

AN ANTHRAX EPIDEMIC IN THE MALTESE ISLANDS

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Bacillus anthracis has during 2001 hit the international headlines through its use in the U.S.A. by terrorists. The bacillum, which causes the disease known as Anthrax, is an excellent weapon to the terrorist's criminal mind since the micro-organism is particularly resistant to environmental changes, withstanding dry heat, and persisting for years in dry earth. Since the infection has become a rare entity in most developed countries, an outbreak of cases particularly in low risk individuals is easily identified with terrorist action. The uncertainty arising from any terrorist action, together with the fear of being exposed to a potentially lethal infection, easily results in fear, alarm and panic in the developed world thus achieving the terrorist's primary scope.

Anthrax has afflicted humans throughout recorded history. The fifth and sixth plagues of Egypt described in Exodus are widely believed to have been anthrax. The disease was featured in the writings of Virgil in 25 BC and was familiar in medieval times as the Black Bane. It was from studies on anthrax that Koch established his famous postulates in 1876, and vaccines against anthrax, the best known being that of Pasteur (1881), were among the first bacterial vaccines developed. Anthrax remains a relatively common infection in the undeveloped

world. It is primarily a disease of sheep, cattle, horses and many other animals; humans are affected only rarely. The infection in humans is usually acquired by the entry of the bacillum spores through injured skin or mucous membranes giving rise to cutaneous anthrax. Rarely, the inhalation anthrax or woolsorter's disease may occur after inhalation of the spores into the lungs. Ingestion of spores in the gastrointestinal tract can give rise to the rare form of intestinal anthrax infection. Careful control of animal herds in the developed world has in general been effective in reducing the cases of anthrax seen in animals and subsequently in man. In the Maltese Islands also, careful screening of imported herds throughout the 20th century by the Veterinary Department has helped prevent the disease from becoming endemic and affecting local herds.

Anthrax infection was never a notifiable disease and hence no records exist regarding its incidence through the decades. It was however a notifiable cause of death. The Veterinary Department, falling under the

overall direction of the Department of Health in the early decades of the 20th century, further recorded cases seen in local and imported animal herds. The published annual reports of the Department of Health since 1896 thus serve to give a general picture of the pattern of this disease on the Maltese Islands. These reports record seven human cases that terminated in a death. The first five cases occurred in the late 19th century (Table 1), while the last case occurred in July 1915. There is unfortunately no published data about animal anthrax infections during the 19th century which can be related to whether the disease noted through the recorded human deaths was endemic or imported from overseas. The 1915 death was possibly associated with the importation of infected cattle, though the closest identified cases of animal Anthrax occurred in a cargo of Tunisian cattle. The animal was destroyed in the Government Incinerator.

Throughout the first half of the twentieth century, imported herds of animals were repeatedly found to be infected with

Year	No. of human deaths	Comments
August 1895	2	1 female aged 55-64 years from Sliema
October 1895		1 female aged 65-74 years from Valletta
1896	1	1 individual aged 15-19 years.
1897	2	2 individuals aged 25-34 & 65-74 years.
July 1915	1	1 male aged 65-74 years.

Table 1: Human Deaths caused by Anthrax in Malta

Year	Infected Cargoes	Destroyed animals
1900	<ul style="list-style-type: none"> • 1 cargo of cattle from Tangier • 1 cargo of cattle from Benghazi 	<ul style="list-style-type: none"> • 4 carcasses destroyed originating from Ras Hanzir (2) and Lazaretto (2)
1902	<ul style="list-style-type: none"> • 3 cattle cargoes from Tunis 	<ul style="list-style-type: none"> • see Table 3
1903-04	<ul style="list-style-type: none"> • 1 cattle cargo from Salonica 	<ul style="list-style-type: none"> • 10 carcasses destroyed originating from the Lazaretto
1908-09	<ul style="list-style-type: none"> • 2 cattle cargoes from Salonica 	<ul style="list-style-type: none"> • 6 carcasses destroyed: 2 from Qormi district, 1 from the Lazaretto, and 2 from on board ships
1909-10		<ul style="list-style-type: none"> • 1 carcass destroyed originating from the Tarxien-Paola-Luqa-Gudia district
1911-12	<ul style="list-style-type: none"> • One case in a bullock imported from Salonica 	<ul style="list-style-type: none"> • 1 carcass destroyed originating from the Msida-Pieta district
1914-15	<ul style="list-style-type: none"> • One case in cargo of Tunisian Cattle 	<ul style="list-style-type: none"> • 2 carcasses destroyed originating from the Msida-Pieta district and on board ship
1918-19	<ul style="list-style-type: none"> • 1 cargo of cattle imported from Tunisia; herd kept in quarantine 	<ul style="list-style-type: none"> • 2 carcasses destroyed originating from the Tarxien-Paola-Luqa-Gudia district

Table 2: Animal Anthrax cases first two decades of 20th century

Anthrax. These were regularly checked by the Government Veterinary Surgeon, and were subsequently destroyed by incineration. Solitary cases also occasionally occurred in local herds, these being similarly destroyed by incineration (Table 2). There was apparently only one instance (1901-1902) when the infection took on epidemic proportions affecting local animals.

This epidemic came to the attention of the authorities in October 1901. By the end of that year no less than 49 cases of dead animals were proved to have died from the infection. The cases occurred contemporaneously in widely separated districts in Malta. This led to the suspicion that the epidemic was probably due to a common cause that was attributed later on to contaminated food. All the possible precautions were taken to prevent the spread of the disease. The carcasses were carted in a specially built contrivance to be destroyed by fire in a temporary incinerator built for the purpose. All infected pens were thoroughly

disinfected, and all other contact animals kept in isolation for seven days. In spite of all these efforts, the infection spread to the sister island of Gozo though only four cases were recorded there during 1901. Because of the lack of an incinerator in this island, disposal of infected carcasses was carried out by sprinkling with petroleum and setting fire to the carcass. The ashes were afterwards buried. Those carcasses that could not be burnt were buried 6-feet deep after being thoroughly disinfected. In the subsequent three months - Jan-March 1902 - fifty further cases of Anthrax were identified affecting various animals including equines (9 cases), bovines (12 cases), ovines (16 cases) and swine (13 cases). The infection persisted until the 6th October 1902. By this time, a total of 138 carcasses

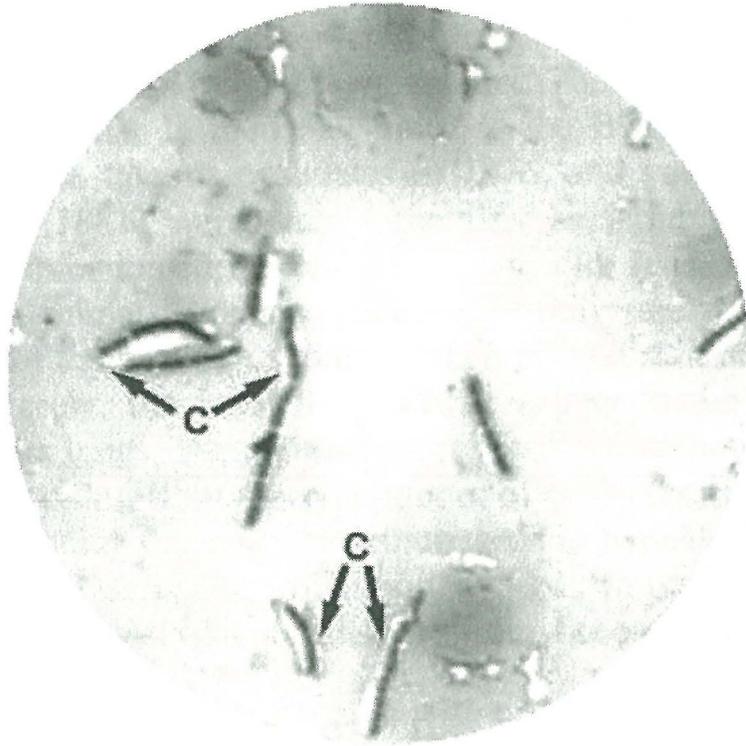
REGION	No. of cases
• Inner Harbour Region	15
• Outer Harbour Region	30
• South Eastern Region	24
• Western Region	30
• Northern Region	21
• Lazaretto & on board ships	18

Table 3: Incinerated carcasses during 1901-02 Anthrax epidemic

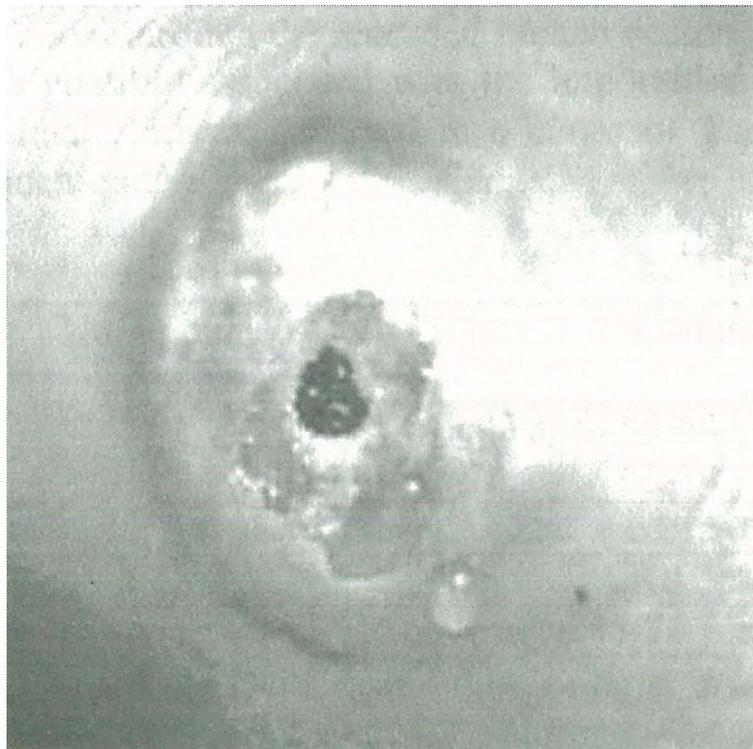
had been incinerated (Table 3). In spite of the epidemic proportion of this outbreak, no cases of Anthrax were recorded in humans.

The problem of inadvertently introducing Anthrax in local herds was taken very seriously by the local health and veterinary authorities. Careful control of all imported animals was carried out and any animals found to be infected were destroyed by incineration. This control was extended occasionally also to imported products made from animal fur. Thus in 1943, a consignment of shaving brushes imported from Japan were tested by the Public Health Laboratory for the possibility of contamination by Anthrax. In the natural state, the infection is relatively easy to control. Not only is the bacillum very susceptible to commonly used antibiotics, but also active immunity to anthrax can be induced in susceptible animals or persons by vaccination with live attenuated bacilli, with spore suspensions, or with protective antigens from culture filtrates. Anthrax immunisation is based on the classical experiments of

Louis Pasteur carried out in 1881. When used by terrorists, the disease is more difficult to control since no high risk group is identifiable for prophylactic vaccination. Treatment is fortunately still effective when instituted early enough.



Anthrax bacillum



Skin lesion