jia theoretical certainty or rationalism needs to be researched from a linguistic perspective, that is, from the perspective of linguistics itself. It is a discipline as well as a perspective. What is the scientific property of language research? This article doesn't focus on the scientific properties of linguistics itself. Instead, it only probes into scientific questions that cannot be ignored while we carry out linguistic researches, from the perspective of language research. Obviously, it is a very complicated question, and we only start from the basic question "what is science". There is no doubt that there are many different definitions of science, and in scientific philosophy it must be more profound than the technical science dis-

Author: FENG Shengli, Department of Chinese Language and Literature, The Chinese University of Hong Kong; Email: sfeng@cuhk.edu.hk

cussed. However, this paper is only to discuss whether linguistics can be perceived as science and what kind of science it can be perceived as. In fact, from the linguistic point of view, science is the most recent thing, which was brought forward in 1950s after Chomsky revolution. The controversy took place in 1950s as well. The famous linguist Hockett clearly stated that linguistics is not science, and simply can not become science. why? He said:

Specialists have been working for a long time on the problem of analyzing, describing, and comparing grammatical systems and the degree of accuracy achieved is much greater than the layman would suspect. At the same time, there remain many points on which precision is till impossible. Some linguists like to believe that grammatical analysis has become a completely objective operation, but this is not true. Phonemic analysis has been brought much nearer such a state: complete precision is not always possible, but we can at least pinpoint the areas of indeterminacy and usually see why they remain indeterminate. But grammatical analysis is still, to a surprising extent, an art: the best and clearest descriptions of language are achieved not by investigators who follow some rigid set of rules, but by those who through some accident of life-history have developed a flair for it.”(Hockett Charles (1958) A Course in Modern Linguistics (P147)).³

The sentence “grammatical analysis is still, to a surprising extent, an art” is of crucial importance, and the key is how to perceive the word “art”. Hockett meant to emphasize that grammatical analysis was not science. But what is it then? He said it was art. Djamouri. R. referred to this “art” as “technique”. I personally assume it as the combination of “technique” and “art”. In conclusion, grammatical analysis is not science, which is the idea of traditional linguists, and even some modern linguists.

If linguistics is not science, why do we still discuss “Linguistics and Science”? Constant changes lead to the development of academic researches. In 1975, Robert Lee proposed that, “Noam Chomsky’s first book on syntactic structures is one of the first serious attempts on the part of a linguist to construct within the tradition of scientific theory-construction a comprehensive theory of language which may be understood in the same sense that a chemical, biological theory is understood by experts in those fields. It is not a mere reorganization of the data into a new kind of library catalog, nor another speculative philosophy about the nature of man and language, but rather a rigorous explication of our intuitions about our language in terms of an overt axiom system, the theorems derivable from it.”

Nowadays, Robert Lee’s ideas have been widely adopted. The most obvious proof should be that the new book *Grammar as a Science* by the famous syntacti-

cian R. Larson was published by MIT Press in 2012, which explicitly introduces grammar as science in the book. It was the first time in the history of linguistics.

How should we comprehend the linguistic revolution of Chomsky? What is the essence of the revolution? Concluding from what Robert Lee mentioned as “science”, I think the three aspects below are primary:

- (1)The tradition of scientific theory-forming.
- (2)An overt axiom system
- (3)Theorems derivable from it

The first one is the tradition of scientific theory-construction, in which axiom is primary and theorems can derive from it. Chomsky’s *Syntactic Structure* is featured with the three characteristics above, which manifests the fundamental properties of science as well. In order to understand the scientific property of linguistics, we need to understand what is axiom system first.

2. What is “axiom-system”?

What are “derivable theorems”? The derivability of theorems depends on the certainty of axioms and the rigidity of logic. “Axiom” is primitive concept that theorems derive from it. In 2008, Marcus Tomalin explicitly emphasized that point in his book *Linguistics and the Formal Sciences*. The statement below is of great importance. He emphasized:

It is important to recognize that the theories grouped together beneath the term Formal Science all utilize some form of the axiomatic-deductive method and that, therefore, despite their many differences, they all involve the deduction of consequences (i.e., theorems) from a small set of intuitively obvious axioms or assumptions, and, as a result, they can be viewed as being unified by the same basic scientific method. In the light of this observation, it should be remembered that not all intellectual enterprises (especially, not even all sciences) can be pursued by means of this method. In order for an axiomatic-deductive system to be constructed at all, it is necessary to be able to state initial assumptions, to identify primary elements of some kind, and to make valid deductive inferences from these assumptions and elements. There are many areas of research that are not understood with sufficient precision to permit an axiomatic-deductive analysis. However, the formal sciences all attempt to utilize this methodology, and it is one of their characteristic features.⁴

The explanation can help us understand what is the essence of science. The few sentences mention what is basic scientific method, what is the methodology that

formal sciences all attempt to utilize, and that it is one of their characteristic features. Therefore, the short paragraph can be regarded as the most explicit illustration of what is science. To be specific, science is “axiom”, deduction and constructing axiomatic system. Only a system like that can be treated as one with scientific properties or characteristics. Specific as follows:

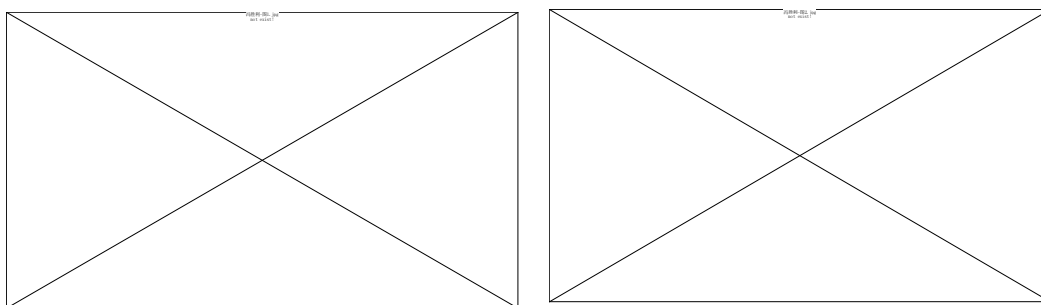
characteristics of Formal Science

1. axiomatic-deductive method
2. deduction of consequences (i.e., theorems)
3. the process of an axiomatic-deductive system:
 - (1) stating initial assumptions;
 - (2) identifying primary elements;
 - (3) making valid deductive inferences from these assumptions and elements;

Given this background, we can take a close look at modern linguistics. The forefront of modern linguistics built up on syntax. Chomsky’s generative grammar is the deduction of formal structure, which certainly possesses the property of formal science. In fact, formal science also has another characteristic, which is presented as shown below, in the book *An Introduction to Transformational Grammars* by Emmon Bach. (1964:143)

It may appear as if our reasoning is circular in a vicious sense. We use various rules to argue for aspects of the theory and then turn around and use the theory to argue for the correctness of the rules. But this impression is based on an incorrect view of the process of scientific reasoning. Reasoning in an empirical science does not proceed in a linear fashion, as I shall stress here. It proceeds on all fronts simultaneously. We are not constructing a pyramid but rather a keystone arch, in which all the pieces must be held up at once.” (Emmon Bach 1964:143)

The basic idea here is that within a theoretical system, every hypothesis, every step of the deduction, and every theorem should not be dispensable, or isolated from each other. Instead, they are indispensable and interrelated. They even depend on each other, which then can hold all together. In such a system, once a component is missing, the whole system will collapse. That is, the real scientific theory is a tight system with all components “interlocking”. If in a system, when one piece is removed, the others can still exist. Then, it is pyramid-type “accumulating” system. However, as Bach speaks of the properties of the scientific system, it is not a pyramid-type accumulating one, but an interlocking one like a keystone arch. This is another property or characteristic of the scientific system (or formal science) to emphasize: the interlocking theory of “a keystone arch”, as shown in the pictures below.



The first picture shows the keystone arch, in which one missing piece will cause the whole structure to collapse. While in the second picture, one missing piece may have little influence on the whole pyramid. What inspirations can we draw from these two structures? It is easy to find that, the first one is the type of interlocking deduction, and the second is accumulating induction. In fact, both “the theory of generating analogy” by Wang Niansun and “the theory of certainty” by Duan Yucai are based on the keystone arch fundamentals. Therefore, there do exist science in Chinese academic history. Obviously, the scientific property here refers to the scientific thoughts. As a matter of fact, the fundamental difference between the science and technology is that, “science is thoughts” while “technology is the physical carrier of scientific thoughts.” Hence, our question is whether there is the mentioned kind of science in Chinese history, or similar kind, which is a significant question to investigate seriously in Chinese intellectual history.

3. Formal Science in China

This is a significant and complex question that cannot be fully answered in this article. The purpose of this paper is to raise questions for future research. Undeniably, there are brilliant achievements in Chinese history - the four great inventions. However, those achievements are mainly the invention and progress of technology. As mentioned above, we are to discuss the major properties of formal science. Does there exist the theory explaining properties of science in the history of China? We may take a look at the theories before Qin Dynasty. In Zhang Taiyan’s article Yuanming, he mentioned that there was discussion about syllogism in Mohist Canon in Chinese history, which was different from that in India or Latin. According to his description, the logic theory gradually vanished after Han Dynasty, which is undoubtedly detrimental to the academic in history. But fortunately, Gu Yanwu and Dai Zhen in Qing Dynasty facilitated the development of “Logic”. There even

appeared a school featured with structural analysis and rigorous logic. These features are much similar to the characteristics of “formal science” mentioned above.

However, we noticed that there are different opinions. Zhu (1994) said: “Chinese language makes science unlikely to exist (referring to *How can I not think of her*⁶). But if that idea is reasonable, what brings the emergence of logic and science in Qing Dynasty?⁷ From our perspective, the research objectives can affect the scientificity of methods (specifically referring to formal science). China’s learning is the learning concentrating on humanity, which is an accepted view and also mentioned in *Analects of Confucius*. Different academic research objectives can lead to different types and functions of science: the study about humanity is dialectical, while physical science comes from the study of nature (referring to Feng Shengli 2003). Qian-Jia scholars focus on studying ancient Chinese literature. Their primary concern is whether the ancient classics are true, and whether the language glossed by ancient commentators is “right or wrong”, which differs from the researches on humanity in older times. Inevitably, there have always been comments on academic in Qing Dynasty, saying that it lacks scientific thoughts, for the scholars just bury themselves in outdated writings. Undoubtedly, it is prejudice. As Zhan Taiyan emphasized in his article, the academic in Qing Dynasty had great logic foundation and influence.

Notably, Dai Zhen’s statement reveals that all judgment must be built on a solid foundation of logic, and that then the judgment must be certain and only. But why they have confidence about the certainty? Their certainty originated from their acquiring different keystones after deep investigation. Every piece of keystone helps constitute a tightly interlocking arch, which wouldn’t let individual piece get a chance to ignore the rules and play their role by themselves. Then there naturally come the certain laws. Based on the arch’s radian and the keystone’s wedge angle, the scholars can know the quantity and size of keystones. Hence, the law can be regarded as definite.

But there are some disagreements, insisting that the ancients’ theory cannot be called science, for there is neither concept nor argument. Indeed, if strictly following the requirements of modern academic research, we cannot find demonstrating forms or procedures.

Moreover, after May 4th Movement, most scholars accepted science and democracy in the west, believing that there was no science in Chinese history. They thought Qian-Jia thoughts should be abandoned along with feudalism so as to realize modernity. This kind of belief prevailed. Thus, Qian-Jia ideas were regarded as backward, which naturally caused great damage to Qian-Jia academics. Actually, there is no further development regarding Qian-Jia scholarships nowadays. But this

paper aims to clarify the misunderstanding about it. Certainly, this paper doesn't mean to defend Qian-jia ideas, but to help establish a correct opinion about it. To be sure, Qian-jia scholars didn't prove how scientific their ideas are, for science is a word just appearing less than 100 years ago in China. But it doesn't mean their ideas are not scientific. Quite a lot scholars unanimously admit that Qian-Jia scholars' statement is of academic value, but they seldom think it is scientific (maybe Hu Shi is the only one that believing its scientific property). This kind of view is not just unfair for Qian-Jia scholars, but also untrue about history, which causes confusion for us regarding what to inherit and what to develop. Hence, this paper will probe into its literature linguistics from academic perspective so as to grasp a better understanding about its scientific thoughts.

4. The Qian-Jia Theoretical/Logical Certainty (T/L Certainty)

We believe that the scientific essence of Qian-Jia academic lies in the word “certainty”, and the core of “certainty” is “logical certainty”, which means “something theoretically has to be like this”. This kind of certainty originates from deduction. As mentioned before, deduction is the most essential part of science. Although Qian-Jia scholars didn't make any declaration that they are making deductions, they did get results, and made judgments with terms like “must” or “have to” to demonstrate the logical deduction (suggesting the deduction process as well). In my opinion, the terms are results of logical deduction, indicating their internal deductive thoughts.

Dai Zhen was a famous Qian-Jia scholar in Qing Dynasty, whose scientific thoughts can be as influential as Galileo's. Dai Zhen proposed some terms like “the ultimate hypothesis”, “verification”, “compliance with law” and “exhaustive deduction” in his article Letter with Yao Xiaolian¹¹, which are all remarkable fruits of his scientific thoughts. All these reflect his scientific thinking of “valuing refined knowledge instead of encyclopedic knowledge”, which is contrary to ancient scholars' idea of being knowledgeable. Moreover, unlike other scholars, Dai Zhen focused on his study instead of being just knowledgeable. As Pietarinen said, science is not primarily concerned with knowledge, and ignorance is what is brought to the force by retroductive inferences. We can find Dai Zhen shared some common understanding with Pietarinen about concentration on the specific field instead of being knowledgeable, though Pietarinen's “knowledge and ignorance” is somewhat extreme. We can get a further understanding about Dai Zhen's scientific idea of

“valuing refined and professional knowledge” if we investigate Pietarinen’s “knowledge and ignorance” :

I defend the view that science is not primarily concerned with knowledge and that its method of arriving at proposing hypotheses does not commit us to have stable beliefs about them. Instead, what drives scientific discovery is related to the kind of ignorance that scientists can cleverly exploit. Not an absence or negation of knowledge, ignorance is what is brought to the force by retroductive inferences.” (The Science to Save Us from Philosophy of Science, talk given at CUHK, June 2014)¹²

Hence, Dai Zhen’s insights coincide with the scientific spirit nowadays, which was displayed in his book as well. He argued the Chinese character “光” was incorrectly used instead of “横” in *The Book of History*. Both characters in ancient China had same pronunciations, but the meaning “横” was much more profound and appropriate. But how Dai Zhen knew it was “横”? And how can he be certain about it? In his childhood, he used to ask his teacher, “How did Zhu Xi know Confucius’ intentions while he had never seen Confucius?”¹³ He asked himself the similar questions and then proved his opinion via logical deduction in his work, which showed the theoretical certainty of Qian-Jia scholars. As his student Wang Niansun stated, “it has been 1,700 years since a work of the same quality appeared”. Their ideas are for the first time in Chinese history, exhibit such kind of certainty and confidence, owing to the scientific thoughts and logical deduction.

5. Certainty in Duan Yucai’s Study

In Duan Yucai’s book *Annotated Shuowen Jiezi*, the word “必”(bi “certainty”) appeared over 20 times. He also frequently used “断无”(duanwu, “certainly not”) and “断知”(duanzhi, “certainly know”), which displayed his strong logical thinking and logical system, which all displays the underlying equation $A=x|y$, if $A=x$, then $A \neq y$. Obviously, what’s worth thinking is that, there will be no “必”(bi “certainty”) without “无”(wu “not”), and that there will be no “deduction” without “certainty” then.¹⁵ Hence, Duan Yucai’s theory of “断无”(duanwu, “certainly not”) is built on the foundation of “theoretical certainty”,¹⁶ which is best explained in his articles.

Except the theories above, he also used the law of sound symbolism as proof in his articles, which contains both the concept of radical consonant (referring to Kawahara 2012)¹⁷ and assonance. All these theories reasonable corresponds to similar western theories. In this paper, we will not evaluate Qian-Jia scholars’ principle

of “only valuing ancient works” (it is a principle, not a theorem).¹⁸ This paper meant to emphasize the logic instead of the principle, which is also the reason why Duan Yucai and Wang Niansun’s ideas are advanced.《段玉裁卷入的两次学术争论及其他》¹⁹)

Some critics think that Duan’s annotations to *Shuowen Jiezi* were too subjective, but actually, he presented reasonable demonstration on his judgment. One example was that he pointed out the emendational mistake of the word “糲” (shen, rice, soup) in *Shuowen Jiezi*, and proposed to replace it with “米粒” (mili, rice). He used 11 steps to prove his judgment as following:

1. Pointing out the mistake: The right words should be “米粒” (mili, rice);
2. Referring to the guideline of *Shuowen Jiezi*, which emphasized the principle of annotation. Hence, the popular word “米粒” (mili, rice) should be used for easy understanding;
3. Citing similar examples from the book *Shuowen Jiezi* itself, so as to strengthen his argument;
4. Citing the use of “米粒” (mili, rice) in other classic books to prove the accepted popular use of this word;
5. Analyzing possible reasons why the writer used “糲” (shen, rice, soup) instead of “米粒” (mili, rice);
6. Applying the method of “reduction to absurdity”, explaining the absurd conclusions if “糲” (shen, rice, soup) is used;
7. Citing common saying as evidence;
8. Citing usage in ancient classics, like in Mencius;
9. Further demonstration by comparing various use of “米粒” (mili, rice) in The Book of Songs and other classic;
10. Giving a judgment based on the precious examples, that the two words “糲” (shen, rice soup) and “米粒” (mili, rice) have different meanings;
11. Finally commenting: It would certainly not be “糲” (shen, rice soup) .

As described above, we can find that Duan’s demonstration is based on lots of evidence before he comes to the final judgment. Undoubtedly, there exist logic, hypothesis, demonstration, and falsification in his book. Indeed, they never used the exact word “logic” or “science”, but we cannot just think there is no logic or science in their work. As the 11 procedures above can tell, their ideas are logic and scientific. On the contrary, we shall apply tools and theories of today to investigate the ancient academics.

6. Certainty in Wang Niansun's Study

Wang Niansun is another famous Qian-Jia scholar, whose ideas are worth studying. We need to probe into how he presented scientific theories and what's his keystone mode like. In his book *Guangya Annotations and Proofs*, there are lots of universal judgments like "whoever...is...". He meant to emphasize that universal judgments can be deduced and that universal judgments can be used to infer truth. But how did Wang Niansun achieve this? His keystone is the invention and application of the logic of categorizing and interlocking. He thinks things of the same category are interlocking, and that they have similar meanings as well. In order to complete *Guangya Annotations and Proofs*, he concentrated on reading and studying for 4 years without stepping out of the house.

From the explanation in his book, we can find his logic pattern. He sorted the horizontal category based on synonyms and the vertical category based on cognates. Then naturally, we can find words of same origin. Based on modern science, Wang Niansun's theory can be concluded as a logic formula, If $A \approx B$, then $[A \rightarrow x, y, z] \wedge [B \rightarrow x, y, z]$ ²¹. When we grasp a typical example, we will grasp the whole category. It is Wang Niansun's great contribution and the precious treasure in Chinese intellectual history.

7. Logic-Certainty and Rationalism among Qian-Jia Scholars

Actually, there were other scholars in Qian-Jia school, like Qian Daxin and Hu Peihui. They all contributed to the scientific development with their own theories about "certainty".²¹ Needless to say, Dai Zhen, Duan Yucai and Wang Niansun are three outstanding figures in Qian-Jia school, and their academic contribution is remarkable. But due to the limited space of this paper, we cannot discuss too many figures. It is expected that the study on scientific and thoughts of Qian-Jia school can start from this article and even become an independent discipline someday in the future.²² The most prominent characteristic of Qian-Jia school is their deductive certainty, which is also the most outstanding academic achievement. Undoubtedly, Dai Zhen is the pioneer, a creative figure like Galileo.²³ Moreover, they did not argue for the right or wrong moral principles; instead, they argued the true or false of academic reasoning. They dedicated themselves to studying the pronunciations, patterns, meanings, cognates and grammar, etc.. In fact, their study on linguistics of Chinese classic is quite similar to Chomsky's generative syntax.

When it comes to the Qian-Jia rationalism, we cannot overlook the scientific

temperament of scholars. They didn't pursue the high-ranking posts or academic reputation, and all they had in mind is to carry out research on literature language. They concentrate on developing scientific thoughts and making scientific discoveries. They decline anyone who asks them to write articles irrelevant to their own study, and all the interpenetration and annotation books manifested their achievements in their circle. Therefore, in the aspect of scientific temperament and academic confidence, we should all learn from Qian-Jia scholars.

8. Conclusion

A hundred years ago, Yan Fu (1854-1921) mentioned in his text *On the Origin of Strength*, that Darwin and other Western scholars (Yuan Qiang 原强) “use one theory to explore the world, investigate the fundamental law, cite similar examples, then extend it to infer the truth and investigate it to achieve the effect”. For over one hundred years, there has been a dramatic change in the social system and academic paradigm, but the logical structure and procedures of “argumentation” do not seem to become part of us. In order to revive Yan Fu's suggestion, we may take a closer look at the procedures as below:

If A, then certainly B.

A = use one theory to explore the world

B = (1) investigate the fundamental law

(2) cite similar examples

(3) extend it to infer the truth

(4) investigate it to achieve the effect

B is the condition to achieve A. If one really can succeed in “investigating the fundamental law”, it is a major breakthrough of the traditional theory. This is a footnote of Qian-Jia statement, because their classics linguistics also “investigates the fundamental law”, although the “law” is about language phenomenon. Moreover, Dai Zhen “extends it to infer the truth” in order to search for the truth of the logic. Still, Qian-Jia scholars “investigate it to achieve the effect”. In different academic discipline like phonology, semantics, and history, this kind of scientific thoughts are displayed (including not only verification, but also falsification). Ironically, over one hundred years after *On the Origin of Strength*, have we accepted and mastered Yan Fu's methods? Secondly, are we certain about whether Qian-Jia scholars possessed this kind of thought proposed by Yan Fu? Thirdly, have we scholars today made some progress or still remain the same with what Yan Fu proposed or as Qian-Jia scholars? Please note: human's way of thinking would only

develop rather than go backward; but thinking ability, like the muscles of the body, would weaken and even atrophy. Academic thinking is facing the same situation. But Qian-Jia scholars are quite enlightening and inspiring: human's potential of scientific thinking can be activated and can be improved through language investigation and linguistic inquiry. One of the important reasons why logical certainty and rationalism emerged in Qian-Jia period in Qing Dynasty is that textual criticism and exegesis were the objects for study.

Notes

1. The arguments presented here were partially published in *China Academic Frontier* Vol.9, 2015. The current research is part of the project on Scientific Research Methods and Concepts in Qian-Jia Scholars Duan Yucai's *Shuowenjiezi Zhu* and Wang Niansun's *Guangya Shuzheng*, supported by the National Social Science Foundation (Annual Important Grant. #15AYY009) and the project on Identification of Chinese as a Foreign Language Style of Register: Identify, Classification and Distribution, supported by Ministry of Education Humanities and Social Science Research Base (MajorProject, #14JJD740003).
2. The scientific spirit and method in Chinese philosophy in: Charles Moore (eds.) *The Chinese Mind: Essentials of Chinese Philosophy and Culture*. 1967. Honolulu: The University Press of Hawaii.
3. 朱晓农(2013)《叫我怎能不想她》商务印书馆。
4. I agree with Zhu Xiaonong's opinions. I also discussed Chinese language's grammar property whether it is similar to formal logic, or dialectical logic in another paper. Quite a lot of scholars also discussed before, but there is still no scientific analysis of specific factors.
5. 《从人本到逻辑的学术转型》《中国社会科学论坛》2013年第一期。
6. The prescription here means to discern "independent evidence" from "tautology". If an "explanation" is just "tautology" not rather than "independent evidence", it can be regarded as a good explanation of high academic value.
7. 参《考工记图后序》之考鬼氏之钟。
8. 事见(清)江藩《汉学师承记》中华书局1983版,第85页。
9. The equation can also be: $(A=x | y) \wedge (A=x) \rightarrow (A=y)$. Zhang Yinsheng's suggestion is appreciated.
10. 参冯胜利2003《从人本到逻辑的学术转型》,《中国社会科学论坛》第1期。
11. If the categorizing is not based on certain logic, then it will just be tautology.
12. Shigeto Kawahara (2012) *Acoustic Bases of Sound Symbolism*. The State University of New Jersey.
13. According to the tradition, scholar Gu Qianli would rather keep the original classic than make any change.
14. 见《文史知识》2010年第7期。

15. 刘盼遂《高邮王氏父子年谱》
16. The equation can also be: $A=B-[(A-x, y, z)-r(B-x, y, z)]$. Zhang Shengli's suggestion is appreciated, and the logic regarding r needs to be further investigated in the future.
17. 阮元的《畴人传》
18. The monographic research on Qian-Jia Scholar's scientific thoughts and method in Tianjin University is a primary purpose of its language research center.
19. 诸可宝《畴人传三遍·卷三》