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Controlling infectious diseases at the end of 18th century in Spain

(1) Introduction

We feared the coming summer. Nations bordering on the already infected countries began to enter upon serious plans for the better keeping out of the enemy. We, a commercial people, were obliged to bring such schemes under consideration; and the question of contagion became matter of earnest disquisition. But the grand question was still unsettled of how this epidemic was generated and increased (...) these reflections made our legislators pause, before they could decide on the laws to be put in force.¹

This paragraph belongs to *The Last Man* (1826) by Mary Shelley, a fiction novel which topic was the human life destroyed by a plague. In the novel, Lionel Verney, alter ego of Mary Shelley, describes the first moment of the epidemic situation and its consequences. Both can be considered a statement about the fillings in the population caused by an epidemic outbreak as well as the social and economic costs. The strange thing is that the description made by Shelley in her fiction became absolutely true in the real life. At the end of eighteenth century and in the early years of the nineteenth, two different incidents related to infectious diseases were taking place in Spain, firstly the introduction of vaccine against smallpox and secondly a yellow fever outbreak, both events from 1800.

First of all let me draw your attention in the yellow fever outbreak happened in the Barcelona harbour in 1803. From 1800, while yellow fever devastated the south and the south-east Spain, inhabitants of Catalonia country and the city of Barcelona — located in the north-east Spain — observed with attention all the facts related to yellow fever epidemics.

In those days no one knew the aetiology of the plague as some people preferred to mention yellow fever. This subject was surrounded by several doubts. At that time was ignored how the contagion could be transmitted, if it was really epidemic or not, if the illness proceeded from overseas, or if it was endemic in Spain. In this sense people was worried about the plague could become endemic in our country if no effective measures were adopted. Or even worse, if although the measures approved by the legislators the yellow fever remained looking for better conditions to attack again. Depending of which were the answers of this basic questions were the resolution adopted in order to be able to fight the contagion.

In the beginning of the Barcelona outbreak, a child seven years old was admitted in the General Hospital of Barcelona — the Hospital of Santa Creu — and she died in a few days. Thanks to the documents preserved in the archives² it has been possible to follow the subsequent facts in relation with this short but relevant outbreak started in the Barcelona harbour in 1803.

The outbreak was effectively controlled from October to December of 1803 without any more relapse. So, this outbreak was quoted in the doctor Gaetano Palloni's (1776–1830) book *Commentario sul morbo petechiale dell' anno 1817* published in Livorno in 1819 and translated into Spanish by Joan Steva³ in 1824, who added more information and comments. So, the Palloni's work contains a

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¹ SHELLEY, Mary (1826), *The Last Man*, edited by Kessinger Publishing, Montana, USA, 2004, p. 183.

² Arxiu Històric de l'Hospital de Santa Creu i Sant Pau (AHHCP), *Oficis motivats per les enfermetats dels mariners de la fragata Lucia i bergantí La Prueba del Pabelló Real. 1803-1804*.

³ PALLONI, Cayetano (1804), *Observaciones médicas y dictamen acerca la calentura reynate en Liorna*, Barcelona, Sierra y Martí. Translation edited with comments by Rafael Steva i Cebrià.

list of patients admitted at the hospital outside the city of Barcelona (hospital so called lazaretto or quarantine station) from October 27th 1803 to January 12th 1804. In total 73 patients were admitted there, 40 of them died, as well as 16 people who died in other parts of the city, mainly in some private houses and in the Hospital of Santa Creu. In summary, although only one hundred people were affected, this outbreak turned into a reference point.⁴

(2) Which were the scenes and what kind of people was involved?

During the period of plague the people who officially carried out in the city with the investigation and possible solutions were mainly, doctors, surgeons, apothecaries, authorities — both from the city government and from the central monarchy delegates in Catalonia — as well as parish priests, all of them supported by the Establishment. The scenes of the facts were their respective institutions involved. The city Council of Barcelona; the Junta Suprema de Sanidad on behalf of the monarchy; the Catholic Church and its delegates; the local press, *Diario de Barcelona*, newspaper founded in 1792 and from French Revolution to Napoleonic control of Spain in 1808 the single medium available in Catalonia to spread news and dominant ideologies; the Academia Médico Práctica, institution that joined practitioners doctors; the Hospital de Santa Creu, institution of health founded in 1401; and finally, the Royal College of Surgery of Barcelona. Through two months of outbreak the authorities asked the experts for reports about of evolution of the plague in the city, sometimes more than one time a day. At the end of the 18th century and early 19th century surgeons, physicians and pharmacists were gathered together in the so-called “Facultad Reunida”. Surgeons and physicians union had several formal problems during the following years. Finally, in the middle of the 19th century surgeons and physicians were rejoined in the Faculty of Medicine of the University of Barcelona when this university was refunded and its rights were returned. So it is important to take into account the dual condition of physician-surgeons acquired before by the people trained in the college of Barcelona.

The Royal College of Surgery of Barcelona was erected next to the Hospital of Santa Creu and was the second college created in Spain. It was founded in 1760 in a country bordering on French (Catalonia, located in the north-east of Spain) and occupied by Spanish military forces. An increasing demand of well medical trained personnel able to attend the soldiers in the several fronts opened in Europe was the reason of the development of this modern medical surgery in the 18th century in Spain.⁵ It is relevant to take into account that since 1714 the borbonic monarchy had cancelled — University of Barcelona included — all the universities in Catalonia for political reasons. Therefore a new university was built in Cervera so far from everywhere. In those days, in Catalonia the above mentioned means that an academic degree related to health only had to be obtained in the Royal College of Surgery of Barcelona. Even more the students of medicine from University of Cervera must practice anatomy in the college.

The academic program developed in the new colleges of surgery was different from the traditional corporative education for surgeons. On the one hand the professors of the college had to exert in the hospital too. On the other the hospital supplied the raw material to the scholars in a training program based on the patient observation. The Hospital of Santa Creu provided the college patients and corpses to be studied. Moreover these new medical-surgeons trained there were not only interested in therapeutics but wanted to know as more as possible about the parts of the body and its function, its physiology and in front of the illness, its pathology being in competition with physicians.

As it was being implemented in other enlightenment scientific institutions, societies and academies, a new form of transmission of knowledge and in our case moreover a new method of teaching, was proposed in the regulations of the new colleges of surgeons in Spain. Its rules established to hold the so called “juntas literarias”⁶ public scientific sessions mainly addressed to scholars as well to other medical literate audiences. Most lectures and discussions were written down and had been preserved

⁴ *Idem*, table IV.

⁵ PÉREZ PÉREZ, Núria (2004), *Sabers i pràctiques anatòmiques al Reial Col·legi de Cirurgia de Barcelona (1760-1800)*, master's degree dissertation in History of Science, Centre d'Estudis d'Història de les Ciències (CEHIC), Universitat Autònoma de Barcelona, pp. 1-178.

⁶ *Juntas Literarias* from the Royal College of Surgery of Barcelona (1760-1835), collection available in Learning and Research Resources Center. Ancient Book Collection. University of Barcelona.

until nowadays. The new perspectives opened by modern chemistry applied to medicine against infectious diseases were showed, discussed and spread out thanks the new academic network raised by specific rules established by the colleges of surgery themselves.⁷

(3) Which was the concept of contagion?

From 1800 and in the following years, under threat from yellow fever, the agents implicated developed several strategies to control the plague. In order to know the aetiology and contagion transmission some explanation about the outbreak was looked for. The origin of contagion was one of the topics of controversy. The question was if contagion could be introduced by foreigner people, individuals from countries when the yellow fever was endemic or if the contagion could be originated in our country, in Spain.

In the beginning of the 19th century concerning chemistry it had already achieved its own language: a new nomenclature and several gases had been characterized, the theory of combustion had been announced and the experimentation in the laboratory constituted a common scientific practice. Chemistry should be considered as a professional, liberal, and a useful activity in a continuum from research papers, reviews, textbooks and its proper diffusion. Taking into account any theory of germs was already available, thanks to the modern chemistry the nature of the infectious agent or virus were identified as something analogous to gas capable to acquire different qualities into the human body being the responsible of the body disorders and capable to be transmitted.

How the contagion could be *put on the air* was other topic of controversy. Some medical doctors thought that the outbreak was not epidemic and the healthy problem was because a kind of emission was transmitted by the air due the poor conditions at the Barcelona harbour this year after torrential rain of autumn.⁸ Other people, as for example some surgeons, were of the opinion a kind of contagion could pass person to person and not by the air.

(4) Which were the strategies to control the outbreak?

During the outbreak, doctors and surgeons must declare to the authorities any suspicious case of yellow fever, isolate the patient outside the city and destroy their belongings. In consequence, the majority of the people infected were identified.

The corps of the people who have been died were inspected. Again, another controversy aroused in terms if autopsy could itself really determine a true diagnosis of yellow fever outbreak or not, because if some not contagious agent were the true origin of the problem, it probably could not be identified in a post-mortem dissection of the corpses. At this point the significance of autopsy to make the accurately diagnoses was discussed but this procedure was highlighted and the corresponding reports of autopsies performed by the surgeons were handed to the authorities.

Chemical fumigation methods to purify private and public places were implemented in order to fight against contagion. Several practices of fumigation using chemical compounds were developed and applied to preserve population of contagion, both in private and public buildings and rooms. One of the more accepted ways to purify the airs was the Guyton de Morveau's method.⁹ For example the Bishop of Barcelona in order to purify churches, argued in favour of fumigation with the following statement in the press:

Don't let our God that because of our negligence parishioners suffer or loose the life of their bodies looking for the life of their souls.¹⁰

⁷ PÉREZ-PÉREZ, Núria (2006), "The instrumental use of chemistry in biomedicine at the end of the eighteenth century", *Proceedings 5h International Conference on the History of Chemistry*, Setember 6-10, 2005, Estoril&Lisbon (Portugal), pp. 416-26.

⁸ SALVÀ I CAMPILLO, Francesc (1806), *Segundo año del Real Estudio de Medicina Clínica en Barcelona*, Barcelona, Manuel Texéro, pp. 88-90.

⁹ GUYTON DE MORVEAU, Louis Bernard (1801), *Traité des moyens de désinfecter l'air, de prevenir la contagion et d'en arreter les progrès*, Paris, Chez Bernard.

¹⁰ "No permita Dios que los Fieles por nuestra negligencia sufran, ni pierdan las vidas de los cuerpos, yendo a buscar en ellos la vida de las almas", *Diario de Barcelona*, "Circular, Barcelona 11 de Octubre de 1804", n° 311, 6th november 1804, pp. 1449-1451.

Other example of different uses of fumigation to preserve contagion were a special kind of bottle designed for individual uses. We know its instructions of use because were published in the *Diario de Barcelona*:

This little bottle, pocket sized, should be made with thickness glass and contained chemical products to purify small rooms. It contained two thirds of commune salt and one part of manganese in water. When it was required, 20 or 25 drops of sulphuric acid had to be added in order to produce the emanation wished. The bottle had to be kept well closed until its use.¹¹

Moreover, while the East and South Spain remained affected by yellow fever, in 1804, specific laws to control the contagion were promulgated: domestic and international trade were controlled; people coming from other countries were regulated, especially people coming from the southern Spain; for all of those that infringed the laws several kinds of punishments were established. Often to announce the population about any new rules and in general in order to spread the knowledge information about contagion were published in the local press *Diario de Barcelona*. This newspaper was the official medium used by the Establishment. From the end of 1803 and through the next year 1804, the subjects of the news were changing depending of the seriousness of this matter ranging from private behaviours to prevent contagion to the announcement of public acts and laws. In their respective institutions, doctors and surgeons were trained to control infectious diseases. Some treatises were translated into Spanish and publication of works about this topic was encouraged.

In Spain, at the beginnings of 19th century, the spread of selected information into the population was a new weapon to fight against the plague and its social consequences.

(5) Which were the strategies to spread the vaccine against smallpox in Spain?

Because the mainly consequence of vaccine was an enormous effort to spread the new preventive technique against smallpox, at this point let me to talk about the consequences of introduction of vaccine against smallpox in Spain. The important infant mortality rate because smallpox, and its socioeconomic consequences justified the efforts of governments — Spanish monarchy included — to spread the new technique, the vaccination using cowpox material, apparently more efficient than inoculation of human smallpox which remained at this time not at all well accepted by the population. The main advantage over inoculation was that vaccination was not contagious, decreasing the prevalence of the disease in time.

By analyzing information contained in the periodical sessions performed at the Royal College of Surgery of Barcelona, sessions so called “juntas literarias” — extremely rich set of sources that has been preserved unprinted until now — we can have more accurately information about the scientific reception of vaccine in Spain. Two sessions were devoted to this topic, the first one in the first of March of 1801,¹² and the second one in May of 1802.¹³ In one of his dissertations, professor Marturià from the Royal College of Surgery of Barcelona stressed the importance to spread this new technique although in practice he had not any experience with that, he said. Taking into account doctor Francesc Piguillem (1771–1826)¹⁴ had introduced vaccine in Spain through Catalonia in December 1800, this subject was discussed by the professors of the Royal College of Surgery very soon.^{15,16}

¹¹ *Diario de Barcelona* “Método de fumigaciones, n° 335, 30rd november 1804, pp. 1561-3. Translated by myself from the original text in Castilian.

¹² MARTURIÀ, Esteve (1801), *Disertación sobre el uso de la vacuna*. Censored by Vicente Pozo in 21st May 1801.

¹³ POZO, Vicente (1802), *Observación leída en 6 de mayo de 1802. Trata de la inoculación de la vacuna*. Censored by Antoni San German (1802), *Lectura apologética a la memoria de Dr. Dn. Vicente Pozo, leída en la junta del 22 de mayo de 1802*.

¹⁴ CALBET, Josep María; CORBELLÀ, Jacint (1981-1983), *Diccionari biogràfic de metges catalans*, Barcelona, Fundació Vives Casajuana, 3702, vol. 2, p. 205.

¹⁵ *Gazeta de Madrid* contained information about the first vaccination performed in Spain, 6th of January of 1801.

¹⁶ Francesc Piguillem got vaccination material from François Colon, French doctor who had vaccinated his own son in 8th of August of 1800 according Woodville, medical doctor from the Inoculation Hospital of London, who introduced this new inoculation technique in France.

However doctor Piguillem was correspondent member of the Academia Médico-Práctica, his colleague's doctors received the new technique against smallpox with more reservations. Some members of this institution considered Piguillem had placed his trust in a too young doctor, François Colon, recently graduated in Paris.¹⁷

The strategies to promote the vaccine in our country were focused basically in two ways. First, training people in the right way to vaccinate in order to avoid false immunization against the smallpox and secondly, informing population about the discovery of this new preventive technique in order to get people feeling close to vaccination.

The educational textbook by Moreau de la Sarthe (1771–1826), a defender of the Jenner's work, with big diffusion around Europe was translated into Spanish by Francisco Xavier Balmis — the responsible of the so called Vaccine Expedition through the new continent.¹⁸ This text, as well others texts published about vaccine, was an example of the importance to reproduce faithfully using colour plates the stages that the spots must show day by day in a successful vaccination.¹⁹ Moreau had an interesting reference to chemistry, when he said: “unlike yellow fever, the cause of the vaccine reaction could not be explained by chemistry”.²⁰

About vaccine other kind of texts were addressed directly to people. Often the strategy of divulgation of right vaccine procedure was using the epistolary genre. This literary genre could operate as carrier encouraging people to read or hearing readers in case of illiterate audiences. One example of that is Francesc Piguillem's book *La vacuna en España o cartas familiares sobre esta nueva inoculación. Escritas a la Señora***, which was published in 1801.²¹ This treatise was addressed to the mother of the first child vaccinated by Piguillem. He said “I will talk you only about vaccine without any of that complicate terms”.²² With this statement Piguillem stressed the informative character of his text in which a colour plate showing the stages of spots were also included.

Another doctor, Josep Canet, correspondent member of the Academia Médico Práctica, also contributed to diffusion of vaccine in his book *Conversaciones sobre la vacuna muy útiles e importantes* (A very useful and important talks about vaccine), published in 1803.²³ Canet exposed in his book, with a clear informative purpose all that thinks people would like to know about vaccine, simulating evening talks between three strategic characters clearly not chosen by chance: an erudite person, a parish priest, and a doctor. This popularization strategy used by the author was looking for his arguments were convincing and well accepted.

(6) Conclusion

On the one hand, when any modern theory about germs had been already enunciated, let me draw your attention to the increasing importance of new chemistry and its instrumental use in medicine, not only as therapeutics but in new ways to consider the organic world, identifying infectious agents (virus) as a kind of gaseous substance. Beside incipient anathomopathology, chemistry was included in the academic programs of the Spanish royal colleges of surgery and, in this medical-surgical context, could have been a crucial tool to understand the unexplained processes that happened in the human body in healthy as well as in illness condition. This was the purpose of the yellow fever outbreak.

¹⁷ OLAGÜE DE ROS, Guillermo; ASTRAIN GALLART (1995), “Propaganda y Filantropismo: los primeros textos sobre la vacunación jenneriana en España (1799-1801)”, 56, pp. 12-3.

¹⁸ BALMIS, Francisco Javier (1803), *Tratado histórico y práctico de la vacuna de J.L. Moreau*, Edicions Alfons el Magnànim, Institució Valenciana d'Estudis i Investigació, Institut d'Estudis Juan Gil-Albert, (facsimile edition), 1987.

¹⁹ *Progresión de los granos de la Vacuna desde el 4º dia hasta el 15 en su tamaño y color natural*. Plate placed before the contents of the book BALMIS, Francisco Javier (1803).

²⁰ BALMIS, Francisco Javier (1803), p. 198.

²¹ PIGUILLEM, Francisco (1801), *La vacuna en España o cartas familiares sobre esta nueva inoculación. Escritas a la Señora***. It contains a plate with the stages that true vaccination should present. Barcelona, por Sierra y Oliver Martí, reeditat altre vegada per l'Ajuntament de Puigcerdà, Puigcerdà, 2000.

²² *Idem*, [translated by myself], the original text is: “Le hablaré únicamente de la Vacuna, sin aquellos términos enredados”.

²³ CANET, Josep (1803), *Conversaciones sobre la vacuna muy útiles e importantes*, Cervera.

On the other hand, I would like to emphasize that the acquisition of new scientific ideas and techniques as well as its practical application went in parallel with its public spreading, information addressed as many medical literate as in general civilian population specially thanks to books and articles published in the media with the support of the Spanish enlightened Establishment powers at the beginning of 19th century. This can be seen exemplified in the cases of the new inoculation method of smallpox, the vaccine, in the yellow fever and, in general, when infectious diseases to run the risk of became epidemic.