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PAPERS

Theoretical Certainty: The Qian-Jia Rationalism[1]

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Initial translation by HUANG Qiuyue

Abstract: In the 16th century, western science made a great advances. Meanwhile, in China, scholars of textual criticism including Gu Yanwu (1613 - 1682), Dai Zhen (1724 - 1777), Duan Yucai (1735 - 1815), Wang Niansun (1744 - 1832) were also facilitating the development of scientific reasoning (Hu, 1967). This paper argues that the Qian-Jia scholars' work represented a new era of traditional research and that the value of scholarship and intellectual work starting from the forementioned scholars are based essentially on what they created, practiced and believed, the principle of logical certainty, a newly developed indigenous rationalism in Chinese intellectual history.

Key words: Qian-Jia logical certainty, rationalism, academic paradigm

1. The Science of Language Analysis

Theoretical certainty, or rationalism as pursued by the school of Qian-Jia scholars should be examined from a linguistic perspective. What are the scientific properties of language analysis? This is a complicated question, and, in order to answer it, we should start from the basic question "what is science"? There is no shortage of definitions of science, and in the philosophy of science they must be even more carefully defined than in technical science per se.

This article will explore the specifically scientific properties of linguistics. We will sttempt to determine whether linguistics is indeed a branch of science, and if yes, what kind of science it is. In fact, the idea that linguistics is a branch of science was brought forward in the 1950s after the Chomskian revolution. During that period, there arose a controversy over whether or not linguistics is a branch of science. For example, the American linguist Charles Hockett proposed that not only is linguistics not science, but that it could not possibly become science. Hockett explains:

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> "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 pre-cision is still impossible. Some linguists like to believe that grammatical analysis has be-come a completely objective operation, but this is not true. Phonemic analysis has been brought much nearer to such a state: complete precision is not always possible, but we can at least pinpoint the areas of indeterminancy 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." Charles Hockett: *A Course in Modern Linguistics* (1958).

Here, the key is how to understand the sentence "grammatical analysis is still … an art." Hockett seemed to suggest that grammatical analysis is not science, but an art instead. The French linguist, Redouane Djamouri, believes that this "art" should be interpreted as "skill." (personal communication) In my opinion, "skill" and "art" can be combined to form "craft." Either case though, grammatical analysis has traditionally been regarded as non-science, a view still held by some contemporary linguists.

The problem is, if linguistics is not science, then there will be no foundation for the common term "language science." Yet scholarly research progresses with time. As Robert Lee pointed out in 1975:

> "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."

Today, Robert Lee's view is considered received wisdom, as evidenced by the title of the book *Grammar of Science*, a work by the MIT grammarian Richard Larson. This represents the first time the term 'grammar' has been linked with 'science' in a book title.

So how do we understand this Chomskian linguistic revolution, and what really is the crux of this revolution? In my view, the true meaning of the Chomskian revolution can be seen in the following three tenets:

(1) The tradition of scientific theory formation.

(2) An overtly axiomatic system.

(3) Theorems that can be derived.

The crucial point is the tradition of scientific theory-construction, in which axioms primary and theorems can derive from them. Chomsky's work exemplifies the above three characteristics, which also manifest the fundamental properties of science. In order to understand the scientific properties of linguistics, we need to first understand the axiom system.

What is an "Axiomatic-system"?

What are derivable theorems? The derivability of theorems depends on the certainty of axioms and logical reasoning. "Axiom" is a primitive concept from which theorems can be derived. In 2008, Marcus Tomalin explicitly emphasized that point in his book *Linguistics and the Formal Science*. His statements below are of great importance in understanding an axiom system:

> 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, de-spite their many differences, they all involve the deduction of consequences (i. e., theo-rems) 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 ob-servation, 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 (Tomalin, 2008).

Tomalin's explanation is helpful in understanding the essence of science. It delineates here the scientific method and the methodology that formal sciences all attempt to utilize.

Tomalin's explanation thus can be regarded as the most explicit illustration of what science is. To be more specific, science is the deduction and construction of an axiomatic system. Only a system like that can be treated as one with the following scientific properties or characteristics·

Characteristics of formal science

1. axiomatic-deductive method
2. deduction of consequences (i. e., theorems)
3. the process of an axiomatic-deductive system:

(1) to state initial assumptions;

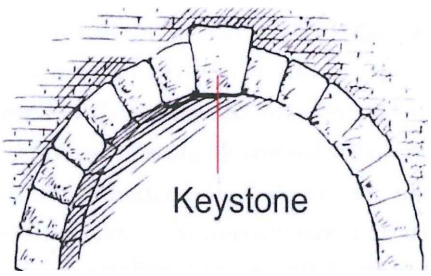
(2) to identify primary elements;

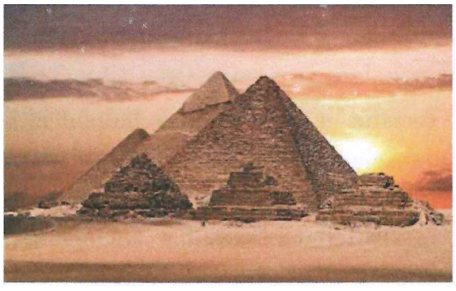
(3) to make valid deductive inferences from these assumptions and elements;

Given this background, we can take a closer look at modern linguistics. The foundation of modern linguistics is arguably derived from syntax. Chomsky's generative grammar is characterized by the deduction of a formal system that demonstrates the properties of formal science. In fact, formal science possesses an additional characteristic alluded to, in the book *An Introduction to Transformational Grammar*, by Emmon Bach (1964):

> "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." (Bach, 1964)

The basic idea here is that within a theoretical system, every hypothesis, every step of the deduction, and every theorem should not be isolated from one other. Instead, they are indispensable and interrelated. They even depend on each other and, thus, can hold all together. In such a system, once a component is removed, the whole system will collapse. That is, the real scientific theory is a tight system with all components being interlocked. If one piece is removed and the others can still exist, it is a pyramid-type system which is characterized by accumulatation of elements. However, as is noted by Bach, the scientific system is not a pyramid-type system, but an interlocking one like a keystone arch. This is another property or characteristic of the scientific system (or formal science) which emphasizes the interlocking relation 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 see that the first one is just like an interlocking deduction system, while the second is an accumulating induction system. In fact, both "the theory of generative analogy" (analogy with a generative relation between each piece involved in the analogy) by Wang Niansun (王念孙) and "the theory of certainty" by Duan Yucai (段玉裁) are based on the key-

stone arch fundamentals as seen below. Thus, there does exist science in Chinese academic history. Obviously, the scientific property here refers to the scientific thought. In fact, the fundamental difference between science and technology is that science consists of thoughts while technology is the physical carrier of scientific thought. Hence, our question is whether there exists the forementioned kind of science in Chinese is a significant question requiring a serious investigation within Chinese intellectual history.

3. Formal Science in China

This is a significant and complex question that cannot be fully answered in just one article. In fact, the purpose of this paper is to raise questions for future research. Undeniably, there have been brilliant achievements in Chinese history, which can be represented by the four great inventions (e. g. paper, gunpowder, compass, movable type printing). However, those achievements were mainly classified as the invention and progress of technology. As noted above, our goal is to explore the major properties of formal science. Does there exist a specific theory that demonstrates the properties of science in the history of China? To examine this question let us take a look at the intellectual history of the pre-Qin Period. In Zhan Taiyan's article *Yuanming* (原名, The Origin of Names/Concepts), Zhang mentions that there was a discussion about syllogism in the *Mohist Canon* (*Mojing* 墨經) in Chinese history, which was different from that in Indian or Latin tradition. According to Zhang's description, logic theory gradually disappeared after the Han Dynasty (206 B. C. – 220 A. D.), which was undoubtedly detrimental to academic development. But fortunately, Gu Yanwu and Dai Zhen in the Qing Dynasty (1644 – 1912) went on facilitate the development of logic theory. There even appeared a school featuring structural analysis and rigorous logic, containing features quite similar to the characteristics of "formal science" mentioned above. However, we notice that there are different opinions on the matter, with Zhu (1994) noting: "Chinese language makes science unlikely to exist. (Zhu, 2013)" However, if this is true, what caused logic and science to emerge in the Qing Dynasty?[2] From our viewpoint, research objectives can affect the scientific property of utilized methods (specifically referring to the methods of formal science). China's academic learning has always concentrated on humanity, a dominant view that is specifically mentioned in the *Analects of Confucius*. Different objectives in academic research may lead to different implementations of scientific thinking: studies in humanities result in dialectical thinking, while studies in physical science tend to emanate from the study of nature (Feng, 2003). Qian-

studying ancient Chinese text-criticism. Their primary concern was whether the ancient classics were original, and whether the interpretation of original language given by ancient commentators was "true or false", which differs from the research on morality in older times in terms of "right or wrong". Undeniably, there has always been bias towards academics in the Qing Dynasty, with scholars just burying themselves in outdated texts and failing to employ scientific thinking. But this is arguably mere prejudice and not consistant with facts. As

Zhang Taiyan emphasized in his article, the academics in the Qing Dynasty were heavily influenced by the foundations of logic. (*Xue Gu* 學蠱)

Notably, Dai Zhen's statement "古本堯典必有作'橫'者" (there must be an original edtion of *Yaodian* where the character 光 was written as 橫) reveals that all judgment must be built on a solid foundation of logic, and that the judgment must be exclusive and unambiguous. But from where did he derive such a confident sense of certainty? His sense of certainty, I would argue, finds its origin in a scientific reasoning that emerged after a period of careful investigation. By this reasoning, every piece of the 'keystone arch' (i. e., the rules and sub-rules of 音 phonology / phonetic representation, 形 the paleography / formal representation of the written forms, and 義 semantics / semantic representation) helps served as the basis for the 'tightly interlocking arch' that resulted in texture truths. This methodology served to ensure that each individual piece plays its designated role in the presentation of scientific truth in the text. Then everything will fall into their proper places. Metaphorically speaking, scholars were able to use the measurements of the arch's radian and the keystone's wedge angle to determine the quantity and the size of the keystone arch. As a result, there are a number of inferred rules and laws that we may regard as definite and universal.

Of course, there may be some disagreements in response to this reasoning. Some may argue that the ancient scholars' theories cannot be called science, since they did not possess the notions, concepts, or arguments of science in the parlance of modern linguistics. Contrarians would also include some scholars in the May Fourth who, being captivated by the Western notions of science and democracy, failed to recognize China's own scientific tradition. In their rush to modernization, they were ready to abandon Qian-Jia scholarship along with feudalism and other notions which they considered outdated. Under these circumstances, Qian-Jia ideas were deemed unenlightened, and would lose ground in the academic standing of the time. As a result, there were no further developments in Qian-Jia scholarship up to the present. It is against this backdrop that this paper aims to initiate an attempt to clarify these misunderstandings regarding Qian-Jia scholarship. However, this paper does not by any means intend to defend the Qian-Jia scholars' ideas as a whole. Instead, it aims to help establish a more objective interpretation. To be sure, Qian-Jia scholars did not say how "scientific" their ideas were, for the word "science (*kexue* 科學)" did not enter Chinese language until well after their time, less than a century ago. But the lack of a word for the concept of the time does not mean that their ideas and thoughts were not scientific. Numerous scholars have unanimously acknowledged the academic value of Qian-Jia scholarship yet they seldom associated this scholarship with the notion of being scientific. Even Hu Shi (1976), later in his career failed to note their deductive method in spite of the fact that it was he who credited the Qian-Jia scholarship as being scientific. Views such as this are not only unfair to Qian-Jia scholars, they are also historically untrue. They misled later generations in their efforts to identify what to inherit and what to develop. Hence, the goal of this paper is to explore textual linguistics from a rational perspective in order to obtain a better understanding of the Qian-Jia scholars' scientific thinking.

The Qian-Jia Logical Certainty (LC)

We believe that the scientific essence of the Qian-Jia scholars lies in the concept of "certainty" (必 *bi*), with the core of "*bi*" argued to be "logical certainty". It means "something logically factual will result in (or lead to) something certain". This kind of certainty originated from a strictly deductive procedure. As mentioned earlier, deduction is a quintessential and fundamental part of science. Although Qian-Jia scholars did not specifically employ the term "deduction," they did get results from, and made judgments with terms such as, "must be" (必) and "it is certainly not" (斷非) to indicate logical results. In my opinion, the terms "must be" (必) and "it is certainly not" (斷非) signify the employment of a logical deduction process, and are suggestive of their internal deductive reasoning.

Dai Zhen was the leading Qian-Jia scholar of the Qing Dynasty. The influence of his scientific thought is arguably comparable to that of Galileo. In his *Letter with Yao Xiaolian* (姚孝廉), Dai Zhen provides remarkable glimpses into his scientific reasoning, employing such notions such as "a full understanding (十分之見)", "verification(必證)","in compliance with the law(靡不條貫)","exhaustive deduction(不留餘義)" and "the ultimate truth(合諸道)." These terms clearly reflect his belief in "valuing deeper understanding instead of encyclopedic knowledge (貴專不貴博, lit. 'specialization over comprehensiveness')", a clear divergence from the ancient scholars' notion of being broadly knowledgeable. Following this philosophy, and in a practice that must be seen as different from his contemporary scholars, Dai Zhen endeavored to understand the nature of objects rather than their superficial observation. As Pietarinen has said, science is not primarily concerned with knowledge, and ignorance is "what is brought to the force by retroductive inferences".

> "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)

We can see that Dai Zhen shared some common assumptions with Pietarinen about concentration on a specific issue instead of being broadly knowledgeable, though Pietarinen's juxtaposition of "knowledge" and "ignorance" is perhaps somewhat extreme. By comparing Dai Zhen's scientific idea of "valuing deeper undersdanding of the objects under study" to Pietarinen's concept of "knowledge and ignorance" quoted above, we can see that Dai Zhen's insights bear much resemblance to the modern notion of science found in Pietarinen's writing. This is precisely the notion that is being developed in this paper.

A case in point is when Dai argues that in *Yaodian* (*The Book of History*), the Chinese

character"光" was incorrectly used in the place of "橫", as mentioned before. These two characters had the same pronunciation in Old Chinese (* C. $g^{w\varsigma}$raŋ vs. * $k^{w\varsigma}$aŋ). Yet the phonological, semantic, and textual evidences all support Dai's proposal that "橫" is a much more profound and appropriate choice. How did Dai Zhen know that it was "橫" and not"光", and how could he be certain about it? The answer to these questions can be traced back to his childhood. Even as a child, Dai would ask his teacher, "How did Zhu Xi (1130-1200) know about Confucius' intentions when he had never met Confucius?" Obviously, he had been asking himself similar questions since then, and clearly formed his opinion by means of logical deduction. This type of practice of searching for truth initiated the notion of theoretical certainty among the Wan (皖派) scholars of the Qian-Jia Period. As his student Wang Niansun has stated, "over the past 1,700 years there had never been any work of such caliber." Indeed, this was the first time in Chinese history that the Wan (皖派) scholars' thought exhibited such certainty and confidence, and it is undoubtedly due to the rigorous imposition of scientific reasoning and logical deduction.

5. Certainty in Duan Yucai's Study

In Duan Yucai's book *Shuowen Jiezi Zhu* 說文解字注 "Annotated Shuowen Jiezi", the word "必" (*bi* "certainty") appears over 20 times. He also frequently used such expressions as "斷無" (*duanwu*, "certainly not") and "斷知" (*duanzhi*, "certainly know"), terminology that shows his strong logical thinking and deduction. Duan's reasoning in his book can be demonstrated by the equation $\forall A = x \mid y$, if $\forall A = x$, then $\forall A \neq y$ (or $(\forall A = x \mid y) \wedge (\forall A = x) \rightarrow (\forall A \neq y)$). What is worth noting is the notion that, there can be no "必" (*bi* "certainty") without "無" (*wu* "not", "nonexistant"), and that there can be no "deduction" without "certainty." Hence, Duan Yucai's theory of "斷無" (*duanwu*, "certainly not") has to be built on the foundation of "theoretical certainty",[3] a point well illustrated throughout his work.

In addition to the theories mentioned above, Duan also used the law of sound symbolism as proof in his book. This symbolism contains both the concepts of assonance between consonants and vowels (Kawahara, 2012) (for relevant argument).

Some critics think that Duan's annotations to *Shuowen Jiezi* were sometimes too subjective. Yet many of the so-called "subjective opinons" were actually logical corollary of the arguments that he presented to support his judgements. One example in *Shuowen Jiezi* was when he pointed out the emendational mistake involving the word "糂" (*shen*, rice, soup). He proposed to replace it with "米粒" (*mili*, rice), employing eleven steps to prove his judgment, as demonstrated below:

1. Pointing out the mistake: The right words should be "米粒" (*mili*, grains of rice);

2. Referring to the guidelines of *Shuowen Jiezi* which emphasized the principle of annotation. Hence, the popular word "米粒" (*mili*, grain of rice) should be used for easy understanding;

3. Citing similar evidence from the *Shuowen Jiezi* itself to back up his argument;

4. Citing the use of "米粒" (*mili*, grain of rice) in other classic texts to prove the accepted popular use of this word;

5. Analyzing possible reasons why "糂" (shen, rice, soup) was printed erroneously;

6. Applying the method of reduction to absurdity, to explain the absurd interpretations if "糂" (*shen*, rice, soup) was to be used;

7. Citing common sayings as additional evidence;

8. Citing usages in ancient classics like *Mencius* 孟子, as linguistic evidence;

9. Providing further demonstrations by comparing various usages of "米粒" (*mili*, rice grain) in *The Book of Songs* and other classics;

10. Determining that the two words "糂"? (*shen*, rice soup) and "米粒" (*mili*, rice grain) have different meanings based on previous examples;

11. Arriving at the final conclusion: It is a logical certainty that "糂" (*shen*, rice soup) is wrong.

As described above, we can see that Duan employed abundant evidence and reasonings in his argumentation before arriving at his final solution. Definition, argumentation, hypothesis, verification, prediction, and falsification each had its own place in his book. He may not have used the exact words "logic" or "science", yet the absence of these specific words should not be taken as evidence for the lack of logic or scientific reasoning (or notions) in his work. The 11 steps above amply demonstrate the logic and scientific nature of his reasoning.

Certainty in Wang Niansun's Study

Wang Niansun is another distinguished Qian-Jia textual scientist. Here let's examine his presentation of scientific theories and what he refered to as his keystone mode. In his book *Gu*

versal (or axiomatic) generalizations such as this "every word that is characterized by x has the meaning of y (凡言 x 者皆有 y 義)". His intention here was to emphasize that universal laws could be deduced, and that universal judgments could be used to present the truth. How did Wang Niansun achieve this? His keystone-method here was the invention and application of the logic of categorizing and interlocking. He thought that things of the same category were interlocked, and that they showed similar properties if they were genetically connected (i. e., etymologically related).

From the explanation in his book, we can find that his pattern of logic is highly innovative (Feng, 2018) (for detailed discussion on this topic) He sorted words into horizontal categories of synonyms and vertical categories of cognates. Then he reasoned that words in the same category share the same origin. Expressed in terms of modern science, Wang Niansun's theory can be represented by the following logic formula, If $A \approx B$, then $[A \rightarrow x, y, z] \wedge [B \rightarrow x, y, z]$ (or $A \approx B \rightarrow [(A \rightarrow x, y, z) \rightarrow r (B \rightarrow x, y, z)]$). This way,

if one understands one typical example, one will understand the rest in the same category. This is Wang Niansun's grand contribution which stands as a major achievement in Chinese intellectual history.

7. Logical-Certainty and Rationalism among the Qian-Jia Scholars

Other scholars in the Qian-Jia school such as Qian Daxin (1728 – 1804) and Hu Peihui (1782 – 1849) also contributed to the development of scientific reasoning with their own respective theories about "logic certainty." However, these three particular Dai Zhen, Duan Yucai and Wang Niansun stand out among the others in the Qian-Jia school with their unique academic contributions. The scientific reasoning in their works is the essence of the Qian-Jia school, and would likely emerge as an independent discipline on scientific thought in future studies. The most prominent characteristics, as well as the most outstanding academic achievements of the Qian-Jia school, concentrate on their deductive certainty. Dai Zhen, as a pioneering scholar in China, may very well be on a par with creative figures such as Galileo in the west. The Wan (皖) School of Qian-Jia scholars did not seek right or wrong moral principles and they debated the truth and falsity of academic reasoning. They dedicated themselves to studying ancient sound patterns, word meanings, cognates and grammar, etc. In fact, their linguistic approach to studying classical Chinese appears to be quite similar to that of the Neogrammarians in the West, especially in terms of rule-oriented linguistic change. Thus, when it comes to Qian-Jia rationalism, we cannot overlook the scientific orientation of these scholars. These were scholars who, instead of pursuing high-ranking posts or literary fame, dedicated themselves to seeking the truth of the textual reality and verifying their interpretations. What mattered to them was to develop scientific reasoning and to make scientific discoveries (Feng, 2018).

8. Conclusion

One hundred years ago, Yan Fu (1854 – 1921) wrote in his article *Yuan Qiang* (原強) "On the Origin of Strength" that Darwin and other Western scholars "ι
explore the world, investigate the fundamental law, cite similar examples, then extend it to infer the truth and investigate it to achieve the effect". In the ensuing century, dramatic changes have swept the social system and academic paradigm, yet the logical structure and procedures of argumentation never seem to have become part of Chinese academic practice and social discourse. In order to put Yan Fu's proposal into practice, we may take a closer look at the procedure 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 precondition to achieve A. Succeeding in "investigating the fundamental law" should be a major advance for the traditional theory. This is the essence of the Qian-Jia scholarship. In their work on Classical Linguistics, for example, they also investigated fundamental linguistic laws (e. g. , bilabial → labiodental, by Qian Daxin), and, specifically, the "laws" that they investigated were those of language. Dai Zhen, in particular, by promoting the search for truth, had revolutionalized the academic paradigm in China, and had exerted a tremendous impact on Qian-Jia scholars in their efforts in various academic disciplines-phonology, semantics, and syntax – where this kind of scientific thought is required through not only verification, but also falsification.

More than a century has passed since the publication of Yan Fu's *On the Origin of Strength*. Have we adopted and practiced Yan Fu's methods? Do we have convincing evidence that Qian-Jia scholars practiced and entertained this kind of thought proposed by Yan Fu? Do scholars today make advances in this respect or are they no different from either Yan Fu or the Qian-Jia scholars? Bear in mind that the power of human thought would progress and not regress. The human brain, akin to the muscles in the body, would weaken and even atrophy for lack of exercise and proper use. This certainly applies to the brain used in academic thinking. In regards to how to expand the human mind, Qian-Jia scholars are quite enlightening and inspiring. They have shown that human potential for scientific thinking can be activated and improved through language investigation and linguistic inquiry. These scholars made textual criticism and exegesis into the objects of their study. As a result, logical certainty and rationalism emerged in the Qian-Jia period of the Qing Dynasty, laying the foundation for a new paradigm of scholarly reasoning.

Notes

1. The arguments presented here were partially published in *Chinese Frontier of Language and Literature*《中文學術前沿》Vol. 9:99 – 117. 2015 (Science Capacity in Linguistic Inquiry —— the Qian-Jia Scholarship 乾嘉理必與語言研究的科學屬性) and partially new. The author thanks Huang Qiuyue for initial translation; his gratitude also goes to Professor Jerome Packard, Professor Zhuqing Li and Mr. Baopeng Ma for their proofreading and editing. The current research is part of the project on Scientific Research Methods and Concepts in Qian-Jia Scholars like Duan Yucai's *Shuowen Jiezi Zhu* and Wang Niansun's supported by the National Social Science Foundation (Annual Important Grant. #15AYY009) and the project on Identification of Stylistic-Register Grammar in Chinese: Identify, Classification and Distribution, supported by the Ministry of Education Humanities and Social Science Research Base

(Major Project, #14JJD740003).

2. I agree with Zhu Xiaonong's opinions. I also discussed the grammatical properties of Chinese language whether it is similar to formal logic or dialectical logic in another paper (see footnote 7). Many scholars also discussed this topic before, but there is still no falsifiable evidence for specific causing factors.
3. Note that if categorization is not based on a certain logic, then it will constitute a mere tautology.

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