The Dutch Distemper: Investigating the Effects of the Dutch Potato Blight on the Prevalence of Scurvy in a 19th Century Rural Dutch Population

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Introduction

Scurvy (or vitamin C deficiency) is a condition that is often overlooked by bioarchaeologists, but that can provide important insights into nutritional stress, including low dietary diversity or famine. Scurvy was often associated with times of poverty, war, crop failures, or periods when fresh produce is scarce. In the Dutch dairy farming community of Beemster, food scarcity was a frequent issue during the late 1800s. The Dutch potato blight hit The Netherlands after the decline of the East-India Company, and recurring harsh winters, crop failures, and blights targeting cattle, limiting food supplies especially in rural communities.

This study examines the prevalence of scurvy in a skeletal collection of known age and date of death from Beemster, and attempts to assess the correlation between the amount of scorbutic cases in individuals known to have lived and died around the time of the Dutch potato blights of 1845 to 1847. This was done in order to establish whether the blight was a significant agent in the heightened prevalence of vitamin C deficiency within this community, or whether there were other factors at play.

Materials and Methods

101 individuals from the cemetery of Middenbeemster (fig. 1), including 80 adults and 21 non-adults (dated to the first half of the 19th C) were macroscopically analysed following Snoddy *et al.*'s[1]. diagnostic method. Individuals are ranked on a scale from unlikely to have scurvy, to possibly scorbutic, and probably scorbutic. Scorbutic lesions affect most areas of the body, but mostly appear as abnormal porosity or new bone formation in the cranium, metaphyseal long bones, and pelvis (figs. 3 & 4) [1,2]. Once the paleopathological data was collected and each individual was scored, the dates of death were examined to see if the Dutch potato famine of 1845 had a significant impact on the rates of scurvy in this population, with the hypothesis that there would be a significant increase in probable individuals after 1845.

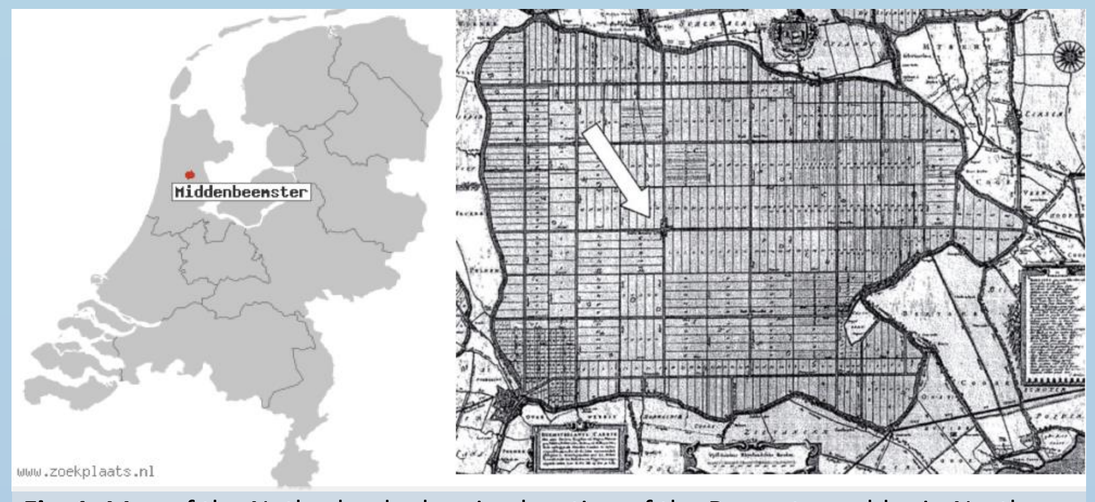

Fig. 1: Map of the Netherlands showing location of the Beemster polder in North Holland and Map of Middenbeemster, with and arrow pointing to the location of the Keyser church cemetery [3,4].

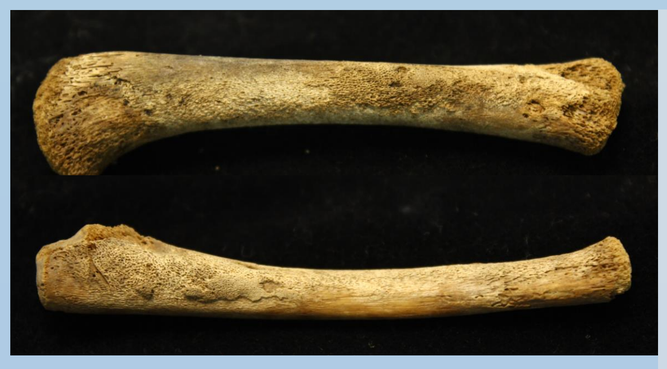

Fig. 3: Examples of new bone formation and abnormal porosity on non-adult right tibia and ulna from St. Mary's Cathedral cemetery, Coventry (site code: SMC99, Sk250). Photo by Anna Davies-Barrett.

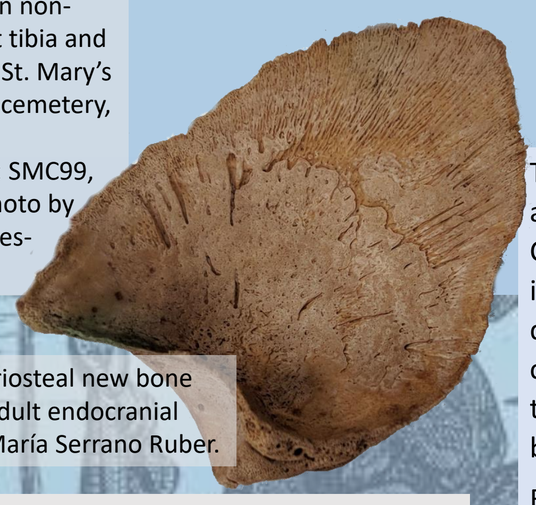

Fig. 4: Extensive periosteal new bone formation on non-adult endocranial parietal. Photo by María Serrano Ruber.

Historical Background

The 19th century was a tumultuous time for The Netherlands, not only in terms of health, but also socioeconomically. The century opened with the dissolution of the Dutch East India Company (VOC), causing a massive drop in employment and subsequent rise in poverty, inflation, and immigration [7]. The remaining population was faced with harsh living conditions during the multiple wars and revolutions that marked the first decades of the 1800s, finally calming down in the 1820s with the establishment of the Dutch Republic [8]. With the loss of the VOC, the Dutch economy had become dependent on its own agricultural output, bolstering trade routes within Europe and its remaining colonies abroad [8].

By the 1830s, the economy saw another downturn, and a decade later the country was hit by multiple harvest failures and potato blights between 1845 and 1847 [9]. This caused a three-year long food scarcity, killing one third of the Dutch population. This scarcity only served to further exacerbate the already existing class divide and increasing health issues [8].

The Dutch diet was generally already very bland and monotonous for lower social classes, consisting mostly of gruels, cheese, local vegetables, and low quality fish and seafood if living in coastal areas, with potatoes becoming a staple ingredient in the late 18th C [10]. This made poor Dutch communities particularly likely to develop nutritional diseases, and some even documented yearly epidemics of scurvy. Middenbeemster was one of these communities, as its farmland was mostly geared towards dairy farming and wool production and would have relied on trade for a supply of fresh produce [11].

Aside from food scarcity, health issues were also often linked to the creation of polders. These swampy areas were a hotbed for a variety of diseases, including cholera or malaria. The combination of this, and the cramped living conditions people were subjected to, led to frequent outbreaks in the country [8]. These factors combined, as well as the likely poor access to medical treatment (usually most accessible in industrial cities), would have made Middenbeemster particularly susceptible to scurvy, especially during periods of scarcity.

Results

In the total population 75,3% (n=76) of individuals were probably scorbutic (adults 73,8% (n=59) and non-adults 81% (n=17)). Of the 101 total individuals, 54 had known dates of death. These individuals were divided up into groups according to whether they were born before or after the Dutch potato blight, and prevalences were compared between the two periods (Table 1). Although there is a slight 2,8% increase in prevalence after 1845, the prevalence of those that died before the blight (n=15) and of those that lived through it (n=38) are very similar, with a prevalence of 86,7% (n=13) and 89,5% (n=34) respectively.

	Pre 1845	Post 1845
Probable Scurvy	13 (86,7%)	34 (89,5%)
Total individuals	15	38

Table 1: Prevalence of scurvy within the datasets of individuals that died before 1845, and those that died after.

Discussion

When comparing the prevalence rates in Middenbeemster with other European populations, it stands out as being somewhat above the expected rate. In a contemporary Irish workhouse population also affected by the potato famine [5] the prevalence was 52%, while a medieval Polish population showed a prevalence of 8%[6]. It may be worth noting that the Polish population was expected to have a much higher prevalence of scurvy, as its symptoms were frequently mentioned in the historical record. This raises the issue of historical misdiagnosis as the physical symptoms are easily confused with other diseases; for instance, bleeding gums could also be attributed to oral infections or periodontal disease.

Within the Middenbeemster population, the most likely demographic groups to develop scurvy were non-adults under 6 years and adult men over 50, although this could be attributed to sample bias. Frequent comorbidities included rickets, osteomalacia, and iron deficiency anaemia- suggesting that nutritional deficiencies in general were rampant at the time, as is to be expected taking into consideration the socioeconomic context.

When comparing the prevalence between the time periods before and after the blights, it becomes clear that there was very little change after the blights begun. This suggests the living conditions were already quite poor, and were not significantly worsened by the blights. It seems likely then that socioeconomic and environmental factors may have played a more significant role in causing scurvy at this time than was previously thought.

Conclusion

While more investigation and a larger sample size of known dates of death is needed to fully understand the extent of scurvy before and after the blights, it seems clear that they were not the main factor affecting vitamin C deficiency rates. Endemic diseases, as well as socioeconomic and environmental factors that were affecting Middenbeemster during this time seem to also have played a significant role in the development of scurvy, and this was in turn somewhat exacerbated by the famines in the late 1800's.

We would like to acknowledge the support of the Middenbeemster community for allowing us access to the remains of their ancestors and the Historical Society Beemster (HGB) for the archival investigations.

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Background Image: Gustave Doré 1875. *Plate 10: Water, water, everywhere, nor any drop to drink.* In Coleridge, S. T. 1875 *Rime of the Ancient Mariner.*