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The "Two Camps" Competition: the 1894 Hong Kong Plague in Two English Medical Journals

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Abstract. Scholars have discussed at length whether Kitasato Shibasaburō or Alexandre Yersin was first to discover the plague bacillus in 1894. Through an analysis of publications as they appeared chronologically in *The Lancet* and the *British Medical Journal* (*BMJ*), this paper reveals that two camps competed to report the news of the plague, show their findings, and express their standpoints. One camp included Shibasaburō Kitasato, James Lowson and *The Lancet*, while the other included Alexandre Yersin, James Centlie and the *BMJ*. This paper concludes that when discussing who was first to discover the plague bacillus, the historical facts should be made clear, especially the "two camps" competition. The roles of James Lowson and James Cantlie and their publications in the controversial debate on the discovery of the plague bacillus should not be neglected.

Key word: Alexandre Yersin, James Lowson, James Cantlie, Shibasaburō Kitasato, the *British Medical Journal*, *The Lancet*, the Plague Bacillus

Introduction

In 1894, the outbreak and widespread nature of bubonic plague in Hong Kong shocked this crown colony (1). Hong Kong, under the British colonial government, was faced with a terrible catastrophe, which resulted in many deaths. The outbreak also marked the beginning of the third plague pandemic worldwide (2). The history of the 1894 Hong Kong plague epidemic has attracted many scholars' attention from different perspectives, including sanitary and health policies, acceptance of Western medicine, the response of Chinese communities, social panic and relief work, medical development and so on (1, 3-7). These publications are mainly from the perspective of social and political history. In addition, the acceptance of germ theory during the 1894 Hong Kong plague has also been widely studied (8-9).

Simultaneously, one of the focal points of discussion around plague bacillus is the matter of who was first to discover it, Kitasato Shibasaburō (1853-1931) or Alexandre Yersin (1862-1943) (10-15). A range of scholars and textbooks offer different answers. Many scholars narrate the story of Kitasato and Yersin in detail. Among them, David Bibel and T.H Chen offer a very detailed discussion on this matter in their article published in 1976. They examine most of the historical materials and medical reports of Kitasato and Yersin, and conclude that Kitasato's description of the plague bacillus was quite similar to Yersin's, but with four major differences (15). Since the diary of acting medical superintendent of the Government Civil Hospital, Dr. James Lowson (1866-1935), was released in 1993, three scholars, G.H. Chao, W.L. Yule and Tom Solomon, respectively, have used this newly released diary to explore the role of Dr. Lowson in the discovery of the plague bacillus (16-18).

Discussion in the above-mentioned papers focuses on three of the most important figures: Kitasato, Yersin and Lowson. However, Kitasato, Yersin, Lowson and James Cantlie (1851-1926) all published their findings in medical journals. Their papers in medical journals have been largely ignored, and there is a dearth of in-depth analysis and comparison, especially with

regards to the role of Cantlie and Lowson in the controversial debate on the discovery of the plague bacillus. This research gap should be addressed. In addition, it should be noted that news about the plague bacillus was released in *The Lancet* and the *BMJ* in June 1894 and thereafter. What were the roles of the two medical journals? This paper does not seek to determine who was "first". Rather, it offers a new perspective, exploring the information about the plague in Hong Kong published in the two journals and demonstrating the competition of the two camps in reporting the epidemic. This paper, through the analysis of publications as they appeared chronologically in *The Lancet* and the *British Medical Journal* (*BMJ*), demonstrates that the two camps competed to report the new results in a timely manner.

Kitasato and Yersin in Hong Kong

In 1894, Japanese bacteriologist Kitasato Shibasaburō was sent by the Japanese government to investigate the cause of the plague in Hong Kong, arriving in the British colony on 12 June. Swiss-French bacteriologist Alexandre Yersin arrived in Hong Kong to investigate the plague on 15 June 1894, representing the Pasteur Institute. Kitasato trained in the German Koch's laboratory, while Yersin trained in the French Pasteur Institute, both world-famous institutes at the time. Both bacteriologists claimed to discover the plague bacillus in June, but Kitasato made his claim earlier.

Kitasato's and Yersin's findings were released in English-language medical journals *The Lancet*, founded in 1823, and the *BMJ*, founded in 1840. As Bibel and Butler mention, Kitasato and Yersin could not communicate in English (10,15). Their most important reports were initially published in Japanese and French. How, then, could they publish their findings in two preeminent English-language medical journals?

Medical journals help shape medical knowledge and opinions (19). The editors have the final say in what is published, and naturally their choices contain bias. There are examples to show that *The Lancet* and the *BMJ* have stood on opposite sides, based on the editors' choices (20). *The Lancet* and the *BMJ* also contain a column to report news updates and the editors' opinions. Furthermore, having findings published in a reputable journal offers recognition to the author on the one hand, and on the other hand, journals are keen to publish pioneering research discoveries to enhance their reputation. In 1894, at the time of the outbreak of plague in Hong Kong, *The Lancet* and the *BMJ* competed to report the news as it broke.

Robert Peckham explores how *The Times* in London received information by telegraph from Hong Kong to report the prevalence of the plague (21). These news reports that were transmitted from Hong Kong to London went not only to the newspapers, but also to medical journals. Unlike *The Times*, medical journals reported and published the materials from a medical perspective for a medical audience, not for the public. Therefore, the reports and news published in medical journals may help us understand what information medical professionals in English medical circles received and how the journals constructed opinions about the plague. The following sections of this paper will focus on the debate about the discovery of the plague bacillus.

Based on the publications appearing in *The Lancet* and the *BMJ*, both journals had their informants in Hong Kong reporting news and information about the epidemic during 1894. This was primarily because the British were concerned that London would be affected, trade would be stopped, and Europeans would contract the disease.

The News and Information about the Plague

Dr. James Lowson examined the first plague patient on 3 May. The first (anonymous) publication about the Hong Kong plague appeared in *The Lancet* on 23 June 1894, approximately 51 days later. The publication was titled *The Plague at Hong Kong*, and *The Lancet* stated that the information had been sent directly from Hong Kong via telegraph. Clearly, *The Lancet* had its own informant in Hong Kong. The article of 23 June reported that the plague arrived in Hong Kong via Canton and Pakhoi, China, and mentioned the sanitary measures and strategies Hong Kong government officials were to implement (22).

Interestingly, this article mentions that "Professor Kitasato of Tokio [Tokyo], late assistant in Professor

Koch's laboratory in Berlin, has succeeded in discovering the bacillus of the plague. Whether that be the case or not, we have yet no means at our disposal of forming a judgment, and it is certainly premature to assume that the bacillus in question is the actual cause of this terrible disease" (22). When *The Lancet* first knew that Kitasato had discovered the plague bacillus, remained cautious. The news about Kitasato's discovery was wired by Dr. James Lowson, who had recorded in his diary that Kitasato arrived in Hong Kong on 13 June and discovered the plague bacillus on 14 June. Lowson wired the news to *The Lancet* on 15 June (16).

After graduating from the University of Edinburgh in 1888, Lowson was appointed as acting medical superintendent of the Hong Kong Government's Civil Hospital in Hong Kong in 1890. Lowson worked for the Hong Kong Colonial Government and was responsible for the clinical medical service. When the plague epidemic occurred in Hong Kong, he was given the important task of examining and curing patients, as well as formulating health policies. As a frontline doctor who knew intimate details about the epidemic, it is not surprising that *The Lancet* kept publishing the news and information about the plague that came from Lowson during that time.

The *BMJ* also published two articles on the epidemic in June. The first one, published on 16 June 1894, was entitled *The Epidemic of Plague in Hong Kong*, in which the author mentions that the *BMJ* received special correspondent telegraphs from Hong Kong reporting on the prevalence of the plague there (23). On 23 June, an article titled *The Plague at Hong Kong* appeared in the *BMJ*. This article was based on detailed notes sent by telegram from Hong Kong describing the symptoms and results of post-mortem examinations (24). On 30 June, another article also appeared reporting on the pressing situation in Hong Kong (25). However, neither article made mention of the discovery of the plague bacillus, and it seemed the *BMJ* had no idea that it was the root cause of the plague at the time.

On 28 July, an article appeared in the *BMJ* entitled *The Plague at Hong Kong* which stated: "Professor Kitasato, formerly assistant to Professor Koch, is here with a staff of Japanese assistants; and Professor Calmettes [Calmette], chief assistant from the Pasteur Institute at Saigon, is also here earnestly engaged bacteriologically" (26). The *BMJ* at this stage seems not to have known about the work of Kitasato and Yersin. Perhaps the *BMJ* heard that the Pasteur Institute had sent its staff to Hong Kong for the plague research and mistakenly assumed that Calmette had been sent. Albert Calmette (1863-1933) was also a famous bacteriologist and in charge of the Pasteur Institute at Saigon, Vietnam. However, in 1894 Calmette was in France.

Reports on the Discovery of the Plague Bacillus

On 4 August 1894, *The Lancet* published an article titled *The Plague in China*, which initiated the debate on the first person to discover the plague bacillus. The article states: "As might have been anticipated, the discovery by Professor Kitasato of a bacillus in the bodies of patients suffering from plague, especially in the bubonic swellings and the spleen, has been followed by other announcements of similar research. One of these is by Dr. Versin [Yersin], of the Pasteur Institute of Saigon, who has discovered another bacillus, which he, too, claims to be the essential cause of the disease" (27). *The Lancet* did not carry out any verification of Kitasato's work. The article also states: "as we have before remarked, the name of Professor Kitasato is a guarantee of accuracy in observation and care in research, and when the opportunity is given for the review of his work it will probably be found to meet the severest tests" (22). Despite the fact that Kitasato was not the only one carrying out this research, *The Lancet* confidently recognized his results. Most likely, *The Lancet* relied fully on prior knowledge that Lowson and Kitasato were trustworthy researchers highly respected in their fields.

In the same issue, *The Lancet* published another article titled *The Plague at Hong Kong*, which states: "We have already announced that Dr. Kitasato has discovered and described a specific plague bacillus. It is highly probable that we shall hear further details of these and other investigations regarding these micro-organisms and their breeding grounds at the forthcoming International Congress of Hygiene and Demography at Budapest next month. As far as the bacteriological side of the disease is concerned there will probably be many local *savants* keen on discovering

a specific bacillus, and it is necessary to caution the profession against accepting all the statements which will no doubt be put forward in this respect" (28). Neither Kitasato nor Yersin participated in the congress held in Budapest in the first week of September 1894. The Colonial Surgeon of Hong Kong, Dr. Ayres, and Lowson submitted a report to the congress (29), citing Kitasato's research findings with Kitasato's permission: "The fact is now completely established that the disease is caused by a specific Bacillus which I have named after its discoverer, Bacillus Kitasatonensis. This discovery has given us a tremendous help in our preventive treatment…This is the greatest advance that we have so far made in connection with the Plague" (29). Lowson referred only to Kitasato's discovery and named this bacterium "Bacillus Kitasatonensis".

Before the Budapest congress, *The Lancet* received further reports from Hong Kong in August, and an article titled *The Plague at Hong Kong*, written by Lowson, was published in *The Lancet* on 11 August. It stated that Lowson had forwarded several preparations of the plague bacillus, some of them prepared for him by Professor Kitasato (30). Lowson seems to have represented Kitasato in publishing his research results. As *The Lancet*'s informant in Hong Kong, Lowson might have experienced great pressure from *The Lancet* to report back on the plague bacillus as soon as possible. *The Lancet* expected Lowson to send an account of the disease and of the appearance of the micro-organisms cultivated outside the body. As such, Lowson wrote in this article that, "I have recently been so engaged in looking after the sick, organizing hospital work, inspecting insanitary houses, and look after the disposal of the dead that I have been unable to find time to do more than send you these few notes and specimens" (30). On 25 August, an article titled *The Bacillus of Bubonic Plague*, authored by Professor Kitasato, appeared in *The Lancet*. This article was dated as having been completed on 7 July and published in the newspaper *The Hong Kong Telegraph* under the title *Professor Kitasato on the Plague* on 20 July (31). It stated that: "In connexion with this paper, for forwarding which to us we have to thank Dr. James A. Lowson, of Hong Kong, our readers are referred to the illustrations of the bacillus which were published in *The Lancet* of August 11th, 1894" (32). It follows that the article of 11 August (in which Kitasato was not named as author) was supplemented with the article of 25 August. Bibel considers that this article might have been translated from German or Japanese (15), while Grove considers that it might have been written by Lowson, with excellent English (33). If Kitasato's article was prepared for submission to the Hong Kong Government when he left, it is very possible that it was translated from German. The author found an article *A Report on the Epidemic of Bubonic Plague at Hong Kong in the Year 1896* by Wilm of the Imperial German Navy published in *Indian Medical Gazette* in July 1897. It recorded that it was "translated for the Government of Hong Kong by Maurice Eden Paul, M.D." (34) It reaffirms the point that the article is regarded as Kitasato's claim to have discovered the plague bacillus, but Solomon argues that Lowson pushed Kitasato to publish too quickly in *The Lancet*, despite the fact that Kitasato's description of the plague bacillus was imprecise (18). Kitasato returned to Japan on 20 July. Strangely, Lowson had the two articles of 11 August and 25 August in hand on 20 July, but chose to send *The Plague at Hong Kong* to *The Lancet* on 11 August with illustrations of the plague bacillus and his descriptions.

Very probably, Kitasato carried out the examination of plague bacillus and Lowson wrote the articles. Because Hong Kong was undergoing a severe epidemic, it is understandable that *The Lancet* would want to report the plague bacillus as soon as possible. Two weeks later, on 25 August, *Lancet* published a similar article, *The Bacillus of Bubonic Plague*, which reaffirmed that Kitasato took the culture sent by Lowson from a patient suffering from the plague (35).

An article titled *The Bacillus of Plague*, published in the *BMJ* on 18 August, stated: "The following is the report of Dr. Woodhead on the specimens handed to him at the Bristol meeting by Mr. Ernest Hart…. The specimens submitted to me for examination from Dr. Cantlie are microscopic preparations of the softened material taken from the liver and spleen of a mouse that had been injected with the blood from the centre of a femoral bubo" (36). Two key persons appeared in this article. One is ophthalmic surgeon Ernest Hart (1835-1898), who was the editor of the *BMJ* from 1866 to 1869 and from 1871 to 1898. Hart also worked with *The Lancet* as co-editor and set up the British Medical

Association. In 1862, Hart assisted the new editor of *The Lancet*, James Wakley (1825-1886). Four years later, Hart accepted the post of editor of the *BMJ* (37). Kieran Walsh describes Hart as a stout defender of the journal (38). The relationship between Hart and *The Lancet* was very tense, which Peter Kandela describes as follows: "his [Hart's] resignation sparked the '30 years' war' between the two journals. There were threats of libel and even physical violence" (39). As editor, Hart would have liked the *BMJ* to be the first to report on major innovations in British medicine (40). The plague bacillus was no exception. Hart obtained specimens for examination from Dr. James Cantlie. The author suspects that Cantlie was the *BMJ*'s informant in Hong Kong, reporting information about the plague, as Cantlie continuously published articles about the Hong Kong plague in the *BMJ*. Scottish physician Dr. James Cantlie, who graduated from the University of Aberdeen in 1873, was the co-founder and dean of the Hong Kong College of Medicine for Chinese (41-42).

In 1894, when the plague epidemic was spreading, the Hong Kong colonial government requested help from Cantlie. Cantlie, as a member of the Sanitary Board, was asked to visit Lai Chi Kok Hospital and report to the Sanitary Board and the Hong Kong Governor. He also took care of patients at Alice Memorial Hospital. According to Chao, the relationship between James Lowson and James Cantlie was not good (16). It is no exaggeration to say that Lowson hated Cantlie. At the same time that Lowson fervently helped Kitasato to conduct his work in Hong Kong, he gave Yersin the cold shoulder, refusing to provide him with what he needed. Solomon considers that the tension derived from Anglo-French relationship (18). However, Cantlie, also British, provided very necessary help to Yersin and was proud of working with Yersin.

In 1911, Cantlie presented an article discussing the plague and its spread throughout world history and in Hong Kong at the Royal Society of Arts. Four doctors commented as discussants on Cantlie's paper. One of discussants, L.W. Sambon, recalled that Cantlie was the first to declare that the plague had arrived in Hong Kong. Cantlie and his wife travelled to Japan and knew that the disease had broken out in China. Kitasato and Yersin had arrived and were conducting research in Hong Kong. Yersin did not receive any help from Lowson and sought help from Cantlie instead. Sambon states: "On arriving at Hong-Kong he met a Japanese doctor, Dr. Kitasato, who had begun to investigate the disease, and who thought he had discovered its cause. At the same time a French naval doctor had just landed — Dr. Yersin — who was altogether unprovided with the necessary apparatus for scientific investigation. Dr. Cantlie at once put his laboratory at Yersin's disposal, and Mrs. Cantlie prepared culture media; and by means of the help thus rendered Yersin discovered the organism which caused plague" (43). Cantlie's base was the Alice Memorial Hospital. Yersin did receive great help from Cantlie and his wife, such as an immersion lens which made the discovery possible (41-42). Cantlie and Yersin worked closely together, to the point where Cantlie and his wife might also be seen as members of Yersin's team.

Undoubtedly, Yersin and Cantlie had a good relationship. When Cantlie went back to Hong Kong, he recognized that Kitasato had discovered the plague bacillus, with the help of Lowson. Furthermore, Kitasato and Lowson had established a very good friendship. Therefore, when Cantlie knew that another bacteriologist, Yersin, could achieve a breakthrough and advance Kitasato's result, he invested in Yersin, providing necessary medical resources. Cantlie's sarcastic comments about the Japanese research team appeared in his book (44). In a 1911 article, the chairman of the Royal Society of Arts, Sir Shirley Murphy, described Cantlie in the following terms: "The author had a very ripe experience of the disease, having been in charge of the plague wards in the plague hospital of Hong-Kong during the outbreak of 1894; and he was intimately associated with the discovery of the plague bacillus at that time" (44) At the end of this article, Cantlie responded to the discussants' comments, and restated that "Yersin, to whom Dr. Sambon had referred, independently rediscovered the plague bacillus previously discovered by the Japanese" (44). Cantlie did not mention Kitasato's name, and highlighted that the main contribution to the discovery of the plague bacillus still belonged to Yersin.

In summary, there were two simultaneously competing camps. One was Kitasato, Lowson and *The Lancet*, while the other was Yersin, Cantlie and the *BMJ*. Kitasato and Yersin competed both scientifically

and medically; Lowson and Cantlie competed in providing medical resources, reporting information, and writing articles and reports; and *The Lancet* and the *BMJ* would both have liked to be the first to publish the research results. Kitasato and Yersin were not good at English and relied on Lowson and Cantlie to present their findings in English medical journals.

Interestingly, at the end of the article dated 18 August, the *BMJ* first announced that Yersin claimed to have isolated a small bacillus in the tissues of plague-stricken patients. This information came from a letter received by M. Duclaux's from Yersin, which was reported in a meeting of the Académie des Sciences the previous week (36). However, Yersin's full report was published in French in September 1894 by the Pasteur Institute (45-46). Yersin cultured material from buboes and inoculated mice, and Cantlie sent the softened material taken from the liver and spleen of a mouse to the *BMJ*. Perhaps because Yersin's report was published in French, his results did not attract much attention in English medical circles.

Another Japanese medical expert Tanemichi Aoyama also arrived at Hong Kong to investigate the plague. Aoyama published a paper in 1895 in which he claimed the bacillus that Kitasato isolated was simply streptococcus (13,15,47). After this claim was made public, other Japanese medical experts also began to doubt Kitasato's result and instead supported Yersin's finding (15). While some claim that Kitasato went on to admit that Yersin was the true discoverer of the plague bacillus and apologized for his mistakes in a conference held in 1925, other scholars doubt the verity of this information (13,15).

The Plague Bacillus in the Soil

When *The Lancet* knew that Cantlie had sent the specimen to the *BMJ*, and the report was published, *The Lancet* reaffirmed its standpoint on 18 August 1894 in its Annotations section. *The Lancet* stated that: "These were the first specimens transmitted to this country and had been carefully examined before they were sent to Bristol for exhibition at the Pathological Museum of the British Medical Association" (48). This sentence was obviously directed against the *BMJ* and Ernest Hart, because the *BMJ* and Hart obtained the specimen for examination at the Bristol conference. *The Lancet* restated that it was the first to announce the discovery of the plague bacillus by Professor Kitasato, the news received from Hong Kong, and that the specimen with a series of illustrations of the special organism associated with the disease, sent by Dr. Lowson, was the first specimen sent to the UK. It also confirmed that Kitasato, an accurate and reliable observer, was the first — nor Yersin — to discover the plague bacillus, and denied that Kitasato had rushed into print without having first satisfied himself as to the accuracy of his observations and experiments. *The Lancet* defended its original position of three years ago. It is interesting that *The Lancet* deeply believed in the accuracy of Kitasato's result, apparently without any further investigation.

Cantlie continued publishing his findings in the *BMJ*. On 25 August, his article titled *The Plague in Hong Kong: Clinical and Pathological Characters* was the most comprehensive report about the plague in Hong Kong, from both a clinical and pathological perspective, in 1894 (49). Cantlie was very active in plague research. Around two years later, both Lowson and Cantlie participated in the Epidemiological Society Conference on 18 December 1896. Cantlie's paper *The Spread of Plague* was delivered to *The Lancet* and the *BMJ* before the conference and published on 2 January and 9 January 1897 respectively (50-51). One of Cantlie's findings under the subheading "Bacteriology" stated: "On June 14th, 1894, Kitasato demonstrated the bacillus, and this was confirmed afterwards by Dr. Yersin of the Pasteur Institute in Saigon, working in an independent manner" (51). However, Cantlie emphasized Yersin's contribution more and listed three important findings made by him. Cantlie stated: "Yersin undertook some experiments to test the truth of the infection of the soil, the results of which elucidate the toxic nature of the bacillus" (51). This point became a battleground at the conference.

Lowson fought back in his presentation, stating that "He and, Drs Kitasato and Takaki denied that the bacilli found by Yersin in the soil had any resemblance to that of the plague, and had little or no faith in his serum treatment" (52). Lowson concluded that all Yersin's work was suspicious, and that the results of inoculation from buboes were mixed. Clearly, Lowson's

statement was aimed at Cantlie. It was included in the conference news published in the *BMJ* on 26 December 1896. The Chairman of the conference, Lane Notter (1843-1923), mainly reported Cantlie and Lowson's points. On 16 January 1897, Palaeopathologist Dr. Armand Ruffer (1859-1917) wrote a letter to the *BMJ* requesting Lowson to provide the reasons for his judgements (53).

Lowson at once wrote a letter titled *The Bacteriology of Plague* to the *BMJ*, published on 23 January 1897. In his correspondence, Lowson denied that he said "All Yersin's work was suspicious" but confirmed that Yersin was in error. Lowson narrated his work with Yersin and Kitasato's assistant Dr. Takaki. Yersin claimed to have found the bacillus in the soil, but Lowson and Takaki could find the plague bacillus in the earth by culture. At the conference, Lowson merely expressed his objection to Yersin's conclusion. Lowson also stated that Yersin's findings were published in the newspaper through Cantlie (54). Christos Lynteris clearly presents the important discussions on the bacilli found in the soil in Hong Kong in 1894 (55). There is Lowson's letter to Kitasato, found in Tokyo and dated 10 August 1894, in which Lowson stated: "I salute you [Kitasato], and hope that you will be able to prepare a new shell filled with pest bacilli for the damned Chinaman. If you can at the same time kill a man called Yersin, for God's sake do so. He has led us a dance in a way, but Takaki will tell you we have got the better of him. I now say that the bacilli are not formed deep in the mud — not deeper than half an inch" (56). Lowson was very clearly hostile to Yersin and considered him a trouble-maker, perhaps partly because when Yersin arrived in Hong Kong, Yersin complained to the Governor of Hong Kong that the Japanese team had bribed the hospital personnel not to provide him with any autopsy facilities (17). Lowson's anger is demonstrated fully in his letter, perhaps partly because Yersin insisted that he could find the plague bacillus in the soil while Kitasato simply found the bacilli in the dust. In his draft of *The Spread of Plague*, Cantlie mentioned that if the bacillus were found in the soil, the houses in Tai Ping Shan district might need to be destroyed by fire to prevent transmission (57). This related to Hong Kong government policies to implement a project of reopening of Tai Ping Shan district. Dr Ayres was extremely concerned about these findings from Kitasato and Yersin at that time, when formulating the policy (55). In the report submitted to the Budapest congress, Lowson originally cited Yersin's findings on the plague bacillus in the soil. But on 18 August 1894, Lowson announced an important statement withdrawing Yersin's findings cited in the report (29).

In April 1895, Lowson submitted a report titled *The Epidemic of Bubonic Plague in Hong Kong, 1894* to the Hong Kong government. He insisted that Kitasato was the first to discover the plague bacillus, on 14 June 1894, and listed the Japanese team's contributions (58). The report described how Kitasato and Yersin were consulted about the possibility of the plague bacillus in the soil. Lowson took Kitasato round the streets and reached the conclusion that Yersin had made a mistake. Cantlie recorded in his draft of *The Spread of Plague* that if the bacillus was found in the soil, the houses might need to be destroyed by fire (57). Lowson's response to Cantlie's paper stated "He [Yersin] said he found the bacillus in earth taken at a depth of 7 in., but afterwards qualified his statement, through Dr. Cantlie, that he had found it not deeper than 3 ins."(59) Cantlie and Lowson went head-to-head, and in the end, the Hong Kong government decided that Tai Ping Shan district should be destroyed by fire (58). Sir Kai Ho Kai (1859–1914) was a member of the Sanitary Board and an unofficial member of the Legislative Council. Ho received his M.B.C.M. from the University of Aberdeen, Scotland, in 1879 and went to St. Thomas' Hospital to take up clinical training. In 1887, Ho, Patrick Manson, and Cantlie co-founded the Hong Kong College of medicine for Chinese (41,42,60). Ho and Cantlie had a close relationship, and it was based on his opinon that Ho and the committee members of the Sanitary Board were convinced to consent to the demolition of Tai Ping Shan district. Ayres, as Lowson's superior, also supported this decision (61)(62). It is easy to imagine that when Lowson heard Cantlie's presentation at the conference, he would have had an emotional reaction.

In the same column, the *BMJ* also allowed Cantlie to respond to Lowson's accusations. Cantlie completely disagreed with Lowson, and praised Yersin

and his work strongly, even though he and Yersin had worked together for only six weeks. Cantlie stated that Yersin's methods were excellent, and his conclusions were scientifically drawn, honest and reliable. Yersin spent all his time conducting research and was a leading bacteriologist. In contrast, Cantlie suggested that Lowson's remarks were not scientific (63).

In 1910, Cantlie concluded his research and published the book *Plague: How to Recognise, Prevent and Treat Plague*, which cited Yersin's findings three times. Cantlie stated objectively: "In 1894 Yersin believed he found the bacillus of plague in the mud floors of dwellings infected by plague, and also in adjacent plots of ground. This observation has not been verified by any other observers" (44). Cantlie still insisted on the correctness of Yersin's results, but with statements that were less emotional. The last sentence shows that he cited Yersin's findings more objectively compared with his responses to Lowson.

Kitasato and Yersin were concerned with their research in their laboratories. They did not cure patients, formulate policies, or work directly to save Hong Kong from the plague. However, Lowson and Cantlie did. Therefore, whether the plague bacillus was found in the soil or not was significant for Lowson and Cantlie.

Kitasato and Yersin conducted experiments, while Lowson and Cantlie participated in reporting their opinions to the Hong Kong Government. Kitasato had many rivals in Japan, such as Aoyama. Kitasato did not retain his place at Tokyo University (64). Lowson and Cantlie participated in reporting their opinions to the Hong Kong Government. The Hong Kong Government, based on their opinions, formulated the measures to deal with the plague. Kitasato was eager to win a good reputation in medical field, while Lowson and Cantlie competed with each other to convince the Hong Kong government to adopt their opinions when formulating their measures.

Conclusion

The debate about the priority of discovery of the plague bacillus is very interesting. The formation of two camps was by chance. 1. Two bacteriologists, Kitasato and Yersin, arrived in Hong Kong at the same time and discovered the plague bacillus quickly and almost at the same time. 2. The Hong Kong Colonial Government assigned two doctors, Lowson and Cantlie, to handle the plague. Lowson's relationship with Yersin, as well as with Cantlie, was poor, and he went as far as to treat them as enemies. 3. *The Lancet* and the *BMJ* were in a competitive relationship, and both would have liked to report the updated news and information about the Hong Kong plague ahead of the other.

Kitasato and Yersin were not good at English and published their research findings in Japanese and French. Lowson and Cantlie seem to have been their agents to make statements in English language medical journals, while Kitasato and Yersin did not participate in the debate or defend themselves. The debate between Lowson and Cantlie was usually based on their faith in Kitasato and Yersin. In fact, Lowson and Cantlie's publications about the plague from a clinical perspective were important as well. Unfortunately, Lowson and Cantlie habitually fell into emotional responses when confronting each other. The dispute eventually devolved into a battle of wills between Lowson and Cantlie.

In previous research on the Hong Kong plague, the role of Cantlie, *The Lancet*, and the *BMJ* has been mostly neglected. Some scholars accept Solomon's account of Anglo-French tension and mistakenly interpret the views expressed in *The Lancet* and the *BMJ* as though they were written by Kitasato and Yersin themselves. Before we investigate who was the first to discover the plague bacillus, the historical facts should be made clear.

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