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Qinghua School of Logic and the Origins of Taiwanese Studies in Modern Logic: A Note on the Early Thought of Mou Zongsan and Yin Haiguang

*Jan VRHOVSKI**

Abstract

The article investigates the early thought of Mou Zongsan and Yin Haiguang, two important founding fathers of Taiwanese philosophy, who contributed significantly to its formation as an academic discipline in the two decades following 1949. The article reveals how their ideas related to modern logic originated from the so-called “Qinghua School of (Mathematical) Logic”. Herewith, the article tries to provide a platform that can be used to answer the questions of continuity and succession between the studies of modern logic as conducted at the most progressive (modernised) universities in late Republican China (especially Qinghua University) on the one side, and the formation and development of studies in logic in post-1949 Taiwan, on the other.

Keywords: modern logic, analytical philosophy, Taiwan, Qinghua School of Logic, Mou Zongsan, Yin Haiguang

Šola logike Qinghua in izvori tajvanskih študij moderne logike: o zgodnji misli Mou Zongsana in Yin Haiguanga

Izvleček

Članek preučuje zgodnjo misel Mou Zongsana in Yin Haiguanga, dveh pomembnih soustanoviteljev tajvanske filozofije, ki sta v prvih dveh desetletjih po letu 1949 znatno prispevala k njenemu oblikovanju kot akademske discipline. Članek razkriva, kako so njune ideje, povezane z moderno logiko, izvirale v tako imenovani »šoli (matematične) logike Qinghua«. Prav tako poskuša priskrbeti platformo, s pomočjo katere lahko odgovorimo na vprašanja kontinuitete in nasledstva med študijami moderne logike na najnaprednejših (moderniziranih) kitajskih univerzah v poznem republikanskem obdobju (s

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poudarkom na Univerzi Qinghua) ter snovanjem in razvojem študij moderne logike na Tajvanu po letu 1949.

Ključne besede: moderna logika, analitična filozofija, Tajvan, šola logike Qinghua, Mou Zongsan, Yin Haiguang

Introduction

This text aims to illuminate and expound on one aspect of the historical link between the developments in the academic discipline of modern logic in the early Taiwanese period (1949–1950s) and the renowned “Qinghua School of (Mathematical) Logic”. We will try to show that this continuity, which hypothetically existed between the Qinghua School of Logic and the developmental trends in Taiwanese studies of modern logic had been established through important intermediaries like Mou Zongsan 牟宗三 (1909–1995) and Yin Haiguang 殷海光 (original name Fusheng 福生, 1919–1969), who had been educated or influenced by members of the above-mentioned school, and had already during their studies in China reached a relatively high degree of mastery and erudition in the field. To confirm the existence of such a continuity, we will outline the main characteristics of the early thought of the above two scholars. An attempt will thus be made to show that both had adopted the same *notions* and *attitudes* towards *modern logic* as advocated by most notable members of the Qinghua circle of logicians.

In the first part of our discussion, we will deliver a short overview of Mou Zongsan’s early (pre-1949) contributions to the spread of ideas from modern logic (symbolic or mathematical logic), as well as to current public discussions that touched upon the nature of logic. A short summary of Mou’s logic-related activities in the pre-1949 period will then be combined with a brief examination of the early writings of Yin Haiguang, all in order to convey a general image of how the influence of Qinghua school of logic manifested itself in their early notions of modern logic.

“Qinghua School of Mathematical Logic”:

A Short Historical Introduction

By the late 1920s, various forms of modern Western logic had already been widely established throughout the most progressive Chinese intellectual and academic circles. During the May Fourth movement in 1919, the significance of notions

like mathematical, pragmatic and dialectical logic had been constantly increasing in public intellectual debates and Chinese academia. At the same time, each of the above-mentioned notions of logic—generally associated with contemporary advances in Western science and philosophy, underwent its own institutional and discursive development. In contrast to pragmatic and dialectical logic, whose portrayal was almost exclusively connected to the propagation of the two corresponding philosophical worldviews in China,¹ the notion of mathematical logic (also referred to as symbolic logic, logistic, etc.) was concurrently developed both as a philosophical notion and scientific discipline. While as a philosophical notion it was first introduced to Chinese intellectual circles as an integral part of positivist philosophy and Western scientific worldview² as propagated by Bertrand Russell, who arrived to China in late 1920, the foundation of its institutional life at Chinese academic institutes only started in the late 1920s, when, in the wake of the reorganisation of the Qinghua College into National Qinghua University, Jin Yuelin 金岳霖 and others set up the first modern department of philosophy in China. Eventually, also owing partially to the prestige attached to analytical philosophy by the most progressive Chinese philosophers, mathematical logic came to occupy an important position at the newly founded Qinghua Department of Philosophy. Thus, in the years following its official establishment in 1928, the

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- 1 In the case of former, the notion of “pragmatic logic” was introduced to broader intellectual circles after the renowned pragmatist philosopher John Dewey arrived at Peking University, in an attempt to provide the main philosophical tenets of the pragmatist philosophy of education, worldview and so on, as expounded by Dewey, with a sound methodological machinery. Naturally, one of the leading figures behind the public exposition of the so-called “pragmatist logic” was Dewey’s former student Hu Shi, who had earned his doctorate in philosophy at Columbia for a thesis entitled *The Development of the Logical Method in Ancient China* (1917), which saw its first publication in China in 1922. In his dissertation Hu espoused the view that in their intellectual or philosophical history the Chinese had essentially developed a pragmatic variety of logic, the most illustrative example of which had been the so-called Mohist and Neo-Mohist logic. As a consequence, Hu also believed that Gongsun Long 公孫龍, Hui Shi 惠施 and others were members of the same school of logic as initiated by Modi 墨翟.
 - 2 One of the most significant exponents of the notion of mathematical logic in early 1920s China was Zhang Shenfu 張申府 (originally called 張嵩年), who at the time also made his name as the greatest Chinese expert on Russell’s philosophy. Later, as a result of Zhang’s strong proclivity towards creating an all-encompassing, comprehensive view of reality, he devised an idea of “greater objectivity”, which would synthesize the subjectivist traditional thought on one side and the objectivist scientific outlook on the other. Throughout his remaining career as a philosopher and a political activist, Zhang repeatedly attempted to reconcile the two main contesting objectivisms of the time. While his first attempt was aimed at reconciliation of the two opposing sides in the “worldviews” debates at the beginning of the 1920s, the most notable of which was the debate on Science and the View on Life (*Kexue yu renshengguan* 科學與人生觀) from 1923, in later years, when Zhang started more ardently advocating dialectical materialism, his propensity for comprehensiveness also materialized in his attempts to reconcile dialectical materialism on one side and mathematical logic (as one of the main methods of Western science) on the other.

department selectively hired a number of philosophers, whose academic renown had in any way been associated with either analytical philosophy (at the time mostly referred to as New Realism, *xin weishi zhuyi* 新唯實主義) or modern formal logic (symbolic or mathematical logic). Consequently, by the early 1930s the elementary curriculum at the department grew to include several individual specialised and general courses on logic. At both graduate and undergraduate levels the first course devoted exclusively to mathematical logic was organised immediately following the appointment of Zhang Shenfu as a lecturer at the department. Eventually, by the time when the first generation of Qinghua-trained modern logicians concluded their studies at the department, the Qinghua School of Philosophy became also known as the “Qinghua School of Mathematical Logic” and, as a result, the academic centre of analytical philosophy in China, too. Although, with time, the original torchbearers of modern logic at the department, such as Jin Yuelin and Zhang Shenfu, had gradually left the realm of deductive logic for more general philosophical topics, the way towards China’s complete appropriation of the field was paved by the future generations of their graduates. Through their efforts, modern logic became an integral part of, at first, the science of philosophy, and later also research in mathematics and technology at Chinese scientific and academic institutes.

In the late Republican period, the Qinghua Department of Philosophy directly or indirectly trained the following logicians, who contributed significantly to the development of modern formal logic in China: Shen Youding 沈有鼎 (Yu-ting Shen, 1908–1992), Wang Xianjun 王憲鈞 (Wang Sian-jun, 1910–1993), and Wang Hao 王浩 (Hao Wang, 1921–1995), among others.³ However, the Qinghua School of Modern Logic and Analytic Philosophy in its later form, especially in the late 1930s and in its wartime state, would also turn out to be the original cradle of modern logic and analytical philosophy in post-1949 Taiwan. Beside Mou Zongsan 牟宗三 (1909–1995), whose early interest as well as concrete engagement in studies of modern formal logic (mathematical logic) have already been more or less taken into account in the recent studies of his philosophical

3 Shen Youding graduated in 1929 and, subsequently, continued his studies in modern formal logic at Harvard. In 1934, he returned to his *alma mater*, and remained teaching until the breakout of the Sino-Japanese war in 1937. Wang Xianjun completed his graduate studies shortly before the start of the war (1936) and in the year 1937 travelled first to Berlin and after that to Vienna, where he studied logic under the world-famous mathematician and logician Kurt Gödel. He returned to China in 1938. Finally, Wang Hao, undoubtedly the most famous Chinese logician of the 20th century, concluded his studies at the wartime Qinghua University (National Southwest Associated University) in 1945. Upon graduation, Wang continued his postgraduate education at Harvard and subsequently spent his entire career in the West.

thought,⁴ in the late 1930s and early 1940s Qinghua University was also the training ground of another future Taiwanese philosopher who can be credited for having transmitted the knowledge and, most importantly, the sense of significance of studies in mathematical logic and analytic philosophy to the new institutions of higher education to Taiwan. There, after the final capitulation of the Republican government in 1949, the first foundation stones of what was to become Taiwanese academic philosophy were laid. This original member of Qinghua Department of Philosophy and the future pioneer of studies of modern logic in Taiwan whom we are referring to here is Yin Haiguang 殷海光 (originally called Yin Fusheng 殷福生, 1919–1969). Yin spent his formative years studying philosophy and logic under Jin Yuelin, Shen Youding and Wang Xianjun at the wartime Qinghua Department of Philosophy (Southwest Associated University). Unlike his older colleague Mou Zongsan, who despite a strong initial interest in logic did not devote his remaining career either to analytical philosophy or modern logic,⁵ after having left Qinghua University Yin Fusheng remained as it were “loyal” to his former field of studies and his past mentor Jin Yuelin. Apart from his in new homeland in Taiwan, Yin was one among many promising young Chinese philosophers whose early academic influences and achievements—at least for the greater part of the 20th century—were beclouded and pushed into obscurity by the destructive winds of war and the change of regime in 1949 that radically redefined China, overturning both its future development as well as the image of its past.

From Mou Zongsan to Yin Haiguang

When, in 1947, the renowned expert on Hegel’s philosophy and lecturer at both Qinghua and Peking universities, He Lin 賀麟 (1902–1992), published a retrospective analysis of the main developmental trends in Chinese philosophy in last few decades, he also indicated that since the beginning of the century China had produced some concrete results in the most advanced branch of Western logic, a field which was generally referred to as “mathematical logic”. Furthermore, he also

4 Most notable monographies, which touch on Mou’s logic-related thought include: N. Serina Chan’s *The Thought of Mou Zongsan* (2011), in its retrospective view Jason Clower’s *Late Works of Mou Zongsan* (2014), and most importantly Rafael Suter’s *Logik und Apriori zwischen Wahrnehmung und Erkenntnis: Eine Studie zum Frühwerk Mou Zongsans (1909–1995) (Logic and the Apriori between Perception and Cognition: A Study in Mou Zongsan’s Early Work (1909–1995))* (2017).

5 Irrespectively of his early studies in logic, he became most famous as the crucial representative of the second generation of the Modern Confucians (*Xin rujia* 新儒家, see for instance Lee 2014, 9; Sernelj 2014, 84–85).

gave a list of those Chinese “logicians” and philosophers who had made the greatest contributions to Chinese advances in the field. In He Lin’s opinion, these included the first Chinese expert in the field, Yu Dawei (David Yule), the famous professor and philosopher Jin Yuelin, Wan Zhuoheng 萬卓恆, the brothers Shen Youding and Shen Youqian 沈有潛, the Chinese historian of logic Wang Dianji 汪奠基, the philosopher Zhang Yinlin 張蔭麟, the Qinghua logician Wang Xianjun and the future leading name of, as it were, “socialist” mathematical logic in China, Hu Shihua 胡世華. This list did not include Zhang Shenfu, who, mainly for political reasons, had been ostracised from the echelons of Qinghua logicians in 1936. Nevertheless, already in the years before that, as a lecturer in analytic philosophy and mathematical logic at Qinghua and Peking universities, Zhang was standing out from the rest of the philosophers at the department. One feature which made him so different from the others was his passionate advocacy of dialectical materialism, and even more peculiarly, a synthesis of mathematical logic and materialist dialectics. Even though Zhang was later expelled from academic life and, after the war, also excluded from the ranks of the CPC (Communist Party of China), the fact nevertheless remains that for a decade before these developments Zhang had been the key propagator of analytic philosophy and mathematical logic among Chinese intellectuals. Besides having written about the notion of mathematical logic, Russell’s main contribution to philosophy, from as early on as 1919, Zhang was also the first lecturer at Beida and Qinghua to have organised a course devoted exclusively to mathematical logic at both universities’ departments of philosophy. Furthermore, his appointment at Qinghua Department of Philosophy led a series of modifications in the basic curriculum, which subsequently contained more courses on logic. Consequently, Zhang inspired many young scholars to focus their studies on logic and Western analytic philosophy. According to the reminiscences of many future Chinese logicians, who at that time were students of philosophy either at Peking or Qinghua universities, another such influence which essentially overshadowed Zhang’s was Jin Yuelin’s textbook *Logic (Luoji 邏輯)*, published in 1935.

Mou Zongsan, Mathematical Logic and the Philosophy of New Realism at Qinghua University, 1933–1940s

As a freshman at the Department of Philosophy at Peking University, in 1929, Mou Zongsan was one of the many young philosophers who were influenced by Zhang Shenfu’s lectures on mathematical logic, Russell and Wittgenstein. Thus, according to Mou’s recollections, his favourite subjects in the framework of undergraduate studies at Peking University were the philosophy of New Realism, the philosophy of Bertrand Russell and mathematical logic (Mou 1993, 41–43).

At the same time, he also became interested in the thought of the renowned English mathematician and philosopher, and the co-author of Russell's *Principia Mathematica*, Alfred North Whitehead (1861–1947). Moreover, as his later writings on logic reveal, in the years following his graduation in 1933, Mou was also closely following Jin Yuelin's philosophical thought and sympathized with the ideas of other established Qinghua logicians, like Shen Youding.⁶

Whilst Mou was discovering other sources of inspiration in both Western and traditional Chinese philosophy, the differences between his ideas and those of his first teacher of mathematical logic and the principles of analytic philosophy, Zhang Shenfu, were steadily increasing (Chan 2011, 14). His ideas about logic approached those common among the main circle of logicians at Qinghua University. An important motivating factor behind Mou's shifting views on logic was the rise of fierce public debates on dialectical materialism, in which the proponents of Marxist dialectics and dialectical materialism, like Ye Qing 葉青 (real name Ren Zhuoxuan 任卓宣, 1896–1990), Li Da 李達 (original name Tingfang 庭芳, 1890–1966) and others, applied established Marxist critiques of formal logic—mainly Plekhanov's and later also Lenin's and others' views on formal logic—to refute the methodological basis of the contesting philosophical currents in China. As a strong opponent of Marxism, Mou eventually joined the ranks of the most outspoken defenders of a notion of logic that was advocated in Western analytical philosophy and assumed in contemporary studies in logic. In the early years (1931–1936) the Marxist attacks on the so-called “formal logic” (comprising contemporary symbolic and traditional Aristotelian logic) mainly revolved around three laws of thought. Therefore, apart from the general notion of logic, in his open defence of logic Mou mostly discussed the correct meaning of these three laws. Here it needs to be noted that the importance of these debates on logic from early 1930s derived from the fact that, as the methodological foundation of philosophy, logic was more or less understood to be the pivotal source of the objectiveness of a philosophical worldview, and hence also as one of the major battlegrounds between contesting ideologies.

With respect to the definition of logic, Mou Zongsan's writings from this period were more or less in line with the views of the representatives of New Realism in China, such as Shen Youding. In his article from 1934, entitled “Logic and Dialectical

6 In his autobiography, Mou reminisced that during the years of study at Beida, he was greatly influenced by Zhang Shenfu's lectures on mathematical logic and Russell and Jin Yuelin's lectures on miscellaneous problems from cotemporary philosophy, with a special focus on New Realism. Furthermore, outside the university the greatest influence on Mou was Zhang Dongsun. With regard to Zhang's lectures on mathematical logic he further noted that even though they were rather simple, they were still the first example of such a specialized course on the topic at Chinese universities (Mou 1993, 43).

Logic” (*Luoji yu bianzheng luoji* 邏輯與辯證邏輯), Mou advocated a monistic notion of pure logic: as one objective, absolute, formal and normative logic. Among three contemporary philosophical outlooks on logic (Russell’s logicism, Hilbert’s formalism and Brouwer’s intuitionism) discussed in the article, Mou expressed his greatest admiration for mathematical logic and logicism, because of which he also furnished his discussion with a detailed introduction to some major concepts from the *Principia Mathematica*. While pure logic as manifested in the cutting-edge logical systems known at the time, like example mathematical logic, was deemed by Mou as the only example of logic as such, Mou’s refutation of “dialectical logic” drew from an assertion that, from its beginnings on, dialectics could only be described as a methodology or in most extreme case a “special logic” (*teshu luoji* 特殊邏輯) or “applied logic” (*yingyong luoji* 應用邏輯), as opposed to pure or general logic.

Mou’s main point of criticism against the Marxist notion of dialectical logic was stated in the third and last part of his article from 1934. The focal argument revolved around the Marxist understanding of the three basic laws of logic. As in all previous points made by Mou, in this argument against dialectical logic he also assumed a position which was in accordance with the views prevalent amongst Qinghua followers of New Realism. What Mou thus emphasized was that the main flaw of the so-called dialectical logic resided in its misinterpretation of identity, especially when it came to propositions and concepts. This flaw was also evident in the way it defined the laws of identity and contradiction.⁷ With respect to the real meaning of these laws, Mou pointed out that logical laws are all based on the aprioristic nature of the human intellect, and can neither be proved nor disproved. In this sense, Mou was a proponent of the idea of pure logic, which assumes that logical propositions do not necessarily have a positive link to reality (the non-positive proposition). In light of his adherence to the Qinghua School of Logic, in the 1930s’ debates on logic Mou finally also took the standpoint that “alternative” logics, such as dialectical logic, could neither be a form of logic nor methodologies, but “theories” focusing on analysing facts.⁸

7 Mou’s reasoning probably evolved from earlier writings by the members of the Qinghua circle, like Jin Yuelin’s “Identity, Equality and Experience” (*Tong, deng yu jingyan* 同、等與經驗) from 1927. His treatment of the notion of contradiction was further aligned with the approach taken by both Jin and Zhang Shenfu in their articles “On Self-Contradiction” from 1927. How passionately Mou followed his teacher Zhang Shenfu’s thought on logic becomes evident from his writings from the early 1930s, in which he echoes Zhang’s strong emphasis on the use of Russell’s theory of types, as well as the adoption of Wittgenstein’s language-philosophical notion of tautology when dealing with contradictions—this was also indicated in Zhang’s article from 1927. A good example thereof is Mou’s article “Contradiction and Theory of Types” from 1933.

8 A similar point was emphasized by Jin in his discussion with Zhang Dongsun in the late 1930s, early 1940s. In 1939, Zhang published a relatively lengthy text in the *Yanjing xuebao* entitled “Different Types of Logic and Culture—Discussed Together with Chinese Neo-Confucianism”, in

In the same 1930s debates Mou also stood out as one of the main proponents of the mathematical variety of formal logic associated with Bertrand Russell—the other was Shen Youding.⁹ His special position rested on the fact that, from 1932 on, Mou had also published a series of articles on modern logic, which were in great part also based on concepts and theories from what was known as mathematical logic.¹⁰ In following both Jin Yuelin and Zhang Shenfu, Mou took an interest in the theory of mathematical logic as outlined in Russell's and Whitehead's *Principia Mathematica*. Apart from that, his views were also influenced by Wittgenstein's philosophy of language and logic, one of the leading Chinese exponents of which was also his former professor, Zhang Shenfu.¹¹ His reproduction and interpretation of mathematical logic and analytic philosophy was, however, paralleled and subsequently also superseded by his strong interest in the philosophy of mind on the one hand, and traditional Chinese philosophical thought on the other. It could be claimed that a strong propensity towards resolving philosophical issues using the methods applied in German classical philosophy (with Kant, Hegel, etc.), epistemology, traditional Chinese cosmology (*Yijing* 易經, *The Book of Changes*) and Neo-Confucianism ultimately dissuaded Mou from becoming a logician, and led him in the direction towards shaping his future identity as a “Confucianist” philosopher.

Nonetheless, Mou's relation with logic did not end with his early meditations on mathematical logic, but persisted long after his focus had shifted to other philosophical questions, which constituted the heart of his later philosophy. A great deal of his early excursions into the realm of modern logic and analytic philosophy were summarized in his first major work on logic, *Logical Paradigms* (*Luoji dianfan* 邏輯典範), which was first published with the Commercial Press in 1941. Although the book basically represents an exhaustive overview of certain

which he developed his idea of culture-based systems of logic, claiming that his views were in accord with Jin's exposition on different systems of logic in his earlier writings. Jin's elaborate answer to Zhang's apparent misunderstanding of the theory of systems of logic, as outlined in the former's 1935 book *Logic*, was published no earlier than in 1941. In the article entitled “On Different Types of Logic” (*Lun butong de luoji* 論不同的邏輯) Jin pointed out that Zhang did not correctly understand the difference between logic and science of logic. While logic as such is essentially universal and unitary, there may be many different sciences of logic.

- 9 This was also noted by the “opposite” side. In 1939, Li Da, who at the time took over the role of the leading discussant on the Marxist side of the debate, described Mou Zongsan as the main representative of the school of “mathematical logicians” (Li 1939, 112).
- 10 See also Chan's *The Thought of Mou Zongsan* (2011, 17). For an extensive analysis of Mou's early logic-related ideas see: Rafael Suter's *Logik und Apriori zwischen Wahrnehmung und Erkenntnis: Eine Studie zum Frühwerk Mou Zongsans (1909–1995)* (2017).
- 11 Zhang not only lectured on Wittgenstein but also created and published the first Chinese translation of Wittgenstein's *Tractatus Logico-Philosophicus* (1927).

aspects of logic from the philosophical perspective (epistemology, Kantian notion of pure reason, and so on), and can also be seen as simply a textbook exercise in the philosophy of logic, in its final section Mou made one decisive step forward. In an attempt to inter-bridge mathematical logic and epistemology (pure mind), Mou combined the knowledge gained in his past encounters with Russell's philosophy and mathematical logic (especially *Principia Mathematica*) with his new understanding in the domain of *a priori* and the notion of pure reason (*chunli* 純理). By probing into the epistemological shadowlands of logic, Mou threaded further away from the purely technical realms of modern logic. Herewith, Mou also managed to circumvent some pivotal and demanding theoretical problems in contemporary logic, like many-valued calculi, details of formalist axiomatization, the theorems of Gödel, and so on. Still, generally speaking, in the above-mentioned section on "Mathematics, Logic and Pure Reason" Mou introduced and expounded on a number of highly technical concepts from *Principia Mathematica* and other concepts related to mathematical logic, including the axiom of infinity from Zermelo-Fraenkel set theory, Cantor's theory of transfinite numbers, and more.¹² In parts related to the mathematical logic of the *Principia*, Mou reconstructed and explained concrete excerpts from Russell's monumental book. Furthermore, Mou also made great effort to demonstrate that mathematics, to which in contemporary science logic was shown to be inextricably linked, was founded on pure reason and inherently contained both a logical and an intuitive basis. In accordance with the epistemic philosophical views Mou chose to espouse, he was consequently also highly sceptical about the so-called "axiomatisms" (*gongli zhuyi* 公理主義) of Hilbert's school of formalism, which after Gödel's ground-breaking discoveries in the 1930s had slowly lost their former appeal among Western logicians. This was also in line with Mou's tendency towards intuitionism.¹³

The *Logical Paradigms* were not the final product of Mou's early work in logic. After his retreat to Taiwan Mou did not completely sever his contact with the science of logic, but continued teaching it at the reorganised National Taiwan

12 In his autobiography Mou indicated that at the time his interest in logic revolved around the *Principia Mathematica*. His intense study of the book eventually led him to write his *Logical Paradigms*. Mou also mentioned that, while he exerted great efforts to master the *Principia*, one of his blind spots was the symbolic logic of C. I. Lewis, especially the concept of strict implication (Mou 1993, 67–68). In the early 1930s, Lewis' theory of logic was the main focus of Jin Yuelin. In these years, Jin's focus slowly shifted towards the Harvard School of Logic and in turn also the notion of induction in logic.

13 In addition to this, the book *Logical Paradigms* contains a series of relatively unique attempts to subject the foundations of modern logic to an epistemological evaluation, and at the same time illustrates Mou's deep understanding of some particular aspects of modern logic. Therefore, the work most definitely deserves a more thorough examination in an individual study.

Normal University. In 1955, following his appointment as a member of the Academic Review Committee at the Taiwanese Ministry of Education, Mou published his second, upgraded textbook on logic entitled *Lize xue* 理則學 (*Studies in Logic*) (Chan 2011, 18). As Mou later reminisced, in this later book his understanding of logic was superseded only with regard to certain concepts from C. I. Lewis' theory of logic (Mou 1993, 68). Nevertheless, the most important point here for us is that even in a time when his mind was occupied with other dimensions of philosophy, at least in the initial period, Mou retained his contact with logic as taught in the framework of the so-called "Qinghua School of Logic" from late 1920s and through the early 1930s.¹⁴ In this way, the fact that in his Taiwanese period Mou still lectured about "mathematical logic" together with elements of New Realism could be seen as a continuation of the very same notion of logic in Taiwan, while Mou could be considered as one of the key figures who helped set down the foundations of the Taiwanese academic discipline of logic, linking the future development of logic in Taiwan with the past trends associated with the study of logic at Beida and Qinghua universities in the 1930s and 40s.

The renowned logician and political philosopher Yin Haiguang was another key intellectual who also contributed significantly to the transmission of the so-called Qinghua School of Logic to the newly forming Taiwanese institutes of higher education. This was important, as after the final victory of the Communists in 1949 the Qinghua School of Logic succumbed to the winds of ideological change and was soon condemned as a form of Western idealism in the early 1950s.

Yin Haiguang: On the Making of the Future Taiwanese Expert on Logic

Yin Haiguang, whose original given name was Fusheng 福生, was exactly ten years younger than Mou. Like Mou, Yin's interest in logic emerged early on in his educational path. However, in contrast to Mou over time his interest in logic was not replaced by any other theories or problems related to philosophy. Moreover, from the beginning Yin's deep affinity for researching logic was established in connection to the "more technical" aspects of logic, and to a lesser degree to the philosophy of logic. It is more than possible that this was a direct consequence of emergence of an entirely new outlook on modern logic, which was imported to Qinghua by the younger generation of its graduates, who, as newly made experts in the field, returned from their postgraduate studies in the West (Europe and the US) with new ideas and energy. This influx of fresh trends in the field caused the center of attention in the studies of logic at the department to shift from Russell's

14 Strong interest in C. I. Lewis, for instance, was typical for Jin Yuelin's studies in the early 1930s etc.

Principia, Lewis' symbolic logic, New Realism, and so on, to topics like many-valued logics, Gödel's Incompleteness Theorems and the like. Apart from the wartime Qinghua University, with the return of Hu Shihua to his homeland in early 1940s and the series of advances in the field made by a circle of mathematicians from Wuhan University, a more technical variety of mathematical logic started to form at Peking and Wuhan universities. Those young professors who revitalized research in logic at Qinghua were Shen Youding and Wang Xianjun. According to biographical accounts, Yin was influenced by both (Qi 2013, 29; Yang 2009, 1).

However, Yin Haiguang's academic interest for logic was born in the early 1930s, when as a young student at the secondary school in Wuchang (武昌中學) Yin first read the (at the time relatively popular and commonly used) textbook *The ABC of Logic* (*Lunlixue ABC 論理學ABC*) by Zhu Zhaocui 朱兆萃.¹⁵ Two years after *The ABC of Logic* was first published as a part of the popular ABC series, Yin found his new source of inspiration in the incomparably more advanced *Logic* by Jin Yuelin (1935), in which, in contrast to the earlier textbook, Yin made his first extensive contact with the mathematical logic of the *Principia Mathematica* (Yang 2009, 1–2). Under the influence of Jin's 1935 textbook, at the age of 15 Yin delved into the realm of mathematical logic for the first time.

After he graduated from secondary school in Wuchang, Yin enrolled into the comparatively progressive Wuhan University. Here, Yin was soon given the chance to undertake new research in the field.¹⁶ Not much later, the profound impression Jin's book left on Yin's young mind materialized in his first contribution to advancing Western logic in China. Already one year after Jin's *Logic* had first been

15 The textbook was published in the *ABC* basic textbooks series by the Shijie shuju 世界書局, which aimed at providing a series of essential/introductory readers for senior secondary schools. Basically, as a result of the first major Republican educational reform in the late 1920s, logic was prescribed as an obligatory course at senior secondary level schools. In a subsequent wave of reforms, the urge for creating new, updated teaching materials for reformed secondary as well as university-level education was stressed, which greatly spurred the generation of new-style textbooks and handbooks on Western science. Zhu Zhaocui contributed two textbooks for the *ABC* series: *The ABC of Logic* (1933) and *The ABC of Educational Psychology* (*Jiaoyu xinlixue ABC 教育心理學ABC*) (1931).

16 The biographical accounts and accounts of reminiscences of Yin's early acquaintances betray some inconsistencies with regard to Yin's early years at Wuhan University. Some authors in their biographical accounts even completely disregard the period between secondary school and 1938. A significant discussion of the fact that Yin was first at Wuhan can be found in Li 2013, 41–45. If Yin indeed was at Wuhan University sometime between 1935 and 1937, he would have had the chance to study modern logic in the framework of Wan Zhuoheng's 萬卓恆 (1902–1948) regular courses on logic (elementary and advanced). Wan, who graduated from the Qinghua Department of Philosophy and completed his graduate studies at Harvard, was a professor at the Department of Philosophy at Wuhan between 1931–1948. Under the influence of the trends at his *alma mater*, in 1932 Wan organized the first course in logic at Wuhan University, which included mathematical logic and was based on the *Principia Mathematica* (see e.g. Xiangren 2017, 26; Guoli Wuhan daxue 1934, 26, 33).

published, Yin produced a long essay entitled “What Exactly are Logic And Science of Logic?” (*Luoji yu luojixue jiuqing shi shenme* 邏輯與邏輯學究竟是什麼) (1936), in which he presented a general definition of logic based on his reading of Jin’s textbook as well as the contemporary American textbook *The Fundamentals of Logic* (written by Frank Miler Chapman and Paul Henle and published in 1933). Although the core of Yin’s understanding of the nature of logic as outlined in his article from 1936 was to some extent based on Chapman’s and Henle’s attempt to lay down definite boundaries between Aristotelian syllogistic logic or traditional formal logic and the earliest forms of modern formal logic, i.e. mathematical or symbolic logic, his understanding of the latter, as demonstrated in the article, was undoubtedly also derived from his encounters with Jin’s 1935 textbook,¹⁷ as was his perception of the notion of logic. Thus, already in 1936, and similarly to Mou Zongsan, Yin maintained an idea of “pure logic”, which he distilled from these books. One immediate result of his reading of Chapman’s and Henle’s *Fundamentals*, and just a few months before the outbreak of the Sino-Japanese war in 1937, was that Yin published his Chinese translation of this textbook.¹⁸

In 1938, Yin’s ambition to study logic under China’s leading experts in the field had finally started to be realized, as he was admitted to the wartime provisional National Southwest Associated University in Kunming (Guoli xinan lianhe daxue 國立西南聯合大學, henceforth referred to as Lianda 聯大). At the wartime Lianda, the departments of philosophy of Qinghua, Peking and Nankai universities were conjoined into one single Department of Philosophy and Psychology. As a freshman at the Department of Philosophy the young Yin was able to attend lectures delivered by Jin Yuelin, with whom Yin eventually also established a closer relationship. Jin, who also served as Yin’s mentor, later advised him to attend advanced classes on modern logic taught by the young experts Shen Youding and Wang Xianjun. Beside logic Yin also attended a number of selective courses on Western analytic philosophy, while he allegedly disliked subjects like Hegel’s philosophy (Yang 2009, 1). Yin completed his undergraduate studies in philosophy in 1942, upon which he continued his studies at the Qinghua Graduate School in Philosophy, studying logic under the supervision of Jin Yuelin.

Yin published a revised version of his 1939 article on the nature of logic in his second year at Lianda. This time the essay was entitled “The Fundamental

17 Chapman’s and Henle’s textbook was divided into three parts: classical logic, contemporary symbolic logic (i.e. mathematical logic) and scientific method. In the second part the authors outlined the most important results in mathematical logic, revolving mainly around the calculi of propositions and classes from Russell’s *Principia*, including the fundamental concepts of its system.

18 Yin’s translation was published under the Chinese title *Luoji jiben* 邏輯基本 by the Zhengzhong publishing house (*Zhengzhong shuju* 正中書局).

Characteristics of the Science of Logic” (*Luoji xue de jiben xingzhi* 邏輯學底基本性質).

Apart from a few hints distilled from various narratives from the time, we are not familiar with Yin’s experience in wartime Qinghua. Regardless of that, what we do know is that both Jin Yuelin’s and Yin Haiguang’s reminiscences confirm the fact that gradually a profound teacher-student relationship had developed between them. While Yin’s focus had apparently been on the *Principia Mathematica*, during his graduate studies he also devoted some effort to learning about current advances in the philosophy of logic. Regarding his intense studies of Russell’s work, Jin Yuelin reminisced that, in the years when Yin was studying under him, his understanding of the *Principia* had developed to the degree that he could enlighten his mentor about some “theoretical problems” which occurred in the former’s textbook *Logic* from 1935, especially those related to the part devoted to “systems of logic”, while at the same time he was also able to provide systematic corrections to those problems (Liu 1994, 393). Apart from that, it seems that Yin had also worked together with other Qinghua logicians, such as Wang Xianjun, in cooperation with whom he prepared the first Chinese translation of Rudolf Carnap’s *Philosophy and Logical Syntax* (first published by the Commercial Press in 1946). Above all, Yin’s erudition in logic came to expression in his short book *Talks on the Science of Logic* (*Luoji xue jianghua* 邏輯學講話) from 1943,¹⁹ in which, although it was intended for the “layman”, Yin set out to explain some important concepts from formal logic, which he tried to put down in simple terms. In his *Talks*, where the essentials of logic were illustrated with an abundance of practical examples from everyday dialogues, Yin adopted a more “philosophical” approach. In other words: he attempted to bring down the pure notion of logic to its ontological foundations and describe it in connection with, for example, the principle of causality, and so on. In addition, in a fairly modern manner (following Russell) Yin also aimed at introducing to his “common” reader the concepts of class, (logical) relation, proposition, paradox, type, variable, etc. and thus in a rather abrupt manner led the layman deeper into the more technical domains of logical algebra, propositional calculus and so on. While on this logical journey, which Yin prepared for the reader, one almost unknowingly and constantly crosses between the domains of traditional and modern formal logic, thus encountering the essentials of logical reasoning, while in the final stage of the journey Yin directed the reader’s attention to the question of the notion and nature of logic.

Akin to his previous meditations on logic (1935), as well as indicating his future orientation towards logic, in his *Talks on Science of Logic* Yin adopted a notion

19 The book was reprinted three year later, in 1946.

of logic which was consistent with the views espoused by the Qinghua circle of logicians, the so-called notion of pure logic. Thus, even a superficial analysis of his writings from his early period reveals a direct continuity with his major propaedeutic work on logic from the Taiwanese period, most notably his two earliest publications that more or less inaugurated the publishing of books on logic in Taiwan: the textbook *What Exactly is Logic?* (*Luoji jiuqing shi shenme?* 邏輯究竟是什麼?) from 1953, which conspicuously echoed his first article on logic from 1935, and a revised university textbook from 1957, *A New Introduction to Logic* (*Luoji xin yin* 邏輯新引). The notion of logic espoused in these writings can in general be seen as extremely devoid of any epistemologically or ontologically positive aspects. In the same manner as, for example, Shen Youding, Yin also recognized that as an aprioristic notion logic possessed concrete boundaries, which separated its essence from thought as such. Similarly, logic also cannot be considered as synonymous with the scientific method, dialectics, metaphysics, general science of inference, etc.²⁰ And in accordance with that, logic was seen as possessing its inner nature, epitomized within the characteristics of formality, universality and consistency. Again, as already mentioned before, this view was typical for how the Qinghua adherents of New Realism viewed logic (see Hu 2002, 137–40).

In 1944, his final year at the university, Yin published an article “A Survey of Contemporary Mathematical Philosophy” (*Xiandai suanli zhhexue gaiguan* 現代算理哲學概觀), which outlined a retrospective of the main currents in the contemporary philosophy of mathematics (mainly formalism and intuitionism). This was Yin’s last publication on logic before those he released in Taiwan. In the same year, Yin also finally severed his ties with Qinghua, for in midst of the intensive political campaign to recruit new soldiers from the ranks of university students Yin ultimately decided to leave the institution (Yang 2009, 2). Even one year later, when the war with the Japanese was over and he was allowed to return home, he did not decide to finish his studies at Qinghua. Instead, he devoted his energy to political causes and started writing articles which incited national awareness and criticized Marxism. As an intellectual with strong ties with the Kuomintang (KMT) he became the editor and the leading pen of the official KMT newspaper the *Central Daily News* (*Zhongyang ribao* 中央日報), and later (in Taiwan) also an editor of the nationalist periodical *The Nation* (*Minzu bao* 民族報) (ibid.). After the victory of the Communists in 1949, and because of his open association with the Nationalist government, Yin was forced to retreat to Taiwan together with the remaining members of the KMT.

20 For a more detailed exposition of Yin’s notion of logic, see Xia 2008.

In the two decades following his relocation to Taiwan, he worked a professor at the National Taiwan University (NTU), where he was able to greatly influence the development of studies of logic in Taiwan (see Dai 2012). At NTU, Yin not only educated the majority of future Taiwanese experts in logic (*ibid.*, 133–34), but, even more importantly, also set down the foundations of the discipline in Taiwan, and consequently also significantly influenced the future image as well as the developmental trajectory of logic on the island. In contrast with Mou Zongsan, in his role as a professor at NTU Yin focused almost exclusively on modern logic and its complementary philosophical theories, as taught in the Qinghua circle. Thus, beside symbolic logic, he further lectured on logical positivism, the philosophy of language, Russell’s philosophy, and the philosophy of logic and science, among other subjects. Thus, Yin continued the tradition he became deeply immersed in during his studies at the wartime Qinghua University, which included not only a specific notion of logic, but also promulgated a certain philosophical apparatus supporting its espoused logical science, based predominantly on the mathematical logic of the *Principia* and to a lesser extent on more recent developments in the field. By the virtue of propagating the above-mentioned notion of science of logic, first through textbooks on logic published in Taiwan, Yin succeeded in embedding the former Qinghua image of the discipline into the underlying tissue of Taiwanese academia, which at the time was still in the process of being formed (see Wang 2010; Dai 2012).

Conclusion: The Question of Continuity and Succession

As we have tried to show in the foregoing analysis, both the figures of our interest, Mou Zongsan and Yin Haiguang, shared a deep and on-going connection with the Qinghua School of Logic and could consequently, each in his own regard, be considered as descendants of this school. In addition, along with a marked affinity for topics in mathematical (also symbolic) logic, which in the early 1930s revolved mainly around Russell and his *Principia Mathematica*, their pertinence to the Qinghua School of Logic was also manifested in their preference for a certain philosophical foundation accompanying and critically defining the inherently technical apparatus of logic. In that way, in their early years, they both espoused a notion of “pure logic”, which at the time was advocated by the most important members of the Qinghua circle, such as Jin Yuelin and Shen Youding, who were also important influences in the academic developmental path of both men. As a consequence, due to the respective roles both these scholars had in formation and establishment of Taiwanese academic philosophy, it can be conjectured that, especially through the specialist Yin Haiguang, a certain degree of continuity existed

between the manner in which the science of logic as a philosophical discipline was treated in the early Taiwanese period (1950s and 1960s) on the one side, and the ideas of the Qinghua School on the other. Since, in his Taiwanese years, Mou gradually turned away from his previous interests in logic, his role in this process consisted mainly in disseminating the focal notion of logic through his early pedagogical work in Taiwan. In this context, we might also assume that Mou's strong association with the Qinghua School of Logic did not simply cease to exist in the year 1949, in the eyes of both his students as well as his colleagues. Thus, even though in his later years Mou followed a completely different philosophical path, in the crucial few years following 1949 he was still known as a former "member" of the Qinghua circle, as well as a formerly prolific writer on the topic of modern logic. In these years, which were vital for the formation of Taiwanese studies of logic, Mou was undoubtedly one of the island's leading experts in modern logic as expounded in the framework of the Qinghua School.²¹

Through the above-mentioned connections, Qinghua-type philosophical outlooks on logic retained a central role in later Taiwanese studies in logic—especially those of New Realism, the Vienna School, and so on, while in mainland China the change of regime and ideology in 1949 helped to speed the trend of the "mathematization" of modern (mathematical) logic, and initiated its ultimate conversion into a purely technical discipline in the framework of new socialist science. Even though this trend had actually originated from the internal developments in the field, and in China had already started to take shape in the 1930s, when a group of mathematicians started researching set theory and Hilbertian ideas regarding axiomatization of mathematics, it could be argued that the revolution of 1949 forcefully ended a line of development which can be identified in the Qinghua School of Logic, while drastically affecting the development of the idea and discipline of modern logic in future Chinese science.

The fact that the regime change of 1949 also marked the moment in history when the Qinghua School of Logic suddenly ceased to exist—at least in the public or official academic sphere—brings us to another important question: Could the

21 We do not assume, however, that Mou invested great effort to disseminate this notion of logic, or that he deliberately propagated it. What we have in mind is rather the idea that the notion of logic, which Mou adopted in his early years, appeared to him as a natural and self-evident definition of logic as such, and not as a particular notion of logic associated exclusively with the Qinghua School of Logic. In this sense, even when Mou eventually departed *from logic* or even if he were to negate logic as such, in so doing he was still maintaining the same notion of logic. This is also the reason why we understood the transition from Qinghua to Taiwanese studies of logic to have occurred mainly by means of continuation of the Qinghua School's *notion* of logic. Moreover, a notion of logic is not only a matter of its (as it were) *inner* definitions, but more so a matter of complexly interwoven epistemological concepts, ontology, philosophical views on science and nature, and so on.

early period of Taiwanese academic discipline of logic be considered a direct successor of Qinghua School of Logic? In other words: Did important agents of the Qinghua School, like Yin Haiguang, continue the work of their former mentors at Qinghua? Or could the shape of academic research in logic in the early Taiwanese period be considered a result of mere natural development, which had its source in the current developments in the international research in mathematical logic? Of course, this question is immensely complex and would most certainly require another, incomparably more extensive comparative study, in which more light would be shed on the content of concrete results, curricular changes, and the scope of philosophical influence of early Taiwanese studies in modern logic. However, in the current text we can claim with much certainty that while the theoretical consistency (continuity) between the “schools” is more or less clear, in light of the drastic shift in Chinese studies of modern logic from the 1950s on, the emerging Taiwanese logic was very much in line with the former Qinghua tradition.²² While, naturally, the most important driving force behind this transmission or alignment with the Qinghua School in Taiwan were intermediaries like Mou Zongsan and Yin Haiguang, who in their years of academic training in China were not only strongly influenced by the members of Qinghua School, but at the same time also contributed significantly to the philosophical and scholarly research into modern logic in China. While at the heart of this transitory period, what connected Taiwanese logic with Qinghua was not loyalty to schools or teachers, but a specific, modern notion of logic, that was believed to be objective, universal and, most of all, useful.

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²² We do not claim that the Qinghua School of Logic represented the only source for logic as an academic discipline in Taiwan, but that it is most likely the earliest and most natural source.

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