

Conclusion

by

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It has been the main aim of this project to establish a methodology, under near-ideal conditions, for the examination of a group of Egyptian mummified remains, and also to identify disease in the bodies and, whenever possible, to determine the cause of death. Furthermore, information was sought which would either confirm our existing knowledge of funerary and religious beliefs and living conditions in ancient Egypt, or would add to the facts already available. In addition, it was hoped that information would be forthcoming which might contribute to the historical data already on record about certain mummies in the collection.

To fulfil these aims a variety of techniques were used. Radiology provides the most acceptable method of investigation because it is a non-destructive technique, and a complete survey was, therefore, carried out. Conventional radiological techniques were employed, but greater scope existed for thorough investigation than on most previous occasions since, instead of portable equipment, it was possible to use hospital-based equipment. In addition, a new technique (tomography) was utilized and this made it possible to examine sites inaccessible to conventional radiography. The radiological survey aimed at providing information in the two main areas: palaeopathology and archaeology; in addition, it provided assistance with the dental survey.

The presence of disease in the mummified organs was determined and identified by using a variety of techniques; these included rehydration and preparation of the mummified tissue which was then examined by means of light microscopy and electron microscopy. In addition to its role in determining the genus of the worm which caused significant disease in one of the mummies, and the nature of the particles found in the lung tissue of another, electron microscopy was also used to examine certain mummies for the presence of heavy metals in the body tissues. A general survey of the mummified tissue also indicated the level of success achieved by the embalmers in preserving the tissues. The various insects found in the Manchester collection were identified by means of the electron microscope.

The bandages of one of the mummies were investigated by various techniques; from this, the nature of the material could be identified, both microscopically and macroscopically, and the substances applied to the bandages could be isolated and characterized. Additionally, their historical background and significance were examined.

A method was devised to obtain the fingerprints and toeprints of a particularly well-preserved mummy, and these provided an additional indication of the estimated

age at death and the lifestyle of the person. Certain human mummies were selected for a controlled experiment in creating three-dimensional 'busts' of the heads, using techniques established on scientific principles, on which further studies and illustrations could be based.

In the wider context, the methods of mummification mentioned in the writings of Herodotus were explored, and a reconstruction of the techniques described there allowed the accuracy of these statements to be assessed.

The unwrapping and dissection of one of the mummies afforded an opportunity to examine a mummy in great detail, using multidisciplinary techniques. It was possible to obtain information which was not provided by the preliminary radiographs, including the presence within the bandages of prosthetic limbs and a phallus, gilded nipple amulets, covers for the finger-nails and toe-nails, and a pair of painted slippers. It also allowed a detailed study to be made of the bones of the head and the tibia. The dating of the bones and the bandages of the mummy by Carbon-14 techniques provided the conclusion that the body was about 1,300 years older than the bandages and therefore must have been re-wrapped at a later period.

In terms of palaeopathology, there were three significant discoveries of disease in the Manchester mummies. These included the calcified nodule in the anterior abdominal wall of Mummy 1770 which was identified by radiological investigation as a Guinea worm, the sand pneumoconiosis discovered in the lung tissue of Nekht-ankh (No. 21470), and the parasitic infestation present in the intestines of Asru (No. 1777). The dental survey showed that, apart from the unusual condition of the teeth of 1770, the teeth of the other human mummies exhibited evidence of the same problems which seem to have afflicted many people in Egypt. The most outstanding dental abnormality was the rare example of double gemination found in the mummy of Khnum-nakht (No. 21471).

In most cases, the cause of death was not apparent, although some of the above conditions may have hastened the death of an individual.

Information relating to religious and funerary customs and to living conditions is less specific but, subject to certain reservations, the experiments in mummification carried out on rats suggest that Herodotus's account of the types of mummification and the length of time involved is probably essentially accurate. Again, the use of tomography in the radiological investigation has enabled the effects of removing the brain to be looked at more closely and, in the wrapped mummies, it has been possible to determine the presence of amulets between

the bandages. In the case of the animal mummies, radiology has enabled 'fake' mummies to be detected and, in some cases, it has also helped to establish the species of an animal within a hitherto unidentifiable package.

Re-examination of the bodies of the Two Brothers has confirmed the original report (1910) that the bodies are of such different types that it is difficult, if not impossible, to regard them as close relatives. Although the inscriptional evidence indicates that they are sons of the same mother, anatomical and other factors make it almost impossible to accept such a statement. It has been suggested that they were half-brothers, but it is perhaps more probable that one of the brothers was an adopted son.

It is also noteworthy that the three reconstructed heads belonging to the Two Brothers and to 1770 all bear a marked resemblance to types represented in ancient art-forms. The heads of the Two Brothers correspond closely to the wooden statuettes found in their tomb and the type of face shown in the head of 1770 can be frequently seen in reliefs and sculpture.

However, the most interesting information relating to religious and funerary customs has undoubtedly derived from the unwrapping of Mummy 1770. The presence of the slippers, nipple amulets, prostheses, finger-nail and toe-nail covers, and cartonnage head and breast covers, suggests that a considerable degree of care was taken to prepare this body for eternity, despite the fact that the person's gender was apparently unknown to those who were involved in re-wrapping the body. The Carbon-14

dating techniques have provided the answers to a variety of questions resulting from the autopsy of this mummy, but the identity and provenance of the mummy and the cause of death cannot be determined. The date arrived at for the re-wrapping will also have to be considered in connection with the religious and funerary customs of that period.¹

Although it would be highly undesirable for numbers of human mummies to be unwrapped and investigated to destruction, it is apparent from this experiment that, undertaken under the right conditions, a total investigation of this kind can provide information which is otherwise inaccessible, even using a non-destructive method of examination such as radiology.

In general, the research carried out on the Manchester collection has indicated that the results of such a multidisciplinary investigation can make a valuable contribution to the existing knowledge of disease, living conditions, and religious practices amongst certain sections of ancient Egyptian society.

An intensive examination, employing mainly non-destructive techniques, of all Egyptian mummified remains and the compilation and co-ordination of the results obtained from such investigations would undoubtedly provide the palaeopathologist and the Egyptologist with a rich source of information relating not only to the history of disease but also to many aspects of ancient Egyptian society.

¹ See forthcoming article.