

## *Chapter 1*

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# Introduction

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*The history of mankind is the history of its diseases.*  
(Henschen 1966:25)

No one would argue that the health of Australian Aboriginal people suffered disastrously following European settlement here in 1788. In addition, it is a commonly-held belief that Aboriginal health before the coming of Whites was probably very good. There is one problem with the latter belief, however, and that is there is little empirical data upon which to base it. In any case, it is not good enough to make such statements, we need to be able to identify and quantify what we mean by them. Until now, any comparisons that have been made between the pre- and post-contact health status of Aboriginal people have relied on ethnographic and ethnohistorical sources. It is these sources, largely unrepresentative and often unreliable respectively, that have been used to construct the non-Aboriginal perspective of what Aboriginal health was like prior to colonisation. It was this uncertainty that originally made me ask: how healthy were Aboriginal people? Other questions naturally followed. Who were the sickest people in Australia, someone had to be? What kinds of disease were here before Europeans arrived? Did Aboriginal people really murder the sick and malformed (another commonly held belief)? Did they suffer from stress, and if so why and in what form? What is the earliest evidence for disease in Australia and what is the disease? What was the health of Australians like during the last Ice Age? and what might the wider interpretations of the patterns of health on this continent tell us about the people themselves and their various lifestyles?

This book has been written to try and answer some of these and many similar questions. They are, I believe, not merely academic but questions that apply not only to Aboriginal people but to us all. Answers to them can help us understand more about the pathology we all suffered at one time or another in the past. They also teach us something about ourselves, the ecology of our species and the origins of our diseases. To answer them, however, we have to take a broad, generalised approach to the subject rather than concentrate on one particular area of Australia or on one or two pathologies.

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Until the early 1980s no systematic palaeopathological study had been undertaken in Australia. Nothing was known about what kinds of disease might have been introduced here by numerous human migrations to the continent or about the health of more recent Aboriginal people. It is surprising that this situation continued in Australia while in Europe and North America the formal study of palaeopathology was celebrating its centenary. It is even more surprising if we remember that Johann Friedrich Esper, acknowledged by some as the father of palaeopathology, made his now famous but erroneous pronouncement on the pathological status of a fossilised cave bear femur some fourteen years before the first Europeans arrived to settle in Australia in 1788. It is not difficult to understand, therefore, that the main reason for writing this text is to help redress an enormous gap in our knowledge of the pre-contact health of Aboriginal Australians and the story of human health in this part of the world over the last 50,000 years or more.

The continuing return of whole skeletal collections to Aboriginal communities for reburial has added further impetus to the production of this book. Because of these events many of the remains used in this survey are no longer available for study. Under these circumstances I felt that it was important to make available much of the palaeopathological data that I have gathered from all Australian collections for over a decade. Unfortunately, the sudden demise of such scientifically important collections has prevented further and much needed study of many pathologies, including rare and unique examples; it has also meant the loss of other important palaeobiological information. Moratoria prevented many collections from being studied for several years before burials took place. Reassessment and further study of certain pathological conditions which I would like to have undertaken has not, therefore, been possible in the interim. This has resulted in a more cursory description and diagnosis of some pathologies than I would have liked. These have been based of necessity on sparse notes taken under the misapprehension that I could have returned to study them further.

Internationally, the 1960s marked a turning point in the study of palaeopathology, following the rather staid and narrow 'medicine at work' approach of the first half of this century. The revival emerged from a dynamism derived from improved methods and analytical techniques which, in themselves, borrowed from the huge advances being made at that time in the fields of physics, chemistry and medicine. Later, data analysis began to focus on systematic assessment and the need to understand patterns of human disease in their wider palaeo-epidemiological context. The pathology of earlier societies was beginning to be seen not just as a product of pathological processes but as a phenomenon closely related to the interplay between demography and social, economic and cultural behaviour on the one hand and the environment on the other. Angel's (1964, 1967) Mediterranean work is a fine example of this new approach. His work emerged soon after palaeopathology 'took off' for a second time in the latter half of the twentieth century. The post-1960s renaissance was born out of a

renewed vigour for understanding palaeoepidemiological problems as well as major improvements in investigative techniques. New techniques were as important an incentive as they had been at the turn of the century when Ruffer (1909) applied histological techniques and Dedekind (1896) added radiography to palaeopathological analysis. The publication of Jarcho's (1966) and Brothwell and Sandison's (1967) edited volumes, however, inspired new ideas and approaches from within the discipline itself. These volumes also gave incentive to many new devotees, they certainly did to me when I read them fifteen years after their publication. They also played an important role in documenting the frontiers of palaeopathology at that time. For these reasons alone their influence cannot be underestimated and they will always remain cornerstones of the palaeopathological literature. During the 1970s 'non-specific' stress markers, such as Harris lines, cribra orbitalia and dental hypoplasia, became more widely used in a mutually supportive way to understand diet, demography and social structure in past societies. With an upsurge in bone composition analysis, palaeonutrition became an inseparable adjunct to palaeopathology as the popularity of the subject grew through volumes such as Wing and Brown (1980).

In the last 10 years palaeopathology has begun to change as a discipline so that now its philosophy and emphasis has altered radically from its Virchowian beginnings. Rather than its major theme being the discovery of past diseases, or the publication of 'interesting' or 'unusual' conditions, its focus is now directed towards the origins and ecology of disease, particularly disease as a function of human demography and adaptation to an ever-changing social and biological environment. We have now entered the era of palaeoepidemiological study in its widest sense.

The combined use of various pathologies and pathological stress markers, together with studies of bone-remodelling dynamics and trace element analysis, now enables us to come to grips with the history of human society in a way never before possible. Ancient communities can be shown more as the living populations they once were, reflecting their particular environments and the constantly changing dynamics of human populations. Interpretations made by the palaeopathologist often add unique, rather sophisticated and vital data to our knowledge of our past and biological history. In this way palaeopathology now plays a part as important to the understanding of the evolution and development of human society as any branch of traditional anthropology and archaeology; in some respects it contributes more. In other words, it strongly underpins our ability to piece together the complex, fascinating and extremely important jigsaw of who we are and where we have come from.

We now know that Australia's slowly emerging human story is very long, although we do not know how long that may turn out to be. It is also enormous in its breadth and extremely complex in its composition. Certainly no single text can do justice to all the information we now have concerning this story as was possible when D. J. Mulvaney first published his *Prehistory of Australia* in 1969. Our

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knowledge and understanding of the culture and diversity of the first Australians has grown at such an astonishing rate since then that many volumes would be needed if we wanted to include all the basic information we have. I have to say that biological anthropology has contributed a respectable slice of that knowledge, adding to the study of prehistory by focussing on the people themselves rather than on the consequences of their behaviour in the rather disembodied way that often characterises archaeological interpretations. It is hoped that this book can add a fresh set of data to the study of the human prehistory of this continent by opening up an area which has been almost completely ignored. In so doing I believe it extends also our knowledge of the wily tenacity and adaptive strengths of the myriads of people who lived on and wandered across the Sahulian (Tasmania, Australia and Papua New Guinea) and then Australian landscape for at least 3000 generations.

## *Chapter 2*

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# Australian palaeopathology, survey methods, samples and ethnohistoric sources

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## **A brief history of Australian palaeopathological study**

This chapter briefly outlines the few major papers that have discussed Australian palaeopathology. I will confine my remarks largely to those publications of substance and will not be referring to every remark made about a pathological bone from Australia, although I assure the reader that there are few of these.

The first palaeopathological survey of Aboriginal skeletal remains undertaken in Australia was made by Cecil Hackett (1933a,b,c, 1963, 1968, 1974, 1976). His data focussed on treponemal lesion morphology, particularly cranial vault lesions. He hoped that through analysis of a series of discrete and unique pathological changes in the appearance of these lesions he would be able to distinguish and document the differences between endemic forms of treponemal infection and those resulting from syphilis. The diagnostic criteria he established helped him achieve these ends so that the palaeoepidemiology of treponemal disease in Australia as well as its spread and distribution around the world could be understood more fully. Hackett extended his research to include a study of the tibial distortion known as 'boomerang leg' and I discuss this more fully in Chapter 6. His work in Australia, however, was part of a lifelong study of the treponematoses, particularly endemic forms, which he had pursued in many parts of the world, including Africa and the Middle East. He did not set out to document the status of Aboriginal health in the past, nor was his work considered strictly of a palaeopathological nature. His main aim was to understand the history of treponematoses and in many ways he achieved this.

Apart from Hackett's publications and a brief description of five scaphocephalic crania by Fenner (1938), only one paper describing

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pathological lesions in Aboriginal skeletal remains was published in Australia before 1970. This was largely descriptive, however, and detailed particular observations made on 325 pathological bones only from the Murray Valley (MacKay 1938). The material was part of the Murray Black collection, named after George Murray Black, who gathered it from what are believed to be a series of discrete traditional burial places adjacent to the Murray River and elsewhere in the region. By the early 1950s the collection amounted to over 1700 individuals and was held jointly by the Anatomy Department of the University of Melbourne and the Australian Institute of Anatomy in Canberra. Until 1938 they were housed only in the latter institution where Charles V. MacKay was acting director at the time his paper was published in the *Australian Medical Journal*. Various pathologies were noted by MacKay, including fractures, osteoarthritis, osteomyelitis, periostitis, osteitis and tibial bowing. His differential diagnosis made brief mention also of the part that 'syphilis' may have played in the formation of some of the infectious lesions he noted. It is interesting to see that MacKay disagreed with Hackett's belief that 'yaws' was present in parts of Australia other than the tropics and that all evidence for treponemal disease in southeastern Australia, particularly in the Murray Black collection, was due to introduced European syphilis. I will take up these arguments again in Chapter 6. In his paper MacKay stated that he would 'embody the detailed result of this work in a special monograph' (MacKay 1938:3). Unfortunately, no monograph ever emerged and although I have attempted to trace a manuscript, all efforts have proved fruitless. MacKay died in 1939.

I must point out that I am largely ignoring references to dental disease. A number of papers referring to these conditions as well as non-metrical and general morphological characteristics of Aboriginal dentition and palate were published by T. D. Campbell and his colleagues in the 1920s and 30s. It is worth pointing out, however, that many of these concern observations on contemporary traditional Aboriginal people as well as those living on missions, and cannot be considered under the category of palaeopathology. By this time Aboriginal dental health was also beginning to suffer from a diet that included large amounts of white sugar and refined flour. For references to this work see the *Bibliography of Anthropology and Genetics* 1991, published by the Department of Dentistry, University of Adelaide.

Between 1938 and the late 1960s no further palaeopathological papers were published in Australia with the exceptions of Dinning's trauma paper (1949) and Macintosh's 1967 contribution describing the Green Gully remains. But between 1973 and 1980 six emerged (Sandison 1973a,b, 1980; Zaino and Zaino 1975; Prokopec 1976; Jurisich and Davies 1976). Two others describe pathology observed during a wider examination and general biological description of remains from Queensland (Wood 1969, 1976)

Sandison's 1973a and 1980 publications are almost identical. The enormous contributions that he made to palaeopathological study, particularly in Britain and Europe, are, unfortunately, not reflected in

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these papers which are marked by their brevity. Several papers have emerged from the twenty-year study of the Roonka population of South Australia (see Pretty and Kricun 1989). For this reason I have chosen to ignore this collection except for one individual.

Zaino and Zaino's (1975) article concentrated on cribra orbitalia and is the only contribution which takes a quantitative approach. Unfortunately, it, again, is very brief and lacks a differential diagnosis and discussion of the palaeoepidemiological implications of the findings. Oddly, the sample also contained many more individuals from New South Wales, where the study was centred, than were in collections at that time.

It was the singular lack of information about pre-contact Aboriginal health and the paucity of palaeopathological information about Australia that provided the main stimulus for my work. This study began with a small survey of cribra orbitalia carried out as part of my honours thesis (Webb 1981, 1982). The bulk of the data described here were gathered during 1982–84 and some were used as the basis for my doctoral thesis (Webb 1984). A briefly edited version of the thesis was published in 1989 along with several papers dealing with individual pathologies (1988, 1990a,b; Webb and Thorne 1985). Since then I have made a number of observations and reconsidered some of my earlier conclusions and interpretations. I wanted to take the opportunity to include these, report a number of pathologies of a more rare as well as interesting nature, and draw together the data in a continental synthesis. Thus, this book has emerged. To make the text more complete and to present as wide a picture as possible in a single volume I have included some data which also appear elsewhere. In some chapters I have decided to retain sections dealing with methods and results although these are an abbreviated version of those appearing in the 1989 publication.

### *The reasons for the survey*

This survey is primarily concerned with the Australian mainland. Tasmania was originally included but the sample has a number of problems concerning size and provenance. Therefore, the results will be published in a separate report. Some reference is made also to limited data from neighbouring regions. For example, I include a report on the palaeopathology of a coastal village community from Papua New Guinea because of its fairly close position to Australia, across Torres Strait, and for general comparative purposes (Chapter 11).

The main aim of this work has been to study a selection of pathologies in order to provide some measure of the health status of late Holocene Aboriginal people living in different parts of the continent. Late Pleistocene remains were also surveyed not only to record the earliest indications of disease on this continent, but to contrast those results with others obtained from the later populations. It is hoped that this study will provide also a picture of pre-contact Aboriginal

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health, palaeoepidemiology, adaptation and the relationship between all these and the environment in a way that may not be possible for us to construct again. Many of the examples described here are no longer available for study but the value of the data necessitates its publication even, at times, in a cursory form. I ask the reader to bear with this.

### *The philosophy behind this survey*

The health of past societies can only be known by making population surveys using optimum samples from many regions. When planning the survey there was a need to present a broad, generalised study rather than concentrate either on one particular area or region of Australia or one or two pathological conditions. Because this is the first survey of its kind from this continent, I thought it essential also to highlight the range of pathology that existed. By comparing results on an inter-regional or area basis, this range could be shown. If there were vast differences in the pattern of health, how big were they? Were there differences between male and female patterns, for example? What might these mean? Were there radical differences between different groups of people? And, where did the healthiest and sickest people live? Once these patterns were established then, it was hoped, reasons for any observed differences might become clear or understood a little better. A survey of only one or two pathologies would not provide these answers, neither could a broad assessment of traditional health be made. At that level one area might have a higher frequency of one particular pathology than another, but how would we know? Using a range of pathologies and an integrated approach, however, it is possible to gauge the overall pattern in an indirect but substantial manner. By using pathologies with different aetiologies the most likely reasons for the manifestation of that particular combination of pathological frequencies can be shown. This approach also provides a better understanding of what the data may reflect in terms of natural and human environments as well as providing a basic template of pathological variation across the continent and defining subtle differences in the sort of stress or pathology affecting one group over another. A healthy group cannot be determined as such until it has been compared with all others. It is for these reasons also that a continental survey is essential, although sample sizes for some areas are so small they have been rendered almost useless for representative interpretation.

Stress indicators, such as cribra orbitalia, dental hypoplasia and Harris lines, are useful in this sort of exercise but not all of them mean the same thing. Some indicate long-term, persistent or chronic forms of stress and others short-term or acute types. The application of these two categories for interpreting skeletal biology of hunter-gatherer society is extremely valuable. For example, some forms of stress might be largely nutritional, caused by seasonal food shortages.

Whereas, a long-term or chronic stress may reflect population size, sedentism, a poor environment or variation in settlement patterns. Similarly, variation in osteoarthritic patterns may not have the same behavioural connotations in all populations.

The present volume seeks to do two things, then. Firstly, it documents a range of pathologies from all over the continent. Secondly, it also provides a temporal as well as a spatial contrast to the health of the first Australians and ties this in with the people's natural and social environments. In so doing I hope it also lays to rest some of the myths surrounding Aboriginal health and that society's toleration and treatment of the sick and injured.

### *A study with caution*

Palaeopathological work is generally but not solely concerned with the identification of diseases suffered by peoples who have no written records. Data obtained in this way are then translated into information that we hope will tell us more about the general living conditions of past societies. Taken one step further, these results, when measured against a background of social, cultural, demographic and environmental factors, allow us to compare and contrast the palaeoepidemiology of ancient human populations from different parts of the world so that we learn more about the history, origins and distribution of our diseases.

The palaeopathologist seeks to identify and interpret past diseases largely from lesions and other pathological indicators left on osteo-archaeological remains. Further information is gained from the soft tissues of mummified remains. Although there are quite a number of the latter remains in Australia, they are not dealt with in this work. Naturally, palaeopathology is limited in what it can tell us about ancient health because it concentrates on those diseases that affect the skeleton only and also those that can be readily identified. Hence, a number of cautionary statements have been raised concerning the equivocal nature of skeletal pathology, the difficulties of accurate lesion identification and the classification of disease from this source (Sandison 1968; Dastugue 1980). Dastugue remarks, for example:

At every step of his work, the paleopathologist must be cautious and aware of his own limitations ... In short ... many paleopathological diagnoses are mere approximations ... Each of us must be aware that his duty is not to give a solution at all costs but to assemble honestly the data of the problem. (5-6)

The possibility arises also that osteological lesions may not be readily classifiable. This can come about because they derive from diseases that may have been unique to a particular era; or have no modern counterpart to compare them with, or those that are ancestral to a contemporary disease but manifest different symptoms (Klepinger

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1983). The cautious worker, therefore, always has to admit that without the benefit of the living patient, a palaeopathological diagnosis can often fall short in its findings.

Certain pathological bone markers, such as cribra orbitalia, Harris lines, dental hypoplasia, non-specific infection and osteoarthritis, are far more useful when used in concert than studied separately. They are particularly rewarding as indicators of the environmental, pathological, nutritional, biomechanical and demographic circumstances of past human communities. Even so, caution is still being expressed over interpretation of some of these. Generally, however, it is felt that more confidence can be placed in them if they are used in a mutually supportive manner, particularly when conclusions are sprinkled with a moderate degree of scepticism. The best palaeopathological studies are probably those that speak in generalities rather than rigid specifics. Moreover, when reasonable sample sizes are used certain pathological trends are hard to ignore and should not be explained away just because an extremely conservative approach may be thought to be more acceptable to colleagues or the wider audience. To me this is as bad as falsifying data: both ignore the *status quo*. Palaeopathological data provide us with more information about human palaeobiology and ecology than any other archaeological evidence I can think of and when studying hunter-gatherer societies such data are probably the most valuable information of all.

### *General methodology*

A section on methodology is not usual in a volume of this type. Nevertheless, I have decided to include a basic outline of the general methods used for three main reasons. First, it is useful for those interested in how the data was gathered and wish to make comparisons with other studies. Second, it helps standardise palaeopathological surveys elsewhere by offering a consistency of methodological approach, which is necessary for comparing the results of various studies of similar pathologies. This can only result in the eventual enhancement of all our diagnoses. Third, fellow workers are, quite naturally, interested in how certain pathologies have been defined, data compiled and results obtained and thus benefit from comparing methods.

### *Osteology*

Much of the data in this book was gathered during research for my doctoral thesis so there were constraints on time and data handling which restricted the survey to the major long bones (humerus, radius, ulna, femur, tibia and fibula) (Table 2–1), and the cranium (Table 2–2). Other parts of the post-cranial skeleton were also studied in a less systematic way. Standards required all long bones to be complete and included broken bones, providing the break was simple and it constituted a complete specimen. Exceptions to this were made with