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## Health and demography in late 19th century Kimberley : a palaeopathological assessment

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### Citation

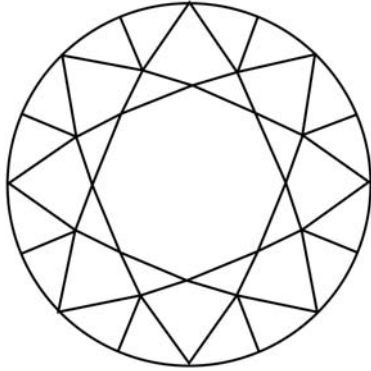
Merwe, A. E. van der. (2010, September 8). *Health and demography in late 19th century Kimberley : a palaeopathological assessment*. Barge's Anthropologica, Leiden. Retrieved from <https://hdl.handle.net/1887/15931>

Version: Corrected Publisher's Version

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## **SUMMARY**

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# **Health and Demography in Late 19<sup>th</sup> Century Kimberley**

A Palaeopathological Assessment



**Kimberley Mine, 1893**  
(McGregor Museum Kimberley Photography nr.1680)



**Dutoitspan Road, early 1900s**  
(McGregor Museum Kimberley Photography nr.1065)

The assessment of palaeopathological lesions present in skeletal population samples plays an important role in the study of human disease through time. Despite the various inherent difficulties to this field of research, described in **Chapter 1**, studying pathology in skeletal material and interpreting it in the light of the demographic composition of the sample population, archaeological findings and historical records still proves to be valuable. The purpose of this thesis was to assess and describe the palaeopathological lesions present in a sample of previously unknown skeletons accidentally uncovered from next to the fenced Gladstone cemetery in Kimberley, South Africa. Lesions were interpreted in association with the archaeological findings at the site, as well as the demographic composition and possible ancestry of the excavated remains.

Trenching by the Sol Plaatje municipality in Kimberley accidentally intersected 145 unmarked graves outside the fenced Gladstone cemetery in 2003. The McGregor Museum in Kimberley became responsible for the recovery and investigation of the disturbed material. Fifteen graves containing 107 skeletons were exhumed from the trench, and remains representing a minimum number of 26 individuals were rescued from another site where material dug out of the trench was dumped. All skeletal remains were analyzed using standard anthropometric techniques, and visually examined for signs of pathology as described in **Chapter 2**.

Archaeological and historical evidence suggested that the skeletal remains were most likely those of migrant mine workers who died between 1897 and 1900. As was reported in **Chapter 3**, the majority of the population consisted of young male individuals of low socio-economic status. Infectious diseases such as treponemal disease (8%), non-specific osteomyelitis (1%) and tuberculosis (1%), was observed. Several cranial and long bone fractures (26%) were also noted and 15% of the individuals in the sample presented with lesions most likely associated with healed scurvy. A high prevalence of Schmörl's nodes (31%) was observed and despite the young age of the individuals in this sample population, degenerative disc disease (15%) and degenerative joint changes (22%) were frequent.

Special attention was given to the high prevalence of mechanical trauma in **Chapter 4**. The frequencies and types of trauma within a population can give important information regarding their lifestyle and the level of medical care available to them. The purpose of this chapter was to assess and interpret the prevalence of trauma in the Gladstone sample population with regards to interpersonal violence, a hazardous working environment, strenuous working requirements expected to be associated with mining, and the availability

## Summary

of medical care. It was concluded that the high prevalence of cranial fractures within this population is suggestive of high levels of interpersonal violence, while long bone fractures, spondylolysis and evidence of longstanding subluxations are testament to the strenuous work requirements and the high-risk environment these individuals were exposed to. The presence of well-reduced fractures and healed amputations suggested that adequate medical care was available to at least some individuals.

Since skeletal evidence of adult scurvy is rarely seen, two chapters were devoted to it: firstly, skeletal lesions suggested to be evidence of adult scurvy were presented in **Chapter 5** and the histological structure of these lesions and the remodeling thereof was dealt with in **Chapter 6**.

An extremely high prevalence of scurvy was well documented as being present among the mining labourers by the end of the 19<sup>th</sup> century (approximately 17% of hospital admissions). A decision was therefore made to investigate the skeletal remains for any skeletal lesions that may be suggestive of adult scurvy. Lesions indicative of possible healed adult scurvy were observed in 16 individuals. These lesions included bilateral ossified haematomas, widespread subperiosteal bone remodelings and periodontal disease. Hospital records and historical documents describing the prevalence of scurvy in the local hospitals as well as the daily diet of the black mine workers supported these findings.

The histological structure of palaeopathological lesions has been described as being diagnostic by some authors. A decision was therefore made to assess whether histological features, as described in the literature, could confirm the macroscopic diagnoses of ossified subperiosteal haematomas, associated with healed scurvy, and syphilitic bone changes observed on the tibiae of some individuals from this skeletal sample.

As was described in **Chapter 6**, a section of bone was removed from lesions on the anterior surface of the tibiae of 14 individuals. These bone changes were macroscopically diagnosed as being indicative of either treponematoses, ossified subperiosteal haematomas, or non-specific periostitis. Ossified haematomas could be histologically identified in seven individuals and three phases of ossified subperiosteal haematoma formation and remodeling were described. Infectious bone changes, most likely associated with treponematoses, were observed in one individual. Histological features described as characteristic of this condition in literature could not be identified in the affected section. It was concluded that although specific pathological conditions can most likely not be diagnosed purely on the basis of histomorphological observations, broad distinctions could be made between lesions

caused by the ossification of subperiosteal haematomas and bone changes due to infectious diseases.

In order to make the study on the health of the 19<sup>th</sup> century miners from Kimberley complete, their dental health was also assessed. As was explained in **Chapter 7**, it can be expected that the dental health of a population may deteriorate when they have easier access to refined carbohydrates and sugars as a result of economic growth in a previously rural society. Historical documents, on the other hand, suggested that, even though these labourers from rural societies were working in an urban setting, restrictions imposed by the compounds prevented them from getting access to the refined foods and sugars which would cause deterioration in dental health. Investigation indicated that the prevalence of dental caries, periapical granulomata and periodontal disease as well as the pattern of antemortem tooth loss observed in the Gladstone sample concurred with dietary descriptions for paupers in historical documents. The relatively low prevalence of carious lesions was ascribed to the limited time migrant labourers spent in Kimberley and the diet restrictions they had to comply with during their stay in the compounds.

Although the presence of supernumerary teeth is not regarded as being pathological and the presence of these teeth does not add any information to the general health status of the sample under study, the teeth described in **Chapter 8** did add interesting detail to the demography of the study population. The high prevalence of this anomaly and the similarities in morphology and location among them suggested that, although several factors may influence the development of supernumerary teeth, there was a possibility of a genetic relationship between some of the individuals affected by hyperdontia in this sample population.

The last paper presented in **Chapter 9** of this thesis deals with the demography of the skeletal population, and specifically with their possible ancestry. An attempt was made to determine the possible ancestry of the unknown individuals excavated from next to the fenced Gladstone cemetery in Kimberley using cranio-morphometry. Results obtained supported the historical documents stating that the majority of labour at the Kimberley mine was done by migrant workers and that the local communities (Khoe-San) did not contribute much to the labour force. Of great importance was that this study reiterated the value of craniometric analyses as a tool to determine the possible ancestry of unknown individuals when used in association with contextual historical information.

## Summary

All of the abovementioned results were taken into consideration to paint a general picture of the demographic composition and the health of the Gladstone skeletal sample in **Chapter 10**. It was concluded that this skeletal sample was representative of what one would expect of a migrant working population. The unhealthy living conditions, unsanitary hospital settings, as well as the absence of antibiotics at the time, combine to explain why tertiary stages of treponemal disease, osteomyelitis and tuberculosis could be observed in this skeletal population. As was suggested by the presence of scurvy and the dental health of this sample population, they followed a diet lacking fresh fruit and vegetables with very limited access to refined carbohydrates and sugars despite the urban setting they were labouring in. Furthermore, high levels of interpersonal violence were suggested by the frequency of cranial fractures observed. Lastly, the frequency of long bone fractures spondylolysis and longstanding subluxations as well as the high prevalence of degenerative lesions observed was testimony of the hazardous environment these individuals were performing hard physical labour in.

This study gave substance to contemporary reports on the appalling conditions and hazards to which migrant workers were exposed when selling their labour to the mines in the late 19<sup>th</sup> century.