Palaeopathology in Egypt and Nubia

A century in review

Edited by

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In loving memory of Judy Miller, member of The Manchester Egyptian Mummy Team, and esteemed colleague and friend

Preface

The original inspiration for this volume came from research that focussed largely on the work of Sir Grafton Elliot Smith and the Archaeological Survey of Nubia. These combined areas of study present an intimidating volume of work, but they cannot be fully understood without also looking at the evolution of the disciplines of palaeopathology and bioarchaeology. Elliot Smith and other early pioneers played pivotal roles in the foundation of these subjects. In many instances they were able to produce studies that have remained unmatched in terms of their scale and impact, and the collections of human remains they amassed continue to present valuable research opportunities.

Both the conference that inspired this volume, and the chapters contained herein provide an opportunity to see how these disciplines have changed over the last hundred years, and explore the directions we may expect them to take in the future. New technologies and improvements to existing methods are being constantly developed and applied to archaeology, providing scholars and scientists with truly exciting opportunities for innovative projects.

The editors would like to dedicate this volume to Dr Judy Miller, teacher, colleague and friend to so many of the KNH team over many years, and who very sadly passed away during its preparation.

Ryan Metcalfe, Jenefer Cockitt and Rosalie David

Manchester, August 2014

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Sir Grafton Elliot Smith: Palaeopathology and the Archaeological Survey of Nubia

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Abstract

A three-year study, 'Sir Grafton Elliot Smith and the Archaeological Survey of Nubia: their significance to the palaeopathological tradition,' was undertaken (2010-2013) at The University of Manchester in partnership with The Natural History Museum, London. This has attempted to assess and redefine Sir Grafton Elliot Smith's contribution to palaeopathology, focusing on his role as Anthropological Advisor to the Archaeological Survey of Nubia. It has also addressed the current state of preservation of the skeletal/archaeological collection from this major rescue project. The preliminary results of this research were presented at a Workshop, 'Palaeopathology in Egypt and Nubia: A Century in Review' (August 29-30, 2012), held at The Natural History Museum, London. This paper provides a brief resumé of Elliot Smith's life and career as an anatomist and palaeopathologist, setting his work in the context of early studies and the development of palaeopathology. It also outlines the main aims and objectives of the recent study.

Early 'unrollings' of mummies

Ancient Egypt became a focus of interest for antiquarians and collectors from Renaissance times onwards, and museums, learned societies, and wealthy individuals in Britain, Europe, and the United States of America vied to purchase antiquities that would enhance their growing collections (Wortham, 1971). Mummies, sometimes regarded as unusual souvenirs of a tour to Egypt, were often amongst these early acquisitions, and from the sixteenth century, many were 'unrolled' (unwrapped) to provide a highlight for an audience invited to attend a social evening. These were frivolous events, and the unwrappings had little scientific value; in most cases, no record was kept or has survived, although occasionally, renowned investigators led the procedure and their published results preserve reliable evidence.

Nevertheless, some of the unwrappings undertaken in the eighteenth and nineteenth centuries were examples of good scientific practice, the projects being undertaken either by multidisciplinary teams, or by serious individual researchers. Leading authorities included Thomas J. Pettigrew (1791-1865), a London surgeon and antiquary who undertook many 'unrollings' and published a history of Egyptian mummies (Pettigrew, 1834); and Augustus B. Granville (1783-1872), a British physician of Italian origin with a great interest in Egyptian mummies who published an important account of ovarian disease in an Egyptian mummy (Granville, 1825). Significant interdisciplinary projects included those undertaken on mummies owned by learned societies: for example, the Belfast Mummy in 1835, and the Leeds Mummy in 1825 (Osburn, 1828).

Beginnings of palaeopathology and the scientific method

Unscientific unrollings were discontinued in the middle of the nineteenth century, and by the early twentieth century, various pioneers were laying the foundations for 'mummy science'. At The University of Manchester (UK), Dr Margaret Murray's interdisciplinary team unwrapped, autopsied, and subsequently investigated and produced a scientific report on the mummies and tomb goods belonging to the 'Two Brothers' (Murray, 1910). Armand Ruffer (1859-1917), a British pathologist who became Professor of Bacteriology at Cairo Medical School in Egypt, devised methods of rehydrating ancient tissues, and 'Ruffer's solution' is still used to rehydrate mummified tissue prior to microscopic examination. He also developed histological techniques to identify disease in Egyptian mummies and skeletons, and key aspects of his work were published posthumously (Ruffer, 1921). He pioneered the study of disease in ancient populations as a distinct and separate area of science, and this sub-discipline, for which he invented the term 'palaeopathology', remains highly relevant to the history of science and medicine, facilitating the study of antiquity through ancient human remains, and providing a basis and context for modern disease studies.

Alfred Lucas, O.B.E. (1867-1945), was a British chemist who also carried out pioneering research in this field. First going to Egypt in the hope of alleviating a lung condition, he became Chemist to the Government Salt Department in Cairo, and Chemist to the Antiquities Service (1923-1932). He played a leading role in the analyses of ancient materials and substances, publishing a uniquely important account of his experiments and observations (Lucas, 1962). He also pioneered conservation and restoration techniques for cleaning and treating excavated material, notably supervising nine years' work undertaken on the contents of the tomb of Tutankhamun.

The legacy of Grafton Elliot Smith

The contribution made to Egyptology and palaeopathology by another early scientist, Sir Grafton Elliot Smith (1871-1937), is the subject of the current project entitled "Sir Grafton Elliot Smith and the Archaeological Survey of Nubia: their significance to the palaeopathological tradition" (supported by The Wellcome Trust [WT090575MA]). This project had two main aims: by examining the importance of Elliot Smith's role as anthropological advisor to the Archaeological Survey of Nubia (ASN), to reassess and acknowledge his hitherto unrecognised contribution to the development of palaeopathology, and to highlight the research potential of the unrivalled skeletal collection obtained from the ASN.

Until now, Elliot Smith's study of the Egyptian royal mummies has been his most acclaimed contribution to palaeopathology. While he was Professor of Anatomy in the Cairo School of Medicine (1900-1909), Gaston Maspero, the Director-General of Antiquities in Egypt, invited him to examine two caches of royal mummies that had been discovered at Deir el-Bahri (1881) and in the Theban tomb of Amenhotep II (1898). This extensive study of the mummies of the rulers of the New Kingdom (1567 BCE – 1085 BCE) ultimately formed the basis of his classic account (Smith, 1912). Over a period of two years, with

additional access to the mummies of priests and commoners, Elliot Smith was able to identify various embalming methods and techniques of mummification in use at different periods, which provided him with the material for a pioneering publication (with co-author, Warren R. Dawson) on techniques of mummification (Smith and Dawson, 1924).

However, Elliot Smith's most groundbreaking contribution is arguably the research which he undertook, with his co-workers Douglas Derry and Frederick Wood Jones, on the thousands of Egyptian and Nubian mummies and skeletons recovered during the Archaeological Survey of Nubia. This was a heritage rescue operation established to save some of the ancient remains threatened by construction of the first dam on the Nile at Aswan in the early 20th century (Smith and Jones, 1910).

Grafton Elliot Smith: The early years

Grafton Elliot Smith was an Australian anatomist and anthropologist with diverse interests and achievements (Dawson, 1938; Crook, 2012). In the medical sphere, his significant contributions include groundbreaking research on the human brain, and innovative methods that changed the course of anatomy teaching in medical schools. In his day, he was a foremost authority on the evolution of man, and a leading proponent of the 'Diffusionist Theory' (the claim that all the world's cultures had emanated from a small number of great civilisations, most notably Egypt), a belief for which he was later criticised and ridiculed.

Named after the town – Grafton in New South Wales, Australia – where he was born, Elliot Smith was the son of a London-born country school-master and his wife, Mary Jane Evans. He recorded that it was his father who initiated his scientific interest, encouraging him to collect specimens of flora and fauna (Smith, 1938, p.114):

> "...when on vacation visits to the seaside I found the carcase of a dead shark on the beach, I proceeded to dissect it with a penknife, and became specially intrigued by the brain which seemed to me to be a veritable collection of puzzling tricks."

From the age of ten, the boy's enthusiasm for physiology was well established. This led him to a career in medicine, and in 1892, he graduated from Sydney University with a Bachelor of Medicine degree. In 1896, with the award of a university travelling scholarship, he set out for London. His studies brought recognition when he was awarded a Research Studentship at St John's College, Cambridge, where his academic progress was further influenced by the Professor of Anatomy, Alexander Macalister. Ernest Rutherford (who, in 1908, was awarded the Nobel Prize for Chemistry) was Elliot Smith's contemporary at Cambridge, and later described him in the following terms (Rutherford, 1938, p.134-135):

> "At the time of which I speak, Elliot Smith was just twenty-five years of age. He was shy and taciturn at first with strangers, while his drooping moustache gave him an appearance almost of melancholy. This soon vanished when he talked with friends on matters in which he was interested, when he became lively and humorous and the best of company. His outward appearance changed markedly in middle age, when he

was clean shaven, rubicund, and a ready and fluent speaker, looking, to my mind, rather like a distinguished and jovial bishop."

Elliot Smith's introduction to Egyptology

Macalister next arranged for Elliot Smith to become the first Professor of Anatomy at the new Government Medical School in Cairo, a post he held from 1900 until 1909. During this period, his anatomical work brought him into contact for the first time with the ancient human remains that archaeologists were uncovering. His initial involvement with Egyptology came about in 1902 when, because of his special interest in the human brain, he was asked to examine a series of ancient human brains from the site of El Amrah (Smith, 1902).

Elliot Smith's developing expertise in this area soon led to an invitation from Gaston Maspero, the Director-General of Antiquities, to participate, with the archaeologist Howard Carter, in the investigation of a mummy in the presence of the pro-Consul, Lord Cromer. Maspero then asked Elliot Smith to examine the mummy of Tuthmosis IV which had been discovered in 1898. In order to provide a detailed anatomical evaluation, Elliot Smith decided to use a new analytical facility – radiography. The only machine available in Cairo was located in a private nursing home: the mummy, accompanied by Elliot Smith and Howard Carter, was transported in a horse-drawn cab, and the first radiographic study of a full-body human mummy was undertaken (Smith, 1912, p.iii-iv, vi-vii).

The Archaeological Survey of Nubia

A decision to raise the first dam at Aswan, with the prospect of resultant flooding of antiquities in that area, prompted Maspero, in 1907, to establish the first Archaeological Survey of Nubia. Placed under the directorship of the American Egyptologist, George Reisner, this was the first extensive archaeological rescue project in the area, and ultimately completed the excavation of over 20,000 burial sites. The results were published in a series of bulletins and reports (e.g. Reisner, 1910; Smith and Jones, 1910), and its contribution to palaeopathology remains unrivalled. As well as acting as a rescue mission, the ASN also sought information on the pattern of successive races and racial mixtures in the area; the extent of the population at different periods; the source and degree of civilisation; the economic basis of existence; and the character of industrialised products. The ASN examined 151 cemeteries in five years; in the first two months alone, researchers worked on eleven cemeteries containing more than 3,000 bodies. This work, covering a period from Predynastic (A-group) to Medieval times, revealed graves, tombs, temples, grave goods, skeletal remains, mummies and animals.

Elliot Smith accepted an invitation to act as anthropological advisor, with responsibility for the ASN's anatomical reports, but he could not have envisaged the scale of the work involved in exhuming and examining thousands of human, as well as animal, remains. Assistants were appointed – from 1907, Douglas Derry, and Frederick Wood Jones. Together with Elliot Smith, they undertook a systematic study of osteological material and statistical analysis, producing extensive data about disease and trauma in this population. They pioneered

modern epidemiological research with this first large-scale study of disease patterns of particular populations (in this case, ancient Egypt and the Sudan). Wood Jones provides an intriguing assessment of Elliot Smith's attitude to work (Jones, 1938, p.139):

> "...more than any other man I have ever met, he was indifferent to his physical surroundings....it might be said with truth that he carried his own environment with him....The only local incidents that affected him were the material objects, such as anatomical subjects, libraries and museums, that happened to be within his reach.
>
> It is certain that his Egyptian period changed and enlarged his outlook; but it was not, as many have supposed, because the romance of the land of the Pharaohs attracted him or had him under a spell. It was rather because Egypt furnished him with skulls and skeletons and mummies; and upon these things he was asked to report to Egyptologists."

Elliot Smith in Manchester and London

Elliot Smith left Cairo in 1909 to take up a post as Professor of Anatomy at The University of Manchester. He remained there until 1919, playing a leading role in creating a first-class School of Anatomy. At this time, Manchester was at the centre of intellectual and scientific interaction, and had attracted leading specialists in a number of fields; these included Rutherford, with whom Elliot Smith was able to renew his friendship.

A collection of human skeletal material, originally owned by Elliot Smith, is still held at The University of Manchester. These remains were examined by a scientist some years ago who classified them as a teaching collection that had no association with the ASN. However, two sharp-eyed postgraduate students engaged in cataloguing the collection noticed excavator's notation marks on some of the bones, and this discovery later enabled some of the skulls and femora to be attributed to the ASN. A pilot scheme which then placed this material into its true context, and enabled it to be tied into the remainder of the known surviving ASN collections, provided the basis for the current project.

Elliot Smith moved to London and completed his career at University College, where he held the Chair of Anatomy from 1919 to 1936. He was involved in the College's strategic plan to integrate biological and social sciences with humanities, supported by funding of over £1.2m, donated by the Rockefeller Foundation in 1920. However, because of funding issues, exacerbated by the 1929 world depression, this ambitious plan did not materialise, and although Grafton Elliot Smith developed cutting-edge anatomy and research-based anthropology, his own vision for an Institute of Human Biology as part of the overall scheme was never fully realised.

The current project: 'Sir Grafton Elliot Smith and the Archaeological Survey of Nubia: their significance to the palaeopathological tradition'

The ASN was one of the earliest, most extensive archaeological rescue projects ever undertaken: human and animal remains and associated archaeological material were

retrieved from hundreds of sites in southern Egypt, threatened by rising water levels. Subsequently, the reclaimed skeletal remains, artefacts and records were distributed to institutions around the world. But why is there now a need to revisit the ASN? First, although the material is of unique significance to disease and anthropological studies, its potential has never been explored, and the original conclusions remain unpublished. The distribution of the ASN material to centres around the world has resulted in fragmented collections, where the physical remains and artefacts are sometimes separated from the archives; cultural interpretation is lacking; and there has been an insignificant amount of modern epidemiological research on this unparalleled material. There is an urgent need to identify and record this unique evidence.

This three-year study (2010-2013) study was undertaken by the KNH Centre for Biomedical Egyptology at The University of Manchester in partnership with The Natural History Museum, London, which holds a major part of the ASN collection. Collaborators on the project included The Duckworth Collection, University of Cambridge; The Manchester Museum; the National Research Centre, Cairo; and in the United States of America, the renowned palaeopathologist, Professor Michael Zimmerman. Other research associations were established with The Royal College of Surgeons, London; The Royal Society of Medicine; the British Museum; the Boston Museum of Fine Arts (USA); and institutions in Egypt.

Archival and scientific resources were used to assess Elliot Smith's contribution to palaeopathology, and the current state of preservation of the skeletal/archaeological collection. Also, radiographs and other techniques were employed to take forward the research on disease patterns that was initiated by Elliot Smith and his colleagues. Current locations of the ASN collections were traced and the material reunited on a publicly accessible, dedicated website as a research resource which can now provide information about identification and distribution locations of excavated materials, disease occurrence, trauma, diet and so forth. In due course, the website will include verification of Elliot Smith's disease diagnoses, results of new disease studies, and statistical analyses of disease patterns based on the collated data.

The results of the project have been made available in academic and popular publications. Outreach activities based on the study have included a day-school in Manchester; an exhibition, "Grave Secrets", at The Manchester Museum (November 2011 – March 2012); and, at The Natural History Museum, London, a Workshop entitled 'Palaeopathology in Egypt and Nubia: A Century in Review' (August 29-30, 2012), and a Public Lecture (August 28, 2012) by Professor M. R. Zimmerman: 'Studying Mummies: Giving Life to a Dry Subject'.

Elliot Smith died on January 1st, 1937. His ideas were wide-ranging and sometimes controversial, but he always believed in a rigorous, scientific review of facts and their interpretation (Crook, 2012, p.151, note 19):

> "We must particularly guard against ideas becoming so embedded that they are accepted as gospel without check or challenge."

It is hoped that, by taking up the challenge of demonstrating that Elliot Smith made a significant and durable contribution to palaeopathology, this project will go some way towards ensuring that his legacy is finally recognised and fully acknowledged.

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