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Logic, 'Logic,' *Luoji,* and 邏輯: Zhang Shizhao and the Translation of 'Logic' into Chinese

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Abstract

In this article we discuss Zhang Shizhao's famous essay *"Lun Fanyi Mingyi* 〈論翻譯名義〉" (On the Meanings of Names in Translation), which played a key role in establishing what is now the standard translation of 'logic' into Chinese, sketching the historical context and analyzing and evaluating the argument he gives for providing a phonemic rather than semantic translation.

Keywords

In 1910 Zhang Shizhao (章士釗, 1881–1973) published an influential essay *"Lun Fanyi Mingyi* 〈論翻譯名義〉" (On the Meanings of Names in Translation). His main example was 'logic,' which he proposed to translate as '*luoji* 邏輯' or '*luojixue* 邏輯學.' Zhang rejected the three most popular renderings at the time – '*mingxue* 名學,' '*bianxue* 辯學,' and '*lunlixue* 論理學' – on the grounds that while each reflected some uses of 'logic' in the European tradition, none managed to do justice to all of them and hence were misleading. Each of these alternatives translated 'logic' through a semantic definition, but this was a bad policy to adopt, he argued, as it meant that new translations would be required every time the definition changed. He advocated '*luoji* (*xue*) 邏輯 (學)' precisely because it did not presuppose a particular definition. As a phonemic loan, it was semantically neutral.

Zhang's essay generated much criticism, to which Zhang responded in subsequent writings, but – unlike in the case of other philosophical terms – his proposed rendering of 'logic' eventually established itself as the standard translation. The arguments he offered raise important issues in the philosophy of translation, and highlight just what a complex and contested activity it is to translate philosophical terms into Chinese, of which the vast majority of philosophers who speak only European languages have no conception. It is Zhang's essay and the issues it raises

that we discuss in the present paper. In the first part we sketch some of the relevant historical and philosophical background, and in the second part we expound and evaluate Zhang's arguments in detail, drawing out their linguistic and philosophical significance.

1   Historical and Philosophical Context

1.1   *A Thumbnail Sketch of the History of Western Logic*

Logic as a discipline is generally taken to have been founded by Aristotle, with his *Organon*, a collection of his works put together by the later Peripatetics, forming the first canonical texts. This comprises not just the *Prior Analytics*, expounding Aristotle's syllogistic theory, and the *Posterior Analytics*, explaining demonstration (establishing scientific knowledge), but also the *Categories* and *De Interpretatione*, presenting his classificatory scheme and conception of names and propositions, as well as the *Topics* and *Sophistical Refutations*, discussing dialectic – or reasoning, more generally, including fallacious reasoning. Rivalling Aristotelian logic in the ancient period was Stoic logic, offering the first system of propositional logic with an account of the nature of propositions (one type of what the Stoics called '*lekta*'). By the time we get to medieval logic, syllogistic theory and propositional logic had been combined, although the latter was mainly seen as supplementing the former, with Aristotelian logic the overarching category.

Although Aristotelianism, in general, was rejected or radically transformed in the early modern period, concern with 'logic' remained, at least in the sense of an 'art of thinking,' as the so-called *Port Royal Logic* conceived it. Leibniz was the most significant logician of the period, but it was only in the nineteenth century that major developments occurred. The most famous work was John Stuart Mill's *System of Logic*, first published in 1843, with six books on names and propositions, reasoning, induction, 'operations

subsidiary to induction,' fallacies, and 'the logic of the moral sciences,' respectively. Although hugely influential, it was clearly modelled on Aristotle's *Organon*, however, and there were no advances in formal logic. This only came with Boolean algebra and, most importantly of all, Frege's invention of quantificational logic, on which all the other subsequent advances depended, such as the theory of relations, modal logic, deontic logic, epistemic logic, and the various forms of non-classical logic. The development of quantificational logic also involved reflections that gave rise to corresponding developments in our conception of names, propositions, scientific methodology, and so on, which led to wider uses of the term 'logic,' whereby any conceptual practice or scheme could be regarded as having a 'logic.'

1.2   *The Meanings of 'Logic'*

The word 'logic' comes from the Greek '*logos*,' meaning 'word,' 'saying', 'statement,' 'discourse,' 'thought,' 'reason.' Etymologically, '*logos*' (as well as '*lekton*') comes from the verb '*legein*,' which originally meant 'collect,' 'gather,' 'pick out,' and subsequently 'say,' 'speak,' 'count' – presumably through what were initially the conceptual metaphors of 'collecting words,' 'gathering thoughts,' and 'picking out things.' As even the thumbnail sketch just given of the history of logic shows, 'logic' came to be used very broadly indeed in Western philosophy. So can we say that 'logic' has any core meaning at all? It has no 'essential' meaning, but we might characterize logic, in its most general sense, as concerned with the *transition between thoughts*. Again, for present purposes, only the simplest *Übersicht* is required to indicate the basic idea.

In thinking, generally, we 'move' from one thought to another, whether 'legitimately' or not. The rules that govern these moves can be codified and systematized, which gives us 'logic' as a 'science of reasoning' and as 'formal logic.' But reflecting on their legitimacy and application in particular cases also enables us to diagnose errors, which gives us 'logic' as 'critical thinking' and as

'informal logic.' The rules can be codified in different ways, with different domains of thinking being considered, which gives us all the various kinds of logical theory – syllogistic, quantificational, intuitionist, modal, and so on. We can also consider non-deductive forms of logic, such as induction, abduction, and analogical reasoning, all of which have also been treated in logic courses and textbooks. Finally, we can analyse thoughts themselves and their linguistic representations, in trying to understand the 'mechanisms' of thought-transitions, which yields talk of propositions, concepts, sentences, names, descriptions, logical connectives, and so on; and we can consider the interrelationships between thought, language and the world, as it is often described, which involve a whole battery of semantic, epistemic and metaphysical concepts. All this is now explored in philosophy of language, philosophy of logic, philosophy of mind, epistemology, and metaphysics, the boundaries between which are porous and continually shifting. Some of this used to fall under the heading of 'philosophical logic,' but we can see all of it as being 'logic' in its widest sense.

Frege and Russell had to expand 'logic' to make it even possible to 'reduce' mathematics to logic. Quantificational logic offered a far more powerful means to analyse forms of reasoning – of transitions between thoughts – than could be achieved by syllogistic theory or Stoic logic or Boolean algebra. Frege, Russell, and Wittgenstein in the *Tractatus* may have thought that 'logic' was essentially the form of logic that Frege had systematized, based on the use of function–argument analysis, but in his later work, Wittgenstein certainly recognized the limitations and questionable assumptions of this form of logic and came to conceive 'logic,' which he also called 'grammar,' in a much broader way, as concerned with all the rules, implicit and explicit, that govern the huge variety of 'language-games' that we play. Our various ways of talking of 'logic' have their own logic, in other words, which must be recognized and understood.

1.3   *Yan Fu and the Translation of Logical Texts and Terms*

As far as the development of logic in China is concerned, which began in earnest towards the end of the nineteenth century, the pioneering figure was Yan Fu (嚴復, 1854–1921). In his account of Yan Fu's role in chapter 3 of *The Discovery of Chinese Logic*,[1] Joachim Kurtz quotes from a letter that Yan wrote to Zhang Yuanji in 1901:

> The insights and truths (*daolizhenru* 道理真如) in [Mill's *Logic*] are as numerous as silk threads in a cocoon; indeed, they are so powerful that they will do away with 80 or 90 percent of China's old patterns, and people's minds will gain utmost strength from their application.[2]

Yan became acquainted with Mill's *Logic* when he studied at the Royal Naval College at Greenwich in England from 1877 to 1879, being impressed with his views on induction, in particular, and he later provided annotated translations of Mill's *Logic*[3] as well as Jevons' *Primer of Logic*.[4] Yan regarded logic as "the science of all sciences" and the "key to the renewal of Chinese scholarship," involving three main elements: an empiricist methodology, precise

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1   Joachim Kurtz, *The Discovery of Chinese Logic* (Leiden: Brill, 2011). We are greatly indebted to Kurtz's pioneering book in the history of Chinese logic. As will soon become clear, however, we will be examining Zhang Shizhao's contribution, and his critique of Yan Fu's approach, in much more detail than Kurtz does, both embedding it in the context of Zhang's Aberdonian education (which is not discussed by Kurtz) and exploring in greater depth the linguistic-philosophical issues it raises; cf. fns. 40, 49 below.

2   Ibid., 147, 171.

3   Yan Fu, *Mule Mingxue*《穆勒名学》(*Mill's Logic*, trans. of J. S. Mill, *A System of Logic: Ratiocinative and Inductive*, in *Collected Works of John Stuart Mill*, 1843, 3rd edn. 1851, 8th edn. 1872, ed. J. M. Robson, Vols. 7–8 [Toronto: University of Toronto Press, 1973–74]) (Nanjing, 1903, Shanghai, 1905).

4   Yan Fu, *Mingxue Qianshuo*《名学浅说》(*Logic Primer*, trans. of William Stanley Jevons, *Elementary Lessons in Logic* [London: Macmillan, 1870, 2nd edn., 1886]) (Shanghai, 1909).

definitions, and the proper use of induction.[5] It was the emphasis on definitions, or '*zhengming* 正名' (the correct use of names), as he described it, that led Yan to translate 'logic' as '*mingxue* 名學,' 'the science of names,' a traditional term that he nevertheless saw as now representing a discipline aimed at correcting the unfortunate Chinese tendency to use ambiguous words. In 1900 Yan founded the first *mingxuehui* 名學會 (Logical Society) in China, and one of those who attended the inaugural lecture by Yan was Zhang Shizhao. Over 500 people attended this lecture, and the Society undoubtedly proved successful in promoting the study of Western logic.[6]

Yan is perhaps most famous today, however, for his formulation of three principles of translation: *xin* 信 (faithfulness), *da* 達 (communicability), and *ya* 雅 (elegance). It appears, however, that he took these three principles from the *Essay on the Principles of Translation* published by the Scottish historian Alexander Tytler (1747–1813) in 1791. Tytler had argued that translation should capture the 'ideas' and 'style' of the source text while also exhibiting an 'ease of original composition' or fluency.[7] Ironically, however, Yan's own translations often failed to respect these principles. His 'translations' of Mill's and Jevons's writings on logic contained paraphrases, summaries, and adaptations. As he wrote in describing his 'translation' of Jevon's *Primer of Logic*: "The general meaning of my translation follows the original work, but I have changed many illustrations and examples in accordance with my own opinions. My sole intention with this book was to adapt it for explanation; I did not pay much attention to whether or not what I wrote corresponded to the original."[8] The 'style' he adopted in translating philosophical works also drew criticism. Liang Qichao (1873–1929), for example, reproached him

for his attempt to imitate archaic, Pre-Qin style: "as these books contain great learning, unless they are translated in fluent and plain writing, how can they benefit schoolboys? Translations are a means to disseminate enlightened ideas among the people. They are not meant to be hidden in deep forests or to earn the translator an immortal reputation."[9] Yan's response was that he was not writing for schoolboys but for those well versed in classical literature.

Objections were also raised to his specific renderings of key terms. One of the most notorious was his translation of 'syllogism' as '*lianzhu* 連珠' or 'linked verse' (literally, 'stringed pearls'), which referred to a genre of Chinese parallel prose from the third and fourth centuries CE, raising questions as to exactly how he understood syllogistic theory. Creativity was also exhibited in translating 'fallacy' as '*yuan* 眢' or 'dried-up well,' adding a graphic image to his claim that 80 to 90 percent of Chinese philosophy committed the fallacy of begging the question,[10] and in using '*zhou* 籀,' meaning 'draw out' or 'recite,' to translate 'induction' as '*neizhou* 內籀' and 'deduction' as '*waizhou* 外籀.'[11]

Although Yan Fu translated 'logic' as '*mingxue* 名學,' he also uses '*luoji* 邏輯' – for the very first time in Chinese translation – in the introduction to his translation of Mill's *Logic*. Significantly, however, he only does so to refer to the *word* 'logic.' He writes (translating back into a blend of English and pinyin!): "*An luoji ci fan mingxue.* 案邏輯此翻名學。" ("Let 'logic' be translated as *mingxue*.")[12] Since Yan Fu avoids using actual English words, the word whose translation is being specified is rendered phonemically instead: in contemporary terminology, 'logic' is not used but mentioned (albeit in a Chinese version). Yan Fu is saying, in

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5   Kurtz, *The Discovery of Chinese Logic*, 150, 154.

6   Ibid., 165ff.

7   Alexander Tytler, *Essay on the Principles of Translation*, ed. J. F. Huntsman (Amsterdam: Benjamins, 1791 [1978]), 15.

8   Kurtz, *The Discovery of Chinese Logic*, 172.

9   Ibid., 175.

10   Yan, *Mingxue Qianshuo*, §185.

11   A list of Yan's renderings of key logical terms in his 'translations' of Mill's and Jevon's works is given in Kurtz, *The Discovery of Chinese Logic*, 177–182, where it is followed by discussion of selected examples, on which we have drawn here.

12   Yan, *Mule Mingxue,* 2.

effect, that 'logic' *means* the science of names, and hence can be translated accordingly.[13] As we will see, Zhang Shizhao takes up Yan Fu's phonemic rendering and argues that it should be used as the *translation* of 'logic,' since 'logic' means far more than just the science of names.

1.4 *The Aberdonian Tradition of Logic*

Zhang's essay was written while he was a student at the University of Aberdeen. So let us briefly outline the Aberdonian context. In the second half of the nineteenth century Aberdeen was one of the leading centres for the study and teaching of logic (broadly understood). King's College (founded in 1495) and Marischal College (founded in 1593) were merged to form the University of Aberdeen in 1860, when the Regius Chair of Logic and English Literature was also established. Alexander Bain (1818–1903) was the first Regius Chair, which he occupied until 1880, becoming Rector of the University a year later. Bain had been strongly influenced by John Stuart Mill (1806–73), with whom he had worked closely on Mill's *System of Logic*, later publishing books on both J. S. Mill and his father James Mill.[14] In 1870 he published his own two-volume work on logic, which dealt with the same topics as those covered in Mill's *Logic*: names and propositions, reasoning, induction, and methodology, though it contained more on the logic of particular sciences, including psychology.

Bain was succeeded in 1880 by William Minto (1845–93), who carried on Bain's work with two books on logic,[15] although his interests lay more in the teaching of English than of logic. In 1893 the Regius Chair was divided into one for Logic and one for English Literature, and Robert Adamson (1852–1902) was appointed to the former, although he only stayed two years before taking up the Chair of Logic at Glasgow. Adamson was primarily a Kant scholar, but as a young man, he had written the entries on logic for the *Encyclopaedia Britannica* in the mid-1870s.[16]

William Davidson (1848–1929) then held the Regius Chair of Logic from 1896 to 1926, and his work continued the tradition of Bain and Minto. He published on the logic of definition in 1885,[17] but also had a strong interest in political theory, exemplified by his *Political Thought in England* in 1913,[18] which discussed utilitarianism. His course on logic covered definition and classification, deductive and inductive logic, the analysis of mind and knowledge, and also offered an introduction to the history of modern philosophy.[19]

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13   Similarly, he renders the suffix '–logy,' as in 'philology,' 'sociology,' 'psychology,' and 'biology,' phonemically as '*luozhi* 羅支,' in specifying how these terms are translated. '*Feiluoluozhi* 斐洛羅支 (philology)' is translated as '*zixue* 字學,' '*suoxiuluozhi* 唆休羅支 (sociology)' as '*qunxue* 群學,' '*shikeluozhi* 什可羅支 (psychology)' as '*xinxue* 心學,' and '*baikeluozhi* 拜可羅支 (biology)' as '*shengxue* 生學.' Since 'logic' governs all scientific thinking, Yan Fu comments, this allusion to 'logic' is entirely appropriate. (Yan, *Mule Mingxue*, 2.)

14   Alexander Bain, *James Mill: A Biography* (London: Longmans, Green, & Co, 1882); *John Stuart Mill: A Criticism with Personal Recollections* (London: Longmans, Green, & Co., 1882).

15   William Minto, *Logic: Inductive and Deductive* (London: John Murray, 1893); *University Extension Manual on Logic* (Edinburgh and London, 1893).

16   Zhang Junmai (張君勱, 1887–1969) was to draw extensively on these articles in his annotated translation, serialized in *Xuebao*《學報》(*Learning*) between December 1906 and January 1908, of Jevons' *Elementary Lessons in Logic* (1870, 1886), which soon established itself as one of the main textbooks of the period. Zhang translated 'logic' by '*lunlixue* 論理學' – 'science of reasoning.' See Kurtz, *The Discovery of Chinese Logic*, 213–216.

17   William Leslie Davidson, *The Logic of Definition: Explained and Applied* (London: Longmans, Green, & Co., 1885).

18   William Leslie Davidson, *Political Thought in England: The Utilitarians from Bentham to J. S. Mill* (New York: Henry Holt and Company, 1913).

19   For further details, see Zou Xiaozhan, *Zhang Shizhao Zhuan*《章士釗传》(*The Biography of Zhang Shizhao*) (Zhengzhou: Henanwenyi Chubanshe, 1999), 63–73; Ming Zhang, "A Journey between East and West: Yang Changji (1871–1920) and his thought" (Ph.D. diss., University of Edinburgh, 2002), 221; Hai Huang, "The Research on the Academic Origin and Methodology of Zhang Shizhao's Logic Thinking," *Studies in Dialectics of Nature* 35, no. 2 (2019): 106.

It was Davidson who was teaching logic when the first students from China came to Aberdeen to study philosophy.

Davidson's book, *The Logic of Definition*, divides into two parts. In the first three chapters, he discusses the nature, modes, and principles of definition, and in the remaining chapters (4–10), he applies his account in exploring definitions in dictionaries, schoolbooks, philosophy (chapters 6–9, comprising nearly half the book), and biology. He distinguishes six modes of defining: essential definition (through genus and differentiation), analytic definition (dividing into constituent concepts), negative defining (through contrast), description, defining through etymology and history, and defining by example. He also discusses other activities that are involved in providing definitions, such as discrimination of synonyms. In applying his account, he then shows how these are combined in defining different terms. The examples he takes of philosophical terms include consciousness, idea, happiness, intuition, sensation, reason, and truth. In defining reason, for example, he suggests that the key methods are analysis, discrimination, and contrast.[20] The aim of the whole book, fully in the tradition of Mill and Bain, is to help make language as perfect as possible. As Davidson puts it, "Well-defined words, clearly understood and intelligently expressed meanings, are a sort of panacea for the thinker; and, in proportion as we approach the ideal here or recede from it, we may expect accuracy and progress in thought or deterioration and confusion."[21] It is easy to see how these words would have appealed to any young Chinese intellectual, keen to renew Chinese thinking at a time of political turmoil.

1.5 *Zhang Shizhao and Aberdeen*

Zhang Shizhao studied at the University of Aberdeen from 1909 until 1912,[22] when he returned to China. Zhang was primarily a political journalist, and had been very active at the beginning of the century in opposing the Qing dynasty. After a failed attempt to assassinate the Governor-general of Guangxi province, however, Zhang had fled to Japan, where he learnt English, and from there he went to Britain in 1908. At Aberdeen he took courses on logic, law, political economy, English, and moral philosophy.[23] The courses on logic and English were taught by Davidson, and the course on moral philosophy was taught by James Baillie, the Regius Professor of Moral Philosophy. At Aberdeen Zhang thus found a congenial place to acquire first-hand knowledge of Western ideas and to reflect not just on Chinese politics but also on the Chinese language and the importance of logic in renewing Chinese culture and society.

Zhang studied logic in the academic year 1909–1910, and he refers to Davidson's book in his essay "On the Meanings of Names in Translation," which was published in 1910, so he presumably read at least some of the book then. In the first chapter, Davidson asks the question: "When is the introduction of a new term into the

20 Davidson, *The Logic of Definition*, 210–228.
21 Ibid., 2.
22 It has been claimed, e.g. by Jenco, that he studied at the University of Edinburgh, but if he ever intended to do so when he travelled to Scotland from London in 1908–09, he actually went to Aberdeen. It is surprising that Jenco did not try to find out what he studied in Scotland, given her concern with his political writings in the years that immediately followed. None of his teachers or any of their work is mentioned in her book, yet their work on moral and political philosophy, especially, would surely have influenced him. See Leigh K. Jenco, *Making the Political: Founding and Action in the Political Theory of Zhang Shizhao* (Cambridge: Cambridge University Press, 2010), 36. As Zhang Ming has argued in a study of the life and thought of Zhang's friend Yang Changji (1871–1920), who also studied at Aberdeen at the same time, "the profound influence of graduates of the University on the development of modern China in various ways cannot be underestimated" (Ming Zhang, *A Journey between East and West*, 209).
23 For details of Zhang's time in Aberdeen, see Ming Zhang, *A Journey between East and West*, ch. 6; Bin Ye, "Searching for the Self: Zhang Shizhao and Chinese Narratives (1903–1927)" (Ph.D. diss., University of California, Berkeley, 2009), 73–81. The information about what courses Zhang took is in Ming Zhang, *A Journey between East and West*, 232, fn. 102.

language philosophically imperative?" He answers: "(1) when there is a new thing to be expressed; (2) when, by the introduction of a new term, tedious circumlocution is avoided; (3) when, by adding to or tampering with the old, confusion is inevitable."[24] This would have struck a chord in Zhang as he wondered what 'logic' meant and how it might be translated into Chinese. The particular passage to which Zhang refers in his essay is where Davidson gives a brief history of the meanings of 'philosophy' from its original sense in ancient Greek of 'love of wisdom.'[25] Zhang drew the obvious conclusion: that translating 'philosophy' into Chinese in such a way as to capture just this sense would be highly misleading.[26] Surprisingly, perhaps, Davidson does not discuss the definition of 'logic' in his book on the logic of definition; but Zhang would have been well placed to appreciate that the same problem arises in translating 'logic' into Chinese as arises in translating 'philosophy.'

2 Zhang's Translation of 'Logic'

2.1 Zhang's Arguments in "On the Meanings of Names in Translation"

From the end of the nineteenth century, when the translation of Western texts began in earnest, Chinese scholars faced the difficult task of finding the most suitable translations in introducing philosophical terms. A debate, which was effectively initiated by Zhang Shizhao, raged about the relative merits of phonemic versus semantic translation, and the problem of translating 'logic' became a focal case. As an advocate of phonemic translation, Zhang proposed translating 'logic' as '*luoji* 邏輯,' adopting the rendering (as we saw

in §1.3 above) that Yan Fu had used in referring to the (English) *word* 'logic.' Of all the terms that Zhang suggested translating phonemically, he was most insistent about 'logic.' He promoted '*luoji* 邏輯' in a series of papers written from 1910 to 1925, especially in the earlier years (1910–15), when he responded to criticisms, and it was finally accepted as the standard translation in 1949. He first argued for phonemic translation in his famous essay "On the Meanings of Names in Translation" (1910), where '*luoji* 邏輯' is taken as his main example.

After a brief foreword by Liang Qichao (under the pseudonym of 'Cang Jiang') and an opening remark in which Zhang anticipates harsh criticism, Zhang states that his aim is to discuss the pros and cons of semantic versus phonemic translation: "*Zai taolun yiyi, yinyi zhi deshi.* 在討論義譯、音譯之得失。"[27] We translate '*yiyi* 義譯' by 'semantic translation' (lit., 'meaning translation') and '*yinyi* 音譯' by 'phonemic translation.' We can see 'semantic translation' as encapsulating what Davidson called 'essential definition' (specifying genus and differentiation), the ideal of which, at least, is to enable us to grasp "the essence of a thing."[28] 'Phonemic translation,' as we have seen, is transliteration. Zhang then asks six questions which he answers in turn during the course of his essay:

1. Concerning semantic translation, can we find a translation that matches the original term?
2. Concerning semantic translation, what are the disadvantages?
3. Even if there is a matching translation, would it be a suitable translation?
4. If a matching translation cannot be found, should I choose the closest one or just give up the method of semantic translation?
5. If a good semantic translation is desired, what errors must we not commit [lit., what diseases must we not catch]?

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24   Davidson, *The Logic of Definition*, 21.
25   Ibid., 8–11.
26   Zhang Shizhao, *"Lun Fanyi Mingyi* 〈論翻譯名義〉*"* (On the Meanings of Names in Translation) (*Guofengbao*, 1, no. 29, 1910), in *Zhang Shizhao Quanji* 章士釗全集 (*The Complete Works of Zhang Shizhao*), eds. Zhang Hanzhi and Bai Ji'an (Shanghai: *Wenhui Chubanshe*, 2000), vol. 1, 448–454.

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27   Ibid., 448.
28   Davidson, *The Logic of Definition*, 41–46.

6. Concerning phonemic translation, what are the advantages and disadvantages?[29]

In answering these six questions, Zhang criticizes the semantic translation of 'logic,' taking '*mingxue* 名學' and '*lunlixue* 論理學' as his main targets. In response to the first question, he argues that it is impossible to find any one or two Chinese characters that can fully match the meaning of 'logic.'[30] He returns to this in answering the sixth question, when he argues that this failure to match is a consequence of the difference between (graphic) Chinese script and (alphabetic) European languages, leaving phonemic translation as the only possibility for matching.[31] The best that semantic translation can do is capture *one* aspect of logic, but never the whole picture. As to '*lunlixue* 論理學,' Zhang accepts that it captures the idea of a 'science of reasoning,'[32] on which he elaborates in a later essay,[33] but he notes his agreement with Yan Fu that it merely reflects one aspect of deductive logic. The same applies to '*mingxue* 名學,' which captures Aristotle's logic, he suggests, but not Baconian logic.[34] Aristotle's logic is understood here as a term logic and Baconian logic as inductive logic, a distinction that he would have learnt from Davidson's book and the course on logic (in the Millian tradition) that Zhang took at Aberdeen.

Zhang's main objection to semantic translation is that it rarely matches the original term, more evidence for which he provides in his writings from 1910 onwards. As to '*mingxue* 名學,' '*ming* 名' only captures 'term' in English: "If 'logic' can be called '*mingxue* 名學,' then it can also be called '*tongxue* 通學' or '*duanxue* 斷學.' Why? The English name of '*ming* 名' is 'term,' of '*tong* 通' 'generalization,' of '*duan* 斷' 'judgement,' which are all just one

aspect of logic."[35] Zhang interprets Yan Fu's '*mingxue* 名學' as the 'science of terms,' which reflects only one meaning. He also remarks that semantic translations, such as '*mingxue* 名學,' '*lunlixue* 論理學,' and '*bianxue* 辯學,' are not as faithful as might be thought. The final character, '*xue* 學,' he remarks, is merely added to capture the idea that what we have here is a 'science,'[36] but this idea is not essential to the meaning of 'logic.' If we take the final character out, however, then only 'term,' 'reasoning,' and 'disputation,' respectively, are left, ruining the translations. '*Luoji* 邏輯,' on the other hand, can be used with or without '*xue* 學.'

Zhang develops this in answering the second question, where he points out that semantic translations are not just partial but also harmful. He identifies two ways in which serious harm may be caused. First, semantic translation may generate ambiguity. Someone encountering the term for the first time may "*wangwen er sheng zhi* 望文而生之" (look at the characters to gain an understanding), but this may mislead them as to its actual meaning. Second, it may generate '*maodunyi* 矛盾義' (contradictory meaning). Suppose we translate 'logic' as '*lunlixue* 論理學.' Then, when we come across a use of '*lunlixue* 論理學' to mean something other than 'science of reasoning,' we may claim that '*lunlixue* 論理學' is not '*lunlixue* 論理學,' a 'contradiction in form' ('*xingshi shang zhi maodun* 形式上之矛盾'). Imposing our own interpretation on the translation of terms, Zhang argues, may hinder the development of the field. He takes Yan Fu's rendering of 'philosophy' as 'love of wisdom' as a bad model, since the meaning of

29 Zhang, "*Lun Fanyi Mingyi*," 449.

30 Ibid., 449.

31 Ibid., 453.

32 Ibid., 449.

33 Zhang Shizhao, "*Shi Luoji* 〈釋邏輯〉" (Elucidating Logic) (*Minlibao*, 1912), in *Zhang Shizhao Quanji*, vol. II, 210–211.

34 Zhang, "*Lun Fanyi Mingyi*," 449.

35 "如邏輯可云名學，當亦可云通學，或云斷學。何也？名於英語爲 term, 通爲 generalisation, 斷爲 judgment, 皆爲邏輯之一部。" Zhang Shizhao, 《*Luoji Zhiyao* 邏輯指要》(*Companion to Logic*) (Shidai Jingshen Chubanshe, 1943) in *Zhang Shizhao Quanji*, vol. VII, 297.

36 "即有時口稱邏輯，意在科學，而省略學字，義亦甚明。且溯厥語源，在原文本無學義，其謂之學者，乃作定義時從而爲之詞耳。" Zhang Shizhao, "*Lun Luoji* 〈論邏輯〉" (On Logic) (*Jiayin Zhoukan*, 1925) in *Zhang Shizhao Quanji*, vol. V, 457.

'philosophy' today is much wider. As noted in §1.5 above, we see here the influence of Davidson's *Logic of Definition*, where just this point is made.[37]

Zhang's answer to the third question is relatively brief. Taking the example of 'political economy' (on which Davidson also wrote and taught), even if a translation matches that term, the English term itself may be in dispute, others talking of 'social economy' instead, for example, which would make the translation no longer suitable.

His answer to the fourth question is equally short. He admits that when a matching semantic translation cannot be found, we may have no choice but to take the closest one. Where finding a semantic translation is altogether too difficult, however, we should resort to phonemic translation.

His answer to the fifth question is the longest. He discusses four kinds of error that can be committed in using semantic translations. First, adopting obsolete characters may create confusion. Second, dragging a term or phrase from one context into a new one carries all sorts of dangers. One example he gives is Yan Fu's translation of 'syllogism' by '*lianzhu* 連珠,' which we mentioned above. Literally meaning 'string of pearls,' this clearly has connotations that may be entirely inappropriate in capturing Aristotelian logic. Third, inappropriate characters fall into two kinds, each of which generates potential problems. The first kind are rarely used characters, which may also have misleading connotations. Here Zhang mentions Yan Fu's translation of 'fallacy' by '*yuanci* 眢詞,' which means 'dried-up well' or 'eye without eyeball.' The second kind are characters that can be used as either nouns or verbs. Zhang says that this is the problem that the use of '*lun* 論' in '*lunlixue* 論理學' faces. '*Lun* 論' can either mean the verb 'to reason' or the noun 'reasoning,' which is particularly confusing in a philosophical context. Fourth, phrases that are too long become less usable. Again he takes one of Yan Fu's translations as an example, his rendering of 'conversion' (as used in syllogistic theory) by '*diaohuancitou* 調換詞頭,' which

literally means 'switching the head of the phrase,' which is not inaccurate but long.

As mentioned above, in answering the final question, Zhang stresses the unique character of the Chinese language. He urges scholars to translate Western terms phonemically, suggesting that we need to allow any neologism, such as '*luoji* 邏輯,' time to grow on us. Once we get used to it, we will not find it as strange as it might initially appear – just as we are now used to phonemic translations of Buddhist terms. Phonemic loans also guarantee that translations will not be abused. In the case of '*luoji* 邏輯,' Zhang's prediction came true. Chinese people now find it very natural to see '*luoji* 邏輯' as the term for 'logic,' so much so that they no longer see it as a phonemic loan at all.

2.2   *Criticisms and Replies*

As Zhang Shizhao predicted, his essay received a lot of criticism; so much, in fact, that he wrote more than a dozen further essays in the years that followed, defending his choice of '*luoji* 邏輯.' His replies remained rooted in what he had said in "On the Meanings of Names in Translation," however, even to the extent of repeating whole sentences, and he continued to insist on his translation of 'logic' by '*luoji* 邏輯.' The two main challenges he faced were from Zhang Lixuan (張禮軒) and Hu Yilu (胡以魯), and he devoted one essay to each in responding.

In May 1912, Zhang Shizhao replied to Zhang Lixuan's challenge in a paper published in *Minlibao*《民立報》,[38] to which Zhang Lixuan's letter was appended.[39] In his account of their dispute, Kurtz gives a helpful summary of Zhang Lixuan's objections:

> Zhang Lixuan argued that phonemic loans should exclusively be employed to represent

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37   Davidson, *The Logic of Definition*, 8–11.

38   Zhang Shizhao, "*Lun Yiming*〈論譯名〉" (On Translating Names) (*Minlibao*, 1912), in *Zhang Shizhao Quanji*, Vol. 11, 302–304.

39   Zhang Lixuan, "Zhang Lixuan's Report to *Minlibao*" (*Minlibao*, 1912), in *Zhang Shizhao Quanji*, Vol. 11, 305–306.

the names of individuals and places or newly discovered and invented things and substances. In all other instances, semantic loans were to be preferred (1) because they were able to provide lay readers with an immediate understanding of the subject in question; (2) because only semantic translations were able to preserve the connection of a term to the semantic field from which it originated in the foreign language; (3) because phonemic loans were much more difficult to memorize; (4) because strict application of Zhang Shizhao's principle to use phonetic renderings whenever no fully appropriate semantic translation could be found would inevitably lead to a drastic increase of 'meaningless' words and characters in the Chinese language; and, finally, (5) because phonemic loans risked causing unintended terminological multiplication, since one and the same term could be transcribed in many different ways depending on personal preferences or regional variations in pronunciation.[40]

Zhang Shizhao condenses and rephrases these five objections into three, which he then answers in turn, drawing on what he said in "On the Meanings of Names in Translation." First, he reports Zhang Lixuan as saying that "the clarification of original terms, whether translated phonemically or semantically, cannot be fully understood unless they have been interpreted in detail or defined."[41] Zhang Shizhao takes this to imply that Zhang Lixuan admits that new definitions of original terms are inevitable, but this is precisely what makes semantic translations problematic, according to Zhang Shizhao, as he said in his earlier essay.

Second, as Zhang Shizhao reports him, Zhang Lixuan argues that '*mingxue* 名學,' '*bianxue* 辯學' and '*lunlixue* 論理學' can provide *some* meaning for learners, but we cannot learn anything from '*luoji* 邏輯.' Zhang Shizhao replies that what Zhang Lixuan takes as the advantages of semantic translation actually show its disadvantages. Again, as he had said in his earlier essay, ambiguity arises when we look at the characters to gain an understanding, which is why semantic translation is unreliable.

Third, Zhang Lixuan is taken to argue that there are too many phonemic loans to choose from in translating 'logic,' such as '*luoji* 羅集,' '*luoji* 落機' and '*laoxia* 老黠.' Such choices generate chaos. Zhang Shizhao responds by reminding him that there are equally choices to be made in semantic translation – and we can simply choose and stick to one, just as he did in adopting Yan Fu's choice of '*luoji* 邏輯.'[42] Furthermore, every scholar who offers their own semantic translation ends up arguing against others. What for Zhang Lixuan is a disadvantage of phonemic loans is actually a disadvantage of semantic translations.

According to Zhang Shizhao, then, Zhang Lixuan's arguments for semantic translation end up being arguments for phonemic translation, and he attempts to show this by drawing on what he said in his earlier paper. At the same time, however, he softens his stance on phonemic translations in response to Zhang Lixuan's points about the difficulties in memorizing phonemic loans and the increase of 'meaningless' terms.[43] He writes: "Whether phonemic or semantic translations should be preferred depends on situations of translation, so cannot be generalized. My advocating phonemic translation does not mean applying this method to every term we encounter. But there are indeed advantages to phonemic translation."[44]

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40   Kurtz, *The Discovery of Chinese Logic*, 272. In what follows, we give a much fuller account of Zhang Shizhao's response to these objections, which Kurtz summarizes in just one paragraph.

41   "原文之界說，無論譯音、譯義，非詳加詮釋，綴以定義，不能完全明瞭。" Zhang, *"Lun Yiming,"* 302.

42   "惟在音譯，則嚴氏曰邏輯，記者亦附和之曰邏輯而已，無爭端也。" Ibid., 303.

43   "使吾國文字添多數無意義之名詞，不易記憶，不便了解。" Zhang Lixuan, *"Zhang Lixuan's Report to Minlibao,"* 305.

44   "翻譯名義之當從音譯，抑從義譯，此必視制語時之情狀爲衡，非可爲概括之詞也。記者之主

What he does advocate, though, is translating 'logic' by '*luoji* 邏輯.'

In our view, Zhang Lixuan's criticism of phonemic loans for being hard to memorize and understand suggests that he is insufficiently aware of how '*luoji* 邏輯' distinguishes itself from other possible phonemic loans. His view of '*luoji* 邏輯' was common to translators at the time, who took phonemic and semantic translation to be antagonistic, with the latter superior. As we will show in §2.3, phonemic translation is not totally unrelated to semantic meaning and is certainly not 'meaningless.'

Zhang Shizhao did not argue for equal consideration for phonemic and semantic translation until he commented on Hu Yilu's paper "On Translating Terms," which appeared in February 1914,[45] which Zhang Shizhao believed was criticizing him. In his reply, 'Translating Terms,'[46] written under the pseudonym Qiu Tong 秋桐, he defended phonemic translation. Hu had claimed that phonemic loans are not translations at all, since they are nothing but imitations of pronunciations, a view reflecting scholars' tendency to see phonemic translation as having no semantic implications. In response, Zhang insists that phonemic loans are just as legitimate as semantic translation and stresses that it is actually difficult to distinguish the two.[47] Semantic translation also involves loans: "Why is only adopting pronunciation called borrowing, but not adopting meaning? If borrowing pronunciation is called phonemic translation, then borrowing meaning should be called semantic translation. Thus, as to translation, it is not the case that translation cannot be both of them."[48] On the one hand, Zhang defends phonemic translation against Hu's criticism; on the other hand, he repeats his replies to Zhang Lixuan, reminding readers that phonemic translation depends on the situation. He continues to insist on the phonemic translation of 'logic' as '*luoji* 邏輯,' an effort that eventually paid off.

2.3   *Phonemic Translation*

Zhang Shizhao initiated the debate about phonemic translation. He claimed that, at least in some cases, phonemic translation is better than semantic translation, and is certainly better in the case of a difficult term such as 'logic.' This was important, since at the beginning of the twentieth century Chinese scholars preferred semantic translation. One of the leading and most respected scholars was Yan Fu, and it was a brave move on Zhang's part to criticize Yan's semantic translations.

Nevertheless, as far as phonemic translation is concerned, there are still issues to discuss.[49] Is it a mere coincidence that the two characters of '*luoji* 邏輯' won out over other possible phonemic loans? Zhang phonemically translated 'inductive logic' as '*yinda luoji* 阴达邏輯' and 'deductive logic' as '*tida luoji* 题达邏輯,' for example, which did not win out over the semi-semantic loans of '*guina luoji* 归纳邏輯' and '*yanyi luoji* 演绎邏輯.' In our view, there are good reasons why '*luoji* 邏輯' caught on.

In the case of the earlier phonemic translations of 'logic,' as listed by Kurtz,[50] they had been offered by missionaries, who, as non-native speakers of Chinese, were only able to randomly assign Chinese characters on the basis of their

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張音譯，斷非遇名詞而輒如此譯之，特謂音譯之利，確有可言者在耳。" Zhang, "*Lun Yiming*," 302.

45   Hu Yilu, "*Lun Yiming* 〈論譯名〉" (On Translating Terms), in *Guoyuxue Caochuang*《國語學草創》 (*The Script of Chinese Language*) (Shanghai: The Commercial Chubanshe, 1933).

46   Zhang Shizhao, "*Yiming* 〈譯名〉" (Translating Terms) (*Jiayin Zazhi*, 1914), in *Zhang Shizhao Quanji*, Vol. III, 67–69.

47   "若如胡君言，分以別之，若者借用，若者翻譯，前者以音，後者以義，此中界說，究亦難明。" Ibid., 67.

48   "蓋借用云者，可以施之於音，亦可施之於義，取其音以入吾文曰借用，取其義以入吾文，亦胡不可曰借用？信如斯也，借用其音者曰音譯，借用其義者曰義譯，譯之云者，果非不可兼賅音義也。" Ibid.

49   In his account of Zhang's arguments in *The Discovery of Chinese Logic* (269–73), Kurtz stops short at just the point, on our view, at which the linguistic-philosophical issues get interesting.

50   Ibid., 263–264.

pronunciation. It might be thought that the characters chosen do not matter nearly as much as in semantic translation, which does require the characters to convey certain meanings. Unlike alphabetic languages, however, all Chinese characters convey some meaning through their structure, even when used as phonemic loans. Chinese characters, in other words, have figure as well as meaning and pronunciation. Compared to alphabetic languages, where figure reveals pronunciation directly, Chinese characters belong to "a logographic system with each grapheme (or character) simultaneously encoding sounds and meaning at the level of the syllable," as Sun puts it.[51] If we choose a character for its pronunciation, then meaning comes together with figure: it is a package deal, for there is an internal relation between its figure and its meaning. Any Chinese character embodies some meaning: we cannot see a character without its figure conveying meaning through its graph.

It should be clear, then, why choosing the right characters for phonemic translations matters. For example, '*laoxia* 老黠' suggests something old and crafty, '*luorijia* 落日加' a setting sun, '*luoji* 落機' a crashing plane, and even '*luoji* 落及' still suggests something falling. Although they all sound like 'logic,' they cannot discard their associated meanings. It is not possible to see them as similar to '*sisizhixue* 思思之學,' meaning the study of thought about thought.[52] We already associate something in looking at a character, regardless of its pronunciation (which might vary, in any case, between different linguistic groups). Chinese language is known for the wealth of its homophones, thousands of characters pronounced by less than 500 syllables (with their tones). It is the characters' figures that distinguish homophones. That is why Chinese characters are more of a visual than an aural symbol. We cannot tell individual characters apart unless we see them, as is wonderfully shown by Zhao Yuanren's famous stories, "*Ji ji ji ji ji* 〈季姬擊雞記〉" and "*Shi shi shi shi shi* 〈施氏食獅史〉," which each use only one set of homophones in their telling.[53] Facing the wealth of homophones, carefully choosing characters is thus crucial to phonemic translation.

2.4   *The Phonemic Translation of 'Logic'*

The case of translating 'logic' provides an excellent illustration of the issues involved in phonemic translation, demonstrating how it can at least be partly reconciled with semantic translation. A good phonemic translation is more than just transcription. Although Zhang Shizhao never commented on the suitability of the two characters in '*luoji* 邏輯,' which he simply took over from Yan Fu,[54] we can nevertheless see him as exercising good (implicit) judgement in promoting this particular phonemic translation. Yan was often criticized, including by Zhang, for showing off his literary knowledge, but while this might be objectionable in the case of semantic translation, it can be a merit in phonemic translation. As a classical scholar, Yan had an excellent sense of the Chinese language, as illustrated by his translation of 'fallacy' mentioned above. It may be no accident, then, that he came up with the two characters in '*luoji* 邏輯,' even if these were only used to refer to the *word* 'logic.' And Zhang, in turn, had enough literary knowledge – and respect for Yan – to recognize the suitability of these characters for a phonemic translation.

So what makes '*luoji* 邏輯' a good phonemic translation? The character '邏' in ancient Chinese consists of the walking radical '*chuo* 辶' and the phonetic component '*luo* 羅,' and originally meant walking with a net to catch birds. Its later meanings, as a verb, include 'patrol,' 'inspect,' and 'watch.' The character '*ji* 輯' in ancient Chinese

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51   Chaofen Sun, *Chinese: A Linguistics Introduction* (Cambridge: Cambridge University Press, 2006), 101–102.

52   Zhang, *Luoji Zhiyao*, 303. Note that the first '*si* 思' is used as a noun, the second as a verb.

53   Zhao Yuanren, *Yuyan Wenti*《语言问题》(*The Issues of Language*) (Beijing: Shangwu Chubanshe, 2003).

54   Zhang, "*Lun Yiming*," 303.

consists of the semantic component '*che* 車' and the phonetic component '*qi* 咠,' and originally meant 'cart' and then, by extension, 'harmonious' (as when a cart is on track). Its later meanings, as a verb, include 'gather up,' 'collect,' 'edit,' 'compile,' and 'repair' (which might all be seen as ways of making something harmonious).[55]

All these later meanings have appropriate connotations for 'logic,' the practice of which might be described (partly metaphorically) as patrolling our reasoning, inspecting our arguments, watching for fallacies, gathering up logical forms, collecting good and bad examples, editing formalizations, compiling axioms and rules, repairing inferences, and so on. We might even see the image of a cart harmoniously on track as reflecting the normative status of logic, which shows us the right way to think and reason. This is not offering a semantic definition of 'logic,' but it does make the chosen phonemes more palatable and memorable to the Chinese reader and hints at the range of meanings that 'logic' has.

It is not just that '*luo* 邏' and '*ji* 輯,' individually, are suitable characters; they also combine well together. This particular combination was *created* by Yan Fu: these two existing characters had never been connected before in representing a single concept. Combining them, then, highlighted the fact that a *new concept* was being introduced into Chinese thinking. Simply adopting an existing combination of characters already in use would have been highly misleading as to the meaning of 'logic.' But the appropriateness of selecting '*luo* 邏' and '*ji* 輯' does not simply consist in their jointly indicating a good range of the meanings of 'logic;' the whole is more than the sum of the two parts. What we have is not mere juxtaposition but an *integration* of two characters, blending their meanings into a satisfying whole – collecting and editing them into something harmonious, as we might say (logically speaking!).

Our talk of 'blending' here is deliberate, since we can make use of conceptual blending theory in elaborating on this.[56] Each Chinese character can be seen as having its own linguistic space, configured by its various meanings, associations, and implications, but the two characters in this case share a generic space, configured by similar or connected features, which facilitates their integration. Their linguistic spaces form the input spaces for the resultant blended space of the combined characters, a blended space that inherits and builds on the features of the generic space. But the linguistic space that results is never a matter of simply adding all the features of the input spaces: some features are carried over, some are dropped, and some are transformed, with further features introduced or emerging, in making the resultant linguistic space as coherent and satisfying as possible (for the relevant purposes).

Like the vast majority of Chinese characters, both '*luo* 邏' and '*ji* 輯' are semantic-phonetic compounds,[57] '*chuo* 辶' and '*che* 車' being the semantic components and '*luo* 羅' and '*qi* 咠' the phonetic components, respectively. The semantic components both suggest movement (walking and travelling in a cart), and the original meanings of the characters also involve the ideas of a net to catch birds and of a cart to carry things, so the relevant generic space could be seen as configured around the core idea of moving and collecting things. Combining the two characters brings into focus what they have in common, semantically, which then provides the basis for the other

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55   The Committee of the Big Dictionary of Chinese, eds., *Hanyu Dacidian*《汉语大字典》(*The Big Dictionary Of Chinese*) (Chengdu: Sichuancishu Chubanshe, 1988).

56   For the classic statement of this, see Gilles Fauconnier and Mark Turner, *The Way We Think: Conceptual Blending and the Mind's Hidden Complexities* (New York: Basic Books, 2002). We replace their talk of 'mental spaces' by 'linguistic spaces' here. To our knowledge, conceptual blending theory has not yet been applied to elucidating the process of combining Chinese characters and hence creating new concepts, but it certainly has potential.

57   This is the usual English translation, at least in philosophical discussions, of '*xingshengzi* 形聲字,' but 'semantic' should be understood in the wider sense of 'significational.'

associations, of editing, repairing, and so on. The association of harmoniousness is an added bonus: not only does it suggest normativity but it also enhances the sense of integration of the combination itself. The phonetic components capture the sound of 'logic,' as pronounced in English, as well as can be done in Chinese, allowing for flexibility in tone and precise pronunciation (e.g., *qi* rather than *ji*), which varies in any case across time and speakers.

A good case can be made out, then, for why the combination of '*luo* 邏' and '*ji* 輯' yields a satisfying translation of 'logic,' even though it might initially seem 'merely' a phonemic translation, taken as semantically neutral. Our suggested case may be too speculative and unconvincing for some, but our main point withstands disagreement about details. '*Luoji* 邏輯' is a more appropriate translation than many other possible phonemic renderings, such as '*luoji* 落機,' with its meaning of a crashing plane (though some critics of formal logic might like this connotation). Whether something like the rationale we have offered went through Yan's mind as he invented '*luoji* 邏輯' or Zhang's mind as he adopted and recommended it is not a decisive issue, either. The associations of the characters and the internal relations between them are there in their use in the long and rich history of the Chinese language, and some of these, at least, will surely have been unconsciously picked up by Yan and Zhang – and recognized, however implicitly, by many of those who accepted '*luoji* 邏輯' as the translation of 'logic.'

2.5   *Accepting the Translation of 'Logic'*

What are the implications of our account of the translation of 'logic' into Chinese for our understanding of translation itself? Yan Fu's three principles of translation were mentioned in §1.3: the principles of *xin* 信 (faithfulness), *da* 達 (communicability), and *ya* 雅 (elegance). Yan clearly saw semantic translation as in accord with the principles of faithfulness and communicability, yet Zhang Shizhao succeeded in turning this against Yan in arguing that no semantic translation, at least in the case of 'logic,' could be faithful to or communicate all its uses. Yan's own translations, while 'elegant' in their literary allusions, were sometimes too literary (such as in translating 'syllogism' by '*lianzhu* 連珠' or 'linked verse,' literally 'stringed pearls'), thus conflicting not only with the principle of faithfulness but also with the principle of communicability, understood as the ability to convey the relevant meaning in the most comprehensible way to the target audience. Yet Yan's literary knowledge was well employed in coming up with '*luoji* 邏輯,' even though he himself only used this to refer to the *word* 'logic.' Zhang recognized its potential for being the ideal place-holder to gradually accrue all the meanings of 'logic.' It was an elegant solution to the problem of communicability, appreciating that conveying the meaning of 'logic' could only occur over time, as more and more texts discussing 'logic' were translated.

Zhang became aware of many of the meanings of 'logic' from the course on logic that he took at Aberdeen, and Davidson's book on the logic of definition provided ammunition in his attack on Yan's translations. Davidson sketched how the meaning of 'philosophy' had changed over time, and while – perhaps surprisingly – he did not do the same in discussing definitions of 'logic,' Zhang saw the analogy and hence the dangers of offering any semantic translation of 'logic.' It is unclear whether either Yan or Zhang knew that the Greek term '*logos*' derived from the verb '*legein*,' which originally meant 'collect,' but there is cross-cultural poetic justice in their choice of '*ji* 輯,' one of whose meanings is also 'collect,' in forming '*luoji* 邏輯.'

Zhang's recognition of the dangers of semantic translation was prescient. For as logic developed in the first half of the twentieth century, logic in the broadly Aristotelian–Millian tradition was replaced, within academic philosophy at any rate, by the new quantificational logic of Frege and Russell. None of the existing semantic translations of 'logic' could have faithfully captured this new logic. It is not surprising, then, that the lectures on 'Mathematical Logic' that Russell gave in Beijing in

1921 were called *Shuli Luoji*《數理邏輯》,[58] using Zhang's phonemic rendering of 'logic.' By the time we get to Jin Yuelin (金岳霖, 1895–1984), whose book on Russell's logic appeared in 1935 under the title '*luoji* 邏輯,' the use of '*luoji* 邏輯' ('逻辑' in later simplified Chinese) in translating 'logic' was becoming firmly established. Jin recognizes that logic can be characterized in various ways, remarking that "we do not know for sure what logic is, since it cannot be defined accurately."[59] All this would have supported the use of '*luoji* 邏輯' in translating 'logic.' When Zhang's own *Luoji Zhiyao*《邏輯指要》(*Companion to Logic*) was published in 1943, his translation of 'logic' was no longer disputed.

3   Conclusion

As we hope we have shown, the translation of 'logic' into Chinese has a 'logic' itself that is worth spelling out and understanding. In *The Discovery of Chinese Logic*, Kurtz collected together many of the translations of logical terms that had been made from the time of the Jesuit mission in China, and we have focused on the one that finally won out in the competition for survival in the central case of 'logic' itself. It did so because it steered clear of offering a semantic definition of 'logic,' and Zhang Shizhao was quite right in arguing against any semantic translation. But it would be wrong to think that the phonemic rendering he took over from Yan Fu was semantically neutral. On the contrary, in combining the two existing characters that he did, Yan invented a new composite word that reflected a good range of the associations of 'logic' that it had accumulated in the long history of its use. It was thus well placed to act as the place-holder for the other meanings that 'logic' soon came to accrue.

The logic of translation is not nearly as well understood as the logic of inference – or even the logic of definition on which William Davidson wrote, which itself inspired Zhang Shizhao to argue for the translation of 'logic' that eventually caught on. And the logic of translation between Chinese and European languages, in particular, is even less well understood. We have only talked about the translation of one term, fundamental as it nevertheless is in philosophy, and it is a special case in many ways. But just as Zhang Shizhao did over a century ago in the Chinese intellectual community, we hope we have helped open up the issues to the English-speaking community today. Translation into Chinese is certainly much more challenging, creative, and philosophically interesting than most European language-speakers appreciate.

Acknowledgements

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58   For an account and back translation (into English from their original Chinese translation) of these lectures, see Lianghua Zhou and Bernard Linsky, "Russell's Two Lectures in China on Mathematical Logic," *Russell: the Journal of Bertrand Russell Studies* 38, no. 1 (2018): 52–68.

59   Jin Yuelin, *Jin Yuelin Quanji*《金岳霖全集》(*The Complete Works of Jin Yuelin*), vol. 6 (Beijing: *Renmin Chubanshe*, 2013 [1935]), 476.