

ESSENTIAL HISTORY OF THE FIGHT AGAINST CHOLERA IN THE GRAND DUCHY OF TUSCANY (1835-1855)

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ABSTRACT

Since 1835 until 1855 Grand Duke of Tuscany, Leopold II, entrusted prof. Pietro Betti to coordinate and direct health combat against 'Cholera morbus' which attacked first city of Livorno on 4 August 1835, and then others cities and parts of Tuscany. The same epidemic recurred in waves between 1836 and 1849. Again, Cholera hit the Grand Duchy extremely hard in 1854 and 1855. Betti immediately understood contagious nature of Cholera outbreak and always presented himself as firm supporter of contagionist theories. His pioneristic measures to stop and contain the epidemic are described and discussed.

Keywords: Cholera morbus, Grand Duke of Tuscany, Livorno, Pietro Betti.

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Introduction

Following cases in the French port of Marseilles and in the Kingdom of Sardinia, the city of Livorno was also struck by a serious epidemic of cholera morbus during the summer of 1835. Originating in Asia, the disease came and went in waves between 1836 and 1849, with recurrences in Livorno as well as outbreaks in other parts of the Grand Duchy of Tuscany and beyond; in the years 1854-55, it hit the region particularly hard.

In the wake of the outbreak, Prof. Pietro Betti (1784-1863), a medical doctor, was entrusted by Grand Duke Leopold II with the coordination and direction of health provisions throughout the state to contain and combat these attacks of cholera, beginning with the initial episode in Livorno on 4 August 1835. As reported in the 'Collezione di tutti i Documenti riguardanti il Cholera-morbus del 1835 in Livorno' ('Collection of All Documents Concerning the Cholera Morbus of 1835 in Livorno')⁽¹⁾, in that

period Betti supervised the infirmaries of the two major hospitals of the capital Florence. Yet in order to manage the health crisis in Livorno, Betti also provisionally carried out the functions of Head Physician of that city's Health Board. In this latter role, his principal official collaborator was a local civic delegation created ad hoc by the Grand Duke. This delegation consisted of about a dozen members, including noblemen, an attorney, a doctor and a canon, all from Livorno. Its primary task was to promptly propose to the local governing authorities the most suitable measures for assisting the suffering population and to organize, collect and distribute private funds for the benefit of the poor.

Historical report

Thanks of his own academic training (in Pisa), his background in clinical medicine and autopsies, and the field experience of his collaborators, Betti immediately understood the contagious nature of the cholera outbreak when it made its first tragic

appearance in Livorno in the summer and autumn of 1835. His awareness of the acute shortage of effective therapeutic means for treating each infected individual led him to draft a handbook on the 'Metodo per purificare gli individui e disinfettare le stanze e le robe che hanno servito al ricovero, o all'uso delle persone affette' ('Method for Sanitizing Patients and Disinfecting the Rooms and Objects Employed during Hospitalization or Used by Infected Persons')⁽²⁾ for the benefit of the civic delegation.

The first point regarded the sanitization of rooms (whether in private homes, hospitals or public offices) that hosted cholera patients as well as of their furniture: the primary recommendation was to clean rooms and objects with a solution of chloride of lime (one part per 50 of spring water); a lighter dose of the solution was also suggested for pre-washing clothing, linen, mattresses, pillows, sheets and anything else that patients had come into contact with. The document further advised the fumigation (or 'perfuming') of duly closed rooms for 7-8 hours (point 2) by using a ceramic pan containing a mixture of two ounces of chloride, an ounce of black manganese oxide powder, two drams of molten potassium nitrate, and three ounces of sulfuric acid at 66 degrees.

In another room (point 3), a similar fumigation method was to be applied to mattresses stuffed with feathers or wool (while those with straw and leaves had perforce to be burnt) as well as to pillows, woollen blankets, quilts, rugs, etc. All of these objects would have to be hung, spread or in any case arranged such they did not come into contact with each other. If, however, any of these items was suspected of having been partially or totally infiltrated or soaked in choleric matter, they had first to be completely tied on all sides with string which had been previously soaked in another mixture (prepared within a special metal boiler) containing yellow wax, linseed oil and Greek pitch, with the latter ingredient predominating over the first two so as to favour rapid drying. These methods, described in point 9, were then also proposed for all other woollen fabrics, such as dresses, suits, trousers and overcoats, with the reminder that they had to be spread out separately and not bundled together; the same recommendation also applied to shoes (point 10).

In point 4, the author advises washerwomen not to handle the clothing of cholera patients (including their sheets, towels, linen and curtains) lest they become infected themselves: such items had first to be cleansed by soaking them for 18 hours in a solution

of one part chloride of lime at 50 degrees and 200 parts spring water. On the other hand, silk, fine-cloth or coloured garments (point 5) had to be soaked for two separate 6-hour periods in a solution of one part chloride of lime, once again at 50°, and 300 parts spring water, making sure to wash them in plenty of fresh water after each soaking cycle so that the fabric and colours were not altered. In point 6, the author noted that chairs with detachable straw seats should be placed in a chest, into which should then be put a pan containing an ounce of sulphur to trigger combustion, such that their fumigation would take place within the well-closed container. He cautioned, though, that the flame should not be allowed to spread to the rest of the contents of the chest. The same procedure could be used as an alternative to that for mattresses, described above, and also for shoes, boots and other footwear, as the author observes in the 10th and final point.

Points 7 and 8, meanwhile, specifically regard all those who come into contact with cholera patients. Those attending to sick persons, including doctors (point 7), should cover their hands and fingers in powdered chloride of lime before touching infected persons, repeating this precaution as soon as the smell of chlorine abates. Whoever has physical contact with choleric patients (point 8) or objects used by them should wash his or her hands in the chlorine solution described in point 4 (with one part chloride of lime at 50 degrees and 200 parts spring water), taking care that the solution is made afresh every 8-10 hours and kept in a closed container. Betti further noted the possibility that the same solution could serve to cleanse the face, without, however, letting it come into contact with the eyes and lips. Otherwise, especially if the health operator was not able to approach the patient with the protection of waxen silk gloves, he or she had to wash his or her hands in diluted vinegar, which could also be used to rinse the mouth and nostrils⁽³⁾.

Beyond this handbook, the author issued other exhaustive 'instructions' (unnumbered) regarding sanitary norms for the transportation of choleric corpses to public cemeteries and for burial procedures. Here again, abundant use of chloride of lime and strong lime mortar was described in detail, with explicit references to the 'incomparable Medical Police' and the 'excellent Giovanni Pietro Frank'⁽⁴⁾.

In addition, in a provision dated 20 August 1835 in Livorno, Betti sanctioned the norm for Caesarean operations on pregnant women who died of cholera, with further specific provisions for the feed-

ing of small children of mothers or wet nurses infected with the disease. These stipulations covered six separate points, which provided detailed instructions on the separation and isolation of babies and on how to carry out alternative forms of feeding: artificial, using goat's milk, or by recourse to other wet nurses. In the case that a wet nurse had previously fed a choleric child, or conversely a baby had been fed by a choleric nurse, it was necessary to quarantine the child for 18 days before bringing him or her back into the group; during that period, all the usual sanitising procedures had obviously to be conducted on objects and persons, as described above.

The sixth and final provision is both paradigmatic and recapitulatory: before giving a suckling child who was fed by a choleric mother or nurse to another wet nurse, it was necessary to undress the child, immerse him or her in a bath containing a solution of highly diluted chloride of lime, and wash his or her head, face, nose alae, and philtrum with a soft sponge soaked in the same solution. Once the child was then dressed in fresh clothes, he or she could be brought to the new wet nurse to continue feeding⁽⁵⁾. Finally, in the offices of the mounts of piety (Monti Pii) of Livorno, operators had to carry out the various methods of purification and fumigation recommended in the handbook cited above with regard to persons, rooms and objects; in addition, a railing or barrier had to be erected in order to avoid contact between the users and the personnel of those structures⁽⁶⁾.

The crucial importance of scrupulously applying the measures for isolating persons suspected of being infected, which we have outlined, found a posteriori confirmation in statistical summaries regarding the cholera outbreaks in Tuscany between 1835 and 1855. Indeed, Betti himself collected abundant data for his five weighty volumes on the 'Asian cholera' (published in Florence by Tipografia delle Murate between 1856 and 1858), which show that a clear majority of infected persons did not survive the illness. In Livorno and surrounding areas in 1835, for example, of a population of 74,500, 2,057 persons took ill, of which 1,171 died. In the same year Florence, with a population of 97,000, recorded 74 deaths out of 103 infected persons. Again in Livorno, between July and October 1837, of 505 ill persons 319 died. Finally, Marciana, a town on the island of Elba with 6,000 inhabitants, had 13 cases of infection, of which 9 resulted in death⁽⁷⁾.

The experience acquired from the epidemic in Livorno in 1835 and the fresh outbreaks that oc-

curred through 1849 confirmed both Pietro Betti's 'contagionist' approach with regard to the 'Asian cholera' and the confidence of the Grand Ducal government in the measures that he proposed to combat the disease. Indeed, in the aftermath of the new invasion of cholera in Tuscany in 1854, his handbook again became a point of reference. It formed the basis of a new publication issued by the Florence prefecture on 18 April 1854 under the title 'Istruzioni pei Medici Chirurghi e pei Parrochi delle campagne' ('Instructions for Medical Doctors and for Parish Priests in Rural Areas'). Its wider circulation this time required amplification with respect to the previous provisions intended for the context of Livorno: now Betti explicitly invited pharmacists to contribute through both their practice and advice to ensure that the well-known measures on 'sanitizing and perfuming' were conducted in accordance with the 'rules of science', including in the most remote and isolated homes in which the illness might make its appearance⁽⁸⁾.

A little less than a year later, at a meeting of the prestigious Accademia dei Georgofili, Pietro Betti gave a quite detailed lecture⁽⁹⁾ on the cholera outbreak that had struck Tuscany in Livorno in 1835, including all the measures and procedures that he had then proposed and issued to fight and circumscribe the disease. He reminded his audience that because the Livorno epidemic had even penetrated the local prisons, taking many lives, just under 200 prisoners were transferred to the Fortezza Nuova until the former places of detention could be safely sanitised. This operation was made possible thanks to the coordinated efforts of the local government and the Collegio Medico Supremo di Sanità (Supreme Medical College of the Health Board), over which he presided. Likewise, several persons undergoing treatment in military infirmaries were moved to civil hospitals.

Betti then spoke of the measures taken to combat the epidemic in Genoa the year before, in Newcastle, England, in 1853, and again in England, France and Bavaria in the first months of 1855. These involved prevention on the collective and individual level, precautions to be taken at home, and moving infected persons to other places - all of which met with success in fighting the disease. These measures, which were 'overblown by foreigners as something new', were in reality simply those which 'humble Tuscany had developed and taught others to implement' since the 1835 outbreak in Livorno. The original point of reference of these measures was

obviously Pietro Betti's handbook, which we have discussed.

In opposition to other explanations for the epidemic (meteorological, terrestrial, etc.) which had been proposed before and during his career, because of Betti bitterly argued with the important clinical physician Maurizio Bufalini(1787-1874)⁽¹⁰⁾, Pietro remained firmly convinced of the contagious nature of the disease, even if he was never able to identify its precise root. In the final part of the last volume of his monumental work on the Asian cholera, Betti in fact observed that the efficient cause of cholera was a certain 'something' able to reproduce within and outside organisms with which it came into contact and to travel from one solid body to another⁽¹¹⁾.

Conclusions

Pietro Betti died in 1863, just a few years before he would have found highly authoritative confirmation of his ideas at the world level in the discoveries of Pasteur and the innovations of Lister. Nonetheless, on the basis of his writings and studies which we have looked at here and in light of the fact that the much more famous and unfortunate Dr Semmelweis (1818-1865) successfully made use of chloride of lime for the first time in 1847 - 12 years after the cholera outbreak in Livorno - as historians are aware, we can confidently characterize Pietro Betti's contagionist theory as a pioneering development in both pre-unification Italy and Europe. Not only were the strictly medical contents of his assumptions valid, but also his ability to create the best team possible in the context of his era marked an important accomplishment, a team which included citizens, government authorities and health workers with different responsibilities and varying levels of religious and governing power. This well-coordinated multidisciplinary approach represents a vital element for the best development of medical science, both for the present and the future.

References

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