

# Smallpox Vaccinations and the Portuguese in Macao

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Dou Zhen Niang Niang,  
goddess of child protection from smallpox.  
In *L'imagerie populaire chinoise*,  
Éditions d'Art Aurora, St. Petersburg, 1988.

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## INTRODUCTION

*As round the room I turn my weeping eyes  
new unaffected scenes of sorrow rise  
Far from my sight that killing picture bear  
the face disfigure and the canvas tear<sup>1</sup>*

Lady Mary Montagu

*We gave those two blankets and a handkerchief out of the smallpox hospital. I hope it will have the desired effect.<sup>2</sup>*

Captain Simeon Ecuyer

Although the World Health Organization declared the world free of smallpox in May 1980, the possibility of the intentional re-occurrence of this dreaded disease continues to linger. Its threat, as a possible agent for bioterrorism, is taken very seriously by world leaders and governments.<sup>3</sup>

Not surprisingly, recent literature has shed light on the history of the eradication of smallpox and the value of preventative vaccinations that mobilized people around the world.

Some examples from the past show that issues related to smallpox immunity played a major role in the history of humanity independent of nationality, social strata and religious creed, in a universal quest to find protection from the devastating disease. For centuries, its feared power was the source of inspiration expressed through different forms of art such as songs, poetry and religious imagery and devotion. A multiplicity of cultures (Chinese, Japanese, European and African) came to rely on supernatural deities against the deadly ravages of smallpox.<sup>4</sup>

During European expansion and conquest, smallpox was introduced inadvertently by the Spanish into the New World, thus largely contributing to the decimation of local populations.<sup>5</sup> Later, it became a destructive instrument when it was employed deliberately to exterminate the Native American population in North America, in one of the first documented attempts at biological warfare.

This article seeks to throw light on the reception of smallpox vaccination in Macao during Portuguese rule. We will concentrate, by way of introduction, on the measures adopted in the context of a trading port with a colonial administration willing to take the

## II CENTENÁRIO DA INTRODUÇÃO DA VACINA CONTRA A VARÍOLA EM MACAU

initiative to support the latest developments in European medicine. Much research still needs to be done on the various Chinese attitudes towards vaccination in South China in the 19<sup>th</sup> and early 20<sup>th</sup> centuries. In particular, on the dichotomy of vaccination versus variolation.

Otherwise, as Roy MacLeod put it; “our understanding of non-western peoples and their role in constituting science remains incomplete”.<sup>6</sup>

### BEFORE THE EXPEDITION: FROM VARIOLATION TO VACCINATION

*I am patriot enough to take pains to bring this useful invention into fashion in England.*<sup>7</sup>

Lady Mary Montagu

*The poorest and most  
destitute doctors  
have invented the inoculation.  
But it must be pointed out  
that those who are inoculated  
are travelling with death.*<sup>8</sup>

A Mexican bolero

Variolation or smallpox inoculation is traceable to Asia, the Middle East and Africa, where for centuries, people were aware that survivors of many infectious diseases were immune to further infection. In China, this age-old procedure basically consisted of extracting variolous samples directly from a smallpox vesicle and introducing the material into other persons through the nose or skin to stimulate the body's natural process of immunization.<sup>9</sup>

Once exposed to the disease through variolation, patients would be immune for life. There was always a slight chance that the patient could come down with the disease, but it was still much safer than the risk of not being vaccinated. If one contracted the disease naturally, it could lead to severe disfiguration and death. The first emperor of the Qing dynasty (Shunzhi) died of smallpox at the age of 43 in 1661, and his successor (the Kangxi emperor) was chosen in part, because he had survived a smallpox attack and was therefore immune. Variolation became well known and it was described by several Chinese authors using poetic names ranging from ‘bean lesion’, ‘bean eruption’ and ‘heavenly flowers’ (Tian hua 天花) to an evocative term

conjuring up the image of an external invasion – Hun pox 匈奴痘.<sup>10</sup> The first authentic description of smallpox is included in the *Zhou Hou Bei Ji Fang* 肘后备急方 (Handbook of Prescriptions for Emergencies) by Ge Hong 葛洪 dating back to the Jin Dynasty (265-419): “Recently there have been persons suffering from epidemic sores which attack the head, face and trunk. In a short time they spread all over the body. The sores have the appearance of hot boils containing some white matter. While some of these pustules are drying up, a fresh crop appears. Patients who recover are disfigured with purplish scars which do not fade until after a year. The people say that it was introduced in the reign of Chien Wu, when that king was fighting the Huns at Nanyang. The name ‘Hun pox’ was given to it.”<sup>11</sup>

Although the English merchant John Lister reported the Chinese method of inoculation to the Royal Society in 1700, it was another variolization practice, widely employed in Turkey, that soon gained favor in Europe especially among children and adults of royalty, the aristocracy and the upper classes.<sup>12</sup> This consisted of inoculating lymphatic fluid extracted directly from a smallpox vesicle through a puncture on the arm of a healthy individual.

The acceptance of this procedure in Great Britain greatly contributed to Lady Mary Wortley Montagu's efforts in 1718 and the inoculation of condemned British prisoners in the 1720s.<sup>13</sup>

At about the same time, variolation began in the American colonies—learned either from inoculating African slaves or through the Jesuits who inoculated Indians in Brazil and Canada.<sup>14</sup> In 1796, Edward Jenner (1749-1823), a rural physician in England, introduced the medical technique of ‘arm-to-arm vaccination’ with the variolic lymph of a cow (hence the name ‘vaccine’ which comes from ‘vacca’, the Latin expression for cow). His procedure established the basis of vaccination against smallpox, which consisted of inserting the virus from a cow into the human skin to cause an infection. Jenner's method, which was published and made available to the public in 1799, faced resistance.<sup>15</sup> As governments began to compel populations to be vaccinated, it became a target of controversy and suspicion throughout the 19<sup>th</sup> century, not only in England and Portugal, but in the colonies of the New World and Asia as well. Important sectors of society,

## BICENTENARY OF THE INTRODUCTION OF THE SMALLPOX VACCINATION TO MACAO

from religious leaders to anti-vaccination societies, vehemently rejected both the idea of infecting humans with an animal disease and being 'infected' by other persons.

Despite the opposition, the term 'vaccination', named after Jenner's method, gradually replaced the term 'variolation' which was henceforth banned. It was made compulsory and became widely practiced in Europe, North America and Asia in the 19<sup>th</sup> century, which was partially a result of Dr. Balmis' outstanding medical achievements.

## THE EXPEDITION, SMALLPOX, AND TRADE

*I don't imagine the annals of history furnish an example of philanthropy so noble, so extensive as this.*<sup>16</sup>

Edward Jenner

*Indeed, the Royal Expedition was the most ambitious medical project conceived and carried out to its day. Its name should be written large on the pages of medical history.*<sup>17</sup>

Michael Smith

Following the same pattern of diffusion as in Europe, the Jennerian vaccination in the Iberian peninsula first became known among royalty and the aristocracy. It was introduced in Portugal shortly after Jenner published his discovery. As late as 1799, two royal princes (Dom Pedro, the future emperor of Brazil) and his brother) were inoculated, which probably helped its introduction into Brazil.<sup>18</sup> Yet, a certain controversy about the procedure persisted for a long time. A report written in 1805 by a Portuguese envoy, which was sent from the University of Coimbra to England to study Jenner's vaccination, was negative about the procedure. This happened, despite the favorable opinion expressed by the Faculty of Medicine and the University Hospital in Coimbra.<sup>19</sup>

In Spain, four years after the publication of Jenner's medical findings, after Charles IV's daughter, Princess Maria Luisa, recovered from smallpox, the king had his sons innoculated and he also promoted smallpox vaccination among his subjects. In 1803, he promulgated a royal order for Don Francisco Xavier Balmis (the royal surgeon), to lead the Real Expedición Filantrópica de la Vacuna (the Balmis-Salvany Expedition) to the Spanish dominions in America and the Philippines, which would last through 1806.<sup>20</sup>

Balmis' expedition should be analyzed in the context of the framework of the Luso-Hispanic expansion and the advancement of scientific knowledge. The monarchies of both Portugal and Spain encouraged the diffusion of scientific knowledge through expeditions. The persons who were involved in Portuguese and Spanish expeditions, either in Africa or South America, made extensive cartographic productions and kept very detailed cultural and scientific records.

The scope of Balmis' expedition was not an exception. Besides the main objective of taking the vaccine across the Atlantic, it also aimed at establishing central vaccination boards to preserve vaccines and regulate vaccinations, as well as to train medical doctors and practitioners. Other objectives of the Expedition were to collect information on medicine used by local peoples and to gather information about the flora and fauna of the places visited.<sup>21</sup>

The lack of a regular supply of vaccination serum and effective preservation methods to transport the vaccine safely to distant places led to the use of human repositories. In Spain, twenty-two healthy orphan boys, between the age of three and nine years, were selected to be the living chain that would keep the virus alive during the Expedition.<sup>22</sup> These non-immune children were chosen from the *Casa de los Niños Expósitos*, a foundling home in Santiago. Isabel Gómez y Cendala, the rectress of the institution, would take care of them during the sea voyage.<sup>23</sup> It was expected that afterwards, the viceroys in the Spanish dominions would be in charge of children's education and sustenance while they were minors.<sup>24</sup> Using the arm-to-arm transfer method, the supply of vaccine would be sustained, thus creating a steady vaccine stock. One pair of children after another was vaccinated every ninth or tenth day with the lymph of those innoculated in the previous week, to store and keep the vaccine effective along the sea journey.

From the 18<sup>th</sup> century onwards, the diffusion of news about smallpox vaccination became widespread via New World gazettes and European scientific journals. The constant interchange and collaboration among scientific associations and traders guilds also contributed to the dissemination of information and even generated congregated efforts to prevent smallpox in the territories that were under western rule.<sup>25</sup> Many doctors and surgeons, like Jenner in his earlier days, embarked on lengthy apprenticeships at sea. Balmis

116 Revista de Cultura • 18 • 2006





## II CENTENÁRIO DA INTRODUÇÃO DA VACINA CONTRA A VARÍOLA EM MACAU

the initiative of introducing the smallpox vaccine in China after it was successfully tried in the British possessions in India. The consignment arrived in October 1803, but had lost its effectiveness due to the long voyage.<sup>29</sup>

On May 17 1805, four months before Balmis' arrival in Macao, Pedro Huet (a sea captain and ship owner of the *Esperanza*), brought the cowpox vaccine from the Philippines. He had apparently vaccinated himself, along with his crew in the same month.<sup>30</sup> This vaccine stock was put to use immediately in Macao, and then taken by Dr. Alexander Pearson to Canton.<sup>31</sup> But perhaps due to an ignorance of how to preserve the lymph or the unfavourable climate, when Balmis arrived in September of the same year, the effectiveness of that vaccine stock was completely diminished.<sup>32</sup>

These vaccination initiatives were not solely dictated by western humanitarian interests; an economic purpose also played a role. In fact before the Balmis expedition, several appeals were made to the king of Spain. A report by one of the king's physicians declared smallpox to be the 'first and principal cause of the depopulation of America'.<sup>33</sup> The Marquis of Bajamar (Governor of the Spanish Council of Indies) for example, had already urged the king of Spain to sanction an expedition to New Spain by stating that as "the result of depopulation, tribute diminished, commerce stagnated, fields lay unattended and mine production declined with consequent reduction in royal income".<sup>34</sup> He noted that depopulation would mean a decrease in income from taxes that the Spanish Crown received from the colonies, commerce and farming.<sup>35</sup>

In the Philippines, Balmis himself stated that his interests in travelling to China were to develop Spain's political and commercial interests.<sup>36</sup> But he did not gain the support of local agents of the *Compañía de Filipinas*, but instead had to rely on the British doctors at the English factory in Canton for help. Ironically however, Balmis commented that the British in China had received a gift from the Spanish king.<sup>37</sup> Not surprisingly, in a city like Macao which depended

exclusively on trade, the news of Balmis' expedition was very much welcomed by the local official administrative apparatus. This happened despite the suffering of residents there, owing to a decrease in the male population, the build-up of debts, and a general decline in commerce in recent years.<sup>38</sup>

### SAILING TO MACAO

After accomplishing his seven-month mission to New Spain, Balmis' expedition was divided in Venezuela on April 29, 1804.<sup>39</sup> Part of the Expedition was placed under the direction of his deputy, José Salvany and went to Santa Fé in Peru and Buenos Aires, while Balmis went to Cuba and Mexico. From the Port of Acapulco, he embarked with another group for the Philippines on February 8, 1805. Balmis' mission was a tremendous success (as acknowledged by Edward Jenner himself) despite several obstacles, delays and personal frustration, because it was not unconditionally accepted in the colonies.<sup>40</sup>

On the last leg of his voyage, Balmis left Spanish America to travel to the Philippines onboard the *Magallanes*—a corvette that carried twenty-six Mexican boys aged four to six years old to serve as vaccine repositories. The voyage lasted around two months. After his arrival in Manila on April 15, Balmis proposed the establishment of a central board of vaccination for the production, conservation and distribution of smallpox lymph. He also opened a health center to which all residents of the city could come to be inoculated. After the long trip, Balmis, who was suffering from dysentery, was prevented from returning to Spain. Aware that the vaccine had not yet reached China, Balmis, who needed a more suitable climate, decided to travel to Macao on September 3, 1805. He carried letters of introduction addressed to the Portuguese authorities in Macao and the Royal Philippine Company's agents from the Captain General of the Philippines.<sup>41</sup>



## BICENTENARY OF THE INTRODUCTION OF THE SMALLPOX VACCINATION TO MACAO

Balmis travelled on the Portuguese ship *La Diligencia* to Macao, carrying three Filipino boys, who were provided by a priest in the parish of Manila, as vaccinal human carriers. Meanwhile, he commissioned his helper, Antonio Gutiérrez, to pursue his vaccination program in the Philippines before returning the Mexican boys to their homeland.<sup>42</sup>

On September 10, after an eight day voyage between Manila and Macao, the vessel was prevented from landing due to unfavorable winds. While laying in Macao's outer harbor, the ship suffered much damage from heavy winds. According to Balmis:

"In a few hours the frigate was dismantled [...] and twenty men lost; there was not one amongst us who did not expect to find a watery grave... my efforts centred on preserving the vaccine and begging for mercy from on high... and I alone gave succour to the three children, despite my lack of energy... finally, on the sixteenth, the weather started to calm down and, at the moment, facing the eminent risks of Chinese pirates and thieves who flood these seas, I

disembarked in a small boat, carrying the children in my arms, thus, assuring our lives and the precious vaccine."<sup>43</sup>

On September 16, Balmis, part of his ship's crew, and the boys took a Chinese fishing boat and managed to land in Macao, where local Portuguese civil authorities and church dignitaries joined to support him.<sup>44</sup>

## BALMIS IN MACAO

*This is precious discovery that benefits mankind and should absolutely be preserved permanently...*<sup>45</sup>

Dr. Domingos Gomes

The diary of Balmis' extraordinary voyage, which would have described in detail his mission to Macao and Canton, was unfortunately destroyed during the French invasions after his return to Spain.<sup>46</sup> Fortunately, some of Balmis' letters and Portuguese official government records of health services in Macao have survived. They provide a vivid description of disease

View of the house where Miguel de Arriaga lived.





## II CENTENÁRIO DA INTRODUÇÃO DA VACINA CONTRA A VARÍOLA EM MACAU

TABLE I.

MAP FROM FIRST RESPONDERS VACCINATION PROGRAM IN MACAO SENT BY *OUVIDOR* ARRIAGA TO THE SECRETARY OF STATE OF NAVY AND OVERSEAS DOMINIONS IN PORTUGAL (16 DECEMBER 1805 – 5 JANUARY 1806)

Younger than 1 year	8
1 - 5 years	135
5- 10 years	94
10- 16 years	38
16 -18 years	2
18 - 24 years	30
Various ages	5
Total	312

Source: Arquivo Histórico Ultramarino (AHU), Lisboa, Macao, cx. 26, doc. no. 4, 1806/01/05 (see image on page 116).

prevention in South China and the effectiveness of the smallpox vaccination technique. They also show how Macao's colonial authorities perceived the importance of the dissemination of the smallpox vaccine. These documents reveal that the Macao authorities were not caught by surprise with the news of Balmis' visit, since they were carefully monitoring the smallpox vaccination mission in Macao. They supported the first establishment of a center in which all of Macao's residents could be vaccinated, and where doctors would be trained and taught the proper procedures. They also introduced a regulatory system in order to record people vaccinated and to keep the virus alive for future generations.

When Macao's authorities launched a campaign to promote vaccination under Balmis' supervision, the vaccination plan had already been explained well in advance of Balmis' arrival by the *ouvidor* (Chief Justice or Court Judge), Miguel de Arriaga Brum da Silveira, who was also the Judge of the Holy House of Mercy.<sup>47</sup>

After Dr. Balmis' arrival Arriaga commissioned and financed Dr. Domingos Gomes with establishing an inoculation programme and preserving the vaccine.<sup>48</sup> In May 1805, a letter written by Arriaga to the Hospital da Casa da Misericórdia [Holy Mercy Hospital], included instructions for the organization of staff, the management of public vaccination sessions (probably

with the vaccine brought by Pedro Huet and his crew), and the identification of social group targets. It also explicitly mentioned that the vaccination sessions should be controlled and certified by the Portuguese surgeon stationed in Macao.<sup>49</sup> Arriaga also ordered that suitable accommodation be prepared at the Hospital da Casa da Misericórdia for smallpox patients from whom the insertion would have to be taken to propagate it daily to prospective volunteers. They needed to be present during the doctor's appointment hours.<sup>50</sup>

Despite Arriaga's instructions and the Macao Holy House of Mercy's agreement to keep up to four patients and pay for all related expenses, the vaccination plan did not take place at the designated hospital. As in Europe and other parts of the world where similar initiatives raised strong resistance, Arriaga regretted that there were no volunteers for the vaccination sessions which were supposed to be held at the Holy House of Mercy's hospital. Therefore, in his letter addressed to the Ministry and Secretary of State on January 10 1806, after the first vaccination sessions took place, Arriaga began his account of the vaccination implementation with reference to the objections that he encountered such as 'superstition and education' within Macao society.<sup>51</sup> His letter implicitly reveals that Arriaga sought to reassure the local population. Through a locally published proclamation, he formally summoned all of Macao's residents (mainly parents, their children and slaves) to his own house, where he would have been the first to be inoculated. In fact, his strategy had precedents in other parts of the world. After the Balmis expedition left Spain and anchored in the Canary Islands, the offspring from the 'familias distinguidas' (distinguished families) were first vaccinated to set the example for the common citizens.<sup>52</sup> Not surprisingly, a similar strategy involving charismatic figures in society and their own families was also implemented by the British in India in 1801.<sup>53</sup>

In Macao, the medical officer physician and army surgeon, Dr. Domingos Gomes, was the head of the Commission created by Arriaga and was responsible for successfully inoculating the first vaccine in Macao on September 16, 1805 with Balmis' assistance.<sup>54</sup> They used the product brought from Manila by Balmis, and the vaccination sessions were conducted exclusively at Miguel de Arriaga Brum da Silveira's house. It was located near the present day headquarters of the Macao SAR Government.



## BICENTENARY OF THE INTRODUCTION OF THE SMALLPOX VACCINATION TO MACAO

TABLE 2.

MAP OF THE SECOND RESPONDERS VACCINATION PROGRAM IN MACAO (JANUARY 1807)

Children of Portuguese, aged 2 months-7 years	41
Children of natives, aged 3 months-7 years	160
Chinese, aged 1 to 8 years	41
New Christians, also Chinese, aged 6 months-12 years	31
Orphans, aged 1-4 years	8
Soldiers from Goa, aged 16-30 years	25
Slaves, among 'cafres' (Kaffirs), Timorese and Malays, aged 4-25 years	71
Total	377

Source: AHU, Macau, cx. 27 doc. no. 4, Oficio, 1807/01/18 (see image on page 117).

The effects of the first phase of the vaccination plan led by Dr. Balmis with Gomes are clearly visible in the available vaccination statistics. Gomes' medical report lists the first responders of the vaccination program that were sent by Arriaga himself in January 1806, to the Ministry and Secretary of State (Table 1).<sup>55</sup> Curiously, the figures wrongly reveal that Balmis and Gomes vaccinated 314 persons instead of 312 during public sessions that were held every 10 days. Yet, there are no additional details about the people who were vaccinated in Macao, except for the information regarding prominent figures of Macao's colonial society. Arriaga and Macao's bishop, Friar Manuel Gualdino, endorsed the vaccination program and chose to be inoculated on that occasion.<sup>56</sup>

Gomes further certified through his medical report that none of the citizens had died from smallpox after he had been commissioned for the inoculation and preservation of the vaccine matter brought by Balmis.<sup>57</sup>

The reports on the smallpox vaccination sent by both Gomes and Arriaga to the Portuguese Crown also reveal that the Portuguese authorities perceived the vaccination as a European practice. And they considered all of those involved in its implementation as pioneers in a struggle against local ignorance and superstitions. In his report, Gomes also praised the colonial government led by Arriaga and the vaccination

program, which had been accomplished under Arriaga's wise and preventive auspices.<sup>58</sup>

After training Gomes in the methods of transmitting and safely conserving the lymph, on October 5, 1805, Balmis left for Canton where he remained for almost two months.<sup>59</sup>

After Balmis' return from Canton on November 30, he pursued the vaccination program with Gomes in Macao. Another Portuguese report, dated January 1807, mentions that 377 people (Table 2)<sup>60</sup> were inoculated during the second stage of the vaccination program. The reports contain more information and shows the extraordinary juxtaposition of origins, cultures and social strata of Macao residents. Despite Balmis' complaints about the lack of cooperation from the *Compañía de Filipinas*, during his stay in Macao and Canton, he made an acquaintance with Dom Francisco António Pereira Thovar, an agent for the company that owned the ship *Bom Jesus de Além*. Thovar offered Balmis passage to Lisbon, which he could pay for later. But he declined, as his passage fare had been paid by Don Juan Martín de Ballesteros, the former chief of the *Compañía de Filipinas*.<sup>61</sup>

Balmis embarked for Lisbon on February of 1806, carrying hundreds of drawings of Chinese flora and 10 boxes of live plants to be offered to the Royal Botanic Gardens in Madrid.<sup>62</sup> He arrived at the British island of St. Helena in June of 1806, where he

## II CENTENÁRIO DA INTRODUÇÃO DA VACINA CONTRA A VARÍOLA EM MACAU

introduced his vaccination method.<sup>63</sup> Finally, he arrived in Spain where he was received by Charles IV on September 7, 1806.

The aftermath of Balmis' pioneering work did not survive long in Spanish America due to the wars for independence, as he would report after his voyage to Mexico in 1809.<sup>64</sup> In Macao however, although the preservation of the vaccination fluid was sporadic, the local authorities made possible preventive measures against smallpox after Balmis's departure. Portuguese official reports and letters included information about the quest for vaccine supplies through either human carriers from the Philippines or samples from Portugal and Japan to stock official colonial medical facilities at times when there were no effective methods for preserving the vaccine against the tropical temperatures.<sup>65</sup>

All of these documents emphasize that this remarkable accomplishment of medical cooperation contributed to Macao being well ahead of other colonial outposts. The local Portuguese government authorities and medical officers in Macao had the insight and

initiative to understand the benefits of continuing Balmis' legacy. It is worthwhile bearing in mind, that in Portugal, the *Instituição Vacínica* [Vaccinic Institution] was only created in 1812.<sup>66</sup>

Macao would remain a center for vaccination in the region. Gradually, the cowpox lymph, following the example in the Philippines, would be replaced by the lymph from the water buffalo, which had identical properties. In 1820, a delegation from Vietnam led by a French doctor who had lived in Macao, returned to obtain the smallpox vaccine so he could inoculate the emperor's children.<sup>67</sup> Again, the vaccine was transported using two children, and it served to implement a vaccination center and train doctors following Balmis' methods.<sup>68</sup>

The smallpox campaigns in Macao lasted until the disease became completely eradicated in 1948. The network of physicians and entrepreneurs in Macao combined with Dr. Balmis' expertise contributed to the implementation of smallpox vaccination in the Pearl River Delta, with repercussions in other parts of Asia. **RC**

## NOTES

- 1 Poem entitled 'Town Eclogues: Saturday; Smallpox. Renaissance Editions, *Selected Prose and Poetry by Lady Mary Wortley Montagu*. <http://darkwing.uoregon.edu/~rbear/montagu.html>; accessed on 12 December 2005.
- 2 Captain Simeon Ecuyer distributed smallpox-infected blankets and handkerchiefs to Native Americans Indians besieging a fort during the French and Indian wars in 1763. This action caused an epidemic in the population, who had no immunity to the disease. John W. Harpster, ed., 'Journal of William Trent', from *Pen Pictures of Early Western Pennsylvania 1720-1829*, pp. 103-4.
- 3 On December 13 2002, following the September 11 attacks on the United States, President George W. Bush ordered a compulsory smallpox vaccination program for all USA military personnel and a voluntary program for vaccinating emergency medical personnel. In the United Kingdom, the vaccination of military and medical specialists in the case of biological attack was announced. Richard Pilch, *Smallpox: Threat, vaccine and US policy*; <http://cns.mis.edu/pubs/week/pdf/smallpox.pdf>; accessed 14 December 2005.
- 4 In China, for instance, Chuan Xian Hua Jie 传香花姐 is considered the Chinese goddess of smallpox. Donald R. Hopkins, *The Greatest Killer: Smallpox in History*.
- 5 One of the first outbreaks of smallpox in the New World was in 1520, when it was introduced by Spanish explorer Hernán Cortés and his soldiers and decimated the Aztec population. Walter Mignolo, *The Darker Side of the Renaissance: Literacy, Territoriality, and Colonization*, *passim*.
- 6 Roy MacLeod, et al. (org.) *Nature and Empire: Science and the colonial enterprise*, p. 6.
- 7 A letter addressed by Lady Mary Montagu to her friend Sarah Chiswell on 1, April 1717, mentioned the practice of 'engrafting'

- (today known as variolation or inoculation). *Lady Mary Montagu*, a site created and hosted by David V. Cohn, Ph.D., Emeritus Professor of Biochemistry, University of Louisville [http://www.findersofscience.net/lady\\_mary\\_montagu.htm](http://www.findersofscience.net/lady_mary_montagu.htm).
- 8 A bolero popularized in Mexico, quoted by Michael Smith, The "Real Expedición Marítima de La Vacuna" in New Spain and Guatemala, *Transactions of the American Philosophical Society*, New Series, Volume 64, Part I, 1974, p. 11.
- 9 One of those techniques involved utilizing the scabs from smallpox lesions soaked in moistened cotton (achieved through using camphor, herbs, or musk) and placing them into the nostrils of a healthy individual for inhalation. A second technique was effected by blowing powdered smallpox scabs into the nostrils through a bamboo tube. Li Shizen 李时珍, a Chinese scholar of the Ming dynasty (1368-1644), compiled the *Ben cao gang mu* 本草纲目 (Great Pharmacopoeia), in which, besides including descriptions of drugs, prescriptions and illustrations, he described the process of smallpox inoculation. Such techniques were also recorded in Chinese medical literature in the 17<sup>th</sup> century by Yu Chang in *Miscellaneous Ideas in Medicine* of 1643, and Dong Han in *San Gang Shi Lue*, written in 1644. Hopkins, *op. cit.*, pp. 108, 114.
- 10 James C. Moore, *The History of the Smallpox*, p. 137.
- 11 F. I. Tseung, 'China's contribution to medicine', *The Bulletin of Hong Kong Chinese Medical Association*, p. 32.
- 12 Nicolau Barquet, and Pere Domingo, 'Smallpox: The Triumph over the Most Terrible of the Ministers of Death', *History of Medicine*, 15 October 1997, Volume 127, Issue 8 (Part 1), pp. 635-642.
- 13 British aristocrat and poet, Lady Mary Wortley Montagu (1689-1762), survived smallpox and contributed to the introduction of variolation in England and Europe, mainly among royalty. Married

## BICENTENARY OF THE INTRODUCTION OF THE SMALLPOX VACCINATION TO MACAO

- to the British ambassador in Constantinople, she witnessed how the Turkish regularly carried out the inoculation and had her sons inoculated. During the epidemic of 1721, Sir Hans Sloane, physician to the royal family, successfully inoculated some British prisoners. *Ibid.*
- 14 'Vacinas', FioCruz (Fundação Osvaldo Cruz), Bio Manguinhos, [http://www.bio.fiocruz.br/interna/vacinas\\_historia.htm](http://www.bio.fiocruz.br/interna/vacinas_historia.htm); accessed on 1 December 2005.
  - 15 Edward Jenner, *An inquiry into the causes and effects of the Variola Vaccinae, a 'disease' discovered in some of the Western Counties of England, particularly Gloucestershire and known by the name of Cowpox*.
  - 16 Dr. Jenner praised the vaccination expedition of King Charles IV on November 22, 1806 in a letter to his friend the Reverend Mr. Dibbin. Rafael E. Tarrago, 'The Balmis Smallpox Expedition', *Perspectives in Health*, vol. 6, No. 1, 2001; [http://www.paho.org/english/dpi/Number11\\_article6.htm](http://www.paho.org/english/dpi/Number11_article6.htm); accessed on 23 November 2005.
  - 17 Smith, *op. cit.*, p. 3.
  - 18 'Vacinas', [http://www.bio.fiocruz.br/interna/vacinas\\_historia.htm](http://www.bio.fiocruz.br/interna/vacinas_historia.htm); accessed on 1 December 2005.
  - 19 Heleodoro Jacinto de Araújo Carneiro, *Reflexões e observações sobre a pratica da inoculação da vaccina, e as suas funestas consequencias feitas em Inglaterra*, Londres, Mr. Cox, Filho, e Baylis, 1808. See Pita, João Rui Pita, "Farmácia, Medicamentos e Saúde Pública em Portugal (1876-1935). Algumas questões e Problemas", paper delivered at a seminar held at the Instituto de Ciências Sociais, on December 10, 2002, in Lisbon.
  - 20 Francisco Javier Balmis (1753-1819) served as a surgeon in the Royal Navy and as the king's physician. He translated an important treaty on vaccination by Moreau de Sarthe into Spanish, and resided in Mexico from 1778 until 1790. Smith, *op. cit.*, p. 20.
  - 21 In the 18<sup>th</sup> century, it became popular among Europeans to record and produce drawings of herbarium specimens and live species of plants. Balmis compiled information about the plants used by the local herbal healers that he met on his voyages, and he pursued this interest in China. *Ibid.*, pp. 16, 61.
  - 22 The children's names were recorded when they arrived in Mexico. *Ibid.*, p. 34.
  - 23 In his reports and letters Balmis praised the rectoress for her generosity and dedication during the voyage, which made her infirm. The expedition included Balmis as director, two practitioners, three male nurses, and a secretary. Smith, *op. cit.*, pp. 20, 60.
  - 24 Smith, *op. cit.*, p. 15.
  - 25 *Ibid.*
  - 26 *Ibid.*, p. 23.
  - 27 Larry Stewart, 'The Edge of Futility: Slaves and Smallpox in the Early Eighteenth Century', *Medical History*, 29(1), 1985, pp. 29-70.
  - 28 Felisberto Calderia Brant Pontes Oliveira Horta, (1772-1842) took part in the movement for Brazilian independence and became well known as a diplomat and minister under Dom Pedro, the Portuguese prince, who became emperor of Brazil in 1825. Genea Plus, [http://genealogia.netopia.pt/pessoas/pes\\_show.php?id=45514](http://genealogia.netopia.pt/pessoas/pes_show.php?id=45514); accessed on 10 November 2005.
  - 29 Dr. Alexander Pearson was appointed as surgeon of the East India Company. Charles R. Boxer, *A note on the interaction of Portuguese and Chinese medicine at Macau and Peking, 16<sup>th</sup>-18<sup>th</sup> centuries*, p. 16.
  - 30 Although it is generally assumed that Pedro Huet or Hueta had Portuguese nationality and he was married to a Portuguese, he might have been a foreigner who had acquired Portuguese nationality. He is sometimes referred to as Pedro Hewitt by English and Chinese authors. See Wu Tien-Te, 'Early days of western medicine in China', *Journal of the North China branch of the Royal Asiatic Society*, 1931, pp. 9-10. He is also referred to as a parsee by a Portuguese author. See José Caetano Soares, *Macau e Assistência, Panorama Médico-Social*, p. 99. He was a Macao resident trader and owner of several ships involved in the Macao, Manila and Batavia routes, and he was also involved in the civic affairs of the city. In a document signed by the Portuguese city dwellers, sending a donation to the Portuguese Crown during the Napoleonic Wars on October, 18, 1805, he confirmed his payment in English. *Arquivos de Macau*, 3<sup>rd</sup> series, vol. IV, no. 6, December 1965, pp. 340-342. As a ship owner, Hut became associated for a certain period with the wealthy trader Manuel Pereira who owned the Casa Garden villa beside Camões Park in Macao. Carl Smith Collection, Public Records Office, HKSAR. In 1813, he was commissioned by *ouvidor* Arriaga to go to India (Bengala) and collect information about opium manufacture by the British. Arquivo Histórico Ultramarino (AHU), Macau, cx. 35, doc. no. 14, Ofício no. 10, 1813/01/11.
  - 31 See letter written by Arriaga to the Hospital da Casa da Misericórdia on May 21, 1805. Arquivo Histórico de Macau/SCM/163, cx. 50. mic. A337.
  - 32 Boxer, *op. cit.*, p. 16.
  - 33 Hopkins, *op. cit.*, p. 224.
  - 34 Smith, *op. cit.*, p. 15.
  - 35 *Ibidem*.
  - 36 Smith, *op. cit.*, p. 58.
  - 37 *Ibid.*, p. 68.
  - 38 AHU, Macau, cx. 20, doc. no. 8, Ofício 1794/03/12 and 1794/11/12.
  - 39 Emilio Balanguer Perigüell, and Rosa Ballester Afol, 'En el nombre de los Niños, Real Expedición Filatrópica de la Vacuna, 1803-1806', Edición electrónica, Asociación Española de la Pediatría, 2003, p. 144; <http://www.aeped.es/balmis/libro-balmis.htm>; accessed on 29 August 2005.
  - 40 A royal order issued by the king of Spain encouraged bishops and other clergy to support the expedition and even record the vaccination of children six months after baptism and record it in a special parochial registry. Yet, in some parts of the Americas and the Philippines, Balmis did not always gain the support of Church dignitaries. Smith, *op. cit.*, p. 14.
  - 41 *Ibid.*, p. 56.
  - 42 Perigüell, *op. cit.*, p. 170.
  - 43 "En pocas horas desmanteló la fragata, [...] y veinte hombres extraviados; no había uno entre nosotros que no esperase por momentos ser sepultado entre las olas del mar ... la conservación de la vacuna y el implorar la misericordia divina fue todo mi conato, sin que el hallarme solo para toda clase de asistencia de los tres niños, ni mi falta de fuerzas fuera capaz a postrarme ... llegó por fin el día dieciséis, en que empezó a serenarse el tiempo y en el momento, arrojando los eminentes riesgos de piratas y ladrones chinos que inundan estos mares, verifiqué mi desembarco en una pequeña canoa, llevando en mis brazos a los niños, con lo que aseguramos nuestras vidas y la preciosa vacuna". Díaz de Yraola, G. quoted in *Libro sobre la Expedición Balmis*, [www.aeped.es/libro.5pdf](http://www.aeped.es/libro.5pdf); accessed on 29 August 2005.
  - 44 *Ibid.*
  - 45 Father Manuel Teixeira, *Os Médicos de Macau*, p. 36.
  - 46 Smith, *op. cit.*, p. 62.
  - 47 Miguel de Arriaga Brum da Silveira (1776-1824) is one of the most famous Portuguese people in Macao's historical annals. When Dr. Balmis arrived in Macao, Arriaga was a young man who after serving in Brazil, had recently arrived in the city where he lived an almost legendary life. Although he was the *ouvidor* (Chief Justice or Court Judge), he also fought off pirates from Macao, managed to oppose the occupation of Macao by the British, and performed the role of diplomat with Chinese officials, with whom he also maintained close commercial and personal ties. He would also become active in the political fight between liberals and constitutionalists and its repercussions in Macao, which would lead him to becoming an opponent of Dr. Gomes in the 1820s. Father Manuel Teixeira, *Miguel de Arriaga, passim*.
  - 48 Teixeira, *A Medicina em Macau*, vol. 2, 'A Nosologia em Macau', pp. 169-70.

## II CENTENÁRIO DA INTRODUÇÃO DA VACINA CONTRA A VARÍOLA EM MACAU

- 49 Arquivo Histórico de Macau/SCM/163, cx. 50. mic. A337.
- 50 In Macao, there were three hospitals: the military hospital, the Chinese hospital and the civil hospital of the Holy House of Mercy. The latter was also an asylum for the elderly and invalids and only accepted Catholics, except in exceptional circumstances. Álvaro de Melo Machado, *Coisas de Macau*, p. 124.
- 51 AHU, Macau, cx. 26 doc. no. 4, Ofício, 1806/01/10.
- 52 Smith, *op. cit.*, p. 20.
- 53 Brimnes, Niels, 'Variolation, Vaccination and Popular Resistance, in Early Colonial India', *Medical History*, 2004, April 1; 48 (2): 199-228.
- 54 Dr. Domingos Gomes, a Portuguese surgeon, came from Bengal (India), a region where the Portuguese had settled since the 17<sup>th</sup> century, to Macao in 1803, where he served as surgeon of the garrison troops on duty in Macau. AHU, Macau, cx. 24 doc. no.29, 1805, 01/11. After 1817, he became an opium trader and a political opponent of Arriaga. He was forced to return to India for political reasons after living in Macao for two decades. Teixeira, *Os Médicos de Macau*, p. 36; Teixeira, *A Medicina em Macau*, vol. 2, p. 71.
- 55 AHU, Macau, cx. 26 doc. no. 4, Mapa, 1806/01/05.
- 56 Friar Manuel Gualdino was Bishop in Macao from 1802 to 1805. *Ibid.*
- 57 AHU, Macau, cx. 26 doc. no. 4, Anexo; 1806/01/26.
- 58 *Ibid.*
- 59 Balmis found a Chinese youth to convey the virus and travelled with him to Canton. Smith, *op. cit.*, p. 59.
- 60 AHU, Macau, cx. 27 doc. no. 4, Ofício, 1807/01/18.
- 61 Smith, *op. cit.*, p. 59.
- 62 Perigüell, *op. cit.*, p. 171.
- 63 On St. Helena Island, Balmis vaccinated children, held several conferences for local doctors and received from the Governor a sealed packet that had arrived six years earlier with a portion of lymph and Jenner's handwritten instructions. Smith, *op. cit.*, p. 60.
- 64 Perigüell, *op. cit.*, p.174.
- 65 For instance, during the 1808 monsoon season, the lymph stock expired, but Balmis' method was pursued, because six boys who had departed from Manila were successively vaccinated during the voyage. Soares, *Macau e a Assistência*, *op. cit.*, p. 100. For information about the acquisition of 100 tubes of vaccine in 1888, see Microfilm A0 703.
- 66 This institution created by proposal from the academic Bernardino António Gomes. Pita, *op. cit.*, p. 13.
- 67 Michele C. Thompson, 'Mission to Macau: Smallpox, Vaccinia and the Nguyen Dynasty', *Portuguese Studies Review*, vol. 9, nos. 1 and 2, 2001, pp.194-232.
- 68 *Ibid.*

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