

# Real Animals: Nationalism and the Practice of Zoological Research in China, 1900s–1930s

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## ABSTRACTS

Als sich die Zoologie zu Beginn des 20. Jahrhunderts in China etablierte, distanzierten sich ihre ersten Vertreter konsequent von früheren chinesischen Formen der wissenschaftlichen Beschäftigung mit Tieren. Stattdessen betonten sie, wie neu ihre Wissenschaft in China sei, mit der sie – wie die Vertreter vieler anderer Disziplinen – dazu beitragen wollten, China wieder „reich und stark“ zu machen. Auf Grundlage eines genaueren Blicks in die ersten zoologischen Fachzeitschriften Chinas zeigt der Artikel jedoch verschiedene Kontinuitäten zur und Bezugnahmen auf die ältere chinesische Tierkunde, die durchaus als bewusste Elemente der Selbstbehauptung gedeutet werden können. Die chinesische Zoologie war also zweifelsohne ein Hybrid. Warum die Rhetorik der Akteure – ebenso wie ein oberflächlicher Blick – anderes suggeriert, erklärt der Artikel insbesondere aus dem globalen politischen Kontext und in Bezug auf den Nationalismus.

When, in the early twentieth century, zoology as an academic subject was established in China, its first agents did all they could to distance themselves from earlier Chinese forms of researching animals. Instead, Chinese zoologists – many of whom had studied abroad – emphasized the complete novelty of their discipline and how it, like many other new branches of science, would contribute to making the Chinese nation “rich and strong” again. Yet by taking a closer look at China’s first scholarly journals devoted to zoology, this article demonstrates how in various ways, the new field was in fact also characterized by continuities and by references to “traditional” ways of studying animals in China. I suggest that such continuities should be read as conscious if understated attempts at self-assertion within an increasingly global scientific community. Thus, Chinese zoology doubtless was a hybrid undertaking far from having severed all connections to the country’s past. From the 1900s to the 1930s, however, both a cursory look as well as the rhetoric of Chinese zoologists suggested otherwise. This contradiction is explained by referring to the global political context as well as the role of nationalism.

## Introduction

In China, the late imperial era, especially the nineteenth and early twentieth centuries, added a myriad of new terms to the lexicon. New fields of knowledge were discovered and appropriated in rapid succession, demanding the coining of new expressions.<sup>1</sup> Among them was *dongwuxue* (動物學) or “zoology”. While many of the new terms would sooner or later be replaced with other translations, *dongwuxue* – literally the “study of moving things”, first introduced in 1885 – stuck and has remained the standard Chinese term for zoology until this day.<sup>2</sup> As is however often the case with “new” terms in the Chinese discourse around 1900 – many of which were in fact what Lydia Liu has termed “return graphic loans” stemming from recent renderings of Western terms into the Japanese language (with translators drawing on older Chinese texts to find proper equivalents) – *dongwu* itself, for animal, had a much longer history, dating back at least to the fourth century BC when it was first used in the Rites of the Zhou (*Zhouli* 周禮). Later, the term lost its prominence but never disappeared completely. According to Roel Sterckx’ fundamental work on animals in early Chinese texts, the most common generic term for “animals” or living beings was *wu* (物) which today would mostly translate as “thing”.<sup>3</sup> Yet I do not want to dwell much longer on the history of linguistic changes around 1900, which has been studied in detail by others.<sup>4</sup> This article, by contrast, deals with *dongwuxue* as a *practice* in late imperial and early Republican China – in other words, as “science in action”, to use the words of Fan Fa-ti quoted in the introduction to this issue. This is not to deny the intimate connections between terminology and action. Rather, I will use the practical side of the history of *dongwuxue* to shed new light on a question which continues to occupy much of the literature, namely, to what degree the new fields of knowledge being incorporated by Chinese around the turn of the twentieth century can really be described as “new” versus “old”, “foreign” versus “native”, or “other” versus “self”. It is certainly true that, as Marwa Elshakry has argued, nationally distinct versions

1 L. H. Liu, *Translingual Practice: Literature, Culture, and Translated Modernity – China, 1900–1937*, Stanford, CA 1995. Research for this article was supported by the Fritz Thyssen Foundation through a Herzog Ernst Scholarship enabling me to conduct research at the Forschungszentrum Gotha in 2016. I wish to thank the colleagues there, in particular Iris Schröder, for their questions and comments on a first draft of this paper, and for their support. I am also grateful to the anonymous reviewer whose suggestions helped me to revise an earlier draft of this article. Finally, thanks are also due to Julia Obertreis and Marc Matten for their questions and critical remarks, and for inviting my contribution.

2 He De 赫德 [Robert Hart] and Ai Yuese 艾約瑟 [Joseph Edkins], *Dongwuxue qimeng* 動物學啟蒙 (Introduction to Zoology), Shanghai 1885.

3 M. Siebert, *Klassen und Hierarchien, Kontrastpaare und Toposgruppen: Formen struktureller Eroberung und literarischer Vereinnahmung der Tierwelt im alten China*, in: *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 162 (2012), pp. 171–196, on p. 172; R. Sterckx, *The Animal and the Daemon in Early China*, Albany 2002, pp. 17–19. *Dong* 動 alone could also stand for “animal”, e.g. in the 5th century C.E. work on literature “The Literary Mind and the Carving of Dragons” (*Wen xin diao long* 文心雕龍), see *Hanyu da zidian* 漢語大字典 (Great Lexicon of Chinese Characters), vol. 1, Wuhan 2006, p. 375. For “return graphic loans”, see Liu, *Translingual Practice*, pp. 33–34.

4 M. Lackner / I. Amelung / J. Kurtz (eds.), *New Terms for New Ideas: Western Knowledge and Lexical Change in Late Imperial China*, Leiden 2001; M. Lackner (ed.), *Mapping Meanings: The Field of New Learning in Late Qing China*, Leiden 2004.

of science – such as “Chinese science” – could only be imagined as such once “European science” had been universalized as a seemingly rootless, global concept, as science *per se*.<sup>5</sup> I will, however, use the example of *dongwuxue* to draw attention to the problem that the binary distinction of “foreign” versus “native” science was initially coined and employed by the historical actors themselves – in our case by the first Chinese zoologists trained abroad, mostly in the US – in an effort to justify and advertise what they were doing. The conscious juxtaposition of “old” and “new” more generally can be said to have become a hallmark of Chinese society from the late nineteenth century onwards.<sup>6</sup> Yet as is well known, there also existed branches of study and schools of thought which explicitly drew on Chinese traditions and established their own versions of nationalism and science in fields ranging from medicine and nuclear physics to geography and agriculture.<sup>7</sup>

However, instead of judging whether the approach chosen by China’s zoologists around 1900 really was as new as they themselves proclaimed, I think it will be more fruitful to relate the idea of novelty to the actual working conditions of early twentieth century Chinese zoologists, in order to see if and how such a perspective can help us to better understand the connection between the discourse of novelty and nationalism in science. It is, I believe, only by such social, political and economic contextualization that we can better grasp the forces driving what at first glance seems like a more or less smooth transfer of an entire system of knowledge from the West to the rest of the world.<sup>8</sup> As Julia Obertreis and Marc A. Matten emphasise in their introduction, local knowledges and practices played a far larger role in this process than has hitherto been acknowledged. In what follows, I will first sketch out the transformation of animal-related knowledge in China around the turn of the century (focusing on taxonomy) and describe how it seemingly led to a complete exchange of the standards of reference. Secondly, by focusing on the first generation of Chinese foreign-trained zoologists from the 1910s to the 1930s, I will explore the effect of their social and economic situation on the discourse of novelty and the question of authentic knowledge of animals. Thirdly, by widening the scope to include foreign – notably European and American – zoologists working in China at

5 M. Elshakry, When Science Became Western: Historiographical Reflections, in: *Isis* 101 (2010) 1, pp. 98–109.

6 Zhitian Luo, *Inheritance within Rupture: Culture and Scholarship in Early Twentieth Century China*, Leiden 2015, pp. 7, 115–123; H. Frölich, Warum die “Neue Politik” keine Kopie war: Das Beispiel der Bildungsreformen in China, 1901–1911, in: L. Henningsen and M. Hofmann (eds.), *Tradition? Variation? Plagiat? Motive und ihre Adaption in China*, Wiesbaden 2012, pp. 33–51.

7 S. Lei, *Neither Donkey nor Horse: Medicine in the Struggle over China’s Modernity*, Chicago 2014; M. Matten, *Coping with Invisible Threats: Nuclear Radiation and Science Dissemination in Maoist China*, in: *East Asian Science, Technology and Society* 12 (2018) 3, pp. 235–256; S. Dabringhaus, *Territorialer Nationalismus in China: Historisch-geographisches Denken 1900–1949*, Köln 2006, pp. 2, 273–274; S. Schmalzer, *Red Revolution, Green Revolution: Scientific Farming in Socialist China*, Chicago 2016; O. Bruun, *Fengshui in China: Geomantic Divination between State Orthodoxy and Popular Religion*, Copenhagen 2003.

8 N. Vittinghoff, Introduction, in: Lackner (ed.), *Mapping Meanings*, pp. 1–22; B. A. Elman, *New Directions in the History of Modern Science in China*, in: *Isis* 98 (2007), 3, pp. 517–523. For a recent treatment of the connections between practical working conditions in the periphery and the course of zoological research in Europe, see K. Pannhorst, *Verpacken, verkaufen, verschenken: Hans Sauters entomologische Praktiken zwischen Formosa und Europa, 1902–1914*, in: *Berichte zur Wissenschaftsgeschichte* 39 (2016), 3, pp. 230–244.

the time, I will shed additional light on the transnational dimension of science in early twentieth-century China and how it was related to nationalism and politics.

## Replacing Authorities

In the minds of many nineteenth-century Chinese scholars, the existence of a certain species of animal mainly depended on whether it had previously been described in the existent literature. Empirical fieldwork, by contrast, was not high on the agenda. Thus, due to their different working styles, the British botanists in nineteenth-century South China so amply described by Fan Fa-ti hardly had any contact with their Chinese counterparts.<sup>9</sup> At first glance, it seems that this division along practical lines was quickly eliminated after 1900. Now, empirical investigation of live or deceased animals replaced the ancient books as sources of authentic knowledge of animals. As an entirely new system of knowledge, *dongwuxue* seemed to first complement the Chinese tradition and then, by the 1920s, to entirely deem it useless.<sup>10</sup> The replacement seemed complete.

But was it? There is little doubt that on the surface at least, authorities were indeed exchanged. Charles Darwin (1809–1882) replaced the once acclaimed sixteenth-century Chinese naturalist Li Shizhen (李時珍, 1518–1583).<sup>11</sup> Tellingly, until this day, no English-language volume on the history of Chinese zoology has been included in the monumental “Science and Civilisation in China” (SCC) series founded by Joseph Needham (1900–1995) which by now runs to 26 books organised into seven volumes, most of which consist of several parts by individual authors. “Biology and Biological Technology” formed the sixth of those seven volumes, and in Needham’s lifetime, only the parts on Agriculture (1984) and Botany (1986) were published while the one on Zoology, authored by Guo Fu, appeared in Chinese only in Beijing in 1999.<sup>12</sup> Whatever the reasons, the history of Chinese zoology certainly did not too readily fit into Needham’s master narrative according to which Chinese science and technology for centuries had far surpassed Europe’s but then had fallen behind – for reasons that Needham had been aiming to discover through his series.<sup>13</sup> It seems that this master narrative could be

9 Fa-ti Fan, *British Naturalists in Qing China: Science, Empire, and Cultural Encounter*, Cambridge, MA 2004.

10 The First World War lessened the Chinese belief in Western science, but not for long. See B. A. Elman, “Universal Science” versus “Chinese Science”: The Changing Identity of Natural Studies in China, 1850–1930, in: *Historiography East and West* 1 (2003), pp. 70–116.

11 J. R. Pusey, *China and Charles Darwin*, Cambridge, MA 1983; Elman, *Universal Science*.

12 F. Bray, *Agriculture*, in: *Science and Civilisation in China*, vol. 6, 2, Cambridge 1984; J. Needham/G.-J. Lu/H.-T. Huang, *Botany*, in: *Science and Civilisation in China*, vol. 6, 1, Cambridge 1986. Between 1996 and 2015, four more parts have been produced. In the preface to Guo Fu’s work, Joseph Needham who had been planning the book together with Guo since the mid-1980s, stated: “The Chinese version is published first and separately, but it is a constituent part of the ‘Science and Civilisation in China’ series.” See Guo Fu 郭鄂, *Zhongguo gudai dongwuxue shi* 中国古代动物学史 (History of Zoology in Ancient China), Beijing 1999.

13 D. Saeger/E. Weber, *Needham’s Grand Question Revisited: On the Meaning and Justification of Causal Claims in the History of Chinese Science*, in: *East Asian Science, Technology, and Medicine* 33 (2011), pp. 13–32.

illustrated more easily and convincingly with reference to astronomy, mathematics or hydraulic engineering, to name but a few.

In contrast to those fields, Chinese knowledge about animals simply appeared to be too mystic and by virtue of its basic principles seemed not to fit at all with Linnaean taxonomy or evolutionary theory – an assumption that was, as more recent research by Roel Sterckx, Roderich Ptak and others has demonstrated, far too general.<sup>14</sup> Yet during most of the twentieth century, this assumption was widely accepted among the general academic audience both in China and abroad. This can be seen from the reactions to Michel Foucault's famous quotation from an obviously fictitious "Chinese encyclopaedia" and its absurd classification of animals in the preface to Foucault's "The Order of Things". Foucault took this humorous classification from a witty 1942 essay by Jorge Luis Borges, but more often than not, the classification has been taken at face value and as proof of a lack of "real" scientific work in pre-1900 China, or at best as proof of the cultural dependency of any scheme of classification.<sup>15</sup>

In contrast to such widespread views, many of the earlier Chinese systems of animal classification, while employing patterns different from those of nineteenth and twentieth century Western zoology, were far from being absurd. Many of them worked with hierarchical schemes. The book *Xunzi* (荀子) from the fourth century B.C., for example stated that all things in the world possessed "energy" (*qi* 氣) but only living things simultaneously possessed a "vegetative principle" (*sheng* 生).<sup>16</sup> In turn, animals were separated from plants by the former's "knowledge" (*zhi* 知), while humans were the only animal additionally equipped with "morals" (*yi* 義). Scholars of later centuries would produce many alternative hierarchies, based on, for example, the mode of birth-giving, the appearance of the body surface, the number of orifices of the body or the existence of an eye-lid. In the fourteenth century, Ye Ziqi (葉子奇, c. 1327–1390) proposed a hierarchy depending on the direction in which the "head" of a living being grew – downwards in the case of plants (their roots), horizontally for animals, and upwards for humans. Apart from the hierarchies put forward in *Xunzi* and other texts, there also existed morphological systems of classification. The most widespread was the separation of the animal world into "crawling" (*chong* 蟲), "fish" (*yu* 魚), "birds" (*niao* 鳥) and "mammals" (*shou* 獸) which was employed by the *Erya* 爾雅, a dictionary dating from the second century BC.<sup>17</sup> Other works dealing in part with animals included the richly illustrated mythical

14 R. Sterckx, Animal Classification in Ancient China, in: East Asian Science, Technology, and Medicine 23 (2005), pp. 26–53. Also see R. Ptak, Literary Species or Real Species? Some Notes on Animals in the Chinese Classics, in: R. Ptak, Birds and Beasts in Chinese Texts and Trade: Lectures Related to South China and the Overseas World, Wiesbaden 2011, pp. 3–17 and especially Siebert, Klassen und Hierarchien.

15 M. Foucault, The Order of Things: An Archaeology of the Human Sciences, New York 1970, p. xv; C. S. Nappi, The Monkey and the Inkpot: Natural History and its Transformations in Early Modern China, Cambridge, MA 2009, pp. 1–2.

16 The following passage is mostly based on Guo Fu, *Zhongguo gudai dongwuxue shi*, pp. 132–141; Siebert, Klassen und Hierarchien; and on Sterckx, Animal Classification.

17 Siebert, Klassen und Hierarchien, pp. 174–179.

geographical text *Shanhaijing* 山海經 from the Western Han 漢 dynasty (206 BC–9 AD).<sup>18</sup>

In terms of quantity of information on animals, perhaps the most important group of sources were the *pulu* 譜錄, or “treatises and lists” on flora and fauna as well as on merchandise and material culture more generally. As Martina Siebert notes, *pulu*, most of which were written during the Song 宋 (960–1279) as well as during the Ming 明 (1368–1644) and Qing 清 (1644–1911) dynasties, have been used extensively by Guo Fu 郭郛 to produce his “History of Zoology in Ancient China” (中国古代动物学史, 1999).<sup>19</sup> Very substantial lists of certain (local) types of animals were also compiled for the genre of local chronicles (*fangzhi* 方志) throughout the empire.<sup>20</sup> By the time of the Qing dynasty, the authors of a famous encyclopaedia, the *Gujin tushu jicheng* (古今圖書集成) completed in 1726, were able to list numerous sources of information on many kinds of animals.<sup>21</sup> Around the same time, depictions of animals in paintings or as illustrations also became ever more detailed and – by today’s standards – more accurate.<sup>22</sup> Yet despite the fact that the aforementioned, morphological schemes of classification were more reminiscent of Western taxonomy, foreign naturalists as well as their early twentieth-century Chinese colleagues found little sense in them, in particular when it came to the far less clear-cut subdivisions. In light of the sheer amount of information on animals in Chinese works stretching back three millennia or more, this turn-of-century rejection might at first come as a surprise. I see, however, at least three conditions which make this rejection seem reasonable. In a nutshell, those were the perceived lack of one unifying system, linguistic barriers, and the nexus between transnational science and nationalism. In the following, I will only briefly touch upon the first two of these reasons but devote much more attention on the issue of nationalism which is at the core of this article.

Firstly, while there did exist a lot of sources on animals, it was the perceived lack of a classificatory scheme akin to Linnaeus in Chinese texts that led early twentieth-century zoologists to look elsewhere. While the classificatory systems mentioned above did exist, they never featured prominently in any of the older works. Perhaps unwillingly, recent and very fruitful attempts by Roderich Ptak and others to dig up the true wealth of animal-related information from pre-imperial and imperial Chinese sources testifies precisely to this relative unimportance of classificatory schemes. Using an approach that reminds the reader of early twentieth century Western authors (see below), Ptak and others have, besides following other questions, searched numerous sources in an attempt to

18 R. E. Strassberg, *A Chinese Bestiary: Strange Creatures from the Guideways through Mountains and Seas (Shanhaijing)*, Berkeley, CA 2002. For this and many more, see Guo Fu, *Zhongguo gudai dongwuxue shi*.

19 M. Siebert, *Pulu: “Abhandlungen und Auflistungen” zu materieller Kultur und Naturkunde im traditionellen China*, Wiesbaden 2006, p. 9, n. 2.

20 For an annotated translation of such a list, see R. Ptak/Baozhu Hu, *The Earliest Extant Bird List of Hainan: An Annotated Translation of the Avian Section in Qiongtai zhi*, Wiesbaden 2015.

21 T. Kaiser, *Unsterblich problematisch: Grus japonensis*, in R. Ptak (ed.), *Tiere im alten China: Studien zur Kulturgeschichte*, Wiesbaden 2009, pp. 3–16.

22 *Ibid.*, p. 14.

identify older Chinese descriptions with certain “species” as recognized by modern zoology, thereby implicitly making up for a lack of such clear-cut divisions in the Chinese sources themselves.<sup>23</sup>

Again, this is not to say that earlier Chinese authors did not classify at all. Yet as Roel Sterckx has pointed out with regard to pre-imperial times, their fundamental principle of classification was very different, attempting to explain interrelations reaching beyond the animal sphere instead of marking boundaries to further subdivide that sphere itself.<sup>24</sup> As the works mentioned above show, this had somewhat changed by late imperial times. The most famous and widespread of the more analytical and empirical works on animals as well as plants was the pharmacopoeia – a collection of pharmaceutics partly of animal origin – put together by the aforementioned Li Shizhen in the sixteenth century under the title *Bencao gangmu* (本草綱目; by no means the single or earliest pharmacopoeia<sup>25</sup>). Li divided mammals into “domesticated” (*chulxu* 畜), “wild” (*shou* 獸), “rodents” (*shu* 鼠), “monkey-like” (*yu* 禺) and “strange” (*guai* 怪). Birds, on the other hand, were classified by Li depending on their habitat, while fish were either scaled or not, and the “crawling” could either be oviparous, pupating, or live in the water. Despite this abundance of categories, the *Bencao gangmu* remained the one Chinese work that Western naturalists were most likely to accept as a source of some sort of knowledge – which does make sense if we take into consideration that Li’s entries on single animal species contained a lot more details than had most of the earlier sources.<sup>26</sup> In their eyes, Li’s book was definitely superior to many other works continuing to appear throughout the nineteenth century, and which relied on moral instead of biological criteria or employed a combination of both.<sup>27</sup>

Parallel to such publications, in the 1880s there appeared the first works on Western zoology in China. In the beginning, these were almost solely authored by missionaries and British employees of the Imperial Maritime Customs.<sup>28</sup> Soon after 1900, however, more and more Chinese periodicals came into print. The earliest of those came under the classical Chinese heading of *bowu* (博物) or “broad knowledge of things”, yet already roughly eighty per cent of their content dealt with topics which would soon be labelled “zoological”.<sup>29</sup> Until around 1919, these early scientific journals would still pay equal respect to, say, British biologist Thomas Huxley (1825–1895) and China’s Li Shizhen,

23 See the chapters in Ptak (ed.), *Tiere im alten China*; R. Ptak, *Marine Animals in Traditional China: Studies in Cultural History*, Wiesbaden 2010. For Ptak’s own reflexions on this approach and a critical engagement with Roel Sterckx’s work (following note), see Ptak, *Literary Species*, esp. pp. 9–11.

24 Sterckx, *Animal Classification*, pp. 26–29. For more details, see Sterckx, *The Animal and the Daemon*.

25 For more on this genre and its long history, see P. U. Unschuld, *Medicine in China: A History of Pharmaceutics*, Berkeley, CA 1986 and Guo Fu, *Zhongguo gudai dongwuxue shi*, pp. 524–526.

26 Kaiser, *Unsterblich*, p. 10.

27 Nappi, *Monkey*, pp. 113–116; Siebert, *Klassen und Hierarchien*, p. 185.

28 Hart and Edkins, *Dongwuxue*.

29 Xu Wenmei 徐文梅, *Zhongguo jindai zui zao de shengwuxue xueshu qikan*: “Zhongguo kexue she shengwu yanjiusuo congkan” 中國近代最早的生物學學術期刊: “中國科學社生物研究所叢刊” (Modern China’s Earliest Biological Scientific Journal: “Science Society of China Biological Research Institute Serial”), in: *Zhongguo keji qikan yanjiu* 20 (2009) 5, pp. 963–965.



printing both men's portraits side by side and calling both of them "great naturalists" (*bowuxue da jia* 博物學大家).<sup>30</sup> The Chinese way of studying nature was still placed on an equal footing with its Western counterpart, and in 1914, the Nanjing-based magazine *Bowuxue zazhi* (博物學雜誌) gave due weight to the former's genealogy, tracing "Chinese" (*Zhonghua* 中華) natural studies back to the book of changes (*Yijing* 易經) in the third millennium BC.<sup>31</sup> In this turn-of-the-century, nationalistic narrative, Li Shizhen was portrayed as a reformer of a long-standing indigenous tradition and as the founder of an independent, empirically working Chinese zoology.<sup>32</sup>

A dozen years earlier, however, in 1902, one of China's first scientific journals, the *Putong xuebao* (普通學報) from Shanghai, had already published an article describing the Linnaean system of classification as a seemingly universal "method of classifying animals".<sup>33</sup> By 1915, Nanjing's *Bowuxue zazhi* also began to tune into the swansong of the Chinese *bowu* tradition. In his introductory essay, Xue Fengchang (薛鳳昌, 1876–1944), who had studied in Japan, bemoaned what he called the "tragedy of Chinese natural studies [*woguo bowuxue zhi beiguan* 我國博物學之悲觀]". According to Xue, this branch of study was suffering from three illnesses: First, the "strangeness of naming" (*mingming zhi shichang* 命名之失常) which, in the case of plants, would randomly relate to habitat, human usage, or outer appearance. Second, he pointed out that the number of species was too low (*zhonglei zhi xishao* 種類之稀少). This deficit Xue blamed on the ancient writings which Chinese naturalists used as standard references, not daring to introduce new species. This, Xue lamented, made it impossible to correctly classify those animals and plants which the ancients (*guren* 古人) had not yet known – despite the obvious fact that "great and abundant China" (*Zhongguo zhi di da wu bo* 中國之地大物博) must have as many species as Europe or America. Third, Xue criticized mistakes in the terminology (*mingcheng zhi miuwu* 名稱之謬誤) resulting from unstandardized ways of translating Chinese names of species into English or Japanese and vice-versa, as well as from the arbitrary introduction of new Chinese names.<sup>34</sup>

Thus in 1915, Xue Fengcheng would still discuss the deficits of traditional natural studies. After 1919, however, such *explicit* reference to tradition was to disappear almost entirely. Instead, the growing number of zoologists educated abroad – most notably in the United States – emphatically related to the West as the only source of real science. In their rhetoric, these "Young Chinese" banned older terms such as *bowu* or *gezhi* (格致) for natural studies to the realm of "superstition" (*mixin* 迷信) entirely and resorted instead to exclusively using the Japanese return graphic loan *kexue* (科學, literally "classified learning based on technical training") which has since remained the standard

30 *Bowu zazhi* [Beijing] 1 (1913) 2, pp. 2–4.

31 *Zhonghua bowuxue yuanliu pian* 中華博物學源流篇 (The Origin and Development of Chinese Natural Studies), in: *Bowuxue zazhi* 1 (1914) 1, pp. 11–23.

32 Nappi, Monkey, p. 138.

33 *Dongwuxue fenlei fa* 動物學分類法 (Zoological Classification), in: *Putong xuebao* 普通學報 (1902) 3, pp. 53–56.

34 Xue Fengchang 薛鳳昌, *Woguo bowuxue zhi beiguan* 我國博物學之悲觀 (The Tragedy of Chinese Science), in: *Bowuxue zazhi* 2 (1915) 2, pp. 1–8.



Chinese (and Japanese) term for science.<sup>35</sup> A Chinese “History of Zoology” published in 1933 already limited itself to developments in Europe – *dongwuxue* seemed to have become a purely Western system of knowledge and method of inquiry.<sup>36</sup>

This, at least, was the story as it appears on surface. Before I turn to casting doubt on that narrative by looking into the actual, practical work of zoologists more deeply, I want to emphasize that the rhetoric of denying any connection to earlier Chinese scholarship must be understood by looking at the larger political and social context of the time. When more and more Chinese scholars translated, published, circulated and taught ever growing amounts of “Western knowledge” in the second half of the nineteenth century, they did so with specific aims in mind. What is often described in China today as the “spread of Western learning to the East” (*xixue dongjian* 西學東漸) was not, as the term might suggest, an almost natural phenomenon; neither was it, as the famous formula by John King Fairbank (1907–1991) – who, as Julia Obertreis and Marc A. Matten note in the introduction to this issue, saw Western “impact” followed by Chinese “response” – implied, a one-way-street. Instead, different schools of thought developed in China around 1900 which developed different answers to the challenges of the day, combining to varying degrees elements of what now became “Chinese” knowledge with certain chosen elements of Western science. Some turned to glorifying allegedly purely Chinese “national learning” (*guoxue* 國學) while others did the same with regard to Western science – in both cases, specific forms and norms of knowledge were meant to solve the crisis many Chinese felt had been troubling their country since at least the mid-nineteenth century.<sup>37</sup> Now that Confucian learning and the Qing dynasty toppled in 1911 had failed to make the Chinese empire “rich and strong” (*fuqiang* 富強) again, for the latter group of scholars at least, Western science was to achieve the same aim for the Chinese nation under the young Republic (while those in power would often rely on modern armies instead). Science and “saving the nation” (*jiu guo* 救國) thus were intimately connected. During the last years of the Qing dynasty, officials had tried (mostly if not exclusively in vain) to save the empire by way of several ambitious reforms. Now a large faction of the new intellectuals, many of whom had studied abroad, subscribed to a much more radical rejuvenation of Chinese culture.<sup>38</sup>

35 B. A. Elman, From Pre-Modern Chinese Natural Studies 格致學 to Modern Science 科學 in China, in: Lackner (ed.), Mapping Meanings, pp. 25–73.

36 Liu Xian 劉咸, *Dongwuxue xiaoshi* 動物學小史 (A Short History of Zoology), Shanghai 1933.

37 Fa-ti Fan, Nature and Nation in Chinese Political Thought: The National Essence Circle in Early Twentieth-Century China, in: L. Daston / F. Vidal (eds.), *The Moral Authority of Nature*, Chicago 2004, pp. 409–437; Tze-Ki Hon, National Essence, National Learning, and Culture: Historical Writings in Guocui xuebao, Xueheng, and Guoxue jikan, in: *Historiography East and West* 1 (2003) 2, pp. 242–286; Xiong Yuezhi 熊月之, *Xixue dongjian yu wan Qing shehui* 西學東漸與晚清社會 (The Dissemination of Western Learning and the Late Qing Society), Shanghai 1994; Ssu-yü Teng / J. K. Fairbank (eds.), *China's Response to the West: A Documentary Survey, 1839–1923*, Cambridge, MA 1954. For a fine example of why this was not a one-way-street, see A. M. Wu, *From Christ to Confucius: German Missionaries, Chinese Christians, and the Globalization of Christianity 1860–1950*, New Haven 2016.

38 C. Furth, *Intellectual Change: From the Reform Movement to the May Fourth Movement, 1895–1920*, in: M. Goldman / Leo Ou-Fan Lee (eds.), *An Intellectual History of Modern China*, Cambridge, UK 2002, pp. 13–96.

## The Practice of *dongwuxue*

Judging from the rhetoric analysed in the previous section, we might expect to find China's early adherents of *dongwuxue* to have no connection to their country's scholarly tradition whatsoever. Yet this was not the case. As often in knowledge transfer, in China, zoology was appropriated and changed in the course of being "transferred". In practical terms, Chinese zoology certainly featured elements that "broke" with the past, yet at the same time it also carried over elements from classical *bowu* learning. Just as Dagmar Schäfer, Martina Siebert and Roel Sterckx argue, any study of animals and knowledge related to them in China should keep an eye on long term developments.<sup>39</sup> Chinese zoology was zoology, yet it was also Chinese.

If this sounds obvious, it does stand in contrast to many recent studies on the history of science in twentieth-century China. Those studies – ranging from the history of the social sciences to archaeology and geology – tend to emphasize breaks while paying much less attention to continuities.<sup>40</sup> A point in case is the role of fieldwork. Doing fieldwork has been identified by these studies as a hallmark and important part of the identity of the new generation of Chinese scientists in the first half of the twentieth century. From social statistics to palaeoanthropology, the demanding and often dirty bodily work gained tremendous importance for the self-staging of those who consciously tried to set themselves apart from the classical image of the bookish scholar.<sup>41</sup>

This finding at first seems to hold true in the case of zoology, too. Indeed, in the late nineteenth century, European zoologists had often blamed Chinese authors for lacking any real-world encounter with the animals they were writing about. The older works quoted above demonstrate that those authors had in fact been keen to integrate every species they found in the literature having come down upon them – which is why, for example, dragons always held their ground.<sup>42</sup> In the 1890s, the German missionary and sinologist Ernst Faber (1839–1899) claimed that Chinese authors knew books much more intimately than nature itself.<sup>43</sup> In fact, even the first Chinese to popularize Western zoology in China primarily came from the ranks of those who had failed the imperial examination system, which despite adjustments remained focused on classical texts, and who saw themselves primarily as compilers and translators. None of them would have

39 D. Schäfer/M. Siebert/R. Sterckx, *Knowing Animals in China's History: An Introduction*, in: D. Schäfer/M. Siebert/R. Sterckx (eds.), *Animals through Chinese History. Earliest Times to 1911*, Cambridge, UK 2018, pp. 1–19, on p. 2.

40 Perhaps with the exception of Chinese medicine, see B. Elman, *On Their Own Terms: Science in China, 1550–1900*, Cambridge, MA 2005, pp. 396–408.

41 G. Yen Shen, *Unearthing the Nation: Modern Geology and Nationalism in Republican China*, Chicago 2014; Tong Lam, *A Passion for Facts: Social Surveys and the Construction of the Chinese Nation State, 1900–1949*, Berkeley, CA 2011; S. Schmalzer, *The People's Peking Man: Popular Science and Human Identity in Twentieth-Century China*, Chicago 2008.

42 Siebert, *Klassen und Hierarchien*, p. 188.

43 Quoted after R. Sterckx, *The Limits of Illustration: Animalia and Pharmacopeia from Guo Pu to Bencao Gangmu*, in: *Asian Medicine* 4 (2008) 2, pp. 357–394, on p. 391.

entertained the idea to go out and look for wild animals themselves.<sup>44</sup> Having spent four years in China, the German malacologist Otto Franz von Möllendorff (1848–1903) in 1877 delivered the following judgement:

*[T]he compilers of more modern works give evidence less of practical observation than of an extensive knowledge of ancient literature; and very often give rise to confusion by indiscriminate use of the terms employed by the older books. Thus we find in many instances that an article about an animal consists in a meagre description together with a rough drawing, supplemented by profuse quotations from old authors.*<sup>45</sup>

Evidently, the “more modern” authors Möllendorff had read continued to follow the example of imperial Chinese *leishu* or encyclopaedia in that they to large degree compiled and re-organised information from earlier works.<sup>46</sup> To counter the ensuing confusion described, von Möllendorff attempted to relate the species he found in the Chinese literature – the *Bencao gangmu* among them – to the terms employed by Western zoology, an approach in some respect similar, as mentioned above, to the recent work of Roderich Ptak, Guo Fu, and others. Already in the early 1930s, von Möllendorff’s pattern had been followed by the British chemist and pharmacist Bernard E. Read (1887–1949). In his English translation of the animal-related passages of the *Bencao gangmu*, Read, who had been teaching in Beijing since 1908, added the probable Latin name to every species listed.<sup>47</sup> Thus Li Shizen’s work merely provided the raw data for Read or von Möllendorff to feed into the new system of knowledge.

Yet the focus of foreign zoologists working in China certainly was not old books but rather fieldwork within the framework of lavishly equipped expeditions, often financed by foreign museums of natural history (see the following section). At first sight, their Chinese colleagues seemed to do precisely the same. Beginning with the *Bowu zazhi* (The Magazine of Natural History), which started publication in Beijing in 1919, we find more and more reports on expeditions conducted by Chinese scientists.

And yet, there were differences setting those expeditions apart from the way in which foreign scientists did fieldwork and presented their results. The main differences were the geographical scope, the thematic foci, and the style of publications. I shall deal with each of these in turn, and relate them to the economic and political context of the time. What I hope to arrive at is a more nuanced picture which neither portrays China’s early practitioners of *dongwuxue* as modern zoologists indistinguishable from their Western

44 Elman, *From Pre-Modern Chinese Natural Studies*, p. 53.

45 O. F. von Möllendorff, *The Vertebrata of the Province of Chihli with Notes on Chinese Zoological Nomenclature*, in: *Journal of the Royal Asiatic Society of Great Britain and Ireland, North-China Branch*, N.F. 11 (1877), pp. 41–111, on p. 42.

46 On that genre, see C. Kaderas, *Die leishu der imperialen Bibliothek des Kaisers Qianlong* (reg. 1736–1796), Wiesbaden 1998, esp. p. 21.

47 B. E. Read, *Chinese Materia Medica: Animals Drugs. II The Wild Animals*, in: *The Peking Society of Natural History Bulletin* 6 (1931/1932) 1, pp. 1–52.

colleagues, nor banishes them to the realm of “tradition”, thus avoiding one of the core binaries alluded to by Julia Obertreis and Marc A. Matten in the introduction.

Regarding geographical scope, expeditions conducted by foreign scientists mostly led to the margins of the territory under control of the Chinese Republic, and often beyond that into the changing territories of several warlords rivalling for power with the central government.<sup>48</sup> This was especially true for archaeologists in the late Qing and early Republic.<sup>49</sup> Due to the sheer size and publicity (and thus written sources) produced by such undertakings, research thus far has heavily concentrated on these large-scale expeditions. Yet they did not necessarily account for the majority of foreign-led expeditions, and certainly not for those led by Chinese.<sup>50</sup>

By contrast, before the beginning of the politically more stable Nanjing decade (1927–1937), Chinese-led zoological expeditions were far more regional and modest in scope. Most of them only inquired about the animal kingdom in the vicinity of the respective research institute. Biologists and geologists of the Society for Natural Studies (*Bowuxue hui* 博物學會), founded in Beijing in 1916, travelled to the Western Hills on the outskirts of the city, to neighbouring Zhili province, or to Shanxi province some 200 kilometres further west.<sup>51</sup> From 1925 on, the English-language *Contributions from the Biological Laboratory of the Science Society of China* in Nanjing almost exclusively published articles on fishes, amphibia and plants found within the city itself or its immediate surroundings. Whenever expeditions went a little further, for example to a neighbouring province, the *Contributions* printed lengthy diaries describing in vivid detail the hardship endured by the scientists in the field.<sup>52</sup> Others even collected their specimen from the city’s markets, most notably many varieties of goldfish.<sup>53</sup>

Large-scale expeditions to far-away regions were hampered by the political and economic situation. Before 1927, both the politically fractured landscape of the Warlord era and the meagre funding of the roughly 30 existing biological research institutes rendered such endeavours almost impossible for Chinese zoologists.<sup>54</sup> And yet these were not the

48 J. M. Jacobs, Nationalist China’s “Great Game”: Leveraging Foreign Explorers in Xinjiang, 1927–1935, in: *Journal of Asian Studies* 73 (2014) 1, pp. 43–64.

49 M. Leutner, Helden, ihre Kämpfe und ihre Siege – Sven Hedin und Wilhelm Filchner in China und Zentralasien, in: W. Kubin (ed.), *Mein Bild in deinem Auge: Exotismus und Moderne: Deutschland – China im 20. Jahrhundert*, Darmstadt 1995, pp. 83–102.

50 See for example the recollections of the Austrian lepidopterologist and botanists Heinrich von Handel-Mazzetti about his trips in Yunnan and Hunan in the 1910s: H. von Handel-Mazzetti, *Naturbilder aus Südwest-China: Erlebnisse und Eindrücke eines österreichischen Forschers während des Weltkrieges*, Wien 1927.

51 *Bowu zazhi* [Beijing] 1 (1919), pp. 24–26, 26–30; 2 (1920), *baogao*, pp. 1–20. There are many more such reports of expeditions to the surroundings of Beijing in the *baogao* section of all issues up to 1925 when the journal seized publication.

52 E. g., *Contributions from the Biological Laboratory of the Science Society of China* 1 (1925) 1, pp. 1–11; 1 (1925) 3, pp. 1–3; 7 (1931) 4, pp. 173–175; 7 (1931) 2, pp. 65–67.

53 Lijing Jiang, Retouching the Past with Living Things: Indigenous Species, Tradition, and Biological Research in Republican China, 1918–1937, in: *Historical Studies in the Natural Sciences* 46 (2016) 2, pp. 154–206.

54 Luo Guihuan 罗桂环, *Minguo shiqi dui Xifang ren zai hua shengwu caiji de xianzhi* 民國時期對西方人在華生物採集的限制 (The Restrictions on Collecting Animal and Botanical Specimens by Westerners in Republican China), in: *Ziran kexue shi yanjiu* 30 (2011) 4, pp. 450–459.

only reasons. In part, the choice of local over distant fauna was a conscious decision. Having graduated mostly from US universities before returning to China, the young zoologists were painfully aware that the 1877 dictum by von Möllendorff, quoted in length above, still held true in the 1920s: that “an exhaustive knowledge of the Fauna Sinensis” was still lacking. And while long-distance expeditions might still lead to the more prestigious discovery of large mammals such as the Great Panda, the skin of which had first been collected by Jesuit missionary Armand David (1826–1900) in Sichuan province in 1869, or unknown varieties of the takin, a goat-antelope, in Tibet in 1907 and 1911, a wealth of less impressive yet far more easily accessible species waited to be inscribed into the Linnaean system.<sup>55</sup>

In terms of geographical scope, it was only in the early 1930s that Chinese zoologists began to conduct expeditions to more distant places within China. The Nanjing decade brought along more stable political conditions, making long-distance travel more comfortable and, above all, safer. In addition, in 1928, Academia Sinica was called into being, a national research body providing scientists with more personnel, institutional support, and financial means. Thus, the Metropolitan Museum of Natural History, founded by Academia Sinica in Beijing in 1930, could envision building a comprehensive taxonomic collection of animals from all of China. To this end, the museum planned to henceforth send out collecting teams to every province twice annually.<sup>56</sup> Already in 1928, Beijing had witnessed the founding of the influential Fan Memorial Institute of Biology (*Jing-sheng shengwu diaochasuo* 靜生生物調查所).<sup>57</sup>

This leads us to the difference in thematic foci. While in the West, the early twentieth century witnessed a turn to experimental biology, Chinese zoologists concentrated on taxonomy, that is, the description of species of animals.<sup>58</sup> While different in methods and terminology, such an interest in the appearance of animals was very much in line with the elder works on animals treated above. Secondly, it was due to the gap just described – remember Xue Fengchang’s 1915 claim that China must have as many species as Europe or America. Thirdly, the interest in taxonomy was born out of Chinese nationalism reaching new heights in the 1920s. Completing the catalogue of indigenous, local species was meant to bring China on an equal footing with the more advanced nations, to open up new economic potential, and to foster pride in things local, and ultimately in the nation.<sup>59</sup> Consequently, while studying the local fauna in the early 1920s, scientists at

55 E. Songster, *Panda Nation. The Construction and Conservation of China’s Modern Icon*, New York 2018, pp. 11–13; E. Schäfer, *Unbekanntes Tibet: Durch die Wildnisse Osttibets zum Dach der Erde*, Berlin 1937, p. 1.

56 Sinensia: Contributions from the National Research Institute of Zoology and Botany, Academia Sinica, 1 (1929) 1, Preface.

57 D.Y. Hong/S. Blackmore, *Plants of China: A Companion to the Flora of China*, Cambridge, UK 2015, pp. 237–239. On the Fan Memorial Institute, see Hu Zonggang 胡宗剛, *Jingsheng shengwu diaochasuo shigao* 靜生生物調查所史稿 (Historical Manuscript of Fan Memorial Institute of Biology), Jinan 2005.

58 L. A. Schneider, *Biology and Revolution in Twentieth-Century China*, Lanham 2003, pp. 37–38; L. K. Nyhart, *Biology Takes Form: Animal Morphology and the German Universities, 1800–1900*, Chicago 1995, p. 243; Jiang, *Retouching*, pp. 195–196.

59 The reasoning behind this was not unlike the textbooks on local customs and conditions introduced by the

Nanjing's Biological Laboratory of the Science Society of China were keen to emphasize that they were researching the *nation's* animals rather than those of Jiangsu province.<sup>60</sup> While China remained politically fractured, its animals – and nature more generally – were meant to testify to the existence of a unified nation.<sup>61</sup> And not only that: Modern, scientific research on the nation's fauna and flora, argued the early biologists, would directly help to unify and safeguard that nation. Biology could be put to direct use by protecting citizens' health through better crops and livestock, and by improving hygiene through fighting bacteria and vermin such as *Schistosoma japonicum*, the parasite causing snail fever.<sup>62</sup>

As Lijing Jiang has recently demonstrated, this concern with the nation influenced the working style of China's zoologists in yet another respect, again linking them more closely to those earlier Chinese ways of studying animals they claimed to be so distant from. In order to get a better grasp of the local fauna, zoologists turned to old books and local gazetteers from imperial times, including but not limited to Li Shizhen's *Bencao gangmu*.<sup>63</sup> What is more, even their style of writing about research trips and biological discoveries – including poems on plants and mountains – at times was reminiscent of that of “traditional poets and scholars”.<sup>64</sup> Investigated closely, the lengthy and poetic reports – quoted above as proof of the rise and importance of fieldwork – simultaneously preserved some elements of the world of traditional Chinese scholarship. Far from seamlessly replacing Chinese ways of studying animals, *dongwuxue* turned out to be a hybrid of zoology and *bowu* studies.

This is also evinced by certain features of the early biological journals. Those of the 1910s, in particular, contained rubrics which illustrated the earlier connection between natural and textual scholarship or were typical for the early Chinese press: readers' questions to the editor complete with answers, “natural studies short stories” (*bowu xiaoshuo* 博物小說) and even “natural studies jokes” (*bowu xiaotan* 博物笑談).<sup>65</sup> It is perhaps little wonder that to a

Ministry of Education in the last years of the Qing dynasty, see Ching May-bo 程美寶, *You aixiang er aiguo. Qingmo Guangdong xiangtu jiaocai de guojia huayu* 由愛鄉而愛國: 清末廣東鄉土教材的國家話語 (To Love my Native-Place, to Love my Country. The National Discourse on Native-Place Textbooks in Late Qing), in: *Lishi yanjiu* 4 (2003), pp. 68–84.

60 Jiang, *Retouching*, pp. 176–177.

61 Fan, *Nature and Nation*, p. 437; Songster, *Panda Nation*, pp. 24–28 and *passim*.

62 Statement on the tenth anniversary of the Biological Laboratory of the Science Society of China, 1932, quoted in: Hu, *Jingsheng shengwu diaochasuo*, p. 6. The same idea led to the Japanese inspired establishment of agricultural experiment stations during the last years of Qing rule. See P. Lavelle, *Agricultural Improvement at China's First Agricultural Experiment Stations*, in: D. Phillips/S. Kingsland (eds.), *New Perspectives on the History of Life Sciences and Agriculture*, New York 2015, pp. 323–344. On the “scattered and unsystematic” beginnings of the fight against schistosomiasis or snail fever in Republican times as well as the much more successful campaigns after 1949, see M. Gross, *Farewell to the God of Plague: Chairman Mao's Campaign to Deworm China*, Oakland 2016, pp. 6–7 and *passim*.

63 Jiang, *Retouching*, p. 182.

64 *Ibid.*, p. 173.

65 Those appeared regularly in *Bowuxue zazhi* since 1914.

historian in search of the “progress” of biology in China, such elements qualify the earlier journals as merely “science disseminating” (*kepu* 科普) rather than truly “scientific”.<sup>66</sup>

## Foreign Zoologists and Chinese Nationalism

While Chinese zoology began extending its reach to every corner of the Republic, the degree of internationalization in animal research also rose. Supported financially by the China Foundation for the Promotion of Education and Culture (*Zhonghua jiaoyu jijinhui* 中華教育基金會) and thus the United States’ Boxer Indemnity Fund, the Nanjing based Biological Laboratory of the Science Society of China had begun to publish its aforementioned journal primarily in English in 1925 already, with the stated aim of making the voice of Chinese zoologists heard internationally and thus help them to become recognized as equal members in the international academic community.<sup>67</sup> Yet internationalization by no means meant overcoming national borders but rather standing the nation’s ground in competition with research conducted in other nations.

The Science Society’s initiative soon bore fruit when the leading British journal *Nature* recognized the Contributions for having placed Nanjing’s Biological Laboratory on the international scientific stage.<sup>68</sup> From 1929 on, Academia Sinica’s National Research Institute of Zoology and Botany followed suit with its journal *Sinensia*. Beginning in 1935, the newly founded Chinese Journal of Zoology published articles in Chinese, English, German, and French. More and more of these articles were authored by non-Chinese zoologists. What is more, Chinese zoologists also wrote about their research using animal specimen which had been collected by foreigners in China and were now stored in museum collections in Europe.<sup>69</sup> Others had such collections sent back to China for inspection. In 1933, for example, a certain S. H. Chen in Beijing analysed several specimens of ants which had been collected by German zoologist Rudolf Mell (1878–1970) in Guangzhou a few years earlier and then taken to Berlin’s Museum of Natural History. In Beijing that same year, there appeared an article on a new species of nematode (or threadworm) which had been taken from the bowels of a walrus at Hagenbeck’s zoo in Hamburg, Germany, and sent to the Chinese author.<sup>70</sup>

While Chinese zoologists thus became more and more intertwined with the international scientific community without fully leaving behind their inherited working styles and thematic foci, Western zoologists working in China after 1900 indeed almost fully ignored earlier Chinese research on animals. Otto Franz von Möllendorff in the 1870s

66 Xu, *Zhongguo jindai zui zao*, p. 963.

67 *Ibid.*, p. 965.

68 *Ibid.*

69 H. S. Wu, On Some Fishes Collected from the Upper Yangtse Valley, in: *Sinensia* 1 (1930) 6, pp. 65–86.

70 S. H. Chen, Some Species of Helticinae from Canton, in: *The Peking Society of Natural History Bulletin* 8 (1933/34) 1, pp. 43–58; H. F. Hsü, A New Nematode, *Anisakis Alata*, from the Walrus, *ibid.*, pp. 59–63.



and Bernard E. Read in the 1930s were among the rare exceptions who, albeit in critical fashion, grappled with the Chinese tradition at all.

That the vast majority of Western scientists did not care about earlier works anymore also had to do with a change in the group of people who conducted research in China. Until the end of the nineteenth century, this had mostly been composed of missionaries like Armand David, and of diplomats who pursued the recognized avocation of collecting plants and animals in their spare time.<sup>71</sup> Yet after 1900, academically trained zoologists were to take the reins, usually in the context of expeditions sent out for research purposes only. Unlike their predecessors, these (almost exclusively) men did not possess any command of the Chinese language. By which name the Chinese called a given species was relevant to them only insofar as the communication with indigenous hunters and collectors demanded such knowledge. Into the 1940s, the majority of foreign expedition reports therefore mention Chinese only as anonymous hunters, servants or other subalterns.<sup>72</sup>

In 1932, Roy Chapman Andrews (1884–1960), who on behalf of the American Museum of Natural History undertook hunting expeditions in China and Mongolia, was among the first to acknowledge the skills of his Chinese – again – assistants. It needs to be noted, however, that Andrews claimed part of the merit for himself since he had chosen the assistants and sent some of them to the United States for further training.<sup>73</sup>

In 1929, the German geographer Günther Köhler (1901–1958), who would go on to a career at various Chinese universities, thanked a Chinese colleague for providing access to certain maps.<sup>74</sup> Yet overall, Western authors seemed to take little notice of the rapid expansion of science going on in China itself, or at least preferred not to give it much prominence. In that respect, the nineteenth century continued. And if Fan Fa-ti rightly argues that despite their invisibility in most written sources, Chinese hunters, collectors and translators in the nineteenth century did play a vital role for the research conducted by foreigners in China, this is even more true for Chinese zoologists in the early twentieth century – even though they, too, usually went unmentioned.<sup>75</sup>

Yet the ignorance, and sometimes arrogance, of Western scientists must also be seen in the context of increasing international competition. While Western zoologists downplayed the contributions of their Chinese colleagues, the latter sought to stand their ground by dissociating themselves from the former. In seemingly paradox fashion, and just as in many other areas, the increasing internationalization of zoology fostered a

71 Fan, *British Naturalists*.

72 R. C. Andrews, *Across Mongolian Plains: A Naturalist's Account of China's "Great Northwest"*, New York 1921, p. 270; Handel-Mazzetti, *Naturbilder*, pp. xiii, 250–251, 357–358; A. Caradja, *Materialien zur einer Mikrolepidopterenfauna des Mienshan, Provinz Shansi, China*, in: *Deutsche Entomologische Zeitschrift "Iris"* 53 (1939), pp. 1–15; A. Caradja, *Materialien zu einer Mikrolepidopterenfauna des Yangtsetales bei Batang*, in: *ibid.*, pp. 15–26.

73 R. C. Andrews (ed.), *The New Conquest of Central Asia: A Narrative of the Explorations of the Central Asiatic Expeditions in Mongolia and China, 1921–1930*, New York 1932, p. 12.

74 G. Köhler, *Der Hwang-Ho: Eine Physiogeographie*, Gotha 1929, Preface and p. 203. On Köhler's career in China, see W. Fuchs, *Günther Köhler in memoriam: 1901–1958*, in: *Oriens Extremus* 5 (1958) 2, pp. 246–251.

75 Fa-ti Fan, *Science in Cultural Borderlands: Methodological Reflections on the Study of Science, European Imperialism, and Cultural Encounter*, in: *East Asian Science, Technology and Society*, 1 (2007) 2, pp. 213–231.

longing for national identity and self-reliance.<sup>76</sup> It was this aim – national, anti-imperial self-assertion – which in practical terms made it imperative for Chinese scientists to keep the foreign agents of science at bay, even though science itself was praised as saviour of the nation.<sup>77</sup> Taking the lead were Chinese archaeologists – again, most of them educated in the United States – who succeeded in lobbying the Beijing government to prevent the export from China of archaeological findings dug up by foreign expeditions.<sup>78</sup> Such regulations soon were extended to foreign expeditions of any kind. Chinese zoologists, too, made the governments in Beijing and later in Nanjing put heavy restraints on foreign zoological and botanical expeditions.<sup>79</sup> To justify their initiative, the eminent biologist Bing Zhi (秉志, 1886–1965), who had graduated from Cornell University and, in 1921, been among the founders of China's first Institute of Biology at Nanjing University, in 1934 argued as follows:

*European and American scientific bodies frequently send out expeditions to China in order to collect animals and plants. They are not greedy but spend enormous amounts of money, travel thousands of kilometres, do not shy away from hard labour and thoroughly reflect upon their research. [The result is that] foreign biologists ship rare treasures out of our country, investigate them and present their findings to the world in important publications. We Chinese must stand up [against this] according to our own plan. We want to till the field on our own, so as to bring in the good harvest ourselves.*<sup>80</sup>

The restrictions which Academia Sinica, with support from the government, henceforth placed on foreign biologists were meant to serve precisely this end. When, for instance, in 1930, an expedition headed by German zoologist Hugo Weigold (1886–1973) and financed by the Museum of the Academy of Natural Sciences in Philadelphia planned to collect specimen of animals and plants in the south-western provinces of Yunnan and Sichuan, Weigold first had to sign a list of terms and conditions in Shanghai. Among other proscriptions, members of the expedition were not allowed to export cultural goods and had to let the Academia inspect any naturalia they wished to take home. The Academia itself was allowed to dispatch several of its own men to accompany Weigold's team. Taking pictures and shooting film had both to be explicitly permitted by the respective local government first; no pictures or film scenes were to be permitted which could "harm the dignity of the Chinese people"; any recordings had to go through inspection by both the ministry of education and the ministry of the interior prior to leaving the country. Most importantly, the expedition team as a gift had to leave two complete sets of all specimen

76 S. Conrad / K. Mühlhahn, Globale Mobilität und Nationalismus: Chinesische Migration und die Re-Territorialisierung des Nationalen um 1900, in: B. Schäbler (ed.), Area Studies und die Welt: Weltregionen und neue Globalgeschichte, Wien 2007, pp. 217–251.

77 Xu, Zhongguo jindai zui zao, p. 965.

78 Shen, Unearthing.

79 Xu, Zhongguo jindai zui zao, pp. 964–965.

80 Bing Zhi 1934, quoted after Luo, Minguo shiqi dui Xifang ren, p. 451.

they would collect with the Academia. Should members of the expedition breach these conditions, the government could ban them from later re-entering China.<sup>81</sup>

Three years earlier, the then rivalling government in Beijing had permitted the Swedish explorer Sven Hedin (1865–1952) to lead an expedition to the Central Asian province of Xinjiang under similar terms, again under pressure from Academia Sinica. Regardless of the government's agenda behind these measures – by granting the expedition, Beijing wanted to demonstrate that Xinjiang, then controlled by a warlord opposed to the expedition, remained under the jurisdiction of the centre – the international community of scientists was alarmed.<sup>82</sup> Petermann's *Mitteilungen aus Justus Perthes' Geographische Anstalt*, the internationally leading journal of explorers, printed a German translation of the contract signed by Hedin. Walter Stötzner (1882–1965), a German zoologist and anthropologist, upon entering China to explore the provinces of the North-East, had to agree to similar terms. In Petermann's *Mitteilungen*, Stötzner wrote that he fully understood that the Beijing government was banning the export of cultural relics. Animals and plants as well as ethnographic objects and recordings, however, to Stötzner presented an entirely different matter:

*Pondering on all the justifications [presented by the Chinese government], one has to concede that the 'Young Chinese' are quite right to demand the conclusion of certain agreements with the foreign explorers. Yet just like the Young Nationalists and Fascists of all countries including the European ones, in their nationalist idealism and their enthusiasm to fight for the nation's goods, they somewhat overshoot their target. [...] Animals and plants and primitive peoples can never and will never be exterminated nor even reduced in number by those few explorers. It is only the Chinese colonist himself who by advancing into the untouched wilderness, bringing his culture with him, is endangering the abundant amount of natural scientific and ethnographic national goods. [...] It is thus high time for natural scientists and ethnographers to get to work here [in Manchuria] in order to collect and observe in the service of all peoples' non-partisan science ('parteilose Wissenschaft aller Völker') before it is too late. It needs to be said, too, that for such work a sufficient number of young Chinese scientists does not yet exist [...], in particular zoologists and anthropologists.*<sup>83</sup>

That Stötzner did discuss those contracts at all is significant insofar as the sheer mentioning of such bureaucratic hindrances did not fit well with the still dominant image of the adventurous Westerner setting out to explore an untouched wilderness.<sup>84</sup> To protect such an image, Western authors usually chose to mention neither contracts with the government nor contributions by their Chinese colleagues. For example, most Western-

81 Luo, *Minguo shiqi dui Xifang ren*, pp. 451–452.

82 For details of Hedin's expedition and the respective agendas of the central government and Xinjiang's warlords, see Jacobs, *Nationalist China's "Great Game"*, pp. 45–52.

83 W. Stötzner, *Die Verträge mit den fremden Forschungsreisenden in China*, in: Dr. A. Petermann's *Mitteilungen aus Justus Perthes' Geographischer Anstalt* 73 (1927), pp. 294–298, on p. 295.

84 Leutner, *Helden*.

language publications which were to result from Sven Hedin's "Central Asian Expedition", lasting from 1927 to 1930, did not mention Xu Xusheng (徐旭生, 1888–1976, also known as Sü Ping-chang) although Xu, dean and professor of history at Peking University, had been appointed by Academia Sinica as an equal co-leader of the expedition.<sup>85</sup> Writing in 1937, just when Chinese sovereignty came under even more serious attack from Japan, the young German zoologist and SS-member, Ernst Schäfer (1910–1992), again did not mention the contracts. Instead, in the foreword to his report on an expedition into Tibet, Schäfer again celebrated the kind of self-image that Chinese scientists and politicians found so appalling, and which at the same time echoed their own linking of science with nationalism:

*The time of the great geographic discoveries might be gone [...]. Yet whoever possesses the will to be a pioneer and the idealism enabling him to endure hardship, and whoever takes pride in labouring for the mother country abroad and in wilderness – all of these will still be drawn with the same furiousness to the white spots on the map of the earth, for science, and for Germany!*<sup>86</sup>

To counter such ambitions, in 1927 already, Academia Sinica had explicitly argued against Hedin's expedition that its name alone meant an insult to Chinese sovereignty. After all, the word "expedition" implied to do scientific research by "foraging into dangerous territory in military fashion", although the territory in question undoubtedly belonged to the territory of the Republic of China. Would, the Academia's statement asked rhetorically, Sweden be willing to grant permission to a Chinese "expedition" into its territory?<sup>87</sup> As much as such an argument was directed against any warlord's claim to independence from Beijing (or, soon, Nanjing), it was equally directed against any foreign scientist implicitly casting doubt on the pre-eminence of the government of the Republic of China.<sup>88</sup> Again, we see how the political context and the quest for power shaped the rhetoric of scientists, scientific policies, and thus scientific results themselves and the ways these would be arrived at (or not).

Yet pride in a fragile national sovereignty – disputed by warlords as well as, if implicitly, by foreign explorers moving about at will as if China was a formal colony – was not the only factor driving Chinese zoologists' lobbying for protective measures. Another one I can only hint at here was the beginning of a Chinese environmental protection movement. This, too, was closely linked to nationalism and the idea that the government should guard the nation's natural treasures. Zoologists criticizing the government for doing too little on this front found themselves vindicated when in 1936, American

85 For a rare exception, see Königlich Schwedische Akademie der Wissenschaften (ed.), *Zur Arthropodenwelt Nordwest-Chinas: Sammlungen Dr. David Hummels in den Jahren 1927–30: Insecta, Myriopoda, Arachnoidea*, Stockholm 1937. Also see Jacobs, *Nationalist China's "Great Game"*, p. 46.

86 Schäfer, *Unbekanntes Tibet*, p. iii.

87 Quoted after Stötzner, *Verträge*, p. 298.

88 Jacobs, *Nationalist China's "Great Game"*, somewhat underscores this second dimension of the Academia's claim to sovereignty, targeting external instead of internal forces.

textile designer and self-made animal catcher Ruth Harkness (1900–1947) succeeded in bringing out of China the first live Great Panda ever, against the fierce resistance of Academia Sinica. Harkness' commercial success was however of such magnitude that she as well as others returned to catch at least eleven more baby Pandas over the next two years, shooting the mothers first. In 1939, in the midst of fighting against Japan, the academy finally pressured the Chinese government to ban the export of live rare animals.<sup>89</sup> This arguably laid the foundation for the ambitious Panda protection and breeding program the Peoples Republic would install only in the 1960s, and for the Panda's eventual rise as China's national icon.<sup>90</sup>

Lastly, as the duty to hand over full sets of collected specimen to Academia Sinica demonstrates, another important factor was the international competition for scientific prestige by being the first to add a certain species to the Linnaean system. Already in the eighteenth century, scientists had been confronted with a problem: Often it was not decisive who had first tracked down and shot (or else collected) a certain animal, but rather whose finding had first made it back to Europe and been described in a scientific journal.<sup>91</sup> The Austrian lepidopterologist and botanist Heinrich von Handel-Mazzetti (1882–1940) was in a rage when in 1917, China's entry into the First World War meant that his collection of butterflies from South China only reached Vienna with more than a year's delay. In the meantime, rivalling zoologists had already described the species Handel-Mazzetti had collected.<sup>92</sup> As expressed in Bing Zhi's statement quoted above, this was exactly the kind of competition which Chinese biologists were trying to enter into. Hence, they began conducting their own, if small-scale, expeditions and issued their own, sometimes foreign-language scientific journals, which reached university libraries from Berlin to Cornell through subscriptions or publication exchange and were meant to ensure that Chinese biologists' discoveries would be recognized as such. In addition, they tried to keep their foreign competitors, who doubtless were superior in terms of financial means and number of educated personnel, at bay by way of the treaties described – all with the aim in mind to become first-time describers and thus name-patrons for a species of animal or plant.

## Conclusion

In a recent interview, historian Luo Zhitian, commenting on China's early twentieth century transformation, stated:

89 Luo, *Minguo shiqi dui Xifang ren*, pp. 455–457; V. C. Croke, *The Lady and the Panda: The True Adventures of the First American Explorer to Bring Back China's Most Exotic Animal*, New York 2005.

90 This programme's story is told in Songster, *Panda Nation*.

91 A. Mariss, "A world of new things": *Praktiken der Naturgeschichte bei Johann Reinhold Forster*, Frankfurt a. M. 2015, pp. 72, 220.

92 Handel-Mazzetti, *Naturbilder*, p. 357.

*[M]odern China indeed exhibited a general tendency toward change outside its own tradition [...]. This is understandable, because our tradition did not help us win wars in modern times. [...] The Chinese discarded classical studies and scholarship because they were deemed useless and even obstacles to China's search for wealth and power. Not surprisingly, in their eagerness to embrace the new world, many educated Chinese were quite ready to abandon their tradition so that they could travel light into the new world.<sup>93</sup>*

Light they did travel, yet not weightless. The example of zoology from the 1900s to the 1930s demonstrates that in the process of transfer, knowledge inevitably was transformed. In order for us to see that transformation, however, early twentieth century Chinese *dongwuxue* requires a particularly close look. After all, many Chinese scientists did their utmost to cover up any traces that would link the newly coined *dongwuxue* back to the Chinese scholarly tradition instead of “zoology” as they had encountered it whilst studying abroad. As suggested by Luo Zhitian, probably many of them truly believed they were doing something entirely new. Also, as my brief overview has shown, the state of animal research in China prior to the turn of the twentieth century certainly helped to create such an impression. Compared to other fields of knowledge – such as philology or hydraulics – earlier Chinese research on animals provided relatively little ground for claiming an equal status with zoology as it was practiced in the West. While the amount of texts related to animals, from the *Shanhaijing* to large numbers of *pulu*, was far larger than earlier research has assumed, those sources were also very diverse in their principles of classification.

Consequently, by the 1920s, Chinese adherents of *dongwuxue* increasingly claimed to be disconnected from the past. As we have seen, such distancing was at least equally induced by the newness of their subject and the way they would treat it as it was induced by the young scientists' desire to help the late nineteenth century slogan of making China “rich and strong” finally come true. Now science, as a distinctively Western method, for many was their tool of choice.

Yet as we turn away from rhetoric to look into the practice of *dongwuxue* as a “science in action”, we find several indications casting, perhaps unsurprisingly, doubt on the claim of complete newness. I have highlighted three of these. True, Chinese zoologists sought to set themselves apart from their predecessors through conducting hard fieldwork and publishing their findings in foreign languages. Still, firstly, their field trips mainly went to the immediate surroundings of their workplace, and even to local food markets. Lack of funds, personnel and a save environment for travel accounted for this – and yet the geographically narrow scope was also due to the biologists' desire to catalogue the entirety of the nation's animals, and not only the more spectacular ones to be found in far-off places. Secondly, the same desire also led Chinese zoologists – in contrast to the concurrent trend in zoology in Europe and America – to choose taxonomy over experimental bio-

93 Yanjie Zhao, Understanding Chinese History in the Context of World History. An Interview with Luo Zhitian, June 4, 2016, in: *Journal of Modern Chinese History* 10 (2016) 2, pp. 206–229, on p. 217.

logy. Thirdly, a close look at their publications reveals that even in terms of their style of writing, we can find many traces – or willful continuations – of China’s earlier scholarly tradition. Not only did zoologists, like the scholars of yore, write poems and poetic reports from the field, but also the early zoological journals continued to feature popular elements such as questions and answers as well as natural history short stories and jokes. If *dongwuxue* was in fact different from zoology in those respects, why would many Chinese nevertheless claim that it was not? Why would they, in line with the now outdated narrative of “diffusion”, portray their field of study as almost place- as well as timeless? The reason again lies in the wider political context which I have dealt with in the third section. In order for “science to save the nation”, Chinese scientists, including zoologists, had to get on an equal footing with their competitors from other nations. This foremost required that their occupation would be identified as nothing but (presumably) universal zoology, not any local variant. Having established such a bottom-line, Chinese zoologists could proceed to lobby the government to put restraints on foreign-led expeditions. Only such an exercise in Chinese sovereignty could make sure that Chinese zoologists would get a fair chance to move to the forefront of their discipline globally, and to assist national consciousness, cohesion, and well-being. Domestic political support thus proved decisive in promoting and shaping Chinese science.

Despite their eagerness, however, to demonstrate to the outside world that they were practicing “universal” zoology, Chinese scientists, at least in their Chinese language publications, continued to tap into certain stylistic and methodological conventions from imperial China’s scholarly tradition. Certainly, Chinese zoologists were “embracing the new world”, and science in particular, because they, as Grace Shen has argued, found science “useful”.<sup>94</sup> Yet embracing Western zoology did not equal dissolving oneself in it. Late imperial and Republican scientists, some wittingly, some unwittingly, built on earlier ways of writing about animals. While making fieldwork a core ingredient of their occupation, as we have seen, many continued to hold knowledge gathered by their forbearers in high esteem, and they continued to include poetry in their scientific contributions. They, in other words, were establishing *dongwuxue* as zoology with Chinese characteristics. Embracing Western science did not only not hinder but perhaps even necessitate such self-assertive behaviour. (Looking back from current, more outspoken and self-confident PRC-claims at a distinct Chinese way of meeting a range of challenges, this may not come as a surprise).

The story of *dongwuxue* thus demonstrates that it was possible to be both Chinese and scientific. While they were embracing Western science, Chinese zoologists did by no means annihilate their own scholarly roots. As a result, China’s early zoologists contributed to the creation of *dongwuxue* as an academic discipline that united features of both Western zoology and earlier Chinese ways of studying animals.

94 G. Shen, Murky Waters: Thoughts on Desire, Utility, and the “Sea of Modern Science”, in: *Isis* 98 (2007) 3, pp. 584–596, on p. 595.