The Complete Compilation of New Knowledge, Xinxue beizuan 新學備纂 (1902): Its Classification Scheme and its Sources

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Research into late Qing encyclopaedias has not, until recently, been the focus of much academic attention. On the one hand this is related to the fact that systematic research on the spread of Western knowledge in China only began during the 1990s, but there is a second problem—that of definition. Zou Zhenhuan 鄒振環, for example, one of the few researchers to deal with that topic, adopts a rather narrow definition of encyclopaedia and proposes that although knowledge about Western encyclopaedias had existed in China since at least the 1870s, the first modern-style encyclopaedia to be published in China was the *Compiled and Translated Encyclopaedia for General Education*, Bian yi putong jiaoyu baike quanshu 編譯普通教育百科全書, published by the Literary Academic Society, Huiwen xueshe 會文學社 in Shanghai in 1903.[1] By contrast, Zhong Shaohua's 鐘少華 book on modern encyclopaedias in China and Japan at the end of the nineteenth and the beginning of the twentieth century adopts a rather broad definition of "encyclopaedias" in China and lists a considerable number of works which actually constitute anthologies or digests of translated books of Western knowledge.[2] We probably would not have this problem of definition had Xu Shou 徐壽 (1818–1884), one of the most prolific translators of Western scientific and technical literature into Chinese in the nineteenth century, succeeded with his plan—devised already in the 1870s—to translate the complete *Encyclopaedia Britannica* into Chinese. Although Xu Shou, John Fryer (1839–1928) and other translators actually translated a number of articles from the *Encyclopaedia Britannica*,

[1] Zou Zhenhuan 鄒振環, "Jindai zuizao baike quanshu de bianyi yu Qingmo wenxian zhong de Dideluo" 近代最早百科全的編譯與清末文獻中的狄德羅 [The compilation and translation of the first modern encyclopaedia and Diderot in late Qing writing], *Fudan xuebao* (*Shehui kexue ban*) 3 (1998): 47–52.

[2] Zhong Shaohua 鐘少華, *Renlei zhishi de xin gongju*: *Zhong-Ri jindai baike quanshu* 人類知識的新工具:中日近代百科全书 [A new tool of human knowledge: A study of early modern encyclopaedias in China and Japan] (Beijing: Beijing tushuguan, 1996).

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which in China were published as monographs, the grandiose plan could not be put into practice, one reason being that in Fryer's view the eighth edition (1852–1860) of the *Encyclopaedia Britannica* was outdated and that the proposed translation should be based rather on a more up-to-date work.[3]

I shall adopt a rather broad definition of encyclopaedia here, which also includes works that have been termed "encyclopaedic" (in Chinese *baike quanshu xing* 百科全書性).[4] Such a definition also covers material which was not specifically written for a particular encyclopaedia, such as compilations of clippings from other sources, a quite common practice at the time. While the bibliographical situation has greatly improved in recent years, hitherto seldom used material such as Zhou Zhenhe's 周振鶴 recently published catalogues of late Qing book-sellers suggest that the amount of encyclopaedic material from the period in question might have been even larger than assumed.[5] Given this situation, it seems sensible to provide some thoughts on the genre before examining one of the publications which I consider representative of the "encyclopaedic material" defined above—the *Complete Compilation of New Knowledge*, Xinxue beizuan 新學備纂.[6] Since the identity of the compiler behind the pen name as well as the publisher are unknown, I will deal directly with the questions of classification, sources and contents of the book.

In the middle of the nineteenth century, translated "Western knowledge" started arriving in China mainly in the form of monographs that treated sometimes highly technical matters. As I have shown elsewhere, this mode of translation led to a very fragmented reception of Western knowledge.[7] Only from the 1880s onward were attempts made to present new knowledge in a more systematic and comprehensive manner, because it had become increasingly difficult for Chinese readers to find relevant information and keep track of the latest developments. They took the form of 'anthologies' or 'digests', the first one being the *Great Collection of Western*

[3] See Wang Yangzong 王揚宗, "Jiangnan zhizaoju fanyiguan shilüe" 江南制造局翻譯館史略 [A brief history of the translation department of the Jiangnan Arsenal], *Zhongguo keji shiliao* 9, no. 3 (1988): 68. An example of such a translation is the entry "International Law" by Edmund Robertson (Encyclopædia Britannica 9th edition, 1881). The translation is Luobocun 羅柏村 [= Robertson], *Gongfa zonglun* 公法總論, trans. Fulanya 傅蘭雅 [= John Fryer] and Wang Zhensheng 汪振聲 (China, 1895).

[4] The Chinese term is used by Zhang Yaqun 張亞群, see his *Keju gaifei yu jindai Zhongguo gaodeng jiaoyu de zhuanxing* 科舉改廢與近代中國高等教育的轉型 [The reform and abolition of the imperial examination and the transformation of higher education in modern China] (Wuhan: Huazhong shifan daxue, 2005), 102. See also the Introduction and the discussion in the article by Rudolf Wagner in this volume.

[5] Zhou Zhenhe 周振鶴, ed., *Wan Qing yingye shumu* 晚清營業書目 [Late Qing book business catalogues] (Shanghai: Shanghai shudian, 2005).

[6] Jianzhai zhuren 漸齋主人, comp., *Xinxue beizuan* (Tianjin: Kaiwen shuju 開文書局, 1902).

[7] Iwo Amelung, "Naming Physics. The Strife to Delineate a Field of Modern Science in Late Imperial China," in *Mapping Meanings*: *Translating Western Knowledge into Late Imperial China*, eds. Michael Lackner and Natascha Vittinghoff (Leiden: Brill, 2004), 381–422.

Learning, Xixue dacheng 西學大成. First published in 1888, it was successful enough to see a reprint in 1895.[8] Some of them, however, such as Joseph Edkins' (1823–1905) *Primer on Science Studies*, Gezhi qimeng 格致啟蒙, which was sponsored by the Imperial Customs and published in 1886 in 16 volumes, were largely unsuccessful.[9]

The fact that such works could be successful is of course related to the growing importance of Western or "new" knowledge, especially after the Sino-Japanese War of 1894–1895; to the changes in the education system; and to the establishment of more institutions of higher learning offering topics based on or related to Western learning. Of special interest, however, are the changes in the official examination system. The reform of the examination system during the late Qing is too complex to be described here in detail.[10] It started already during the Tongzhi 同治 era (1862–1874), but significant changes only began in 1888 with the introduction of the so-called "mathematical division," *suanxue ke* 算學科. This addition to the regular examination system consisted of Western knowledge and, contrary to the name of this division, not only mathematics but also the sciences, international law, manufacturing, etc.[11] This addition also changed the proportions of the subject matter that was to be examined: The so-called "policy questions," *cewen* 策問, in which this part of knowledge was examined, steadily gained in importance up until 1905. Other parts of the examination system likewise became more "westernised", and already in 1889 Wang Kangnian 汪康年 (1860–1911), for example, reported that his examination had required Western knowledge.[12] More important, however, was the proposal to introduce a "special examination" on statecraft, *jingji teke* 經濟特科, which was first submitted in 1897 and formally announced at the beginning of 1898. This statecraft examination was to cover the six areas of domestic politics, foreign relations, finance, military sciences and manufacturing. A far-reaching decision of the Guangxu 光緒 emperor (1875–1908) during the Hundred Days' Reform of 1898 was to completely abolish the eight-legged-essay, *bagu wen* 八股文, and to

[8] Wang Xiqing 王西清 and Lu Tiqing 盧梯青, comps., *Xixue dacheng* 西學大成 [Great collection of Western learning] (Shanghai: Datong shuju, 1888; repr. Shanghai: Zuiliutang shufang, 1895).

[9] Ai Yuese 艾約瑟 [= Joseph Edkins], *Gezhi qimeng* 格致啟蒙 [Primer on science studies] (Shanghai: Imperial Customs, 1886). That this series was not very successful was at least partly due to the rather idiosyncratic translations provided by Edkins, see Iwo Amelung, "Some Notes on Translations of the *Physics Primer* and Physical Terminology in Late Imperial China," *Wakumon* 7(2004): 11–34. However, even this work saw at least two reprints.

[10] See Wolfgang Franke, *The Reform and Abolition of the Traditional Chinese Examination System* (Cambridge, MA: Harvard University Press, 1960) and Benjamin Elman, *A Cultural History of Civil Examinations in Late Imperial China* (Berkeley: University of California Press, 2000).

[11] Yang Qifu 楊齊福, "Yangwu yundong shiqi keju zhidu de gaige" 洋務運動時期科舉制度的改革 [Reforms of the examination system during the era of the Yangwu movement], *Wuxi jiaoyu xueyuan xuebao* 20, no. 1 (2000): 42–46.

[12] He actually "used the concept of 'attraction,' *xili* 吸力, in order to elucidate the character *xi* 系 (to be related to) and explained the newest astronomic insights," cf. Luo Zhitian 羅志田 "Qing ji keju zhi gaige de shehui yingxiang," 清季科舉制改革的社會影響 [Reforms of the examination system during the Qing and their societal impact], *Zhongguo shehui kexue* 4 (1998): 186.

make the afore-mentioned "policy questions" the main focus on all levels of the examination system. While this decision was rescinded after the failure of the reform, it was essentially re-instated with the beginning of the "Reform of Governance," Xinzheng 新政, in 1901. From then on, the second round of the examinations consisted of five policy questions on "governance and technical learning in the different countries," (各國政治藝學策).[13] At the same time, the "special examination" on statecraft was put into effect. These reformed examinations were only employed for the provincial and the metropolitan examinations during the years 1902–1904 (and in 1902 not in all provinces) because the examination system was abolished for good in 1905. Even though these reforms were soon superseded by more decisive steps, their impact should not be underestimated. The contents of the examinations now differed greatly from the traditional examinations for which prospective officials had prepared by attending traditional Chinese academies and making use of the extensive literature especially compiled for the purpose. Some of the questions in the new examination system became quite specialised, as the following examples demonstrate:

> Which man of the West was the first to pay attention to mechanics? Is it possible to prove that the method to determine the centre of weight has points in common [with that underlying] Chinese books and instruments? Mechanics is divided into two subjects, namely statics and dynamics. Please try to describe the instruments used [for them] and the forces that are driving [them] in order to make clear their guiding principles![14]
>
> 西人講求重學始於何人 中心之法有與中國之書與器相合者能證其說否 重學分徑靜重動重兩科 試歷究所用之器所推之力以引伸其旨策
>
> The West employs the method of statistics. Using a single table, they compile all aspects of government measures that have been introduced. Now Japan has also established a statistical bureau. Is it appropriate to copy it or not?[15]
>
> 泰西以統計之法 編次為表一切施政之方 近日本亦設統計院 是否便於仿行策
>
> At the beginning of the reforms in Japan, foreigners were hired and the strength of the country increased daily. Egypt has hired more than one thousand foreigners and in consequence lost its financial autonomy. The country therefore does not thrive. Try to describe in detail the benefits and pitfalls of [these policies]![16]
>
> 日本變法之初聘用西人而國以日強 埃及用外國人至千餘員 遂失財政裁判之權 而國以不振 試詳言其得失利弊策
>
> How many of the sixty-four chemical elements have an effect on agriculture and how can this effect be described? Agricultural chemistry in many aspects corresponds to

[13] Research on the policy questions in the reformed examination system is scarce. See, however, Liu Longxin 劉龍心, "Cong keju dao xuetang—lun wan Qing de zhishi zhuanxing" 從科舉到學堂—論晚清的知識轉型 [From the examination system to the new schools—on intellectual change during the late Qing], *Zhongyang yanjiuyuan jindaishi yanjiusuo jikan* 58 (2007): 105–139.

[14] Unless otherwise indicated, all translations are mine. *Guangxi xiangshi timinglu* 廣西鄉試題名錄 [Ranking records of the Guangxi Provincial examination] (China: 1903), 10a.

[15] Gu Tinglong 顧廷龍, ed., *Qingdai zhujuan jicheng* 清代硃卷集成 [Collection of examination essays] (Taibei: Chengwen, 1992), 331:119

[16] Gu Tinglong, ed., *Qingdai zhujuan jicheng*, 90: 187.

> [agricultural practices described in] the *Rites of the Zhou*. Consult clear-cut Chinese and Western research in the natural sciences and chemistry in order to support experiments![17]
>
> 化學家六十四原質關於農學者凡幾其效用若何農務化學多合周禮試參酌中西研求理化晰言者以資實驗策

There is ample evidence of the deep impact that the reform of the examination system had on society. After hearing rumours in Hunan at the beginning of 1898 about a possible reform of the examination system, Pi Xirui 皮錫瑞 (1850–1904), to give one example, wrote: "Once [people] hereabouts will hear about a document announcing a reform of the examination system, the prices for Western books will inevitably explode" (此間聞變科舉之文, 西學書價必大漲). Pi Xirui, who at that time had already passed the provincial examinations, immediately consulted Liang Qichao's 梁啟超 (1873–1928) *Bibliography of Western Learning*, Xixue shumu biao 西學書目表, in order to determine which Western books were most important so as to purchase and read them.[18] Booksellers quickly noticed how much more difficult it now became to sell traditional Chinese literature and tried to make up for their losses on this side by offering an ever larger supply of books with Western contents, a practice lampooned in Li Boyuan's 李伯元 (1867–1906) novel *A Short History of Civilisation*, Wenming xiaoshi 文明小史.[19] For publishers and printers, the reform also constituted a highly welcome business opportunity. It is quite clear that many of the publications which we would consider as "encyclopaedic" came as a direct response to the reform of the examination system. The regulations of the reformed examination system allowed candidates to take books into the examination compound, a fact that certainly gave an extra boost to the publication of new-style encyclopaedic material.[20] The direct link of these works with the examination system is at times already evident from their titles. These quite often refer to "policy questions," *cewen* 策問, "policy essays", *celun* 策論, and "learning [relevant for] policy questions," *cexue* 策學. *Jingji* 經濟 in a book title is normally a reference to the statecraft examinations, and the term "tasks of the time," *shiwu* 時務, also seems to be a reference to policy questions because, during the Tang dynasty, "policy questions" were known as *shiwu ce* 時務策.

Quite a few of these "encyclopaedias" explicitly refer to the changes in the examination system as one of the reasons for their compilation. One good example is the preface to the *Grand Prospectus of Policy Questions Regarding Chinese and Foreign Matters*, Zhong wai cewen daguan 中外策問大觀:

> In the autumn of the year 1902 [the Emperor] decreed to examine scholars with policy questions related to Chinese and Western historical events and governance. This had the purpose of

[17] *Henan xiangshi weimo* 河南鄉試闈墨 [Examination essays of the Henan Provincial examination] (1903), 63a.

[18] Luo Zhitian, "Qing ji keju zhi gaige de shehui yingxiang," 186–7.

[19] Li Boyuan 李伯元, *Wenming xiaoshi* 文明小史 [A short history of civilisation], in *Li Boyuan quanji* 李伯元全集, edited by Xue Zhengxing 薛正興 (Nanjing: Jiangsu guji, 1997), 1:236–263.

[20] Rui Magone, "Locomotive Literati: Center and Periphery in Imperial China's Last Civil Examinations (1903, 1904)." Unpublished paper presented at Emory University, 2007, 8.

removing all obstacles, shake [the Empire] out of its pedantic and rotten state, and stimulate the Empire to become [a place] where men with insight into the present and broad knowledge of the past, a wide grasp of things Chinese and penetrating understanding of things foreign will thrive! This is nowadays a key link for changing weakness into strength. As a general rule, because our divine country has since antiquity made closing its borders and keeping to itself its guiding principle, very few scholars and officials are familiar with the politics and religious affairs beyond the borders of the country, while those who do hold forth on foreign affairs commit errors and mistakes that present more of an obstacle than a thick layer of fog.

Over the last thirty years, worldwide communications as well as direct and indirect knowledge have been growing daily, and our scholars likewise consider that a good acquaintanceship with the countries in all four directions should be a matter of course, and that not knowing about foreign affairs is a disgrace. However, only extraordinary persons with a determined mind have started to busy themselves with these affairs and they barely make up one or two percent, while the teachers in the village schools and the narrow-minded students continue to tackle the eight-legged essay and the eight rhymes, as before. If someone mentions current politics and foreign affairs they turn away and are not willing to listen, but once an educational reform is pushed through, they are flabbergasted and disoriented and when they buy books on current affairs from the bookshops they are not [able] to choose between good or bad and right or wrong. From morning to evening they ponder them in the hope for inspiration. Coveting the profits lying in this, the booksellers copy and extract from everything and bind this [information] into books and sell these widely in order to make profit—to the point that the rafters are bending under the weight of these volumes, all of which just makes the knowledgeable sick![21]

清之壬寅秋下詔, 以中外史事政治策論試士; 所以抉破錮蔽, 振起迂腐, 歐天下以成通今博古、閎中、達外之才盛哉!今日轉弱為強之一大關鍵也。夫吾神州從古以閉關自守為宗旨, 學士大夫鮮通域外政教, 即有好談外事者, 所謬誤猶不啻隔如重霧障。三十多年來, 環球交通聞見日廣, 士亦以周知四國為然, 不通曉外事為恥矣。然惟豪傑有志者始從事於此, 百不得一二, 而裡塾蒙師、繩瓮溝瞀之子猶攻八股、八韻, 語以時政外事掉首不願聞, 一旦功令驟政則駭愕無措雜。購坊行時務等不擇優劣真偽, 朝夕揣摩以期一得。書賈覬所隱益, 東抄西撮, 剌取成篇, 廣售牟利, 幾於汗牛充棟, 識者病焉。

Such a preface had of course an advertising function; nevertheless, its description of how the market was flooded by the publications that ensued from the changes in the examination system during the first years of the twentieth century certainly hits the mark. Even if these encyclopaedic materials provided "enlightenment" this was nonetheless driven by business concerns.[22] The encyclopaedias created a veritable boom in China's fledgling publishing business, even before the really big market opened up for textbooks for the new education system. The foreign-educated scientist Ren Hongjun 任鴻寯 (1886–1961), acknowledged in 1919 the importance that encyclopaedic material like the *Great Collection of Western Learning* and the *Comprehensive Examination of Current Affairs*, Shiwu tongkao 時務通考[23] had for many scholars while preparing for the examinations. Ren, however, also pointed out that reading scientific texts without using test-tubes

[21] Lu Runyang 陸潤庠, "Xu" 序 [Preface], in *Zhong wai cewen daguan*, comps. Lei Jin 雷縉 and Lu Runyang 陸潤庠 (Shanghai [?]: Yangengshan zhuang, 1903), 1b–2a.

[22] For the European situation in the eighteenth century see Robert Darnton, *The Business of Enlightenment. A Publishing History of the* Encyclopédie *1775–1800* (Cambridge, MA, London: Harvard University Press, 1979).

[23] Qilu zhuren 杞盧主人, comp., *Shiwu tongkao* (Shanghai: Dianshizhai, 1897).

or engaging in laboratory practice did not produce the scientists that a pressurised China so urgently needed at that time.[24]

While the encyclopaedias dealt with in this paper certainly constitute a genre unprecedented in Chinese history, they are not entirely unrelated to other genres—especially the statecraft writings. The later collections of the statecraft school also catered to the needs of examination candidates and partly were published by publishers who also engaged in the encyclopaedia business. There clearly was a mutual influence. The *Comprehensive Collection of Statecraft Essays from Our August Dynasty*, Huangchao jingshi wen tongbian 皇朝經世文統編 (1901), for example, alludes in its preface to the special statecraft examination, which had originally been proposed in 1897 but only imperially ordered in 1901 (and carried out in 1903), and it actually was classified on the basis of the different subjects of the examination.[25] The title originally intended for the *Statecraft Essays from Our August Dynasty, Fifth Collection*, Huangchao jingshi wenbian wu ji 皇朝經世文編五集, published in 1902, was *Classified Collection of Writings on Current Affairs*, Shiwu fenlei wenbian 時務分類文編, (this title is printed on the margin of the single pages).[26] Such a title was typical for the "encyclopaedias" on which I am focusing in this paper. Some of the statecraft collections actually made use of the same material as the collections of "new learning." A more systematic assessment of Qing encyclopaedias would need to take this rather complex problem into account.

Classification

Modern research on eighteenth and nineteenth century Western encyclopaedias has shown that although most of them were ordered alphabetically rather than topically, they nonetheless contributed greatly to the classification of the sciences and the emergence of scientific disciplines. Thus to a certain extent encyclopaedic classification can be and has been considered an important step in the evolution of modern scientific disciplines as taught at the universities.[27] By comparison, the topic of classification and the evolution of a modern system of academic disciplines in late Imperial China have received much less attention.[28] Indeed, most research on this

[24] Ren Hongjun 任鴻雋, "He wei kexuejia?" 何為科學家 [What is a scientist?], *Xin Qingnian* 6, no. 3 (1919): 179–186.

[25] Shao Zhitang 邵之棠, comp., *Huangchao jingshi wen tongbian* (Shanghai: Baoshanzhai, 1901).

[26] Qiushizhai 求是齋, comp., *Huangchao jingshi wenbian wu ji* (Shanghai: Yiyin shi, 1902).

[27] Richard Yeo, "Reading Encyclopaedias. Science and the Organization of Knowledge in British Dictionaries of Arts and Sciences, 1730–1850", *Isis* 82 (1991): 24–49, and Riki G. A. Dolby, "Classification of the Sciences: The Nineteenth Century Tradition," in *Classifications in their Social Context*, eds. Roy F. Ellen and David Reason (London/New York: Academic Press, 1979), 167–193.

[28] One important exception, however, is Zuo Yuhe 左玉河, *Cong sibu zhi xue dao qike zhi xue—xueshu fenke yu jindai Zhongguo zhishi xitong de chuangjian* 從四部之學到七科之學—學術分可與近代中國知識系統的創建 [From the 'knowledge' of the Four Treasuries to the 'learning of the seven departments'—Academic classification and the creation of a modern Chinese knowledge system] (Shanghai: Shanghai shudian, 2004).

topic is focused on the way Western knowledge was first inserted into the traditional Chinese system of classification and on the reversal of this process during the Republican era, when traditional Chinese knowledge needed to be accommodated by a system of classification that was now Western-dominated.[29] In actual fact, however, even at the end of the nineteenth century the situation was very complex and the whole issue of classification was of great importance for the reception of Western knowledge. Liang Qichao's famous statement that "the classification of Western books is most difficult" certainly was valid not only for Liang Qichao,[30] but for most Chinese scholars dealing with Western knowledge in one way or another. Classification was important for epistemological reasons, but above all because the classification system presented the readers with the sole means to locate the information they needed. Only toward the very end of the Qing dynasty were formal keys—such as stroke numbers for characters—introduced as aides for locating entries. Most "encyclopaedias" thus have rather elaborate classified tables of contents—at times extending over several volumes—listing the topics contained within a given class. If we look into classification schemes of such encyclopaedias and compare them with the two most influential bibliographies of works on new knowledge from that time, namely the ones by Liang Qichao and Xu Weize 徐維則 (active between 1882 and 1903), no clear picture of classification emerges.[31]

[29] See for example Luo Zhitian, "Xifang xueshu fenlei yu minchu guoxue de xueke dingwei" 西方學術分類與民初國學的學科定位 [The Western academic classification and the establishment of the discipline of 'national studies' during the early Republican Era], *Sichuan daxue xuebao* (*zhexue shehui kexue ban*) 5 (2001): 75–82, and Luo Zhitian, "Guoxue bu shi xue: Xifang xueshu fenlei yu minchu guoxue dingwei de kunhuo" 國學不是學: 西方學術分類與民初國學定位的困惑 ['National Learning' is not learning. Western academic classification and doubts about establishing 'national studies' at the beginning of the Republican era], *Shehui kexue yanjiu* 1 (2002): 117–121.

[30] Liang Qichao, "Xixue shumu biao xuli" 西學書目表序例 [Preface and reading instructions to the Bibliography of Western Knowledge], *Shiwubao*, Guangxu 22, 11th day of 9th month (1896), 3a–6b.

[31] Liang Qichao, *Xixue shumu biao* 西學書目表 [*Bibliography of Western Learning*], Shanghai: Shenshijizhai, 1896; Xu Weize, "Dong Xi xue shulu," in *Jindai yishu mu* 近代譯書目, ed. Wang Tao, Gu Xieguang *et al*. (Beijing: Beijing tushuguan, 2003), 1–24. I have used the following encyclopaedic works: Wang Xiqing 王西清 and Lu Tiqing 盧梯青, eds., *Xixue dacheng* 西學大成 [Great collection of Western learning] (Shanghai: Datong shuju, 1888); Sun Jia'nai 孫家鼐 comp., *Xu xixue dacheng* 續西學大成 [Great collection of Western learning. Sequel] (Shanghai: Feihongge shulin, 1897); Qian Feng 錢豐, comp., *Wanguo fenlei shiwu dacheng* 萬國分類時務大成 [A comprehensive summary of current affairs by category and for all nations] (Shanghai: Shenjiang Xiuhai shanfang, 1897); Gu Qiyi 顧其義 and Wu Wenzao 吳文藻, comp., *Xifa cexue huiyuan* 西法策學匯源 [Digest of Western methods useful for policy questions] (Shanghai: Hongbao shuju, 1897); Li Timotai 李提摩太 [= Timothy Richard], *Fenlei jingji shiwu celun* 分類經濟時務策論 [Classified compendium of policy questions on statecraft and current affairs] (Shanghai: Jieji shuju, 1901); Li Timotai 李提摩太 [= Timothy Richard], ed., *Guangxue leibian* 廣學類編 [parallel title: *Handy Cyclopedia*] (1901; repr. Shanghai: Guangxuehui, 1903); Zhu Dawen 朱大文 and Ling Gengyang 凌賡颺, eds., *Wanguo zhengzhi yixue quanshu* 萬國政治藝學全書 [A compendium of the governance and technical learning of all nations] (Shanghai: Hongwen shuju, 1902); Dianshizhai zhuren 點石齋主人, *Shiwu tongkao xubian* 時務通攷續編

Actually there were almost as many systems of classification as books, and none of the works employed a classification system close to the system of the seven disciplines, *qi ke* 七科, that was to dominate during the early Republican era. One striking feature of all the classification schemes, however, is the lack of a layer of super-classes, i.e. there is no concept of natural sciences, social sciences, humanities etc. Even the distinction between "learning" and politics/organization first introduced by Liang Qichao (who, however, simultaneously stressed the close relationship between the two) is rarely found in the works under scrutiny here. Even one level below such super-classes, we fail to find any consistent use of a concept such as "physics." As I have pointed out elsewhere, this was due to the fragmented nature of the reception of new knowledge from the middle of the nineteenth century onward,[32] but it also reflects the focus on "applied knowledge," which was an important feature of most of the classification schemes in late nineteenth and early twentieth century encyclopaedias.

Most of the classification schemes do not offer a systematic place for what today would be called "humanities." "History," *shixue* 史學, of course, is a subject contained in almost all of the classifications analysed here, and naturally was of great importance for both practical and political reasons. The term *wenxue* 文學 that shows up in some works does not refer to "literature" in the modern sense but in most cases to different styles of composing texts, including official documents, etc. The importance of "philosophy" as a category of "new learning" was only recognized by very few of these early encyclopaedias. Xu Weize in his bibliography grouped it under the heading *lixue* 理學 (learning of principle), others, if they chose to treat it at all, put it in a category denoting "sciences in general," for which several Chinese terms were used. The same holds true for logic, a field with which Liang Qichao was still completely at a loss. As a consequence, he put it (alongside with cooking books) into his famous category of "books which cannot be categorized," *wu ke gui lei* 無可歸類.[33]

The categories, furthermore, employed in Chinese classification systems around the turn of the twentieth century were not necessarily one-to-one equivalents of the corresponding Western terms. Mechanics, for example, which in Chinese

[Sequel to the *Comprehensive examination of current affairs*] (Shanghai: Dianshizhai, 1901); Yang Yuhui 楊毓煇, *Gezhi zhiping tongyi* 格致治平通議 [General discussion of the sciences and good rulership] (Shanghai: 1902); Chen Changshen 陳昌紳, ed., *Fenlei shiwu tongzuan* 分類時務通纂 [Comprehensive classified compilation on contemporary affairs] (Shanghai: Wenlan shuju,1902), and *Zhong xi jingji celun tongkao* 中西經濟策論通考 [Complete assessment of Chinese and Western knowledge relevant to statecraft and policy questions] (Shanghai: Shenliu dushutang, 1902). A table giving the results has been included in Ameilong 阿梅龍 [= Iwo Amelung], "Wan Qing baike quanshu *Xinxue beizuan* jiqi yu keju zhidu de guanxi" 晚清百科全書、《新學備纂》及其與科舉制度的關係 [Late Qing encyclopaedias, the *Complete Compilation of New Knowledge* and its relationship with the examination system], in *Jindai Zhongguo de baike cishu* 近代中國的百科辭書, eds. Chen Pingyuan 陳平原 and Miliena 米列娜 [= Milena Doleželová-Velingerová,] (Beijing: Peking University Press, 2007), 112–134.

[32] Iwo Amelung, "Naming Physics."

[33] Cf. Joachim Kurtz, *The Discovery of Chinese Logic* (Leiden: Brill, 2011), 5.

classifications is most often referred to as *zhongxue* 重學, literally "the study of weight," placed far more emphasis on "application" than it did in the West. Newton's laws of motion thus were much less prominent than they would have been in any textbook—or encyclopaedia for that matter—in the West.[34] Another interesting example is *tuxue* 圖學, literally "the study/learning of maps/charts/diagrams/illustrations." Contrary to the expectation that this would primarily refer to the compilation of maps, and that its systematic place would thus have been as a sub-category of earth studies,[35] the contents covered by *tuxue* in most publications—including the *Complete Compilation of New Knowledge*—is much broader and extends to the whole range of possibilities the term *tu* has to offer, i.e. charts, maps—including techniques of surveying—paintings, and even photography. Although exotic for the Western observer, such a treatment makes sense, since probably for a Chinese scholar or official not too familiar with Western knowledge and desperate for a quick reference on say "photography," the natural choice would be to look for it under the category of *tu*.

The *Complete Compilation of New Knowledge* differs from other works, but not in any spectacular way. Some subjects that are addressed in other collections, such as politics/organization, law and foreign relations/international law, are lacking altogether, while some practical information on the countries of the world can be found in other categories, such as information on units of weights and measures in the section on mathematics, information on agricultural and other products from the various countries of the world in "economics/science of commerce," etc. A striking innovation in the *Complete Compilation* is the inclusion of a category for "micro-organisms," *weishengwu* 微生物. This topic was not particularly prominent in China prior to the beginning of the twentieth century, although John Fryer's article "On the struggle between man and bacteria," which was published in the *Chinese Scientific Magazine*, Gezhi huibian 格致彙編,[36] did inspire Zhang Binglin 章炳麟 (1868–1936) to write his "On bacteria," Jun shuo 菌說.[37] Most of the material used for this category, however, was based on translations from the Japanese. Another category of the *Complete Compilation*, inspired by Japanese terminology is "gymnastics" or "callisthenics," *ticaoxue* 體操學. This soon was to become very

[34] On the reception of mechanical knowledge in late Imperial China, see Iwo Amelung, "Weights and Forces: The Introduction of Western Mechanics into Late Qing China," in *New Terms for New Ideas. Western Knowledge and Lexical Change in Late Imperial China*, eds. Michael Lackner, Iwo Amelung and Joachim Kurtz (Leiden: Brill, 2001), 197–234.

[35] On the modernization of cartographic practice during the very late Qing, see Iwo Amelung, "New Maps for the Modernizing State. Western Cartographic Knowledge and its Application in 19th and 20th Century China," in *Graphics and Text in the Production of Technical Knowledge in China*, *The Warp and the Weft*, eds. Francesca Bray, Vera Lichtman and Georges Metailié (Leiden: Brill, 2007), 685–726.

[36] Fulanya 傅蘭雅 [= John Fryer], "Ren yu weishengwu zhengzhan lun" 人與微生物爭戰論 [On the struggle between man and bacteria], *Gezhi huibian* 格致彙編 7, no. 1 (Fall 1892): 30a–37b.

[37] Zhang Taiyan 章太炎, "Jun shuo," in *Zhang Taiyan zhenglun xuanji* 章太炎政論選集, ed. Tang Zhijun 湯志鈞 (Beijing: Zhonghua, 1977), 1: 128–144.

prominent as part of the new system of primary education, but hardly played an important role in China prior to 1904/1905. It was closely related to the military, and information about it was mainly based on Chinese translations of Japanese sources. Even more unusual is the inclusion of the category psychology, *xinlingxue* 心靈學, which does not show up in other encyclopaedias of the time and whose contents were mainly based on the first Chinese translation of a book on psychology done by Yan Yongjing 顏永京 (1839–1898) and published in 1889.[38] Finally, it should be stressed that agriculture played an important role and actually was divided into agriculture in a stricter sense, *nongxue* 農學, and "animal husbandry," *muxue* 牧學. Such a classification is also rarely seen in other encyclopaedias.

Sources and Contents

None of the early Chinese "encyclopaedias" consists chiefly of original entries by one or several authors. They were compiled in a copy-and-paste technique from different sources.[39] While some of these encyclopaedias make ample use of the literary genre closest to the new-style policy essays of the examination system, namely the examination questions of the prize essay contest at the Shanghai Polytechnic Institution, others are almost completely based on translations of Western knowledge. The main problem for the researcher is that very few of these books make their sources explicit. One exception is the *Complete Compilation*, which as a rule gives the title of the work on which a piece of information included in the book was based—the information normally being a verbatim quotation from the work in question.

In order to assess the resources on which the work drew, I have attempted to identify every source and counted the frequency with which it was used. The result of this somewhat mechanical undertaking was surprising insofar as the book quotes from well over 300 different sources. As the preface to the book explains, the compilers had mainly consulted works translated earlier into Chinese, but they also used a number of foreign language, i.e. Japanese, English and possibly French sources, which according to the preface amount to 10–20 %. While I was unable to identify every single source used in the *Complete Compilation*, it is clear that their distribution over the various chapters is rather uneven. The chapter on mathematics draws on over 60 different sources, and for the chapter on agriculture we can identify more than 50; by contrast, the chapter on gymnastics makes use of just six separate sources, while zoology only draws on three. Not all of the sources were monographs; in many cases short treatises and articles were used—mostly from the *Chinese Scientific Magazine*. It should be noted in passing that the *Complete*

[38] Cf. Haiwen 海文 [= Joseph Haven], *Xinlingxue* 心靈學 [Mental philosophy], trans. Yan Yongjing 顏永京 (Shanghai: Yizhi shuhui, 1889).

[39] For a study of this issue, see the contributions of Natascha Gentz and Rudolf G. Wagner in this volume.

Compilation actually contains knowledge extracted from Western encyclopaedias such as the *Encyclopaedia Britannica*, *Chambers's Information for the People*, etc. because some of the sources used in the book are translated from these encyclopaedias.

The wide-ranging contents of the book and the differences between the individual chapters make it difficult to provide unified characterizations of their contents and sources. One can state, however, that the *Complete Compilation* relies heavily on the set of rather early translations of Western works that remained influential throughout the second half of the nineteenth century. This set includes works such as *On the Heavens*, Tan tian 談天 (1859), *An Elementary Treatise on Mechanics* translated as Zhongxue 重學 (1859, 1866 and 1867), *Wells's Principles and Applications of Chemistry* translated as Huaxue jianyuan 化學鑑原 (1871), the *Introduction to the Sciences*, Gewu rumen 格物入門, compiled by W.A.P. Martin (1827–1916) in 1868, the *Manual on Mineralogy*, Jinshi shibie 金石識別 (1871), and others. Most of these books had been published by government-sponsored institutions such as the College of Foreign Languages, Tongwen guan 同文館, in Beijing and, most importantly, the Jiangnan Arsenal, Jiangnan zhizaoju 江南制造局, in Shanghai, and they had seen several reprints over the following decades.

The preface of the *Complete Compilation* explicitly states that "80–90 %" of the work makes use of these earlier translations, while also adding "10–20 % of newly translated material [is] from Japanese and Western sources." There are two subject areas, however, for which the *Complete Compilation* also employs "pure" Chinese sources, or, as the preface by the compiler describes it, "publications by well-read scholars of our country," 我國通人著述.[40] Apparently the compiler was of the opinion that the two areas of mathematics and astronomy offered the possibility of a certain degree of "hybridity" since both areas have a long Chinese history. On closer examination, however, it becomes quite clear that even here the role played by Chinese tradition was minimal. Equally limited is the direct influence of the much earlier Jesuit translations. Except for the translation of Euclid's *Elements*, Jihe yuanben 幾何原本, which originally was done by Xu Guangqi 徐光啟 (1562–1631) and Matteo Ricci (1552–1610) but only first completed by Li Shanlan 李善蘭 (1811–1882) and Alexander Wylie (1815–1887) during the 1850s, there are almost no references to Jesuit translations.[41] The *Complete Compilation*, however, does use a number of works by important Chinese mathematicians of the eighteenth and early nineteenth century. While not directly linked to translations from the West, they made use of insights first offered in Jesuit translations.[42] References to the Chinese scientific tradition are otherwise exceedingly rare. The single reference

[40] Jianzhai zhuren 漸齋主人, "Xu" 序 [Preface], in Jianzhai zhuren, comp., *Xinxue beizuan*, 1b–2a.

[41] Peter M. Engelfriet, *Euclid in China. The Genesis of the First Translation of Euclid's Elements Books I–VI* (*Jihe yuanben*; *Beijing*, *1607*) *and its Reception up to 1723*, 138. (Leiden: Brill, 1998).

[42] Except for the books written by Mei Wending 梅文鼎 (1633–1721), these include works by Luo Shilin 羅士琳 (1784–1853) and Xia Luanxiang 夏鸞翔 (1822–1864), Zou Boqi 鄒伯奇 (1819–1869), and others; on the problem in general see Tian Miao田淼, *Zhongguo shuxue de*

to the supposedly Chinese origins of Western mechanics seems accidental and not part of any systematic attempt to push the theory of the "Chinese origins of Western science."

How was the new knowledge presented? The sheer volume and diversity of the material makes a definite answer difficult, but sampling the section on mechanics shows that the compilers of the encyclopaedia had a good grasp of the field as it had been introduced to China at this time. They had identified the most important translations and duly relied for the most part on *An Elementary Treatise on Mechanics* translated by Edkins and Li Shanlan. It is unclear whether they realized that the material on mechanics they quoted from Gu Guanguang's 顧觀光 (1799–1862) *External Notes on the Nine Numbers*, Jiushu wailu 九數外錄, was in turn based entirely on this translation. Be that as it may, on the whole the treatment of mechanics is convincing and concise. The treatment of the laws of motion for example, which again is digested from Edkins' and Li's translation, is clearer and more concise than the source. It is interesting that the compilers did not refer to the sections dealing with mechanics in general works on physics, such as the translation of Ganot's popular *Cours de physique purement expérimentale*, Xingxing xueyao 形性學要, published in 1899. The reason is probably that they did not realize that the book contained an important treatment of mechanics.

As already noted, the section on agriculture quotes from more sources than most other sections. While agriculture did play a very important role in traditional Chinese writing, it was not very high on the list of Chinese priorities in the middle of the nineteenth century when Western knowledge was first introduced. The number of titles translated up to 1897 was limited by any standard, and Xiong Yuezhi has pointed out that the few relevant works translated by the Jiangnan Arsenal failed to exert any influence on agricultural developments of the time.[43] It thus is no accident that the *Great Collection of Western Learning*, which was published in 1888, does not contain a section on agriculture. Given this, it is remarkable that the *Complete Compilation* (1902) has such an extensive section on agriculture. One reason for this is that questions of agriculture had become important in the reformed examination system.[44] The other apparent reason was that since 1896, the maverick Luo Zhenyu 羅振玉 (1866–1940) had begun to engage in numerous translation activities relating to works on agriculture, mostly from the Japanese. The *Agricultural Science Review*, Nongxue bao 農學報, and the *Collectanea of Works on Agricultural Science*, Nongxue congshu 農學叢書, included translations by eminent and influential men such as Fan Bingqing 樊炳清 (1876–1931), Wang Guowei 王國維 (1877–1927) and Luo Zhenyu himself. They constituted the main sources for the *Complete Compilation* on questions of

xihua licheng 中國數學的西化歷程 [The Westernisation of mathematics in China] (Jinan: Shandong jiaoyu, 2005).

[43] Cf. Xiong Yuezhi 熊月之, *Xixue dongjian yu wan Qing shehui* 西學東漸與晚清社 [Dissemination of Western knowledge and the late Qing society] (Shanghai: Shanghai renmin, 1994), 516.

[44] In the provincial and metropolitan examinations between 1902 and 1904 there were at least ten policy questions relating to new agricultural methods.

agriculture, which in this way contributed to the development of scientific agriculture in China. Despite its importance, this topic has remained virtually un-researched to this day.[45]

One problem of the *Complete Compilation* was the question of the terminology to be employed. Since the work quoted from a great number of different sources, confusion in technical terms was unavoidable. It must have constituted a challenge for the readers of the collection and was in all likelihood a real problem to understand. Instances are too numerous to be treated here in detail; "mechanics" for example, was mostly referred to as *zhongxue* 重學 ("science of weights"), but quite often also as *lixue* 力學 (literally "science of forces"); chemical affinity at times was called *huaheli* 化合力 and at other times *aili* 愛力. Much terminological confusion also prevails with regard to chemical elements, compounds, etc.

The widespread terminological confusion which is shared by the encyclopaedic works can be viewed as indicative of the compilers' lack of 'real' understanding of the scientific issues at stake. A more extensive use of translations from the Japanese in the *Complete Compilation*, it should be noted, would have resulted in even greater confusion because of the great difference between the terminology used in the available Chinese translations and the new Japanese works. Once translations from the Japanese and their terminology had begun to dominate textbooks, as happened around 1904, the *Complete Compilation* must have quickly lost its usefulness.

Another factor detracting from the value of the *Complete Compilation* as well as many other encyclopaedias of the time is their complete lack of illustrations. This is especially striking when comparing the *Complete Compilation* with its sources, which abound in illustrations. It is ironic that this work, which has a special section on maps, charts and illustrations, eschews the use of these very useful devices. Most likely time pressures and cost factors prompted the compiler to forego illustrations, even though the reformed examination system for the first time allowed illustrations to be used in the policy essays. We may wonder how a reader more or less ignorant of the topic was to understand the phenomenon of refraction or the law of reflection without the help of an illustration. The same is true for geometrical problems, and also for many objects. Prisms, for example, were something new in China, and it is easy to imagine that somebody trying for the first time to acquaint himself with optics might not be able to visualize the object—a triangular prism—referred to in the book as "three-edged mirror," *sanlengjing* 三棱鏡. Somebody who wanted to know how to determine the position of a ship on the high seas and has been introduced to astronomical methods through the *Complete Compilation* must have been at a complete loss to understand what the text was saying without illustrations. This observation finds an echo in Ren Hongjun's early reproach that Western science as introduced at the end of the nineteenth and the beginning of the twentieth

[45] The only systematic research on this question has been conducted by Lü Shunchang, whose research results are published in several works; cf. for example Lü Shunchang 呂順長, *Qingmo Zhejiang yu Riben* 清末浙江與日本 [Late Qing Zhejiang and Japan] (Shanghai: Shanghai guji, 2001), 184–204.

century in China was mainly 'textual science'—meaning the assumption that 'useful knowledge' could be successfully transmitted by almost exclusive reliance on the written word.[46]

By Way of Conclusion

In this brief paper I have suggested that there is a close relationship between the emergence of the genre of writings, which I here have called "encyclopaedias," and the late Qing reforms of the examination system. Future research on encyclopaedias should take this relationship seriously and look more systematically at the examination papers of the times and particularly deal with the question of to what extent not only policy essays, but all examination questions were based on knowledge introduced by means of encyclopaedias.

A look at the classifications, the sources and the contents of these encyclopaedias does show the beginnings of a new era in some domains—as for instance the inclusion of subjects such as "gymnastics" or "micro-organisms" in the *Complete Compilation*, or its strong emphasis on a science-based agriculture. On the whole, however, the knowledge was recent rather than "brand new." In fact my analysis of the *Complete Compilation*, which probably would hold true for other encyclopaedias as well, shows that in a certain sense these encyclopaedic endeavours were the culmination and simultaneously the end-point of a phase in the introduction of new knowledge that had started in the early 1850s. It was only in the *Complete Compilation* and similar encyclopaedias that this new knowledge finally enjoyed the importance that it should have deserved much earlier. Just that in this moment, the seasoned "new knowledge" presented here was displaced in many fields by an even newer knowledge that reached China mainly from Japan, made use of entirely new classificatory and terminological resources, and extended to areas hardly touched by the preceding efforts.

This preliminary analysis of the *Complete Compilation* has focused on the "bookish" aspects of the reception of Western sciences during the late nineteenth and early twentieth centuries. Such an approach is justified by the sheer amount of material like the *Complete Compilation* and its complete neglect by research up to now.

Zhou Zhenhe's observation that many Chinese scholars and officials during the late Qing hoped that "wealth and power would emerge from books" is certainly justified.[47] To a certain extent, the abolition of the examination system in 1905 reacted to a much lampooned "bookishness" among Chinese scholars, and it probably was due to the abolition of this examination system that works like the *Complete Compilation* lost their importance for a greater reading public. During the tumultuous years between 1897 and 1905, however, they certainly played a prominent role.

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[46] Ren Hongjun, "He wei kexuejia?".

[47] Zhou Zhenhe 周振鶴, "Shu zhong zi you fuqiang shu?" 書中自有富強術 [Can wealth and power really be found in books?], *Dushu* 12 (1992): 49–54.

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