Minakata Kumagusu in London: Challenging Eurocentrism in the Pages of *Nature*

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Abstract: The Japanese biologist and ethnologist Minakata Kumagusu has achieved a degree of celebrity in Japan for being the first Asian contributor to the British scientific magazine *Nature*. However, although Minakata's many contributions to *Nature* from 1893 to 1914 provided British readers with rare insight into Asian scientific achievements, he is seldom discussed in history of science scholarship produced by American, British and European researchers. In this article we examine Minakata's *Nature* articles to gain insight into how his encounter with the eurocentrism of British culture while living in London from 1892 to 1900 affected his intellectual development. We argue that having his articles published in *Nature* to gain scientific recognition was not Mintakata's real goal. Rather, we demonstrate that his *Nature* articles were connected to a larger project that inspired Minakata for much of his life, a descriptive sociology of Japan. For this descriptive sociology, Minakata wished to construct a new form of historical analysis that drew on past Asian sources, as well as anthropological and sociological perspectives learned from British philosopher of evolution Herbert Spencer and British anthropologists such as Edward Clodd, Edward Tylor and Andrew Lang. Minakata's writings reveal him to be much more than a conduit of information about Asia. He was also a pioneering global intellectual who sought to demonstrate how Asian science connected to, and even complemented, western science.

Keywords: Minakata Kumagusu; *Nature*; Herbert Spencer; evolution; transnational history; Japanese and British science

Introduction

Volume three of Joseph Needham's monumental multi-volume study *Science and Civilisation in China*, first published in 1959, was considered by him to represent the core of the 'work as a whole.' In this volume Needham, and his co-author Wang Ling, sought to 'elucidate the contributions of traditional Chinese civilisation to mathematics and to the sciences of the heavens and the earth—astronomy and meteorology above, geography and geology below.' However, they did not limit the discussion to Chinese science. Their primary goal was to explore 'the relation of mathematics to science in East and West.' In a section on star nomenclature, they dealt with the question: to what extent was there 'any similarity between Chinese and European recognition of asterisms and constellations'? Their answer was that there was very little likeness. A table showing how constellations developed in the west, when compared with corresponding parts of the sky in the Chinese planisphere, strongly suggested 'that the nomenclature of the Chinese constellations grew up in almost complete independence of the West.' For support on this point, Needham and Wang then referred to a Japanese figure who would have been unknown to their audience: Minakata Kumagusu. Minakata, they declared, shrewdly observed that there were no maritime names to be found in Chinese skies, 'for there is nothing corresponding to Cetus, Delphinus, Cancer, etc.' On the other hand, the bureaucratic nature of ancient Chinese civilisation was mirrored in the large number of star names referring to earthly officials.[1] Needham and Wang's reference was to an article by Minakata published in the late nineteenth century in the science journal *Nature*.[2] It is not surprising that Needham and Wang enrolled Minakata in their quest to bring the past scientific and technological achievements of China to the attention of an English audience. In his fifty articles published in the distinguished British scientific journal *Nature*, Minakata pursued a goal that shared much in common with that of

Needham and Wang in their *Science and Civilization in China*, but which provided an assessment of Asian science that differed from theirs in important respects.[3]

Although Minakata was a prolific contributor to *Nature* over a sixteen-year period, and although Needham and Wang referred to him in the third volume of *Science and Civilization in China*, he is still seldom discussed in history of science scholarship produced by American, British and European researchers. However, a transnational study of nineteenth century Japanese and British science cannot afford to ignore him. In this article we will focus primarily on the articles that Minakata wrote for *Nature* from 1893 to 1914. This will allow us to examine how living in London from 1892 to 1900 affected Minakata's intellectual development in this period in his life as he grappled with the eurocentrism of British culture. Minakata achieved a degree of celebrity at the time for being the magazine's first Asian contributor and for his articles which provided rare insight into Asian scientific achievements. But having his articles published in *Nature* to gain scientific recognition was not his real goal. His *Nature* articles were connected to a larger project that inspired Minakata for much of his life, a descriptive sociology of Japan. For this descriptive sociology, Minakata wished to construct a new form of historical analysis that drew on past Asian sources, as well as anthropological and sociological perspectives learned from British philosopher of evolution Herbert Spencer and British anthropologists such as Edward Clodd, Edward Tylor and Andrew Lang. The research that Minakata undertook at the British Museum for this larger project can be seen in his *London Extracts*, fifty-two volume notebooks of transcriptions. Minakata drew from this research to produce his *Nature* articles, which educated British audiences about the importance of Asian science, past and present. Therefore, Minakata is important not just because he was the first Japanese contributor to the British scientific magazine *Nature*. He is significant because of his role as pioneering global

intellectual who sought to place Asian science on a par with western science, when the epistemic and cultural prestige of western science was beginning to look impregnable in both Britain and Japan.[4]

The Life of a Japanese Wanderer

Minakata Kumagusu was born in 1867 to a merchant family of devout Shingon Buddhists in the castle city of Wakayama on Japan's Kii peninsula. The many biographies of Minakata invariably point out that he displayed exceptional memory and intellectual curiosity from a young age. It is said that, by the age of thirteen, he had already read, transcribed, and memorized several canonical multi-volume Japanese and Chinese encyclopaedias.[5] Encouraged by these early displays of academic prowess, his father sent him to Tokyo at the age of sixteen to attend a preparatory school that would enable him to sit entrance exams for the University of Tokyo, which became part of the Imperial University in 1886.[6] The elder Minakata's ambition for his son did not turn out as planned. Minakata did enter the University of Tokyo Preparatory School but failed an important examination there and dropped out of school. (Figure 1) This marked the beginning of a peripatetic spell for Minakata. He persuaded his father, who was now very wealthy, to fund his studies in the United States, and enrolled at a business college in San Francisco. However, once there, Minakata decided to move: first to Chicago, then to Michigan, Florida, and eventually the Caribbean. In 1892, after six years of nomadism, he boarded a ship for Liverpool before making his way to London, where he would live a relatively, and uncharacteristically, settled existence for the next eight years. It was from there that he contributed most of his articles to the weekly science magazine *Nature*.

Figure 1. The Younger Minakata, courtesy of the Minakata Kumagusu Archives, Tanabe, Japan

The reading room at the British Museum provided a base for Minakata's academic activities. He applied for readership in the library on April 10th, 1895, three years after arriving in London. For the next three and a half years he visited the library almost every day, spending the whole afternoon there until the 8 o'clock closing time. The British Museum held rare books, many unavailable in Japan or anywhere else, that were essential for his grand project of a descriptive sociology of Japan. Minakata gained access to the British Library with the help of British friends who shared his scholarly interest in Asian culture. Charles Hercules Read (1857-1929), a museum curator, stood as guarantor for Minakata's readers pass to the British Museum reading room. He was assistant in the department of British and medieval antiquities and ethnography in 1895, and deeply involved in the Society of Antiquaries, the British Association for the Advancement of Science, and the Anthropological Institute.[7] Read's career had been encouraged by Augustus Wollaston Franks (1826-1897), collector and moving force behind the British Museum. It was Read who had introduced Minakata to Franks on September 22, 1893 as a young, learned Japanese scholar who could advise the Museum on its Oriental collection. Franks was deeply involved in the Society of Antiquaries, President of the International Congress of Archaeology and Anthropology, and Vice President of the Anthropological Institute. Franks introduced Minakata to Robert Kennaway Douglas (1838-1913), then Keeper of the Department of Oriental Printed Books and Manuscripts at the British Museum, just created in 1892.[8] When Douglas met Minakata, he was impressed by the range of Minakata's scholarship.[9] He offered Minakata permanent employment as an associate curator, but Minakata asked instead

if he could work on small projects, leaving time for his own research and preserving his independence.[10]

Minakata's status as the first Japanese contributor to *Nature* means that his London years have attracted considerable scholarly attention.[11] Recent work on this chapter of Minakata's life have sought to temper earlier, more ebullient, portrayals. These reassessments point out that *Nature* of Minakata's era was not the cutting-edge peer-reviewed international science journal of today. They also call attention to the fact that almost all of Minakata's contributions to *Nature* appeared in the correspondence column, rather than the bulletin section, where—implicit in the clarification—is where the 'real' science was published. In his monograph on Minakata's activities in London, Shimura Masaki argues that Minakata positioned himself as a useful intermediary for British readers, providing them with information on Asia from Japanese and Chinese sources that they could not themselves access.[12] Shimura points out that Minataka's first contribution, 'The Constellations of the Far East', would have been particularly appealing to *Nature*'s then editor, the amateur astronomer Norman Lockyer. Portrayals of Minakata as an 'informant' or 'cultural translator' position him as a conduit of information from the so-called 'East' to the west.[13] Although Minakata scholars do not use the term, their descriptions cast him in the mould of the 'go-between': an individual who acts as a bridge between intellectual traditions thereby enabling new knowledge to arise.[14]

One by-product of the immense volume of Japanese scholarship on Minakata is its fragmentation. Minakata's *Nature* articles tend to be treated in isolation from his other writings, which span fields as broad as folklore, Buddhism, heritage, mycology and sexology. But for Minakata these were overlapping projects that he often pursued simultaneously. Minakata developed and mobilized a correspondence network to advance his intellectual pursuits. He

frequently corresponded with the Buddhist priest Toki Hōryū—so much so that the reprints of their correspondence fills a hefty volume; received visits from and engaged in extensive dialogue with fellow biologists, including the Russian entomologist Baron Osten-Sacken; and called on associates in Japan to supply him with books, even asking one, Murayama Eisaku, to travel to verify information in a rare book in Japan on his behalf.[15] He also saw his British associates as resources. He would solicit information from *Nature*'s readers when he reached a dead end in his research and called in favours from British Orientalists after his return to Japan.[16] Though Minakata hinted at these networks in his *Nature* articles, these relationships were not cultivated with the magazine's readers foremost in his mind. This is where characterisations of Minakata as a go-between falter. Minakata was not simply an enabler of other's endeavours. Rather he aimed to position himself at the centre of his own network, much like a spider at the centre of its web. In this respect, he can be viewed in a similar vein to Charles Darwin who, in the words of Janet Browne, used his networks of correspondence to make his home 'into a centre of administration and calculation, in which he churned out requests for information and processed answers.'[17] The historian James Secord has depicted Charles Darwin as a new breed of intellectual, who travelled around the world during the Beagle voyage and then later built an international correspondence network that allowed him to 'vicariously travel the globe'. However, Darwin was not the only 'characteristic figure of the first great age of globalisation.'[18] There were many others in this period—not born and bred Englishmen—who can also be seen as characteristic of the era. Minakata was one of them. He too participated in the global discourse about science through his correspondence, the range of his research, and the cross-cultural thrust of his writings. While for Darwin it was a stately home in Kent that he turned into his 'intellectual factory', for Minakata it was a cramped bedsit in Kensington.

Minakata's Audiences

Minakata had been an enthusiastic reader of *Nature* since his time in the United States. (Figure 2) He took out a subscription after his move to Michigan. He read the journal for forty-five years, during his time in London and after he returned to Japan, until he cancelled his subscription in 1932.[19] Japanese scholars have already pointed to the significance of the *Nature* articles. Shimura considers whether Minakata's articles found a comfortable home in *Nature* due to Norman Lockyer's interest in archeoastronomy.[20] Lockyer, as editor of the journal, would have been involved in any decision to publish a submitted piece. However, although Minakata's first article on the constellations of the Far East was relevant for archeoastronomy, the subsequent pieces were primarily on natural history and folklore, not astronomy. Moreover, it is not clear that Lockyer was particularly interested in Minakata's work. As Shimura has pointed out, Lockyer refused to intervene when Minakata was expelled from the British Museum. In 1919, years after leaving England, Minakata wrote to a correspondent that he had met Lockyer and he was an old man of unparalleled arrogance.[21]

Figure 2 Minakata's signed copy of an issue of *Nature*, courtesy of the Minakata Kumagusu Archives, Tanabe, Japan

If Minakata's attention to archeoastronomy was not the primary reason for *Nature* to be attracted to his work, what was? It is more likely, as some Minakata scholars have argued, that he was seen as a rare source of information on the 'Far East'.[22] In 1925 Minakata himself stated in a letter that his contributions to *Nature* were meant to introduce Westerners to the existence of

Eastern scientific traditions of the past.[23] Shimura has discussed how during the period in which Minakata was submitting his work to *Nature* there were nine other articles published that dealt with Japan or Asia. The publication of Minakata's articles were part of a broader effort in the journal to communicate about science in Asia to British readers.[24] However, Minakata's pieces stood out for two reasons. First, the other articles on Japan were written by western contributors based in Japan and focused primarily on phenomena they had studied, such as earthquakes and volcanoes. In her study of the history of *Nature*, Melinda Baldwin has shown that the journal did not begin to include scientists outside Britain's borders until the early twentieth century. At the end of the nineteenth century *Nature* was still a publication by and for British men of science.[25] Second, none of the other articles aimed to explore the history of Asian science; neither did they attempt to compare western to Asian science. Minakata was not just trying to inform the British audience about western scientific developments in modern Asia. He sought to encourage a reassessment of Asian science by attempting to counter the British perception of Asia as lagging far behind western science.[26] Minakata is unique in how he tried to refute eurocentrism in the pages of *Nature*, one of the most influential scientific journals for the British reading audience.

Minakata's critique of eurocentrism was directed not only at the readers of *Nature*, but also at those in Japan who treated western science as a privileged system of knowledge. The Japan of Minakata's youth was a country marked by profound societal upheaval. The Meiji Restoration of 1868, which occurred just one year after Minakata's birth, ushered in a political regime that saw western science as a means of cementing its authority. This was in response to an emerging geopolitical reality. Japan now had semicolonial status as a result of being subject to unequal treaties with European and American powers. In response, the Meiji government turned to western institutions—and science—as models for reform. One of their main initiatives for

building the foundations of modern science in Japan came when Minakata was ten years old with the establishment of Japan's first university, the University of Tokyo. The primacy of western science in this institution was clear from its outset: of the fifteen professors hired in the department of science, only three were Japanese. Naturally, these American and European teachers—among them the zoologist Edward Morse—brought with them an approach that 'reflected, in both style and method, the way science was being studied and taught in the West.'[27] The transformation was therefore not merely institutional but epistemic, and it resulted in the marginalisation of a repository of texts and methods that had long been the bedrock of Japanese intellectual life. Minakata aimed to bring these texts back to the forefront of the Japanese consciousness as well as to the eyes of *Nature*'s readers.

For the most part, the works that saw their stock tumble were from the *materia medica* (*honzōgaku* in Japanese) tradition. *Honzōgaku* was a totalising epistemic system that aimed at no less than the systematic ordering of all knowledge about nature in accordance with Neo-Confucian cosmology.[28] The foundations of this epistemic tradition can be traced to China. Indeed, the 'entire field of nature studies in early modern Japan began with the introduction of a Chinese encyclopaedia, Li Shizhen's *Bencao gangmu* (Systematic Materia Medica).'[29] This work, originally published in Nanjing in 1596, was brought to the attention of a Japanese audience thanks to an edited version prepared by the scholar Hayashi Razan in the early seventeenth century. This in turn served as a template for a raft of Japanese works, many of which adopted the similar titles (*Bencao gangmu* is pronounced *Honzō kōmoku* in Japanese). The major innovation of Li Shizhen's work was its organisational principles that created a hierarchy of all that existed in the world. All natural things were grouped into sixteen major 'kinds', which were in turn divided into smaller categories, which were then further divided into 'species'.[30]

This systematic method of ordering the known world was one of the first casualties of the introduction of western sciences as it was replaced, in large part, by the scientific taxonomy derived from Carl Linnaeus.

Minakata was critical of the way in which longstanding intellectual traditions were jettisoned.[31] He delivered particularly scathing critiques of the Meiji government's approach after his return to Japan in 1900. He took particular umbrage at the government over its shrine merger policy, which he argued would result in no less than the destruction of the entire fabric of Japanese communal life.[32] Minakata's writings in *Nature* show that these were long-brewing concerns. However, his approach in *Nature* contrasted with his later, more polemic statements. Rather, he creatively used sources from the *honzōgaku* tradition alongside others—works from the Chinese classical canon, western scientific works, as well as ones produced by modern Japanese scientists—to reject the idea of antagonistic opposition between knowledge systems[33] now cast as 'traditional' and 'modern'.

The Privileging of Western Science

Minakata pointed out that ignorance of the history of Asian science contributed to a Eurocentric perspective that privileged western science. In one of his earliest articles in *Nature*, Minakata informed the audience about 'oriental beliefs' about bees and wasps through the ages, which could be found as early as 53 B.C.[34] He pursued this topic in subsequent pieces. In the ninth edition of the *Encyclopaedia Britannica*, a British doctor wrote that the plague had been found in China since 1871. Minakata asserted that in fact the Chinese scholar Hong Liangji had reported that an earlier occurrence took place in the late eighteenth century.[35] Four years later Minakata told *Nature* readers that the earliest description of leaf insects came from a ninth century Chinese

account.[36] Minakata did not hesitate to correct revered western scientists when they were mistaken. The Swiss botanist Augustin Pyramus de Candolle had asserted that maize was introduced into Japan in the sixteenth century. Minakata had evidence from an eighteenth-century Japanese household encyclopedia that maize was to be found there at least a century earlier.[37]

Minakata also drew attention to anticipations of scientific discoveries usually attributed to western figures. It wasn't just that the British were ignorant about Asian science in general or that representatives of the Meiji government had questioned the validity of Asia's past scientific accomplishments. They continually privileged western scientific investigations. Minakata was irked by Western ignorance of Chinese science, which he felt had bred arrogance. In a letter to Toki Hōryū he complained that many of the so-called discoveries of Westerners were 'nothing extraordinary.'[38] He pointed out that though Westerners frequently referred to texts from Greek and Roman antiquity, much of what these works contained was 'mundane' and had, in fact, already been 'covered abundantly in Buddhist scriptures.'[39] He took the same approach in his 'An Intelligence of the Frog' in which he pointed out that observations by the evolutionary biologist George J. Romanes about frogs' awareness of their location, made in his work *Animal Intelligence* (1886), had already been noted by the Japanese physician Terashima Ryōan in his *Wakan sansai zue* (Illustrated Encyclopaedia of the Three Realms in Japanese and Chinese) of 1713.[40]

In an 1895 issue of *Nature* a Mr. R. I. Pocock suggested that the observation of a spider's web may have led to the art of netting. But Minakata insisted that this observation had already been made long ago in China in the fourth century A.D. in a book by a Taôist recluse.[41] Remarkable sounds heard in forests and oceans reported by British correspondents in the pages

of *Nature* were recorded much earlier in Chinese and Japanese sources.[42] Similarly, Minakata affirmed that the earliest mention of the alga Hydrodictyon was in Duan Chengshi's *Miscellaneous Morsels from Youyang*, which dated back to the ninth century.[43] Perhaps Minakata's most striking claim was that Duan Chengshi had been the first to discuss colour adaptation, anticipating Darwin's views. 'It seems of interest to record that the Chinese,' Minakata wrote, 'neglectful of the sciences as they are nowadays, nevertheless suggested the Darwinian interpretation of animal colours as early as the ninth century.'[44] Though he acknowledged that the Chinese were not currently as advanced as they had been in the past, Minakata pushed for a reassessment of the entire Chinese scientific tradition.

Symmetrical Knowledge Systems

Rejecting the tendency to privilege western over eastern science was the first step in Minakata's efforts to educate both British and modern Japanese audiences about the value of past Asian knowledge. Asserting the Asian priority of scientific discoveries was not a particularly original strategy. Chinese, Indian, and Egyptian scholars have made similar claims to push back on the totalising claims of western science.[45] Minakata's strategy for educating both of his audiences about Asian science and culture was more complex than previous scholars have recognized. Minakata took the further step of treating western and eastern science as symmetrical knowledge systems that were on equal footing. While Minakata was not reluctant to examine the errors of western science, he was also open to discussing how superstitious beliefs had infected Asian science. In one of his longest *Nature* articles, Minakata explored a series of absurd illusions. 'Although the Chinese were singularly free from the barren speculations on the artificial breeding of honey-bees from dead oxen,' of which some examples could be found in the west,

Minakata asserted, 'they did not escape the invasion of another enterprising illusion.' This was the belief that new turtles would grow if one were torn to pieces, mixed with a specific juice, and buried.[46] However in addition to pointing to the shortcomings of both western and Asian science, Minakata was also interested in gathering information about parallels between the two scientific systems. Some of his articles were requests from the readers of *Nature* that would help him compare Asian and western science. In an article on interpreting omens from the observation of the combat of shell-fish in China, Japan, and Cambodia, he asks if this is peculiar to the peoples of the Far East or are there 'any instances of the same method described in other parts of the world?'[47]

Perhaps the most vivid example of how Minakata thought about science as a knowledge system is contained in his very first article in *Nature*, 'The Constellations of the Far East.' Here he discusses the 'fabrication of constellations' in Asia. Although Minakata's focus is Asian constellations, the underlying purpose is to show that like all celestial systems, the Chinese one was originally developed independently, even of western systems.[48] This was the aspect of Minakata's article that had attracted Needham and Wang's attention. Frederick Little has discussed how Minakata offered a comparative approach to understanding how ancient Chinese and Indian civilizations developed their constellation systems independently at first, later influencing each other.[49] Minakata suggested that each race does not rely on its 'own plan in the fabrication of constellations.' The Chinese system modelled the stars and constellations on various objects and attributes, such as animals, human actions, and family relations. The positions of the system harmonised with the conditions of the Chinese social system that existed for many centuries before the dawn of the Han dynasty (c. 200 B.C.). By contrast, the Indian system was linked to Buddhism and existed previous to the Chinese one.[50]

Seeing eastern and western knowledge systems as symmetrical led Minakata to put Chinese and Japanese sources alongside and in conversation with Western works. We see this approach in two of his articles on a species of marine creature called the *scolopendra catacea*, in which he pointed out that descriptions of this creature by the Roman rhetorician Aelian in his zoological work *Natura Animalium* bore striking similarity to another, the *mukade-kujira* (centipede-whale), described by Kaibara Ekiken in his *honzōgaku* treatise *Yamato Honzō*. The creature described by both authors, Minakata noted, were 'very probably certain species of sharks with the habit of swimming one following another.'[51] In another article he likened descriptions of the formation of amber in *Shishuo Xinyu* (A New Account of the Tales of the World), which contained material dating back to the 2nd century AD, to the simile 'like gum from the cherry,' attributed to Pliny.[52]

Minakata's desire to engage with these works on their own terms meant that he also drew on tales of the supernatural. The Japanese encyclopaedias that he often referenced tended to include descriptions of uncanny creatures. Monsters were, after all, part of the natural world that *honzōgaku* scholars aimed to categorize. The *Wakan sansai zue*, one of Minakata's most cited sources, included descriptions of beasts such as dragons, water goblins and sea-monks.[53] When he deemed it appropriate, Minakata turned to fantastical tales for evidence. He drew on the late-eighteenth century work *Hokuetsu kidan* (Strange Tales from Echigo Province), to suggest a possible cause of sounds described by Major Head in his *Forest Scenes* (1829) and in Olaus Magnus's work *Histoire des pays Septentrionaus* (1561). A similar sound, he noted, was described in this collection of strange tales. It was 'a noise certain to be heard in autumnal days, just before a fine weather turns to stormy, it being sounded as if the thunder falls from the cloud, or the snow slides down the mountain.'[54] In the literary work, these sounds were attributed to

corpse of hero that had been buried under a temple. However, as Minakata pointed out, the author of this literary piece noted that this was the same sound made by 'the action of the tide-waves upon the earth.'[55] Capacious in his use of Asian sources, Minakata also drew on novels,[56] poetry,[57] war tales,[58] travel narratives,[59] and sutras.[60]

The Debt to Spencer and Victorian Anthropology

Spencer's sociology and the work of Victorian anthropologists such as Tylor, Clodd, and Lang provided Minakata with the tools he needed to understand science as a set of evolving knowledge systems developed by different cultures. Minakata's debt to Spencer has been noted by previous scholars.[61] As G. Clinton Godart has shown, Spencer was widely read in Japan, especially in the 1870s and 1880s.[62] Minakata first encountered Spencer while in Tokyo from 1883-1886 and read Spencer more deeply when he was in the United States from 1887 to 1892, before he arrived in London.[63] Minakata's British friends recognized Minakata's attraction to Spencer. In a letter of introduction of May 16, 1898, written by Read to the prominent folklorist George Gomme, Minakata was described as a 'student of Herbert Spencer and of his studies.'[64] Minakata mentions Spencer several times in his *Nature* articles.[65] In a piece on Chinese beliefs about caves he refers to Spencer's *Principles of Sociology*, where he discusses the belief in the underground creation of humanity in Asia, Africa, and American indigenous cultures.[66] Minakata later turns to Spencer again in a piece about ghosts. He referred to how Spencer exposed the various inconsistencies occurring in ghost-stories of savage races in *Principles of Sociology*.[67] A number of Minakata's articles in *Nature* explore Asian mythology and folklore, including beliefs associated with ghosts, demons, and the dead. Minakata would also have found discussions of how humans had understood the world in the works of the Victorian anthropologists.

As Matsui Ryūgo has shown, Minakata read and annotated both Spencer's *The Study of Sociology* and one volume of *Descriptive Sociology*.[68] In *The Study of Sociology*, Spencer outlines his views on the discipline of sociology. He explains the hindrances to sociology, especially the ill effects of biases like patriotism. Scholars, Spencer declares, must free themselves from patriotism although it is difficult. Historians have been unable to root out patriotism, which is why historical accounts differ significantly from one nation to the next. In his annotations written in the book Minakata gives examples in Japanese historical writing that prove Spencer's point. Minakata therefore agrees with Spencer's warning on the dangers of patriotism. However, Minakata believes that Spencer is inconsistent in applying his own principles. Spencer criticizes the European slave trade, but not the British export of opium to China. Even Spencer cannot escape a western way of thinking shaped by eurocentrism. In other annotations Minakata rejects the implications of Spencer's division of the world into 'western' civilization and 'non-western' civilization, as it could be used to reinforce a Eurocentric perspective by casting the former as more advanced than the latter.[69] Minakata's strategy was designed to remove the hierarchical assumptions lying behind references to 'western' and 'non-western' civilizations. However, he could not do away completely with the distinction when he argued for the equality between competing knowledge systems.

In the course of preparing his *Principles of Sociology* (first edition, 1876), Spencer collected and classified large quantities of facts relating to societies of different types, ancient and modern.[70] This work began in October 1867, with the help of several assistants, and was originally intended as the preliminary data for *Principles of Sociology*. But Spencer later decided to publish the information in table form under the title *Descriptive Sociology*. Each of the thirteen volumes, which appeared from 1873 to 1934, contained data on diverse types of

societies at different stages of social evolution, using a classification system that Spencer had developed.[71] The volumes included information, in chart form, on political and ecclesiastical institutions, language, philosophy, science, and major events over the course of the history of that particular region of the world. Spencer's *Descriptive Sociology* interested Minakata, and he purchased one volume of the *series, Types of Lowest Races, Negritto Races, and Malayo-Polynesian*, first published in 1874. The idea behind *London Extracts*, Minakata's transcriptions of data on people from around the world for his project on a descriptive sociology of Japan, likely came from Spencer's *Descriptive Sociology*.[72] (Figure 3)

Figure 3 The London Extracts, courtesy of the Minakata Kumagusu Museum, Shirahama, Japan

The work of Victorian anthropologists also shaped Minakata's thinking, especially when it came to insight into the anthropological nature of different knowledge systems, both past and present. A list of Minakata's western books in his library contains a number of works on anthropology, including Edward Clodd's *The Childhood of Religions* (1875), Edward Tylor's *Anthropology* (1881), and Andrew Lang's *Custom and Myth* (1884) and *The Making of Religion* (1898).[73] From Clodd, Minakata learned about the common origins and beliefs of all religions, myths, legends and fairy tales all around the world. Clodd argued that 'our religion is one among many religions.'[74] Since Christianity was one of a family of world religions there was nothing special or unique about it. From Minakata's perspective, the equality of religions raised questions about privileging any aspects of western culture, including science. Clodd himself did not deal with science in *The Making of Religion*, but Tylor dealt with both religion and science in

his *Anthropology*. According to George Stocking, the logical thrust of Tylor's earlier work, *Primitive Culture* (1871) was to reduce Christianity to mythology.[75] However, in addition to discussing the evolution of religion, race, language, the arts of life, and myth in *Anthropology,* Tylor also included a chapter on 'Science.' Here Tylor traced the rise and progress of science in anthropological terms. 'Savages and barbarians,' Tylor asserted, possessed the common knowledge needed to carry on 'the struggle of life.' The ancients of a later stage of progress developed the roots of modern mechanical science. 'Imperfect as ancient knowledge was,' Tylor declared, 'it may be plainly seen how modern science is based upon it.' Tylor asserted that many of the scientific achievements of the ancients had been lost in the Middle Ages. He remarked that 'it sometimes surprises a modern reader that the "wisdom of the ancients" should still now and then be set up as an authority in science.'[76] However, the anthropological approach to the evolution of science explained why ancient knowledge deserved to be treated with more respect. Minakata's appeal to the wisdom contained in older Japanese and Chinese texts echoes Tylor's point about the wisdom of the ancients.[77]

In addition to Clodd and Tylor, Lang also provided Minakata with some interesting insights that could be used to develop an anthropological perspective on science. Strikingly, in his *Custom and Myth,* Lang argued that the 'star-stories of savage and civilised races closely resemble each other,' a concept that may have stimulated Minakata to write his first *Nature* article on 'The Constellations of the Far East.'[78] However, in his *Making of Religion,* Lang included a discussion of the parallels between religion and science that was reminiscent of Tylor's earlier treatment of them in both *Primitive Culture* and *Anthropology,* and which simultaneously reflected the growing distance between these two anthropologists by the 1890's due to Lang's interest in psychical research.[79] Lang wrote that religion, according to recent

anthropology, was the latest 'evolutionary form of a series of mistakes, fallacies, and illusions.' Nevertheless, he resisted the conclusion that religion was untrue. 'The inference is not,' he maintained, 'perhaps, logical, for all our science itself is the result of progressive refinements upon hypotheses originally erroneous, fashioned to explain facts misconceived. Yet our science is true, within its limits, though very far from being exhaustion of the truth.' While Tylor undermined the value of religion, Lang pointed to the parallel between the development of religion and science as justification for the truth of religion. Just as science had been refined during the evolutionary process though it arose out of primitive fallacies and false hypotheses, so had religion.[80] To Minakata, in light of the insights of Spencer and a number of the most important Victorian anthropologists, Eurocentric perspectives were impossible to maintain, even when it came to evaluating the status of western science.

Conclusion

Sometime in 1898 Minakata wrote to the Trustees of the British Museum in an unsuccessful attempt to preserve his research privileges in the library. In November of 1897 he had punched a museum official in the nose, and his reader's ticket was suspended for two months. A year later he attacked a different person in the middle of the Reading Room and was banished from the British Museum for good.[81] Minakata defended his actions to the Trustees, asserting that he had been insulted regularly by other readers in the library. One man, Minakata wrote, had offended him 'by repetitions of dirty curses, funny grimaces, and menacing talks.' Minakata pleaded with the Trustees to restore his privileges as access to the resources of the British Museum were essential if he were to complete an 'intended work' that he had been researching for five years in the library. He explained that he had left Japan for the United States and Britain to gather

knowledge about other cultures for 'comparison's sake' so he could write a 'descriptive sociology of Japan.' Just before he arrived in London, he received inspiration from a report that Herbert Spencer had declared that it was a 'matter of great pity that Japan possessed as yet no sociological history.'[82] By the time he was expelled from the Museum in December 1898, he had compiled approximately thirty-seven volumes of *London Extracts*. After his expulsion from the British Museum, Minakata continued his work on the *London Extracts* in the libraries of the Natural History Museum and the Victoria and Albert Museum (referred to as the South Kensington Museum until 1899) until he left England for Japan in 1900. By the time he departed, *London Extracts* had swelled to fifty-two volumes and numbered more than 10,000 pages. In its pages were transcriptions of about 700 books in English, French, Italian, German, Spanish, Greek and Latin, in addition to Chinese and Japanese works.[83] One of the main themes in the transcribed material is how the west viewed Asia. Another was data on various peoples of the world, likely due to Spencer's influence.[84]

Today Minakata enjoys a celebrity in Japan unusual for a scientist. Since the 1980s there has been a 'Minakata boom' that has seen an impressive number of publications on the polymath, among them a manga by the renowned artist Mizuki Shigeru. This popularity draws a steady stream of visitors to the Minakata Kumagusu Museum in Tanabe, Wakayama, which sits on the site where Minakata settled after his return to Japan. His archives, housed fifteen kilometres away, is a hive of activity where academics trawl through Minakata's seemingly inexhaustible trove of notes, sketches, books, and correspondence. The archives have provided ample material to sustain *Kumagusu Studies*, a journal dedicated to all things Minakata, for well over two decades. Though the museum touches on his London years, much of the material focuses on the years after Minakata returned home. Much is made of Minakata's ecological and

heritage preservation efforts, as well as of his role in the development of folklore studies in Japan. The museum also presents his magnum opus, *Jūnishiko* (A Study of 12 Animals of Chinese Zodiac), the culmination of his project of Spencerian sociology. The scientist that the museum presents blossomed after he had ceased contributing to the scientific journal *Nature*. Back home, Minakata returned to collecting natural specimens focusing his investigations on fungi and slime moulds, an activity that brought him such renown that he was invited to give a lecture on this topic to Emperor Hirohito in 1929. Though Minakata's activities eventually garnered him esteem in his later years, much of his life was spent outside of the mainstream of the Japanese scientific establishment.

An analysis of Minakata's *Nature* articles throws new light on the transnational history of Japanese and British science, not just the interest of those scholars who work in the area of Minakata studies. The *Nature* articles reveal how he worked against the grain of the beliefs and expectations of various constituencies. He encouraged *Nature*'s mainly British readers to look beyond the west, introducing them to canonical Japanese and Chinese works. Minakata also pushed against the grain of the Meiji government who, in his eyes, was complicit in this marginalization of Japan's intellectual heritage in its hankering for all things western. Though scholars have picked up on Minakata's antagonism to the government's modernizing efforts in his protests against their shrine merger policy, his *Nature* articles highlight the intellectual foundations from which such opposition developed.

Minakata's *Nature* articles also show him as much more than a conduit of information about Asia for the journal's readers. *Nature* was of value to Minakata because it provided him with an opportunity to subtly critique eurocentrism in the pages of an influential and widely read periodical. Also, it was connected to the project that mattered most to him—producing a

Spencerian sociology of Japan. Much of his time in Britain was spent compiling his *London Extracts,* which lay bare the research he carried out in pursuit of this goal. If we compare the fifty-two thick notebooks that comprise his *London Extracts* with his fifty, mostly short, articles in *Nature,* it is clear which project consumed more of his energies. To develop his sociology, he needed access to the British Museum and thus shrewdly networked with Orientalists there, even if it meant dealing with indignities that he would not have otherwise tolerated. *Nature* was useful to Minakata as it introduced him to the heart of British science. When *Nature* was no longer receptive to his contributions after his return to Japan, Minakata published instead in *Notes & Queries* to maintain his networks among the British scholarly community. *Nature* also provided a venue for Minakata to test ideas. His writings in *Nature* can thus more profitably be seen as a tip of an iceberg comprising his wider activities. These tips sometimes hint at his much larger project: a topic introduced in *Nature* could lie dormant resurfacing sometime later in the same journal or even in *Notes & Queries*, evidence that Minakata had continued reading around the topic and mulling on it for some time.

Minakata used sources from the *materia medica* tradition alongside classical, medieval and contemporary works from China and Japan to challenge western science's claim to universality. Though Needham drew on Minakata in his comparison of Chinese and Western sciences, the two scientists had differing aims. Needham's multivolume *Science and Civilization in China* project, though credited for bringing attention to China's early scientific achievements, has been criticized for its civilizational approach to the history of science. In Needham's 'grand titration' China was conceived as tributary 'that flowed into the river of modern science.' Though Needham aimed to 'restore for China its pride' his driving concern—the so-called 'Needham question'—was why did modern science 'develop only in the Western world?'[85]

Minakata, however, did not see modern science as a unique achievement. For him, Asian and Western sciences represented parallel knowledge systems. They were of equal value. The roots of Minakata's thinking were evident from an early age. Aged just fifteen, Minakata expressed a desire to develop an encyclopaedia bringing together the knowledge of Japan, China and the West.[86]

He wanted *Nature's* readers to embrace scientific heterogeneity. Paradoxically, as *Nature* become more international after the turn of the century, it became less welcoming to Minakata's cosmopolitanism. It is remarkable how non-confrontational his rhetorical strategies were considering the radicalism of his position. However, this underscores his wider message: Asian knowledge systems were not in conflict with western ones. Knowledge was local. It was shaped by the context in which it was produced, and thus had equal claims to truth. Minakata's cosmopolitan approach anticipated many of the questions that historians of science are grappling with today: Where do the boundaries of science lie? Who creates these boundaries? Whom do such boundaries exclude? Minakata's aim was not to assert the primacy of Asian science—he was not chauvinistic in his claims—but to show how Asian science connected to and even complemented western science, a science that was also embedded in and shaped by its own local context. In envisioning science as a global, rather than universal, enterprise, Minakata was perhaps a global historian of science before his time.

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[1] Joseph Needham and Wang Ling, *Science and Civilisation in China*, Volume 3: *Mathematics and the Sciences of the Heavens and the Earth* (Cambridge University Press, Cambridge, 1959), pp. xli, 272-273. In this article we adopt the Japanese order (i.e., family name first, followed by personal name) when providing Japanese names. Minakata is often referred to by his personal name, Kumagusu, in Japanese-language scholarship, an approach typically used

for historically significant figures. However, to avoid confusion, we refer to him throughout by his family name of Minakata.

[2] Needham and Wang, *Science and Civilisation*, p. 778. The reference to Minakata's article was: Kumagusu Minakata, "The Constellations of the Far East," *Nature* **48**, No. 1249, 541-543 (Oct. 5, 1893).

[3] Minakata wrote 50 articles for *Nature*. However, a note is sometimes considered by Minakata scholars as the 51st article. (The anonymous note is: "Note on Specimen Submitted to Nature," *Nature* **66**, No. 1707, 279-280 [1902].) This, in part, explains why scholars provide different counts of the total number of *Nature* articles written by Minakata. Blacker claims that he contributed 50 articles in English to *Nature* while Shimura puts the number at 51. Little lists 45 articles, but one is actually the note on him. See: Carmen Blacker, "Minakata Kumagusu: A Neglected Genius," *Folklore* **94**, No. 2, 139-152 (1983), at p. 139; Shimura Masaki, "Igirisu to Ajia o musubu nettowāku—Minakata Kumagusu to 'Neichā' o chūshin ni,"(The Scientific Network between Asian Countries and England: Minakata Kumagusu and *Nature*) *Vikutoriachō bunka kenkyū* **16**, 111-127 (2018), at p. 14; Frederick Alan Little, "Lost in Translation: Non-Linear Literary, Cultural, Temporal, Political, and Cosmological Transformations—the Anglo-Japanese Productions of Minakata Kumagusu," Ph.D. Thesis, Rutgers, the State University of New Jersey, 2012, 258-260. A full list of Minakata's *Nature* articles would include the 44 in Little's bibliography plus 6 more: "Remarkable Sounds," *Nature* **53**, No. 1371, 317 (Feb. 6, 1898); "On the Augury from Combat of Shell-Fish," *Nature* **57**, No. 1476, 342, (Feb. 10, 1898); "Colours of Plasmodia of Some Mycetozoa," *Nature* **83**, No. 2121, 489 (June 23, 1910); "A Singular Mammal Called 'Orocoma,'" *Nature* **84**, No. 2124, 40 (July 14, 1910); "Colours of Plasmodia of Some Mycetozoa," *Nature* **90**, No. 2243, 220 (1912); and "Trepanning Among Ancient Peoples," *Nature* **92**, No. 2307, 555 (Jan. 15, 1914).

[4] In encouraging a reassessment of what we refer to here as 'Asian science', primarily as a shorthand, Minakata drew primarily on Japanese and Chinese, but sometimes Indian, sources. The period when Minakata was contributing to *Nature* was one of tension between Japan and China, and the two countries went to war in 1894-95. As historians have shown, China held a contradictory position for many Japanese at the time. China offered an antiquity from which many Japanese 'could begin a narrative of their civilization,' but from which Japan could also contemporaneously separate itself as a nation-state. Stefan Tanaka, *Japan's Orient: Rendering Pasts into History* (University of California Press, Berkeley, 1993), p. 108.

[5] Blacker, "Minakata Kumagusu," p. 140.

[6] Although now known as the University of Tokyo, at the time it was named the Imperial University, before being renamed to Tokyo Imperial University in 1897.

[7] David M. Wilson, "Read, Sir (Charles) Hercules," ODNB.

[8] Little, "Lost in Translation," p. 28.

[9] Yu-Ying Brown, "Sir Robert Kennaway Douglas and His Contemporaries," *The British Library Journal* **24**, No. 1, 122-129 (Spring 1998), at pp. 123-125, 128-129.

[10] Little, "Lost in Translation," p. 28.

[11] Shimura Masaki, *Minakata Kumagusu no Rondon: Kokusai gakujutsushi to kindai kagaku no shinpo* (Minakata Kumagusu's London: International scientific journals and the progress of modern science), (Keio Gijuku Daigaku Shuppankai, 2020), Shimura Masaki, "Igirisu to Ajia o musubu nettowāku," pp. 111-127, Muraoka Kenji, "Characteristics of the Science Magazine Nature during the Days of Minakata Kumagusu's Contribution (1893-1914)," *Kumagusu Studies* **11**, 12-29 (2017).

[12] Shimura, *Minakata Kumagusu no Rondon* , p. 78.

[13] Tamura Yoshiya, "The English Essays of Minakata Kumagusu—Centering on his Contributions to Nature," *Discuss Japan—Japan Foreign Policy Forum* No. **16**, [1-11] (2013), at p.7; Little, "Lost in Translation," p. 38.

[14] Simon Schaffer, Lissa Roberts, Kapil Raj and James Delbourgo, eds., *The Brokered World: Go-Betweens and Global Intelligence*, 1770-1820 (Science History Publications, Sagamore, MA., 2009); Kapil Raj, "Go-Betweens, Travellers, and Cultural Translators," in Bernard Lightman ed., *A Companion to the History of Science* (John Wiley, Chichester, 2016), pp. 39-57.

[15] In one article, Minakata wrote: "I have to thank Mr. Eisaku Muaryama, an assiduous Pâli scholar, who was kind enough to make a journey on my behalf with the sole intention of personal examination of the Chinese text." Minakata Kumagusu, "The Story of the 'Wandering Jew'," *Nature* **53**, No. 1361, 78 (Nov. 28, 1895).

[16] Minakata Kumagusu, "The Centipede-Whale," *Nature* **56**, No. 1454, 445 (Sept. 9, 1897); Haruko Iwakami and Peter F. Kornicki (eds), *F.V. Dickins' letters to Ernest M. Satow, Kumagusu Minakata and others, a collection of transcriptions and Japanese translations* (Editions Synapse, Tokyo, 2011).

[17] Janet Browne, *Charles Darwin: The Power of Place* (Alfred A. Knopf, New York, 2003), p. 11.
[18] James Secord, "Global Darwin," in *Darwin*, ed. William Brown and Andrew C. Fabian (Cambridge University Press, Cambridge, 2010), p. 32.
[19] Little, "Lost in Translation," p. 82; Masaki Shimura, "Igirisu to Ajia o musubu nettowāku", p. 114.
[20] Archeoastronomy is the study of the history of astronomy and of solar eclipses and supernova in ancient records and relics.
[21] Masaki Shimura, "Minakata Kumagusu to 'Nechā—'Tōyō no seiza' keisai o megutte" (Minakata Kumagusu and 'Nature': The Publication of 'The Constellations of the Far East)," *Rekishi bunka shakairon kōza kiyō* **13**, 85-96 (Feb. 2016), at p. 86.
[22] Little, "Lost in Translation," p. 144; Blacker, "Minakata Kumagusu," p. 144.
[23] Yoshiya, "English Essays of Minakata Kumagusu," p. [6].
[24] Shimura, "Igirisu to Ajia o musubu nettowāku," pp. 117-119.
[25] Melinda Baldwin, *Making Nature: The History of a Scientific Journal* (University of Chicago Press, Chicago, 2015), pp. 101, 114-115, 120-122.
[26] Shimura, *Minakata Kumagusu no Rondon*, p. 77.
[27] Federico Marcon, *The Knowledge of Nature and the Nature of Knowledge in Early Modern Japan* (Chicago University Press, Chicago, 2015), p.301
[28] Marcon, *The Knowledge of Nature*, p.33
[29] Marcon, *The Knowledge of Nature*, p.28
[30] Georges Métailié, "The *Bencao gangmu* of Li Shizen: An Innovation in Natural History?," in *Innovation in Chinese Medicine*, ed. Elizabeth Hsu (Cambridge University Press, Cambridge, 2001), pp. 221-261
[31] Eiko Honda points out to the Meiji government's persecution of Buddhism as a major factor in Minakata's antagonism to the regime. She also stresses the role of Shingon Buddhism, to which Minakata and his family were adherents, in shaping his intellectual outlook. See Eiko Honda, "Minakata Kumagusu and the Emergence of Queer Nature: Civilization, Theory and Buddhist Science, and Microbes, 1887-1892," *Modern Asian Studies* **57**, No. 4, 1105-1134 (2023).
[32] The 'shrine consolidation' policy decreed that there would be only one shrine per village, which meant that many shrines, and their surrounding forests, would be eliminated.
[33] The term "knowledge systems" is not used by Minakata. We are using that term to describe his conception of how scientific knowledge varies from one culture to another. It is a term borrowed from the scholarship on the history of knowledge. Beattie and Morgan assert that "the history of knowledge is a broader and more capacious framing that acknowledges the existence of a variety of different knowledge systems, while allowing for no system to take analytical precedent over another." See James Beattie and Ruth A. Morgan, "From History of Science to History of Knowledge," in *The Routledge Handbook of Science and Empire*, ed. Andrew Goss (Routledge, London and New York, 2021), pp. 228-237, on p. 229.
[34] Minakata Kumagusu, "Some Oriental Beliefs about Bees and Wasps," *Nature* **50**, No. 1280, 30 (May 10, 1894).
[35] Minakata Kumagusu, "Plague in China," *Nature* **59**, No. 1529, 370 (Feb. 16, 1899).
[36] Minakata Kumagusu, "Early Chinese Description of the Leaf-Insects," *Nature* **77**, No. 1991, 173 (Dec. 26, 1907).
[37] Minakata Kumagusu, "Indian Corn," *Nature* **61**, No. 1582, 392 (Feb. 22, 1900).
[38] Cited in Shimura, *Minakata Kumagusu no Rondon*, p.76
[39] Ibid.
[40] Minakata Kumagusu, "An Intelligence of the Frog," *Nature* **50**, No. 1282, 79 (May 24, 1894).
[41] Minakata Kumagusu, "The Invention of the Net," *Nature* **52**, No. 1339, 197 (June 27, 1895).
[42] Minakata Kumagusu, "Remarkable Sounds," *Nature* **53**, No. 1375, 414 (March 5, 1896); idem, "Remarkable Sounds," *Nature* **53**, No. 1383, 605 (April 30, 1896); idem, "Remarkable Sounds," *Nature* **54**, No. 1387, 78 (May 28, 1896).
[43] Minakata Kumagusu, "The Earliest Mention of Hydrodictyon," *Nature* **70**, No. 1817, 396 (Aug. 25, 1904).
[44] Minakata Kumagusu, "Early Chinese Observations on Colour Adaptations," *Nature* **48**, No. 1250, 567 (Oct. 12, 1893).
[45] Marwa Elshakry, "When Science Became Western: Historiographical Reflections," *Isis* **101**, No.1, 98-109 (2010).
[46] Minakata Kumagusu, "Notes on the Bugonia—Superstitions—The Occurrence of *Eristalis Tenax* in India," *Nature* **58**, No. 1492, 101-103 (June 2, 1898), at p. 101.

[47] Minakata Kumagusu, "On Augury from Combat of Shell-fish," *Nature* **56**, No. 1437, 30-31 (May 13, 1897), at p. 31. There are other examples of Minakata throwing out questions to the *Nature* audience. Minakata asked for help from readers of *Nature* in identifying species of fresh-water alga he had found in Japan. He also requested that a mycologist identify a specimen he had found as he questioned the division of the genus Calostoma into eastern and western groups. Minakata's rejection of the artificiality of 'East' and 'West' in identifying mycological species parallels his reservations about using 'East' and 'West' to divide up human civilizations into groups. Finally, he hoped that a phycologist would identify a curious algal growth on a medaka fish. See: "Notes," **66**, No. 1707, 277-281 (July 17, 1902), at p. 279; Minakata Kumagusu, "Distribution of Caolstoma," *Nature* **68**, No. 1761, 296 (July 30, 1903); Minakata Kumagusu, "An Alga Growing on Fish," *Nature* **79**, No. 2039, 99 (Nov. 26, 1908).
[48] Tamura, "The English Essays of Minakata Kumagusu," p. [4].
[49] Little, "Lost in Translation," p. 82.
[50] Minakata, "Constellations of the Far East," pp. 541-543.
[51] Minakata Kumagusu, "The Centipede-Whale," *Nature* **58**, No. 1511, 570-571 (Oct. 13, 1898), at p. 571. His references to Aelian were to Gessner's edition of the work.
[52] He quoted the following from *Shishuo Xinyu*: "amber is said to be formed from the subterraneous metamorphosis of the gum of peach trees." Minakata Kumagusu, "Chinese Theories of the Origin of Amber," *Nature* **51**, No. 1317, 294 (Jan. 24, 1895). Although Minakata describes this a as a work from the fifth century, Matsui Ryūgo et al point out that *Shishuo Xinyu*, the work Minakata likely meant by "Shi shwoh," brings together sources from the second to fourth centuries. Matsui Ryūgo, Tamura Yoshi, and Nakanishi Sumi eds., *Minakata Kumagusu Eibun Ronkō: 'Neichā' Shihen* (Shūeisha, Tokyo, 2005), p. 78.
[53] Mathias Hayek, "Igyō to kairui: *Wakan sansai zue* ni okeru 'yōkai teki' sonzai" in Tachibana Hirofumi and Tezuka Keiko eds., *Bunka o utsusu kagami o migaku: Ijin, yōkai, fiirudo wāku* (Serika Shobō, 2018), 89-108.
[54] Kumagusu, "Remarkable Sounds," *Nature* **54**, No. 1387, 78 (May 28, 1896).
[55] Ibid.
[56] Minakata Kumagusu, "The Antiquity of the 'Finger-Print' Method," *Nature* **51**, no. 1313, 199-200 (27 Dec, 1894).
[57] Minakata Kumagusu, "The Invention of the Net," *Nature* **52,** no. 1339, 197 (27 June 1895).
[58] Minakata Kumagusu, "The Centipede-Whale," *Nature* **58**, no. 1511, 570-571 (13 Oct 1898).
[59] Minakata Kumagusu, "Remarkable Sounds," *Nature* **53**, no. 1375, 414 (5 Mar 1896).
[60] Minakata Kumagusu, "Some Oriental Beliefs about Bees and Wasps," p. 30.
[61] Little, *Lost in Translation*, p. 92; Matsui Ryūgo, "Minakata Kumagusu and the British Museum," *Discuss Japan: Japan Foreign Policy Forum* No. **16,** [1-8] (2013), at p. [3]. Recently, Eiko Honda has offered a different, but fascinating, perspective on Minakata's views on Spencer and social evolution. See: Eiko Honda, "Minakata Kumagusu and the Emergence of Queer Nature: Civilization Theory, Buddhist Science, and Microbes, 1887-1892," *Modern Asian Studies*, 1-30 (2023). doi:10.1017/S0026749X22000385.
[62] G. Clinton Godart, "Spencerism in Japan: Boom and Bust of a Theory," in *Global Spencerism*: *The Communication and Appropriation of a British Evolutionist*, ed. Bernard Lightman (Brill, Leiden, 2016), p. 56.
[63] Matsui Ryūgo, "A Study of Marginal Notes of Minakata Kumagusu Written in His Collection of the Works of Herbert Spencer," *Kumagusu Studies* **9**, 247-227 (2015), at p. 247.
[64] Matsui Ryūgo, "C. H. Read's Letters to Minakata," *Kumagusu Studies* **11**, 77-83 (March 2017), at p. 80.
[65] Minakata's debt to Spencer is not to be found through a discussion of the term "social Darwinism." Recent scholarship has raised questions about the usefulness of this term as a historical tool. Sean Lei, for example, has rejected the use of the term in an analysis of the important Chinese intellectual, Yan Fu, who was also significantly influenced by Spencer's evolutionism. See Sean Hsiang-lin Lei, "The Dawn of Science as Cultural Authority in China: *Tianyanlun* (On Heavenly Evolution) in the Post-1895 Debate over the Engagement with Western Civilization," *East Asian Science, Technology and Society* **16**, No. 3, 408-432 (2022), at pp. 410-411.
[66] Minakata Kumagusu, "Chinese Beliefs About Caves," *Nature* **51**, No. 1307, 57 (Nov. 15, 1894).
[67] Minakata Kumagusu, "Illogicality Concerning Ghosts," *Nature* **61**, No. 1589, 564 (April 12, 1900).
[68] Ryūgo, "Study of Marginal Notes of Minakata Kumagusu," pp. 247-227.
[69] Ryūguo, "Study of Marginal Notes of Minakata Kumagusu,", pp. 239-237.
[70] Henry R. Teddler (ed), *Descriptive Sociology: Or*, *Groups of Sociological Facts*, *Classified and Arranged by Herbert Spencer: Chinese*, Compiled by E. T. C. Werner (Williams and Norgate, London, 1910), p. iii.
[71] Jonathan H. Turner, "Herbert Spencer's Sociological Legacy," in *Herbert Spencer: Legacies*, ed. Mark Francis and Michael W. Taylor (Routledge, London and New York, 2015), p. 63.

[72] Matsui Ryūgo points out that anthropological works features strongly in *London Extracts*. According to Matsui, Minakata used anthropology, rather than sociology, in his attempt to imitate Spencer's descriptive sociology. Matsui Ryūgo, *Minakata Kumagusu: Fukugan no kakumon kōsō* (Keio Gijuku Daigaku Shuppankai, Tokyo, 2016), p. 278.

[73] "Title Index of Western Books," Minakata Kumagusu Ki'nenkan, eds. *Minkata Kumagusu Ki'nenkan Zōhin Mokuroku, Shiryō, Zōsho hen* (List of Materials, Documents and Books at the Minakata Kumagusu Archives), (Shirahama: Minakata Kumagusu Ki'nenkan, 1998), 464-488.

[74] Edward Clodd, *The Childhood of Religions: Embracing a Simple Account of the Birth and Growth of Myths and Legends* (Henry S. King, London, 1875), p. 8.

[75] George W. Stocking, Jr., *Victorian Anthropology* (The Free Press, New York, 1987), p. 195.

[76] Edward Tylor, *Anthropology: An Introduction to the Study of Man and Civilization* (Macmillan & Co., London, 1881), pp. 309, 323-324, 331.

[77] Minakata regarded Tylor highly. He purchased Tylor's *Primitive Culture* in 1890 while in the United States, leaving annotations in the work. Minakata also mentioned Tylor in a letter to Toki Hōryū noting that he had travelled to Oxford where Tylor was giving a speech. Matsu, Minakata Kumagusu, *Minakata Kumagusu: Fukugan no kakumon kōsō*, p. 281.

[78] Andrew Lang, *Custom and Myth* (Longmans, Green, and Co., London, 1884), p. 125.

[79] Efram Sera-Shriar, *Psychic Investigators: Anthropology, Modern Spiritualism, and Credible Witnesses in the Late Victorian Age* (University of Pittsburgh Press, Pittsburgh, 2022), pp. 83, 86.

[80] Andrew Lang, *The Myth of Religion* (Longmans, Green, and Co., London, 1898), p. 51.

[81] Blacker, "Minakata Kumagusu," p. 143.

[82] Matsui Ryūgo, Shimura Masaki, and Gouranga Charan Pradhan, "English Writings of Minakata Kumagusu:'Petition Letter' to the Trustees of the British Museum," *Kumagusu Studies* No. **16**, 57-84 (2022), at pp. 77-80.

[83] Matsui, "Minakata Kumagusu and the British Museum," p. [1]. Minakata's biographers invariably remark on his remarkable linguistic repertoire, which is, improbably, said to include as many as twenty languages. Blacker,"Minakata Kumagusu," p. 139.

[84] Matsui, "A Study of Marginal Notes of Minakata Kumagusu," p. 233.

[85]Roger Hart, "Beyond Science and Civilization: A Post-Needham Critique," *East Asian Science, Technology, and Medicine*, No.**16,** 88-114 (1999), at p. 94; Joseph Needham, *The Grand Titration: Science and Society in East and West* (University of Toronto Press, Toronto, 1969), p. 16.

[86] Satoshi Ohara and Jean-Christophe Valmalette, *Minakata Kumagusu: L'émergence d'une pensée écologique entre Orient et Occident* (Animaviva Multilingüe, Engordany, 2015), p. 25.