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YAN FU AND THE TASKS OF THE TRANSLATOR

INTRODUCTION¹

For Yan Fu 嚴復 (1853–1921)², the ideas of Western philosophy and sociology, and above all the evolutionary theories of the Social-Darwinists, held a deep fascination. The eight major works he translated were, in many cases, steeped in the language of natural science, and the metaphors which their authors used were often taken directly from the fields of biology, chemistry and physics. In the course of his translations Yan Fu had therefore to deal with many dozens of scientific terms. Some already had translations; others he was the first to render in Chinese. The manner in which Yan Fu approached this aspect of the task of translation is of interest for several reasons. He was by far the most influential translator of his generation, admired as much for his Chinese prose style as for his skill as the greatest contemporary interpreter of Western thought. He stands at the watershed between the translations of the missionaries and the early modern government schools and arsenals—carried out between 1840 and 1895—and the wave of scientific translations from Japanese sources which dominated the period from 1900 to the May Fourth Movement of 1919. Finally, he himself played a direct though ambiguous role in the process of standardization of science terminology in China as Head of the State Terminology Bureau and other similar organizations in the dying years of the Qing regime.

1. YAN FU'S WORK AS A TRANSLATOR

Yan Fu first encountered Western science in the English-language section of the Fuzhou Shipyard School, where he studied arithmetic, geometry, algebra, analytical geometry, trigonometry, physics, mecha-

¹ I am grateful to Joachim Kurtz for his help with finding various sources on Yan Fu, and for his comments on previous drafts of this paper. I am of course responsible for any errors or omissions that remain.

² His *ming* was Zongguang 宗光. At different times in his life he was styled Yan Jidao 嚴幾道 and Yan Youling 嚴又陵.

tics, chemistry, geology and navigation.³ In 1877, he travelled to Britain, where he studied seamanship, first at Portsmouth, and then at the Royal Naval College in Greenwich.⁴

After returning to China in 1879 he taught at Fuzhou Shipyard School (*Chuanzheng xuetaang* 船政學堂) for a short time, before moving to the Beiyang Naval Academy (*Beiyang shuishu xuetaang* 北洋水師學堂) in Tianjin, where he eventually became Principal.⁵ In 1902, the National University (*Jingshi daxue* 京師大學) in Beijing set up the Bureau for the Compilation and Translation of Books (*Bianyi shuju* 編譯書局), where Yan Fu became Director, working there for 2 years.⁶ In 1908 or 1909 he was invited by the Board of Education (*Xuebu* 學部) to work as the Head of the Bureau for the Revision of Terminology (*Shending mingciguan zongzuan* 審定名詞館總纂) to make dictionaries and glossaries of terms. He worked there for three years⁷, but, although an “astonishing number of draft glossaries” were prepared, most were never completed.⁸ It is said by one biographer that he used the Bureau merely as a means of earning a living (*jie guan mi*

³ On Yan Fu's life, see He Lin 賀麟. 1925. “Yan Fu de fanyi” 嚴復的翻譯 (The translations of Yan Fu), *Dongfang zazhi* 22.20, pp. 75–87; Chen Baochen 陳寶琛. 1932. “Qing gu zizheng daifu haijun xie dutong Yan jun muzhiming” 清故資政大夫海軍協都統嚴君墓誌銘 (An epitaph on the tomb of Yan [Fu], former Advisory Councillor and Deputy Admiral), in: Min Erchang 閔爾昌 (ed.). *Beizhuan jibu* 碑傳集補 (A supplement to the collection of epitaphs). Beijing: Yanjing daxue, pp. 18b–20a; Wang Yunxi 王允皙. 1932. “Houguan Yan xiansheng xingzhuang” 侯官嚴先生行裝 (The actions of Mr. Yan [Fu] from Houguan), in: Min Erchang 1932, pp. 10b–12b; Wang Quchang 王遽常. 1936. *Yan Jidao nianpu* 嚴幾道年譜 (Annalistic biography of Yan Fu). Shanghai: Shangwu yinshuguan; Arthur W. Hummel (ed.). 1943. *Eminent Chinese of the Ch'ing Period*. 2 vols. Washington, D.C.: United States Government Printing Office, pp. 443–4; Wang Shi 王弼. 1957. *Yan Fu zhuan* 嚴復傳 (Biography of Yan Fu). Shanghai: Shanghai renmin chubanshe; Benjamin Schwartz. 1964. *In Search of Wealth and Power: Yen Fu and the West*. Cambridge, Mass.: Harvard University Press; Zhang Zhijian 張志建. 1995. *Yan Fu xueshu sixiang yanjiu* 嚴復學術思想研究 (Researches on the academic thought of Yan Fu). Beijing: Shangwu yinshuguan.

⁴ There is little trace of Yan Fu's sojourn in Britain, but he is mentioned in Admiralty records held in the Public Record Office, Kew, under the name of Yen Tsung-kwang or Yen Tsung-Quang (that is, Yan Zongguang) (PRO ADM 12/1017 for 1878 and PRO ADM 12/1036 for 1879).

⁵ Schwartz 1964, p. 30.

⁶ Wang Shi 1957, p. 62; Schwartz 1964, p. 143.

⁷ Schwartz 1964, p. 213. Wang Quchang 1936, p. 79 gives 1908. Min Erchang 1932, Appendix, p. 9a, also implies 1908. See also Ma Zuyi 馬祖毅. 1984. *Zhongguo fanyi jianshi* 中國翻譯簡史 (An outline history of translation in China). Beijing: Zhongguo duiwai fanyi chubanshe, p. 330.

⁸ Wang Quchang 1936, p. 79.

shi 藉館覓食) and that he did not throw himself heart and soul into the work (*wei pao xin li* 未拋心力).⁹

His heart was indeed not in technical translation, but in the transmission of the political ideas which he had discovered in the West, and which he felt to be of urgent relevance to the future of China. In the late 1890s, spurred by the national disasters he saw unfolding around him, he began translating a number of key works of modern Western thought¹⁰, namely, in order of their year of publication:

- (1) *Evolution and Ethics* by Thomas H. Huxley as *Tianyanlun* 天演論 (On evolution), 1898¹¹;
- (2) *The Study of Sociology* by Herbert Spencer as *Qunxue yiyen* 群學肄言 (A study of sociology), 1902¹²;
- (3) *The Wealth of Nations* by Adam Smith as *Yuanfu* 原富 (On wealth), 1902¹³;
- (4) *On Liberty* by John Stuart Mill as *Qunji quanjie lun* 群己權界論 (On the boundary between the rights of society and rights of the individual), 1903¹⁴;
- (5) *A History of Politics* by Edward Jenks as *Shehui tongquan* 社會通詮 (A full account of society), 1904¹⁵;

⁹ Wang Quchang 1936, p. 79; Wang Shi 1957, p. 65.

¹⁰ The publication dates are taken from the re-editions in the series *Yan yi mingzhu congkan* 嚴譯名著叢看 (Anthology of famous translations by Yan [Fu]). 1981. 8 vols. Beijing: Shangwu yinshuguan, cross-checked with He Lin 1925, pp. 76–7. The translations were actually completed several years earlier in some cases, and Yan Fu's circle would already have been influenced by some of them during the late 1890s.

¹¹ Yan Fu (tr.). 1981a [1898]. *Tianyanlun* 天演論 (On evolution). Beijing: Shangwu yinshuguan (hereafter *TYL*). Orig. Thomas Henry Huxley. 1895. "Evolution and Ethics" and *Other Essays*. London: Macmillan (hereafter *EE*). Yan Fu began this translation in 1894/5 and completed it in 1896. Cf. Schwartz 1964, pp. 91 and 98–9. He Lin 1925, pp. 76–7 gives 1905 as the publication date.

¹² Yan Fu (tr.). 1981b [1902]. *Qunxue yiyen* 群學肄言 (A study of sociology). Beijing: Shangwu yinshuguan (hereafter *QXY*). Orig. Herbert Spencer. 1874. *The Study of Sociology*. 2nd edition. London: Henry S. King (hereafter *SS*).

¹³ Yan Fu (tr.). 1981c [1902]. *Yuanfu* 原富 (On wealth). Beijing: Shangwu yinshuguan (hereafter *YF*). Orig. Adam Smith. 1776 [1776]. *The Wealth of Nations. Books I–III*. London: Penguin Classics (hereafter *WN*). The translation was carried out 1897–1900. Cf. Schwartz 1964, p. 115.

¹⁴ Yan Fu (tr.). 1981d [1903]. *Qunji quanjie lun* 群己權界論 (On the boundary between the rights of society and rights of the individual). Beijing: Shangwu yinshuguan (hereafter *QJQL*). He Lin 1925, pp. 76–7 gives 1902, but the preface is dated 1903. Cf. Schwartz 1964, p. 142. Orig. John Stuart Mill. 1979 [1859]. *On Liberty*. London: Penguin Classics (hereafter *OL*).

¹⁵ Yan Fu (tr.). 1981e [1904]. *Shehui tongquan* 社會通詮 (A full account of society). Beijing: Shangwu yinshuguan (hereafter *SHTQ*). Orig. Edward Jenks. 1900. *A History of Politics*. London: Dent (hereafter *AHOP*, not seen).

(6) *System of Logic* by John Stuart Mill as *Mule mingxue* 穆勒名學 (Mill's *Logic*), 1905;¹⁶

(7) *The Spirit of the Laws* by Montesquieu as *Fayi* 法意 (The meaning of the laws), 1909;¹⁷

(8) *Primer of Logic* by William Stanley Jevons as *Mingxue qianshuo* 名學淺說 (An outline of logic), 1909.¹⁸

Several of these works proved popular and influential; unlike many of the science translations of the late Qing, we can be sure that Yan Fu's works were read by relatively large numbers of people, and so his methods, his terminology and its subsequent fate make a particularly interesting case-study.

2. THE THREE PROBLEMS OF TRANSLATION

In his prefaces and commentaries Yan Fu affords us insights into his translation techniques. His most famous account of the method he employed is in the preface to *Tiyananlun*, where he explained that the three problems in achieving an ideal translation are: faithfulness to the original text (*xin* 信); communication of the ideas (*da* 達), and literary elegance (*ya* 雅):

[Having] fused and gathered (*rong hui* 融會) the marvellous principles (*shenli* 神理) of the whole text in [my] mind, [I] lower [my] brush to write the words, and, if [the rendering] is a good one, it will suffice to cover the meaning (*zi shan hu bei* 自善互備)¹⁹. If the principles behind

¹⁶ Yan Fu (tr.). 1981f [1905]. *Mule mingxue* 穆勒名學 (Mill's *Logic*). Beijing: Shangwu yinshuguan (hereafter *MLMX*). Yan Fu began the translation in 1900; Schwartz 1964, p. 188 gives 1905 for its publication date. John Stuart Mill. 1879. *System of Logic, Ratiocinative and Inductive*. 10th edition. London: Longmans Green (hereafter *SL*).

¹⁷ Yan Fu (tr.). 1981g [1909]. *Fayi* 法意 (The meaning of the laws). Beijing: Shangwu yinshuguan (hereafter *FY*). Schwartz 1964, p. 149 gives 1909 as the publication date. The re-edition is entitled *Mengdesijiu Fayi* 孟德斯鳩法意 (Montesquieu's *The Meaning of the Laws*). Orig. Charles de Montesquieu. 1949 [1728]. *The Spirit of the Laws*. Translated by Thomas Nugent. New York: Hafner Press (hereafter *TSOTL*).

¹⁸ Yan Fu (tr.). 1981h [1909]. *Mingxue qianshuo* 名學淺說 (An outline of logic). Beijing: Shangwu yinshuguan (hereafter *MXQS*). Orig. William Stanley Jevons. 1889 [1870]. *Primer of Logic*. London: Macmillan (hereafter *POL*). The front page has the title *Logic*, but all subsequent pages have the heading *Primer of Logic*, and so I have used the latter title.

¹⁹ This somewhat obscure expression appears as *zi ran hu bei* 自然互備 in He Lin 1925, p. 79, meaning "naturally referring one to the other".

the terms in the source text are very profound and hard to explain, then the context is used to reveal the meaning.²⁰

Yan Fu's style was known to be difficult, but it was widely admired, and his literary skill probably encouraged his contemporaries to take his work more seriously than the worthy but often pedestrian prose of less gifted translators. He often manipulates the context—with or without warning the reader—to explain the meaning, sinicizing foreign references, interpolating commentaries, sometimes even rewriting whole sections. He makes this obvious at times, by signalling that the following paragraph is his own work, but often there is no indication that he has departed from his source.

3. ALTERATIONS TO THE SOURCE-TEXT

Minor changes and helpful interpolations were intended to make the text more comprehensible for Chinese readers. Whilst rendering "... there is a name for every person, and for every remarkable place" he inserted the examples of the famous beauty Xishi 西施, the sacred Taishan 泰山 and the Yellow River;²¹ for "truths which we know only by way of inference" he cited the existence of volcanoes in Antarctica and the frozen Arctic Ocean.²² In translating Mill's *System of Logic* he gave the Hanlin Academy 翰林院 as an example of a 'collective name',²³ whilst in a section on disjunctive syllogisms in Jevons' *Primer of Logic*, the famous Chinese statesmen Zhang Zhidong 張之洞 (1837–1909) and Yuan Shikai 袁世凱 (1859–1916) replaced the names of Benjamin Disraeli (1804–1881) and William Gladstone (1809–1898). In the same text, "the lamaist ruler of Tibet" replaces "present King of Siam" as an example of a 'general term'²⁴; exotic British delicacies such as beef and potatoes were substituted by the more familiar Chinese dishes of swallow's nest and shark's fin.²⁵ In a more subtle case, in dealing with the philosophical concept of 'quality', Yan Fu added 'hard' to the term 'white' in Jevons' text—*jianbai* 堅白 'hard and white' being a stock example of a pervasive quality in

²⁰ *TYL*, p. xi.

²¹ *MLMX*, p. 25; *SL*, p. 27.

²² *MLMX*, p. 5; *SL*, p. 5.

²³ *MLMX*, p. 26; *SL*, p. 28.

²⁴ *MXQS*, p. 9.

²⁵ *MXQS*, p. 80.

dialogues attributed to the ancient Chinese logician Gongsun Long 公孫龍 (c. 320 to c. 250 BC) and in the logic of the later Mohists.²⁶

Occasionally, the risk of offending his Chinese readers necessitated changes of substance to the original text. Whilst rendering Jevons' remarks relating to dark skin colour, he substituted the Japanese for the Chinese²⁷, and where it was stated that the Chinese had copied a table of logarithms from a Western source, Yan Fu simply omitted the slighting reference.²⁸

Occasionally, he may have altered the text because he genuinely did not understand the reference, for instance, Mill's reference to the phlogiston and oxygen theories of combustion was altered to "phlogiston and affinity" (*huojing aili* 火精愛力).

4. CONSISTENCY

Names of foreigners may appear in more than one version, the philosopher Etienne de Condillac (1715–1780) being rendered both as *Kangzhilun* 康智倫²⁹ and *Kangzhila* 康智臘³⁰ in *Mule mingxue*, and even key terms such as 'syllogism' are given different renderings in the same work³¹, suggesting that Yan Fu did not always record his previous choices of terms and transliterations. It is true that he was working alone, but in this respect his work contrasts strongly with the high consistency of the Chinese translators of the Jiangnan Arsenal, and suggest that he did not regard consistency as of great importance.

5. SCIENTIFIC TERMINOLOGY³²

Yan Fu took a cavalier attitude to the translation of scientific terms, choosing eclectically from the existing systems of terminology. In

²⁶ *MXQS*, pp. 21 and 46. See A. C. Graham. 1978. *Later Mohist Logic, Ethics and Science*. Hong Kong: The Chinese University of Hong Kong Press and London: School of Oriental and African Studies, London University, pp. 170–6 and 404–8.

²⁷ *MXQS*, p. 80, translating *POL*, p. 61.

²⁸ *POL*, p. 109.

²⁹ *MLMX*, p. 27.

³⁰ *MLMX*, p. 163.

³¹ Namely *lianzhu* 聯珠 (*MXQS*, p. 1) and *lianzhu* 連珠 (*MXQS*, p. 8).

³² See Maurice Crosland. 1978. *Historical Studies in the Language of Chemistry*. New York: Dover, for a classic account of the history of chemical language.

chemistry, for instance, he uses terms for the elements adopted by *Huaxue chujie* 化學初階 (First steps in chemistry, 1870)³³ (nickel³⁴, chlorine³⁵, hydrogen³⁶, nitrogen³⁷, silica³⁸, bicarbonate of soda³⁹); names of elements, acids and salts derived from *Gewu rumen* 格物入門 (Introduction to the sciences, 1868)⁴⁰ and *Huaxue zhinan* 化學指南 (A guide to chemistry, 1873)⁴¹ (arsenious acid⁴², sulphuric acid⁴³, nitric acid⁴⁴, muriatic acid⁴⁵, silicic acid⁴⁶, iron oxide⁴⁷); and terms from *Huaxue jianyuan* 化學鑑原 (Mirroring the origins of chemistry, 1871)⁴⁸ (chemical affinity⁴⁹, hydrated alumina⁵⁰, iron oxide⁵¹, magnesium⁵², iodine⁵³, bromine⁵⁴, silicic acid⁵⁵, silver nitrate⁵⁶). There is also at least one case in which he confuses the *Huaxue zhinan* character for calcium, *hui* 鈣 with the *Huaxue chujie* term for potassium, *hui* 鉀⁵⁷.

³³ John Glasgow Kerr (Jia Yuehan 嘉約翰) (tr.). 1870. *Huaxue chujie* 化學初階 (First steps in chemistry). Guangzhou: Boji yiju. Orig. David A. Wells. 1862. *Principles and Applications of Chemistry*. New York: Ivison, Phinney and Co.

³⁴ TYL, p. 72.

³⁵ MLMX, p. 130.

³⁶ MLMX, p. 130.

³⁷ MLMX, p. 200.

³⁸ MLMX, p. 130.

³⁹ MLMX, p. 413.

⁴⁰ W. A. P. Martin (Ding Weiliang 丁韞良). 1868. *Gewu rumen* 格物入門 (Introduction to the sciences). 7 vols. Beijing: Tongwenguan.

⁴¹ Anatole Billequin (Biligan 畢利樺) (tr.). 1873. *Huaxue zhinan* 化學指南 (A guide to chemistry). Beijing: Tongwenguan. Orig. Faustino Malaguti. 1858–1860. *Leçons élémentaires de chimie*. 2 vols. 2nd edition. Paris: Dezobry, E. Magdeleine.

⁴² MLMX, p. 349. The *Huaxue zhinan* character is slightly different.

⁴³ MLMX, p. 130.

⁴⁴ MLMX, p. 130.

⁴⁵ MLMX, p. 351.

⁴⁶ MLMX, p. 408.

⁴⁷ MLMX, p. 398.

⁴⁸ Xu Shou 徐壽 and John Fryer (trs.). 1871. *Huaxue jianyuan* 化學鑑原 (Mirroring the origins of chemistry). Shanghai: Jiangnan Arsenal. Orig. David A. Wells. 1862. *Principles and Applications of Chemistry*. New York: Ivison, Phinney and Co.

⁴⁹ QXYX, pp. 129, 151, 154; TYL, p. 8; MLMX, p. 350.

⁵⁰ MLMX, p. 408.

⁵¹ MLMX, p. 35.

⁵² MLMX, p. 366.

⁵³ MLMX, p. 366.

⁵⁴ MLMX, p. 366.

⁵⁵ MLMX, p. 408.

⁵⁶ MLMX, p. 351.

⁵⁷ MLMX, p. 191.

In view of his work as a standardizer it is strange to discover how eclectic and perhaps even disorganized Yan Fu was. Moreover, as had happened before with other would-be standardizers, he seems to have found many of the existing terms vulgar or abhorrent, and was tempted into making an already confusing situation even worse by creating ‘better’ terms himself⁵⁸, such as *li* 鋰 for lithium⁵⁹, *mu* 鉍 for bismuth⁶⁰ and *se* 鉍 for selenium⁶¹.

6. THE PROBLEM OF AMBIGUITY

That purity of the relationship between the Chinese language and the phenomenal world (which Confucius regarded as having existed in the early Zhou period) had already been lost, explains his concern with the rectification of names.⁶² Confucius cites the case of the *gu* 觚, originally a ‘cornered’ drinking vessel—indicated in the Chinese character by the component *jiao* 角 (horn)—which had come to be used for vessels without such corners.⁶³ The stability of names was for Confucius the basis of a stable morality and a stable society: ambiguity could lead to moral uncertainty and confusion.

Some ambiguity is a feature of all terms which have developed naturally out of a language, as each new term carries with it a resemblance to—a metaphor of—an earlier, often more concrete, meaning:

...When a name, by successive extensions, has come to be applied to things among which there does not exist this gross resemblance common to them all, still at every step in its progress we shall find such a resemblance.⁶⁴

Yan was keenly aware of the problems posed by ambiguity of terms, especially once they had been corrupted by careless and vulgar use:

As far as terms with fixed and unambiguous meanings (*ding yi wu qi zhi zi* 定義勿歧之字) are concerned, they are seldom encountered (*dai bu duo gou* 殆不多購) other than in newly-coined scientific and philo-

⁵⁸ Ma Zuyi 1984, p. 330.

⁵⁹ *MLMX*, p. 366.

⁶⁰ *MLMX*, p. 349.

⁶¹ *MLMX*, p. 367.

⁶² *Confucius: The Analects*. 1993. Translated by Raymond Dawson. Oxford, New York: Oxford University Press, 13.5–6.

⁶³ *Ibid.*, 6.23.

⁶⁴ *SL*, p. 175.

sophical terms. And often [even though] initially [the terms] have a single, pure meaning, after being bandied about with different meanings by uneducated people, their meanings become disparate and diffuse (*you qi wu gui* 遊騎無歸). The listeners all interpret these [different] meanings (*ge wei zhi jie* 各為之解), and so ambiguities grow steadily worse. [This is the case with] all the new terms such as ‘rights’ (*quanli* 權利), ‘duty’ (*yiwu* 義務), ‘judicature’ (*sifa* 司法), ‘freedom’ (*ziyou* 自由), and so on.⁶⁵

Yet, after long experience of translation, he commented in a section of *Mingxue qianshuo* devoted to derived meanings of colloquial words, that

... the majority of Chinese characters show many meanings, and moreover these meanings may be closely or distantly related to one another. Yet this is not an obstacle [to communication], and may even be of benefit. It is not an obstacle because, although the meanings are actually disparate one from another (*yi ben xiang kui* 義本相睽), their sounds are [all] borrowed from each other [that is, they are homophones]. Thus, when they are spoken, the listener knows [their meanings by the context] and not only is there no confusion, but the principle [of what is being said] assuredly suffers no harm. The beneficial aspect of ambiguity arises from this cause, that, because of it, there are not too many Chinese characters, which would make it very hard to learn them all.⁶⁶

Thus ambiguities may sometimes be a liability, but the ambiguity entails a richness which may be semantic as well as etymological. Ambiguities seem to make terms which have grown naturally—through extended metaphor—out of the language more likely to survive than crass neologisms. This has something in common with biological variation—too restricted a meaning makes a term more vulnerable to abandonment.⁶⁷ In his translation of Spencer’s *The Study of Sociology*, Yan Fu admits that *tian* 天, for all its layers of meaning, is actually a good match with the English term ‘nature’. His biographer, Benjamin Schwartz comments:

⁶⁵ *MXQS*, p. 18. Cf. Zhou Zhenfu 周振甫. 1964. *Yan Fu sixiang shuping* 嚴復思想述平 (An evaluation of the thought of Yan Fu). Taipei: Taiwan Zhonghua shuju, pp. 55–6.

⁶⁶ *MXQS*, p. 17.

⁶⁷ See David Wright. “Translated Terms as Meme Products”, forthcoming in: Fabrizio Pregadio and Wang Chunmei (eds). *Beyond the Four Seas. Science and Technology in China and the West, 1600–2000*, for a discussion of the evolution of terms.

[Yan Fu] seems justified in assuming that the word *t'ien* [*tian* 天] covers a range of ambiguity not far removed from that of the word 'nature'. With other terms the range of congruity of meaning may be somewhat smaller, but generally the area of overlap is considerable. Furthermore, the consistent use of the same term in highly diverse contexts tends to reduce the area of incongruity.⁶⁸

In discussing terms which only indicate a degree of a certain property, Yan Fu curiously cites the passage in *Mencius* where the sage asks whether the cowards who run away fifty paces from the heat of battle should not be mocked as much as those who run one hundred paces—suggesting that cowardice is an absolute quality. Yet the point he wishes to make is the opposite, namely that cowardice, like hotness or coldness, is actually a matter of degree, and is therefore incapable of absolutely clear definition.⁶⁹

7. NEOLOGISMS

Yan Fu prefers to use deliberately anachronistic terms such as *jingjiao* 景教⁷⁰ for 'Christianity', used in the Tang Dynasty for the Nestorian sect, to transliterations or vulgar neologisms. He was dismissive of terms in which Chinese names for foreign things were made by the careless combination of existing characters—*jie jiu hu xin* 借舊呼新 "borrowing the old to name the new"—to make a new term, such as *zimingzhong* 自鳴鐘 'self-chirping clock' for 'chiming clock', *huolunchuan* 火輪船 'fire wheel boat' for 'steam boat'—which has no 'fire wheel'—and *liushengji* 留聲機 'phonograph' does not actually 'leave sounds'.⁷¹ The string of words from which they are constructed denote no more than what Mill called "a confused huddle of objects, having nothing whatever in common; and [the term therefore] connotes nothing, not even a vague and general resemblance."⁷² A badly-constructed term results in the failing to resemble the object perceived (*fei suo jian zhi zhen tong hu* 非所見之真同乎), and hence sows confusion and disorder.

⁶⁸ Schwartz 1964, p. 96. See *QXY*, p. 298 for Yan Fu's own comments.

⁶⁹ *MXQS*, 12.23, *POL*, p. 20. See *Mencius*, 1970. Translated by D. C. Lau. London: Penguin Classics, p. 51.

⁷⁰ *MLMX*, p. 41.

⁷¹ *MLMX*, pp. 36 and 139; *SL*, 1.172.

⁷² *MLMX*, p. 141; *SL*, 1.173.

Yan Fu disliked the influx of Japanese terms such as *zhexue* 哲學 for ‘philosophy’, *jingji* 經濟 for ‘economy’⁷³ or *geming* 革命 for ‘revolution’, preferring, for instance, to translate ‘philosophy’ either by his own coinage *aizhixue* 愛智學 (study of the love of knowledge) or by the much older Neo-Confucian expression *lixue* 理學 (study of principle).⁷⁴ His own expressions for ‘chemistry’ (*zhixue* 質學, the study of substances)⁷⁵, ‘sociology’ (*qunxue* 群學, the study of the horde), ‘evolution’ (*tianyan* 天演, heavenly evolution) and ‘revolution’ (*zhuanlun* 轉輪, ‘turning wheel’) tended to be displaced rather rapidly by other authors’ Chinese terms or by graphic loans from Japanese.⁷⁶

It is striking that the most successful translator of his day was to use so many terms—both his own coinages and even those he chose from the existing lexicon—which were quickly eliminated in the ‘struggle for existence’ between rival terms which took place in the first decades of the twentieth century. It would seem therefore that Yan Fu’s use of neologisms had little influence on the terminology which followed, in contrast to the *ideas* in his translations, which were enormously influential.

8. THE RICHNESS AND DANGERS OF METAPHOR

Metaphor allows the growth or extension of meaning by analogy or presumed causal connection (*feng* 風 originally meant ‘wind’ but was extended to mean ‘mad’⁷⁷) or by presumed resemblance. This can be a natural and unexceptionable extension: for instance ‘stone’ *shi* 石, originally a rock found on a mountain side⁷⁸, became used for objects

⁷³ *MLMX*, p. 12, and Schwartz 1964, p. 95. It is unimportant for this argument whether or not in any given case such words were in fact so-called ‘return graphic loans’. Cf. Lydia H. Liu. 1995. *Translingual Practice. Literature, National Culture, and Translated Modernity—China, 1900–1937*. Stanford: Stanford University Press, p. 33.

⁷⁴ *MLMX*, p. 12.

⁷⁵ *MLMX*, p. 1.

⁷⁶ He seems, for instance, to have invented *daimeng* 珀瑤 for ‘diamond’, perhaps because the existing term *jin’gangshi* 金剛石 had too many Buddhist associations, yet no-one else seems to have followed him in its use. Another example is *bili* 比理 for ‘bread’, *QXYY*, p. 11.

⁷⁷ *MLMX*, p. 42. *Feng* is more usually written with the sickness radical as *feng* 瘋.

⁷⁸ This is a reference to the ancient form of the character *shi* 石, showing a boulder at the foot of a cliff. Cf. Xu Shen 許慎. 1977. *Shuowen jiezi* 說文解字 (Describing the pictograms and explaining the compound characters). Beijing: Zhonghua shuju, p. 194.

which have something in common with stone, such as the hard pips in fruit and the calculi in the bladder; and was applied, by extension, to objects sharing similar characteristics to stone, such as jade and lode-stone *cishi* 慈石.⁷⁹ Everyday language often creates false analogies, such as calling both ‘planets’ and ‘stars’ *xing* 星, or by confusing mercury oxide (*gongyang* 汞養) with vermilion (mercury sulphide *zhusha* 朱砂).⁸⁰ Yan Fu also pointed out that the graph may suggest something falls into a category which in fact it does not: *jing* 鯨 ‘whale’ is not really a fish at all, even though the Chinese character includes the fish 魚 radical.⁸¹ In *Mingxue qianshuo* he abandoned Jevons’ disquisition on the various meanings of ‘house’ in English, choosing instead to show that the Chinese term *qi* 氣 may legitimately be used for true gases such as nitrogen and hydrogen, but applying it to imponderable ‘fluids’ such as electricity was unwise.⁸²

A metaphor is rarely completely new: as Mill pointed out, it grows out of another existing metaphor by an evolutionary process. A completely sharp and unfuzzy relationship between terms is thus actually rather an unnatural one in real languages. We think through metaphors, and the richness or ambiguity of the metaphors is what often gives them their power, and their success in evolutionary terms comes from their ability to tap our feeling that the resemblance to which they allude is real. Once formed, a good metaphor will reproduce itself by spawning daughter metaphors formed on the same model. Yan Fu’s most successful translations are exercises in free-wheeling, periphrastic, fertile metaphor, drawn far more from Chinese than from Western sources.

9. CHINESE PARALLELS IN WESTERN THOUGHT

Yan Fu was interpreting Western thought for Chinese readers, but first he had to interpret it for himself, and in the process he found many elements of Chinese thought embedded in his Western sources. This was not the crude claim that “China got there first” (*gu yi you zhi*

⁷⁹ *MLMX*, p. 35.

⁸⁰ *MLMX*, p. 36. Presumably mercury oxide and mercury sulphide can be confused because of their red colour. Yan Fu calls the latter simply *sha* 砂 ‘gravel’, but he must mean *zhusha* 朱砂.

⁸¹ *MLMX*, p. 36.

⁸² *MXQS*, p. 19.

古已有之) but a genuine discovery—also made by many others who took the trouble to read works on ‘Western studies’—that the ideas of Western philosophers were sometimes strikingly consonant with views developed independently in China. It is, for instance, startling to find a diagram of the ‘Supreme Ultimate’ (*taijitu* 太極圖), showing the struggle of *yin* 陰 with *yang* 陽, amidst the Venn diagrams of a work on modern logic⁸³, but Yan Fu clearly found in Jevons’ discussion of the periodicity of tides, and the interplay of light and darkness, parallels with the teachings of the Song Neo-Confucians.

10. SCIENCE AS A SOURCE OF METAPHOR

By the time he was working on his great translations, Western science had become part of Yan Fu’s way of thinking, and it had become natural for him to resort to scientific metaphors to explain some of the complex ideas which he was handling.

For instance, in translating Chapter 6 of Book I of *Wealth of Nations* he explained the “component parts of the price of commodities” (rent, labour and profit) by likening it to the way the chemist analyzes a substance into its elements, an analogy which cannot be found in Adam Smith.⁸⁴ In *Qunxue yiyán* 群學肄言, a passage on the institutions of society is transformed into a description of biological evolution, complete with ‘struggle for survival’, ‘natural selection’ and ‘the absorption of atoms for nourishment’.⁸⁵

The most ingenious example of such ‘scientizing’ insertions is perhaps a discussion of opposing political parties in *On Liberty*, in which Mill describes the necessity of there being two complementary parties, one of “order or stability” and one of “progress or reform”. Yan Fu compares the parties to the gases nitrogen and oxygen in the air, the rather inert gas nitrogen being “conservative”, and the more reactive oxygen being “progressive”.⁸⁶ Yan Fu obviously found the parallel instructive, but it is open to doubt whether his readers found much enlightenment in comparing a parliament to a mixture of gases.

⁸³ *MXQS*, p. 87.

⁸⁴ *YF*, p. 44. See *MXQS*, p. 31 for another example of an interpolated chemical analogy.

⁸⁵ *QXYY*, p. 14; *SS*, p. 19.

⁸⁶ *QJQL*, p. 51; *OL*, p. 100. It may perhaps have been a facetious reference to ‘hot air’.

CONCLUSION

Yan Fu's knowledge of Western science and his practical experience of its applications was almost unparalleled in China at the time. He had undergone a rather thorough grounding in scientific theory in Fuzhou, but more importantly he had lived and worked in the West for several years, commanding ships and using the scientific techniques of a modern mariner. Western science became part of his way of thinking, and, like Xu Shou 徐壽 (1818–1884), the great science translator of an earlier generation, he explicitly rejected traditional Chinese medicine, and the notions of *yin-yang* 陰陽 and the *wuxing* 五行, the 'five phases' or 'elements'.⁸⁷

In respect of the criterion faithfulness (*xin* 信), Yan Fu falls far short of many other translators of the late Qing period. He seems to have regarded the source-text as only his starting point, and was not concerned that his ideas were different from or even contradictory to those of the original author. This stemmed from his belief that the ideas he was translating had parallels in the great storehouse of Chinese thought, stretching back over two millennia, and specifically from the *zhu* 諸子 or pre-Qin non-canonical writers. It is for this reason that in choosing and creating terms he deliberately used expressions which harked back to high antiquity.⁸⁸ He often rejected Japanese neologisms as being crass and vulgar, although his own alternatives rarely survived the competition of their Japanese rivals. In his later translations he seems to have tacitly conceded that many of his terms had not taken root in the Chinese lexicon.

His essays into terminology seem in fact to have been almost universally unsuccessful. Whereas Xu Shou's chemical terms survived several decades of intense competition to become the basis for the modern system of chemical nomenclature, Yan Fu's neologisms, with their deliberate pedantry and archaism, met with little enthusiasm from his contemporaries.

⁸⁷ *MXQS*, p. 110.6. See James Reardon-Anderson. 1991. *The Study of Change. Chemistry in China, 1840–1949*. Cambridge: Cambridge University Press, p. 29; and David Wright. 1995. "Xu Shou 徐壽 and Xu Jianyin 徐建寅: Careers in Western Science in Nineteenth-Century China", *The Journal of the Royal Asiatic Society* 5.1, pp. 49–90, for Xu Shou and his attitude to some aspects of traditional Chinese thought.

⁸⁸ For example, he preferred *ziyao* 自繇 to *ziyou* 自由 for 'liberty', as the latter was "not ancient" (*fei yi wei gu ye* 非以為古也).

In the communication of ideas (*da* 達) and the beauty of his style (*ya* 雅) he was an acknowledged master, even though his prose was regarded as difficult for those unfamiliar with the works of the pre-Qin writers. Of his profound influence on the generation following China's defeat by Japan in 1895 there can be no doubt. A younger contemporary, the writer Lu Xun 魯迅 (1881–1936) described his excitement when, as a student at the Nanjing Mining and Railway College, he rushed to the south of the city to buy a copy of the recently-published *Tianyanlun*, a “thin book, lithographed on white paper, costing exactly 500 cash”, which he read with deep fascination, a new world of unfamiliar names and unsettling ideas opening before him as he chewed peppers and peanut rice.⁸⁹

Yan Fu's own comments on the difficulties of translation can be compared and measured against his practice, but it is apparent that his three precepts are inadequate to explain how and why his translations were so successful. The translation of ideas is itself the making of complex metaphor, an act of creation whose success can only be judged some time after the event, when the ideas themselves have taken root and have been given new life in the host culture. As Walter Benjamin wrote in “The Task of the Translator”:

A real translation is transparent; it does not cover the original, does not block its light, but allows the pure language, as though reinforced by its own medium, to shine upon the original all the more fully. ...It is the task of the translator to release in his own language that pure language which is under the spell of another, to liberate language imprisoned in a work in his re-creation of that work.⁹⁰

⁸⁹ Lu Xun 魯迅 . 1978 [1927]. *Zhaohua xishi qianxi* 朝花夕拾淺析 (An annotated *Dawn blossoms picked at dusk*). Fujian: Fujian renmin chubanshe, p. 117.

⁹⁰ Walter Benjamin. 1992 [1970]. *Illuminations*. Edited by Hannah Arendt. London: Fortuna Press, pp. 79–80.

APPENDIX

Table 1: Natural science terminology in Yan Fu's translations

<i>Chinese term</i>	<i>Source</i>	<i>English meaning</i>	<i>Reference to original text</i>
<i>atun</i> 阿屯	<i>MLMX</i> 367.22	[atom]	---
<i>aili</i> 愛力	<i>TYL</i> 8.2 <i>MLMX</i> 350.11 <i>QXYY</i> 129.1 <i>QJQL</i> 39.13	[chemical affinity] (chemical) force [attraction] [affinity]	--- <i>SL</i> 473 --- <i>OL</i> 98
<i>baijin</i> 白金	<i>MLMX</i> 366.24 <i>YF</i> 18.18–19 <i>YF</i> 179.15	platina (= platinum) [silver] [platinum]	<i>SL</i> 496 --- ---
<i>boyang</i> 玻養	<i>MLMX</i> 130.7	silica	<i>SL</i> 159
<i>bo</i> 鉑	<i>YF</i> 179.15	[platinum]	---
<i>boladingnan</i> 柏拉丁難	<i>YF</i> 179.15	[platinum]	---
<i>chayuanjing</i> 察遠鏡	<i>MLMX</i> 17.16	telescope	---
<i>chijin</i> 赤金	<i>YF</i> 18.19	[copper]	---
<i>cishi</i> 慈石	<i>MLMX</i> 35.16	[lodestone]	---
<i>daimeng</i> 玳瑁	<i>MLMX</i> 87.15	diamond	<i>SL</i> 103
<i>dan</i> 丹	<i>MLMX</i> 380.2	red precipitate [= mercury (II) oxide]	<i>SL</i> 512
<i>dan</i> 淡	<i>MXQS</i> 82.10	nitrogen	<i>POL</i> 139
<i>danzhi</i> 淡質	<i>MLMX</i> 200	nitrogen	<i>SL</i> 254
<i>dengfen</i> 等分	<i>MLMX</i> 200.15	chemical equivalents	<i>SL</i> 254
<i>dili</i> 抵力	<i>TYL</i> 7.1 <i>QXYY</i> 151.20	[repulsion]	--- ---
<i>dixue zhi jia</i> 地學之家	<i>TYL</i> 2.13	[geologists]	---
<i>dian</i> 碘	<i>MLMX</i> 366.24	iodine	<i>SL</i> 496

Table 1: Natural science terminology in Yan Fu's translations (cont.)

<i>Chinese term</i>	<i>Source</i>	<i>English meaning</i>	<i>Reference to original text</i>
<i>dianli</i> 點力	<i>TYL</i> 8.4	[intermolecular forces]	---
<i>feijinlei</i> 非金類	<i>MXQS</i> 11.18	non-metallic	<i>POL</i> 18
<i>ge</i> 鎳	<i>TYL</i> 72.6	<i>nickel</i>	<i>EE</i> 67
<i>gong</i> 汞	<i>MLMX</i> 380.2	mercury	<i>SL</i> 512
<i>gongyan</i> 汞鹽	<i>MLMX</i> 349.15	mercury salts	<i>SL</i> 472
<i>guanli</i> 官理	<i>TYL</i> 8.16	organs	---
<i>guangxue</i> 光學	<i>MLMX</i> 198.2	optics	<i>SL</i> 251
<i>hanshu</i> 寒暑	<i>TYL</i> 9.8	[temperature]	---
<i>hezhi</i> 合質	<i>MLMX</i> 130.4	compound	<i>SL</i> 159
<i>huaxue</i> 化學	<i>MXQS</i> 23.7 <i>QXY</i> 84.15 <i>YF</i> 44.18	chemical (adj.) [chemistry] [chemistry]	<i>POL</i> 29 --- ---
<i>huang</i> 磺	<i>MLMX</i> 115.3 <i>MXQS</i> 19.10	sulphur [sulphur]	<i>SL</i> 137 ---
<i>huangqiang</i> 磺強	<i>MLMX</i> 130.6 <i>QXY</i> 9.21	sulphuric acid sulphurous acid	<i>SL</i> 159 <i>SS</i> 12
<i>huangyang</i> 磺養	<i>MLMX</i> 130.7	sulphurous acid	<i>SL</i> 159
<i>huilü</i> 鈹綠	<i>MLMX</i> 191.5	hypochloride of calcium	<i>SL</i> 242
<i>huojing</i> 火精	<i>QJQL</i> 39.13	phlogiston	<i>OL</i> 98
<i>jian</i> 碱	<i>MLMX</i> 129.23	alkali	<i>SL</i> 159
<i>jian zhong zhi jin</i> 碱中之金	<i>MLMX</i> 234.23	potassium	<i>SL</i> 305
<i>jiangshi</i> 僵石	<i>TYL</i> 2.13 <i>QXY</i> 175.13	[fossil] fossil	--- <i>SS</i> 227
<i>jinlei</i> 金類	<i>MXQS</i> 11.18	metallic	<i>POL</i> 19

Table 1: Natural science terminology in Yan Fu's translations (cont.)

<i>Chinese term</i>	<i>Source</i>	<i>English meaning</i>	<i>Reference to original text</i>
<i>jinji</i> 勁積	<i>MLMX</i> 301.21	momentum	<i>SL</i> 402
<i>kexue</i> 科學	<i>MLMX</i> 3.13	science	<i>SL</i> 3
<i>kuai</i> 塊	<i>MLMX</i> 301.20	mass	<i>SL</i> 402
<i>lüyang</i> 鋁養	<i>MLMX</i> 408.8	hydrated alumina	<i>SL</i> 553
<i>mei</i> 鎂	<i>MLMX</i> 366.21	magnesia	<i>SL</i> 496
<i>mopo</i> 莫破	<i>QXYX</i> 174.2	atom	<i>SS</i> 225
<i>mopo zhidian</i> 莫破質點	<i>MLMX</i> 218.24 <i>QXYX</i> 9.12–13	atom molecules	<i>SL</i> 254 <i>SS</i> 12
<i>muyan</i> 鈹鹽	<i>MLMX</i> 349.15	bismuth salts	<i>SL</i> 472
<i>na</i> 鈉	<i>MXQS</i> 79.20	sodium	---
<i>neijing zhi xue</i> 內景之學	<i>QXYX</i> 44.20	physiology	<i>SS</i> 57
<i>nie</i> 鎳	<i>MXQS</i> 60.8	nickel	<i>POL</i> 72
<i>niefu</i> 涅夫	<i>TYL</i> 8.6 <i>QXYX</i> 50.15	[nerve] nerve	--- <i>SS</i> 65
<i>niepulasi</i> 涅菩刺斯	<i>TYL</i> 6.23	nebulous (potentiality)	<i>EE</i> 50
<i>niepu xingqi</i> 涅菩星氣	<i>QXYX</i> 6.12–13	nebula	<i>SS</i> 8
<i>pi</i> 砒	<i>MLMX</i> 191.3	arsenic	<i>SL</i> 241
<i>piyan zhi ke</i> 砒鹽之科	<i>QXYX</i> 44.20	anatomy	<i>SS</i> 57
<i>qing</i> 輕	<i>MXQS</i> 60.14	[hydrogen]	---
<i>se</i> 鉍	<i>MLMX</i> 367.1	[selenium]	<i>SL</i> 496
<i>seliniya</i> 塞利尼亞	<i>MLMX</i> 367.1	selenia	<i>SL</i> 496

Table 1: Natural science terminology in Yan Fu's translations (cont.)

<i>Chinese term</i>	<i>Source</i>	<i>English meaning</i>	<i>Reference to original text</i>
<i>shenhui</i> 蜃灰	TYL 2.10	chalk	EE 3
<i>shenglei</i> 生類	TYL 8.15	living things	---
<i>shengqi</i> 生氣	MLMX 124.13	life	SL 152
<i>shengxue</i> 生學	TYL 4.1	biology	---
<i>shuixue</i> 水學	MLMX 198.1	hydrostatics	SL 251
<i>sitelini</i> 斯特力尼	MXQS 115.4	strychnine	POL 127
<i>sulii</i> 速率	MLMX 301.18	velocity	SL
<i>suan</i> 酸	MLMX 129.13, 198.22	acid	SL 159, 252
<i>tan</i> 炭	MXQS 60.14	carbon	---
<i>tansuan</i> 炭酸	MXQS 79.8	carbonic acid	POL 91
<i>tanyang</i> 炭養	TYL 10.9 MLMX 130.7 MXQS 78.11	[carbon dioxide] carbonic acid carbonic oxide gas	--- SL 159 POL 90
<i>tili</i> 體力	TYL 8.5	[corporeal force]	---
<i>tianyan</i> 天演	TYL 2.20 QXYY 14.17	evolution development	EE 6 SS 19
<i>tianze</i> 天擇	TYL 2.20 QXYY 14.18	[natural selection]	EE 4 ---
<i>tiexiu</i> 鐵鏽	MLMX 398.20, 366.24	[iron oxide] rust	SL 513
<i>tieryang</i> 鐵養	MLMX 35.15	[iron oxide]	---
<i>tongliu</i> 銅綠	MXQS 81.5	[copper chloride]	---
<i>tongyang</i> 銅養	MXQS 81.6	[copper oxide]	---
<i>wujing</i> 物競	TYL 2.20 QXYY 14.18	struggle for existence	EE 4 ---

Table 1: Natural science terminology in Yan Fu's translations (cont.)

<i>Chinese term</i>	<i>Source</i>	<i>English meaning</i>	<i>Reference to original text</i>
<i>wuti zhi li</i> 物體之力	<i>TYL</i> 8.2	[corporeal force]	---
<i>wuzhi aiju</i> 物質愛拒	<i>MLMX</i> 301.17	chemical action	<i>SL</i> 402
<i>xisuan</i> 矽酸	<i>MLMX</i> 408.8	silicic acid	<i>SL</i> 553
<i>xili</i> 吸力	<i>TYL</i> 7.1 <i>QXYY</i> 238.23	[attraction]	--- <i>SS</i> 310
<i>xianjing</i> 顯鏡	<i>TYL</i> 2.11	[microscope]	---
<i>xianweijing</i> 顯微鏡	<i>MLMX</i> 17.16	[microscope]	---
<i>xiao</i> 硝	<i>MXQS</i> 19.10	nitrogen	---
<i>xiaoqiang</i> 硝強	<i>MLMX</i> 130.6	nitric acid	<i>SL</i> 159
<i>xinsuan</i> 錒酸	<i>MLMX</i> 349.15	arsenious acid	<i>SL</i> 472
<i>xinyang</i> 錒養	<i>MXQS</i> 115.4	arsenic [oxide]	<i>POL</i> 127
<i>xingqi</i> 星氣	<i>QXYY</i> 175.2	nebula	<i>SS</i> 175
<i>xiu</i> 溴	<i>MLMX</i> 366.24	bromine	<i>SL</i> 496
<i>yamoniya</i> 亞摩尼亞	<i>TYL</i> 10.9	[ammonia]	---
<i>yanqiang</i> 鹽強	<i>MLMX</i> 130.3, 351.15	muriatic acid [= hydrochloric acid]	<i>SL</i> 159, 475
<i>yangqi</i> 養氣	<i>QXYY</i> 52.5 <i>MXQS</i> 48.16	oxygen oxygen	<i>SS</i> 66 <i>POL</i> 58
<i>yijing</i> 異晶	<i>QXYY</i> 38.15	allotrope	<i>SS</i> 49
<i>yitai</i> 以太	<i>MLMX</i> 304.14 <i>QXYY</i> 239.1	ether ether	<i>SL</i> 405 <i>SS</i> 311
<i>yitai gangqi</i> 以太剛氣	<i>MLMX</i> 214.21	[subtle] ether	<i>SL</i> 276
<i>yituo</i> 伊脫	<i>TYL</i> 70.11	[(luminiferous) ether]	---

Table 1: Natural science terminology in Yan Fu's translations (cont.)

Chinese term	Source	English meaning	Reference to original text
yindanyang 銀淡養	MLMX 351.12	silver nitrate	SL 474
yinxue 音學	MLMX 198.2	acoustics	SL 251
yuansu 原素	MXQS 91.14	element	POL 103
yuanying 原行	QXYX 38.11 MXQS 25.2 YF 44.19	element [element] [component parts]	SS 49 --- ---
yuanying 原質	MXQS 23.7, 81.8	element	--- ---
zatong 雜銅	MXQS 60.8	bronze	POL 72
zazhi 雜質	QXYX 38.11 MXQS 91.13	compound	SS 49 ---
zaoshi 燥濕	TYL 9.8	humidity	---
zhidian 質點	TYL 7.1 QXYX 7.9, 9.14, 39.1 MXQS 9.21	[particle] molecule molecules particles of matter	--- SS 311, 49 POL 16
zhidian zhi li 質點之力	TYL 8.2	[intermolecular forces]	---
zhijue 知覺	TYL 8.16	consciousness	---
zhiti 支體	TYL 8.16	limbs and bodies	---
zhixue 質學	MLMX 130.4 QXYX 56.9	chemistry chemistry	SL 159 SS 72
zhixuejia 質學家	QXYX 39.2	chemist	SS 48

Notes: (1) See the footnotes 11–18 above for the codes for translated and original works. All references to Yan Fu's translated works are to the re-editions in *Yan yi mingzhu congkan* 嚴譯名著叢刊 (Anthology of famous translations by Yan [Fu]). 1981. Beijing: Shangwu yinshuguan. (2) The numbers represent page number and line, e.g. 35.2 means "line 2 of page 35". (3) Yan Fu's commentary is distinguished from the main text of the translations by giving the English translation in square brackets. (4) '---' in column 4 indicates that the terms are not present in the original text.

