AN EGYPTIAN MUMMY & COFFIN IN UNIVERSITY COLLEGE CORK

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An Egyptian Mummy and Coffin

in

University College Cork:

a preliminary scientific investigation

(Text and Portfolio)

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by

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Abstract

This thesis is an attempt to establish the relationship between an Egyptian mummy, cartonnage and coffin. To this end, the mummy was x-rayed by conventional means and CT scanning to discover possible a date and to discover whether there was anything unusual about it from the point of view of pathology, bandaging, or mummification process. The bandages were analysed microscopically and by chemical analyses. The cartonnage was examined to extablish a possible method for its manufacture, and to discover whether all four pieces belonged together. The inscriptions and subjects depicted upon it were drawn and photographed and where possible, interpreted. The provenance of the coffin was established, its inscriptions and art work recorded by drawing and photography and its present location communicated to the Topographical Bibliography of Egyptian Inscriptions etc. at the Griffith Institute at Oxford.

CHAPTER ONE

1.1. Introduction and aims

1.1.1. Background to the study

There is in the teaching collection of the Department of Archaeology at University College Cork, an Egyptian mummy, which is partially covered by cartonnage and contained in a coffin. In 1975 M J O'Kelly, Professor of Archaeology at University College Cork (1946-1982) showed it to me and asked me to investigate it and discover whatever I could, since nothing seemed to be known about it, apart from the fact that it had been under the floor boards in the Pathology Lecture Theatre for some time, and during structural alterations there had been moved to a store in the Lee Maltings.

1.1.2. Oral tradition

It is an unfortunate fact that it was the fate of many mummies in small collections, to arrive at a date unspecified , from a donor unspecified, for a reason unspecified - even from a place unspecified. It is a quite common occurrence that the mummified occupant of a coffin was not the original owner, nor a person for whom the coffin was ever intended.

When therefore, a mummy is seen in a coffin it is reasonable that the question 'do they belong together' should arise. In any archaeological investigation questions regarding the possibility of primary and subsequent burials etc. usually arise. In the case of the Cork mummy and coffin it is very easy to see that both do not belong together. Why, when, where, how and by whom were they put together? The history of the mummy and coffin during its time in UCC can be recounted only on the basis of local oral tradition and folk memory. As in all oral traditions, the factual and the fanciful can be difficult to separate but fact sometimes emerges and this case is no exception.

1.1.3. In 1975, press interest was aroused in the rumoured existence of a mummy in UCC. On July 16th of that year Mr. Denis Reading of *The Cork Examiner* published an article entitled '2000-year old mummy comes to light'. It was hoped that this would awaken some memories, and on August 2nd a note appeared in the *Evening Echo*, sister paper of the *Cork Examiner*, thanking a person who had telephoned *The Cork Examiner* office to inform them that he remembered the mummy and that it had been brought here from Egypt by Professor Pearson, Professor of *Materia Medica* (1884 to 1900), and Professor of Surgery (1900 to 1924). I contacted members of the Pearson family, but they did not have any knowledge of this, nor did they know whether the Professor had ever been

to Egypt. Professor Pearson was Examiner in Surgery for the Indian Medical Service in 1912, and this may have been the reason for this caller's assumption that he had brought the mummy here.

The Obituary for Professor Pearson in the *British Medical Journal* (May 21 1947) does not suggest any connection with Egypt, nor does Pearson's own 'Review of Medical Education in Cork' in *The Lancet* Dec 31 1927.

1.1.4. A further consequence of the *Examiner* article was my chance encounter with a lady, Dr Mary O'Donovan neé Cross, Assistant in Pathology (1930-1934), at University College Cork. She expressed great annoyance at the publication of this article, and asserted that she knew "all about it". It was, she said, totally uninteresting, and intimated that there had been more than one mummy in the College. Recently, Msx Virginia Teahan, Archivist to the College has ascertained from Dr O'Donovan's daughter, Dr Margaret O'Connor, that Dr O'Donovan did not wish to discuss the mummy because the bodies of members of the Crown Forces (the so-called Black and Tans) murdered by the Irish Republican Army, were dumped outside the Medical Building in UCC during Black and Tan War (1920-1921). These were used for anatomical dissection, the practice was accepted by the police and no questions were

asked[1]. However, the mummy was a body from an unidentifiable source, and in order that no awkward questions should be asked about it, her late husband Professor W O'Donovan, Professor of Pathology at University College Cork (1941-1955) hid it under the floorboards in the Pathology Lecture Theatre. I think we can be certain that these other 'mummies' were not Egyptian in origin - it is far more likely that they were victims of a very different fate met nearer home. None of Dr O'Donovan's contemporaries in UCC seem to know any more than she where this mummy came from. They knew it was there but had no interest in it.

Conversations with other retired members of UCC staff are equally unenlightening. Some people are 'certain' that it was in the old Natural History Museum, which was housed in what later became Reading Room Two of the Library, and is now part of the Administration offices. Others are equally 'certain' that it was in the Cork Public Museum in Fitzgerald's Park. The late Professor O'Kelly would have known if it had been in either place, but never intimated this to me.

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[1] I have checked this out recently with Dr V.R. O'Sullivan who says that he was told by the late Mr. J. Raftery, Senior Technician in the Anatomy Department during the 1940s and early 1950s that this was standard practice.

J P McCarthy (1986, 4-5) refers to mummified remains exhibited by Dr Richard Caulfield, Librarian at Queen's College Cork, 1881-1887. He has not been able to discover whether Caulfield had any connection with this mummy. If the mummy and coffin came to QCC together, Caulfield could not have been involved, given that Caulfield died in 1887 and the coffin was not discovered until 1903 (see below Section 3.5.1.). This is also true of the suggestion by Professor Sean Teegan (pers comm) of the involvement of President W K Sullivan, second President of QCC (1865-1888) who had numerous contacts around the world, was responsible for planting many of the exotic trees and initiating the Natural History Museum in College.

The ambiguity of these stories and lack of documentary evidence is such that the unreliability of the oral tradition is underlined.

1.2.1. Among the archival records in the Library of UCC are delivery notes etc. for various antiquities purchased by Sir Bertram Windle Professor of Archaeology at University College Cork (1910-1919). Although various Egyptian items are mentioned, there is no mention of a mummy or mummy case. By 1910 it was illegal to export mummified remains from Egypt, so it may have been unwise to acknowledge in writing the delivery of a mummy to an institution. There was also the memory of the dismissal of Benjamin Alcock, Professor of

Anatomy at Queen's College Cork (1849-1854), on account of his alleged abuse of the Anatomy Act by obtaining subjects for anatomy under false pretences. An Anatomy Museum existed in the College, and a catalogue of its holdings was published in 1912. It does not mention the presence of mummified remains.

1.2.2. There is no record among the *Minutes of the Govern ding Body* or its predecessor, *the Body Corporate*, where all gifts were acknowledged under the Regulations which lay down the procedures for agenda for these meetings. The *Reports of the Presidents* do not refer to any such items, and the *Minutes of the Cork Cuiverian Society* are also silent about it, as are records in the Department of Pathology.

1.2.3. During the course of structural alterations in the Pathology Department, the mummy was moved to the store in the Lee Maltings, Prospect Row, at the request of Professor M J O'Kelly, Professor of Archaeology University College Cork, 1946 to 1982. Storage conditions here were unsuitable, and when Professor O'Kelly asked me to work on the mummy, it was moved to that part of the Lee Maltings which is still occupied by the Library, where conditions for storage were almost ideal.

1.3.1. In 1976 I visited the British Museum, and brought photographs of the mummy and coffin. The name of the mummy as inscribed on the cartonnage was deciphered by the Department of Egyptian Antiquities as Pa Khnum, son of Tkmy born of the Lady of the House Wy. They did not decipher any name on the coffin at that time, and my subsequent acquaintance with the inscriptions suggested to me that as the name Pa Khnum was not in evidence on the coffin, it and the mummy did not belong together. Recently, in July 1988, Ms Barbara Adams of the Petrie Museum at University College London suggested that I send as much information about the coffin as I had available to Dr John Taylor, now Curator in the Department of Egyptian Antiquites at the British Museum. He immediately recognised the coffin as belonging to one Hor, son of Tjakhonsurud, his mother Tjaenhotep, noble Lady of the House. The history of the coffin then came to light and so a provenance is now established. This will be discussed below, section 4.5.1. He did not suggest a provenance for the mummy, however.

1.4.1. The aim of this study is to make as full a record as possible of the mummy, textiles, cartonnage and coffin, and by this means to contribute to the data currently being captured world wide on the history of mummification, history of medicine, and social history of the Egyptian civilisation. I have relied on the cooperation of experts in the medical and scientific fields, as well as Egyptology, art and archaeol-

ogy. The medical personnel comprised an engineer, radiologists, haematologists and a dentist. In the scientific field, I have had the assistance of a chemist and electron microscopist, while Egyptology, art and archaeology are self evident.[2] The various specialist reports are brought together and assessed here. There then follows a detailed description of the subjects painted on the cartonnage and coffin. Each section of the coffin and cartonnage has been photographed, traced, reduced, reproduced and coloured.

1.4.2. Parameters to be studied:

In this study, the group of subjects is examined under 4 main headings, viz., the mummy, textiles (other than cartonnage) and other materials, cartonnage and coffin. Each subject is described in detail and answers are sought to a series of research questions. These questions are:

1. Mummy:

a What is the name, age, sex, weight, and date of the mummy?

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[2] I was particularly fortunate in procuring the aid of a chemist, Mr John Evans of North East London Polytechnic, as he has a wide range of experience in the application of scientific techniques to archaeology, and especially Egyptology.

b Medical observations *ante mortem*:

What was general state of health of the individual?

Were any physical abnormalities in evidence?

Were any pathological conditions noticed?

Is there any evidence of trauma?

To what blood group did it belong?

Is it possible to establish the cause of death?

c Dental observations *ante mortem*

What was the general condition of the dentition?

Is there evidence of pathological conditions of gums or teeth?

Had any been lost or removed?

Is there evidence for prostheses, bridges or other dental work?

d What procedures were followed in order to achieve this particular mummified state?

Can we say how the body was treated prior to mummification?

Had putrefaction set in?

Had any limbs been lost?

Had any bones been broken or dislocated?

Had any prostheses been necessary or used?

e How was the body treated during the mummification process?

Does any soft tissue survive?

Were any internal organs left in the body?

Were any parcels of organs replaced in the body?

Was any subcutaneous packing used?

How was the body packed?

How was the cranial cavity packed?

How was the body wrapped?

f How did the teeth, gums and mouth fare during the mummification process

g Is it possible to establish whether the body was rewrapped on some other occasion? If so, when, why, where, how and by whom?

h Were amulets used in wrapping the body?

i Is there any evidence of attack by insects or rodents

j How does this data compare with reports of other such investigations

k What inferences can be drawn from this data regarding the diet and socio-economic milieu of this individual

2. Textiles (other than cartonnage) and other materials

a What is the nature of the textiles associated with the

mummy ?

b How many different textures, weaves can be identified?

c Is there any evidence of dyeing?

d Is there any evidence of attack by insects or rodents?

e Are there any inscriptions on the textiles?

f How were the textiles applied to the body during the mummification process?

g What other materials can be identifed in the textiles?

h What is the nature/composition of these materials?

i What is the reason for their use?

j How does this data compare with data from other such studies?

3. Cartonnage

a What is cartonnage?

b What are the various components of this particular cartonnage?
Is it possible to ascertain that they form a unified whole?

c Is there any evidence of attack by insects or rodents?

d What are the subjects depicted upon it?

e What is its date?

f How can we know whether it and the mummy belong together?

g How does this data relate to other such studies?

4. Coffin

a What is the construction of container and of lid?

b What are the measurements of container and lid?

c What are the various registers of decoration?

d What are the inscriptions?

e What is the chemical composition of paint?

f Is it possible to identify what wood or woods used?

g What caused the infestation of the coffin?

Finally the question regarding the relationship of all four items, one to the other is raised, and a solution offered.

CHAPTER TWO

Materials and Methods

2.1. The Mummy

2.1.1. Etymology

The word 'mummy' comes from the Arabic word for bitumen, *mumiya*. This appellation is due to the often badly embalmed bodies of the Late Period (600-343 BC) having a blackened and brittle appearance, which led people to believe that they had been dipped in bitumen (Hamilton-Paterson and Andrews, 1978, 36).

2.1.2. Theory of mummification

'You will not cease living; you will not cease to be young, for always and forever' cried the priest at the end of the embalming ritual (Thomas, 1987, 457). He points out (p 455) that while decay is the justification for all funeral rites, forbidding it absolutely is the *sine qua non* of mummification. There is, he says a profound need underlying mummification which is common to all civilizations, whether they display the corpse, hide it in a sarcophagus, or incinerate it: to stabilize the deceased in an indestructible medium.

In many cases, it is only through the physical remains of funerary practices that archaeology can hope to uncover the *modus vivendi* of civilisations. It is usually true of the western world that while the monuments of the departed are still visible, those who raised them, and for whom they were raised are anonymous, and their names can never be uttered, because they can never be known.

The Ancient Egyptian civilisation has provided us with a legacy similar to that of any other ancient civilisation, except in this case so much more has survived. Not only have we got the monument, we can often name the person or persons for whom it was intended. Not only can we name the individual, we can on occasion have access to his or her body, because of the phenomenon so peculiar to the Egyptian civilisation, mummification.

In this thesis I shall not discuss burial practices other than mummification. Suffice it to say that other burial practices, of which similar evidence survives among many civilisations, also existed in the Predynastic and Old Kingdom Period (3100-2200 BC). These are discussed, for example, in Spencer (1982, 29-42)

2.1.2. History of mummification

Spencer (1982, 29) suggests that belief in life after death 'may have been a particularly logical development in Egypt, conditioned by the nature of the country'. Many burials which predate 3000 BC, have been found with well-preserved skin and hair still adhering to the bones (Spencer, 1982, 30). The dryness of the desert sand had a dessicating effect on the body, and the fluids of decomposition were readily absorbed by it, thus saving the body from decay. It was reasonable that Egyptians, observing this preservation when burials were exposed for any reason, should conclude that continued existence after death was dependent upon preservation of the body.

Concern to improve the conditions of the dead resulted in various attempts to protect the body from the sand (Spencer, 1982, 33-35). Among these, in the First Dynasty (3100-2890 BC), was wrapping the body in many layers of bandages with or without the provision of a coffin (Spencer 1982, 34-35). These practices were counter-productive, because they prevented direct contact with the dry sand, and encouraged decay.

Most scholars are agreed that the dessication of the body, the underlying principle in mummification, was effected by the use of natron, a naturally occurring substance of sodium carbonate decahydrate ($NA_2CO_3IOH_2O$). Sandison (1963, 259) discusses the use of natron in mummification, based on his own and Lucas's (1911, 13) experiments. He and Lucas agree

that the expression used by Herodotus,[1] *Histories II* (85-92), *taricheuousi*, is that also used for preserving fish by salting. He concludes (1963, 267) that natron was used in solid form rather than in solution.

More recently, Garner (1979, 19-24) carried out experiments which also confirm the findings of Lucas and Sandison. He has also shown that while natron could be reused, the more often it was used, the less effective it was.

2.1.3. Handling of body prior to mummification

Although contemporary Egyptian sources are informative about the ritual of mummification, they are not helpful regarding its technique. Although Herodotus says (*Histories II* 86) 'they conceal the body for seventy days,' we know from *Genesis* 50:2-3[2] that the actual embalming process took forty days, whereas the entire process from death to burial took seventy days.

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[1] This is the *locus classicus* of the description of mummification

[2] 'The doctors embalmed Israel and it took them forty days for embalming takes forty days to complete. The Egyptians mourned him for 70 days'.

After death, the body was taken first to the *ibu*, or place of purification, (Hamilton-Paterson and Andrews, 1978,44). On the fourth day it was taken to the *wabet*, the place of embalming (Spencer, 1982, 126). (On the other hand, there was also the *per-nefer* which probably combined both functions (Hamilton-Paterson and Andrews, 1978, 44)). There is a text of the Roman Period (30 BC-200 AD) in which directions are given to embalmers concerning different stages in the preservation of the body, beginning with the anointing of the head. Given the importance of the head and face for the Egyptians (Spencer, 1982, 128) it is understandable that they should be anxious to prevent the putrefaction which would very quickly have set in.

2.1.4. Excerebration

Previous evidence as cited by scholars up to and including Spencer (1982, 117) suggested that removal of the brain was first practiced during the Eighteenth Dynasty (1567-1320 BC). Strouhal (1986, 141-154) now claims that there is evidence for this practice as early as the Middle Kingdom (1900-1700 BC). Leek (1969, 112-116) has carried out experiments which show that 'the brain tissue was not drawn out with a hook: it was removed by degrees because its viscid consistency caused it to adhere to the instrument'. Access to the cranial

cavity was generally gained by breaking the ethmoid bone with a chisel inserted through the nostril. The brain tissue, which had become semi-liquid at death, was further softened by means of a hook. There is wide evidence of this practice.

2.1.3. Evisceration

The commencement of the Fourth Dynasty (2613-2494 BC) saw the first attempts at removal of the viscera in an attempt to prevent decomposition of the body. The mummies from which this evidence comes were wrapped in a 'skin' of linen bandages moulded to fit their bodies. Facial details had been added in paint. The viscera of Queen Hetepheres (c.2590 BC) were preserved in a four-compartmented alabaster box, thus giving rise to what soon became the canopic jar phenomenon, in which viscera were preserved in four limestone jars.

2.1.4. Scientific examination

2.1.4.1. Introduction

The scientific examination of Egyptian mummies dates back to the work of Gaston Maspero in 1889 and G.E. Smith in 1912 on the mummies from two Theban caches. They did not have access to x-ray equipment, as the apparatus developed by Roentgen in 1895 was too unwieldy and cumbersome. Furthermore, as they

were unwilling to unwrap many of the bodies which had been beautifully wrapped, did not learn a great deal. Isherwood, Jarvis and Fawcett (1979, 25) note that the first radiographs of mummified material (a child and a cat) were obtained by W Konig at the Senkenberg Museum, Frankfurt in March 1896. In Liverpool during the same year Thurston Holland obtained x-rays of a mummified bird, and noted "the advantage of this class of subject is that there is no movement." Two years later Petrie made use of x-rays to investigate mummified human remains, and in 1904 Elliot Smith, assisted by Howard Carter x-rayed the mummy of Tuthmosis IV (18th Dynasty c.1575-1308 BC). In this last case, the condition of the epiphysis enabled the age of the King at the time of his death to be deduced precisely (Isherwood *et al* 1979, 25).

2.1.4.2. Radiology

X-rays belong to the electro-magnetic spectrum, as do light, radio and television waves. They are produced when a stream of electrons from a heated filament strike a suitable target, variation in the speed and quantity of which will affect the quantity and penetrative quality of the x-ray beam. The region of the target where the x-rays are produced is called the focal spot, and since sharp shadows are needed, this spot must be as small as possible, preferably less than 1 mm square.

When x-rays pass through an object, they are differentially absorbed by its component materials. The degree to which they are absorbed are dependent on the density and atomic number of the material - the higher the atomic number, the greater the absorption. Bone or metal therefore will absorb more x-rays than soft tissue or air. The x-rays which are ultimately transmitted through the object may be recorded on special photographic film. This radiograph is, therefore, a 'shadowgram', related to the different absorption characteristics of the materials which make up the object. Dense materials appear white, less dense materials varying shades of grey to black.

While conventional radiographs may be obtained frontally or laterally, features of interest may be partially or completely obscured by under- or over-lying structures tomography, however, is a method of obtaining x-rays of slices of tissue in any plane of interest. Computed tomography (CT) is an x-ray transmission technique where the x-ray beam is highly collimated and the radiographic film replaced by scintillation or ionisation detectors. Isherwood *et al* (1979, 32) say that it enables cross-sections of an object to be calculated from precise measurements of transmitted radiation intensity. Digital to analog conversion and appropriate grey-scaling enables the large amount of numerical data to be presented as a pictorial display on a

television monitor. CT not only eliminates the problem of superimposition, but also enables quantitative interrogation of both normal and abnormal structures which may not be visualised by plain radiography or conventional tomography.

2.1.4.3. Other studies

Although many studies in the radiography of mummified remains have been published[3], according to Isherwood *et al* (1979, 25-39) most have been radiographed on site in museums or at archaeological sites, necessitating mobile compact equipment, which could be attached to local electricity supplies or associated with suitable isotope sources. Near ideal conditions were available for the Manchester investigation, however, as the specimens were all transported from the Museum to the Department of Neuroradiology, Manchester Royal Infirmary where the appropriate specialised radiological equipment was available. These included 'the Elema Schonander Mimer III radiological unit equipped with a 0.3 mm

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[3] examples of these are:
Moodie R L (1931) *Roentological studies of egyptian and peruvian mummies* Field Museum of Natural History Chicago, Ill.; Gray P H K (1973) The radiography of mummies of ancient Egyptians *Journal of Human Evolution* 2 51-53; Gray P H K (1966) Radiological aspects of the mummies of ancient Egyptians in the Rijksmuseum van Oudheden, Leiden. Reprinted from *Oudheidkundige mededelingen uit het Rijksmuseum van Oudheden,* Leiden; Dawson, W R and Gray, P H K (1968) *Catalogue of Egyptian antiquities in the British Museum (1):Mummies and human remains*, Oxford Univ Pr; Gray P H K and Slow D (1968) *Egyptian mummies in the City of Liverpool Museums*, Liverpool Corporation; Harris J E and Weeks K R (1973) *X-raying the pharoahs*, Scribner & Sons, New York.

focal spot x-ray tube capable of orbiting the subject, of fluoroscopy by means of a 7 in. image intensifier and television and of varying sectional thickness tomography at any angle of orbit. Two specimens were also investigated in the University Department of Diagnostic Radiology, Medical School, University of Manchester, by computed tomography (EMI CT5005) - a technique designed to obtain transverse body sections 5 to 13 mm in thickness'. Probably one of the most important features of the Manchester project was that one of the mummies (1770) was examined both before and after unwrapping thus 'enabling the validity of the methods and results to be established'.

More recently, a group of eleven Egyptian mummies from the Museum of Fine Arts, Boston, was investigated by Marx and D'Auria (1986), who note 'there have been only scattered case reports of this technique's having been applied to the investigation of Egyptian mummies' (1986, 321). Their procedure was as follows: 'After frontal and lateral radiogrpahs were obtained, the intact specimens wrapped in their original linen and cartonnage, were studied on a Siemen's Somatom-2^{tm}CT scanner. Images were acquired using a 50 cm scan circle, 125 kV peak, 460 mAS and a scanning time of 10 seconds. Scans were 8 mm thick and were obtained contiguously from head to proximal femur and then every 16 to 24 mm from proximal femur to feet. There was no gantry angualtion. Window width and level were adjusted throughout imaging depending upon the density of the parts imaged' (1986, 322).

Strouhal, Kvicala and Vyhnanek (1986) and Notman (1986) have also reported on their projects in using the CT scanner. Notman (1986, 259) stresses the importance of the necessity for using the most recent equipment and also points out the desirability of using fiberoptic endoscopy in conjunction with scanning.

2.1.4.5. UCC mummy

After a couple of refusals from other radiologists to participate in the x-raying of the mummy, the late Dr. Joseph Galvin, Radiologist with the Southern Health Board at St. Teresa's Clinic, Dyke Parade, volunteered to undertake the project in January 1978. The mummy was removed from the coffin by means of leather straps, placed on a stretcher, covered and transported by the Library Attendants the 50 yards across the road from the Lee Maltings. Frontal x-rays were taken on a Tridorus T5F.

In July 1982 we arranged with Dr. Michael Hurley Neuroradiologist at the Cork Regional Hospital to have the mummy investigated by computed tomography. At this time the machine in use was a *Delta*-Scan 50. This machine is now obsolete, and at the request of Mr. Cyril Elliot of Siemens, Dr. Lovett, Neuroradiologist at the Mercy Hospital Cork, volunteered to scan the mummy using the most modern equipment

- the Somatom scanner already described. Although the Marx and D'Auria (1986) paper was not available to us at the time, the technique described is almost identical. The main difference lies in the thickness of our slices being constant, and the feet were not included. This machine had the advantage of enabling the data to be down loaded onto floppy disks, which can be interrogated in the future. For present purposes however radiographs were produced on film. There are 2 series, HSp and FSp. In the HSp series the head was inserted first into the scanner, in the FSp series, feet first. This inverted the lateral views, but the machine compensated for this and right and left sides are indicated.

The system utilizes an arbitrary scale from -1000 to +1000 Hounsfield units, where air and water are assigned values of -1000 and 0 respectively, with dense bone having a value near +1000. Unfortunately however there are no publications yet available in which values for bandages, packing, resin and other materials have been given. For this reason, it was not considered useful to give values to these areas in this thesis.

2.1.5. Bacteriology

The mummy was examined for any bacterial or fungal growth. Swabs were taken on clinical sterile swabs from the toes, nose, linen and the wood shavings under the head. These were sent to St. Finbarr's Hospital, Douglas Road, Cork in July, 1976, where they were tested in aerobic and anaerobic cultures. No growths were obtained in either case.

2.1.6. Blood grouping

To follow

2.1.7. Dental examination

The dental history of the Ancient Egyptian population has been well documented. The teeth of the UCC mummy were removed by Dr V R O'Sullivan of the Department of Anatomy, UCC. They were examined by stereo optical microscope, which although it works on a basis similar to the transmission optical microscope outlined below, allows the surface of the object to be examined. The results are presented and discussed, Section 4.1.5.

2.2. Textiles (excluding cartonnage)

2.2.1. Ancient Egyptian textiles

The textiles associated with the Manchester Mummy 1770 were recorded and discussed by Wild who noted (1979, 133) that while 'large quantities of ancient textile material have survived in Egypt, comparatively little of it has been adequately published.

Crowfoot (1954, 432-456) and Hall (1986) discuss the manufacture of linen in Ancient Egypt, and agree that it is known from Fayum and Badari from soon after 5000 BC. It is made from *Linum usitatissimum* L, formerly known as *Linum humile* L. Lucas (1962, 142) points out that cotton fabric has not been recorded from Egypt before the Roman period (30 BC - 200 AD) therefore it is reasonable to postulate that the textiles associated with the UCC mummy are linen rather than cotton. However, a sample of bandage which had become detached from the toes area was sent to Mr. John Evans of the Department of Mathematics and Physical Sciences at North East London Polytechnic.[4] His methods of examination are discussed below at Sections 2.3. and 2.4. and his conclusions in Section 4.2. and 4.3.

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[4] Hereafter 'Evans'.

The manufacturing process of linen is too well known to dwell on it here. It is discussed at length by Crowfoot (1954), Lucas (1962, 142-146) and most recently Hall (1986).

Hall (1986, 12) and Crowfoot (1954, 433) discuss the use of spindles and whorls. Hall points out that the suspended spindle was the most popular. The loom is discussed by Crowfoot (1954, 425), and Hall (1986, 13) comments that two types of loom were known in Egypt, the earlier of which, the horizontal ground loom, was used exclusively until the end of the Middle Kingdom. It is illustrated in various contemporary tomb scenes, and wooden models of it survive. The Hyksos Dynasties (1785-1567 BC) were probably responsible for the introduction of the vertical-framed two-beamed type, but it did not replace the older type entirely.

Crowfoot (1954, 429) and Hall (1986, 15) agree that despite the complexity of some weaves, all were variations on the plain or tabby weave. In this, the weft thread (pick) passed over and under the warp threads (ends). The pick passed under one end, and over the next in the next row (called the throw), thus forming an interlocking structure. Weft and warp fringes often seen on Egyptian textiles were originally short uncut loops, which have become untwisted through wear and deterioration. Trademarks of individual ateliers, and weaver's marks set in the selvedge, can often be identified through particular fringe construction methods.

Ancient Egyptian linen ranges in colour from white through light brown to golden brown. Hall (1986, 9) attributes this to the differences in the maturity of the flax plants, and their preparation. There are, she remarks, four qualities of linen, 'royal linen' or *byssos*, 'fine thin cloth', 'thin cloth', 'smooth or ordinary cloth'. This last type would have commanded the lowest price, and would have provided better protection against the evening cold, when used for garments. Hall asserts (1986, 7) that repaired domestic fabrics, such as old sheets, towels and clothing, were handed over by relatives to the embalmers for recycling into mummy bandages for the deceased. A New Kingdom funeral lament confirms this:

'She who was rich in fine linen, who loved clothes, lies in the cast-off garment of yesterday'.

Obviously we can, sometimes at least, look to mummy cloth for domestic information.

2.3. Other materials

2.3.1. Resin

The word used by the Ancient Egyptians for the resin for mummification is *s* (pronounced *ash*). There has been much controversy over the years about the meaning of this word (Lucas, 1962, 320). Lucas (1962, 319-325) says that the botanical sources of these true resins, as opposed to gum resins, are unknown. His experiments have convinced him (1962, 321) that most resins used in connection with mummification resemble the properties of coniferous resins, except that most of them are insoluble in turpentine, but are largely soluble in alcohol and other solvents. The likely sources are Cilician fir *(Abies cilicica)*, Aleppo Pine *(Pinus halepensis)* and the Stone or Umbrella Pine *Pinus Pinea*.

One of the most noticeable features of these resins is the difference in the colour range: red, black, brown and even slate (Lucas, 1962, 321-322). He points out that it has not been possible to establish the cause of the black colour, nor whether it was originally black, or became so with age. The presence of fatty acids may have been a cause, but it is also likely that the heating process used to render the resin

sufficiently liquid for pouring, may have caused charring, and therefore blackening.[5]

The resin associated with the UCC mummy was analysed by Evans using emission spectroscopy and the results are discussed in section 4.3.1. below.

2.4. Examination of materials associated with UCC mummy

2.4.1. Introduction

In the first instance, samples from the various layers were detached and examined on the basis of the data sheet devised by Ms Elizabeth Heckett of the Department of Archaeology at University College Cork, tailored to fit the requirements of this investigation (fig 1). These data, presented in Table 1, Section 4.2.2, were compared with the results obtained by Wild (1979, 133) and the results are discussed below, Section 4.2.2.

Evans also examined the textiles using optical and scanning electronmicroscopy.

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[5] Zimmerman (1977, 35) says 'The skin of the resinated mummies showed a coagulation necrosis of the type seen in thermal burns. This finding [confirms] artistic representations of the resin being applied in a hot liquid state.'

FIBRE; LINEN WEAVE; TABBY SPIN DIRECTION; S DEGREE OF SPIN; MEDIUM

NO	CONTEXT	YARN DIAMETER IN MM		NO OF THREADS PER CM		MUNSELL COLOR CHART	COMMENTS
		SYS 1	SYS 2	SYS 1	SYS 2	NO	

Fig 1

Sys System 1 and 2; because weft and warp are not distinguishable

2.4.2. Microscopic examination

The eye will separate two objects if they are not closer than 0.1 mm at a normal viewing distance of 25 cm. This is the limiting factor of the human eye and any finer detail than this must be enlarged to be resolved. A simple hand magnifier or a complex compound microscope can be used to enlarge the image. The microscope objective lens possesses the ability to make fine structural detail in the specimen distinct. Resolving power (i.e. the smallest distance between two points which can be seen as separate on the image) improves with shorter wavelengths of light. In the optical microscope, the finest possible resolving power is obtained with ultraviolet radiation, which represents the shortest usable wavelength in this type of microscopy.

The simplest electron microscope is very similar to the optical microscope. Both have condenser lenses to concentrate the incident beam upon the specimen, the beam passes through the specimen and is focused by the objective and projector lens to form an enlarged image on a fluorescent screen. However for electrons to reach their acceleration speed, they must operate in a high vacuum (10^{-3} to 10^{-6} torr, 1 torr = 1 mm of mercury at O C).

Scanning electronmicroscopy (SEM)is used to examine the surfaces of solid objects. A fine beam of electrons scans the specimen and an image is built up sequentially on a cathode ray tube, analogous to the formation of a television picture giving a topographical image with a good depth of field. Resolving power, depth of field and contrast are the most important characteristics of the SEM. The depth of field in microscopy, as in photography, is the distance from the nearest part of the subject that is in acceptable focus. In photomicrography, the higher the magnification, and the higher the numerical aperture, the shorter the depth of field. In the SEM, the depth of field is extreme, because the electron beam scanning the specimen has relatively little divergence and is almost parallel to the optic axis. Most of the secondary electrons that are emitted are recorded. The intensity of this emission is very sensitive to the tilted angle of the specimen surface, and therefore, the topographical features of the specimen. By changing the area of scan on the specimen the magnification can be changed in a series of steps (20x to 100,000x).

Contrast is achieved in the SEM by the collecting system - which means that the secondary electrons generated by the scanning beam are collected. The efficiency of the electron emission and collection is highest when the specimen plane is tilted at an angle to the direction of the primary beam and facing the collector.

This method was used to analyse the composition of the paint and plaster. Each specimen was mounted onto a 10mm brass stub and glued into position with the conductive carbon depoxy glue.

2.4.3 Chemical analyses

These analyses were carried out by Evans using thin layer chromatography, high performance liquid chromatography, infrared spectroscopy, and emission spectroscopy all of which had been used in the Manchester Museum Mummy Project, and comparisons are made with the results obtained, Section 4.2.2. and 4.3.1. below

Chromatography is the name given to a group of methods that permit the separation, isolation identification and quantification of components in a mixture. Thin layer chromatography (TLC) and High Performance Liquid Chromatography (HPLC) are two complementary modes of liquid chromatography. In (TLC) the sample is applied as a small spot or streak to a dry thin sorbent layer supported on a glass, plastic, or metal plate. The mobile phase, in this case, hexane, chloroform, (i.e. solvent) moves through the stationary phase (i.e. the thin sorbent layer) by capillary action, sometimes assisted by gravity or pressure. HPLC differs from TLC in that the samples are injected into a solvent

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equilibrated column in the former; also solvents are fluted in the former, limited in the latter; and in HPLC the column and liquid are in equilibrium, whereas a vapor phase is necessary for this in TLC. Both systems, along with their respective procedures, are clearly discussed and compared in Fried and Sherma (1986).

In the electromagnetic field the region of radiant energy ranges in wavelengths from 10 metres to $1x10^{-10}$ centimetres. The infrared region covers the range from approx. 12,500 to 10 cm^{-1}, but the middle-infrared region (1428 - 909 cm^{-1}) is the one most commonly employed . 'This portion usually contains a large number of absorption peaks and shows fairly clear differences between even and closely related compounds. Although not every absorption peak can always be assigned to particular vibrations in a molecule, the fact that each spectrum is characteristic for the substance from which it has been obtained enables identification to be made by using the spectra in this region as "fingerprints" and looking for the identical absorption pattern in a library of spectra'. (Denney 1973, 51).

Emission spectroscopy was specifically used for the examination of the resin. 'Electrons in the ground state may be promoted to higher energy levels by excitation of the atoms using electrical or thermal means. On reverting to the ground state, or any intermediated energy level, the absorbed

energy is recorded to give a representation of the emission spectrum for the substance...' (Denney, 1973, 46). The study of the composition of alloys for purity and minor constituents is carried out by means of that type of emission spectroscopy used for atomic spectra, in which character lines for metals are recorded on a photographic plate.

The results and conclusions are discussed, Section 4.3.1. below.

2.5. Cartonnage

Although what seems to resemble a type of cartonnage had been used in Egypt from very early times, (Spencer, 1982, 39), Taylor (pers comm) has pointed out that this was only an outer 'skin' of linen and plaster placed over the corpse. There is only one treastise available on the manufacture of cartonnage viz., Adams (1967). Lucas merely refers to its existence (Lucas, 1962, 4) and notes that the plaster was a mixture of whiting and gum. Adams (1967, 58) agrees with this. Adams (1967) is concerned with the manufacture of a cartonnage coffin, whereas that on the UCC mummy consists of four individual pieces: a *usekh* collar and trunk covering which are made without papyrus, and a head covering and foot covering which have a papyrus layer in them. Interestingly, the soles of the foot covering have none.

2.5.1. Papyrus

Papyrology, like Egyptology, is not taught in Ireland and I have not so far succeeded in getting a papyrologist to examine this.

There are several treatises on the manufacture of papyrus, both from classical sources (e.g. Herodotus[6], Theophrastus[7] and Pliny)[8] and in modern times (e.g. Lewis, 1974). For the purpose of this thesis however, Lucas (1962, 137-139) discusses it adequately.

Papyrus is made from the plant *Cyperus Papyrus*, which belongs to the sedge family. It can grow to a height of ten feet excluding the flowering top and root, and the maximum diameter seen by Lucas was 1.4 in. (1962, 137). The stem is triangular in section and consists of two parts, a thin outer rind and an inner cellular pith. Lucas points out that the freshness of the plant is the fundamental requisite for successful manufacture of the writing material. The stems are cut into manipulable lengths from which the outer rind is stripped. The inner pith is cut with a knife and slices can be pulled off. These are placed vertically on an absorbent

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[6] Herodotus *[Histories]* trans. A R Godley. Cambridge, Mass., Harvard, Univ Press, [1920].

[7] Theophrastus *Enquiry into plants* Vol. IV, 8, 3, 4.

[8] *De re rustica*

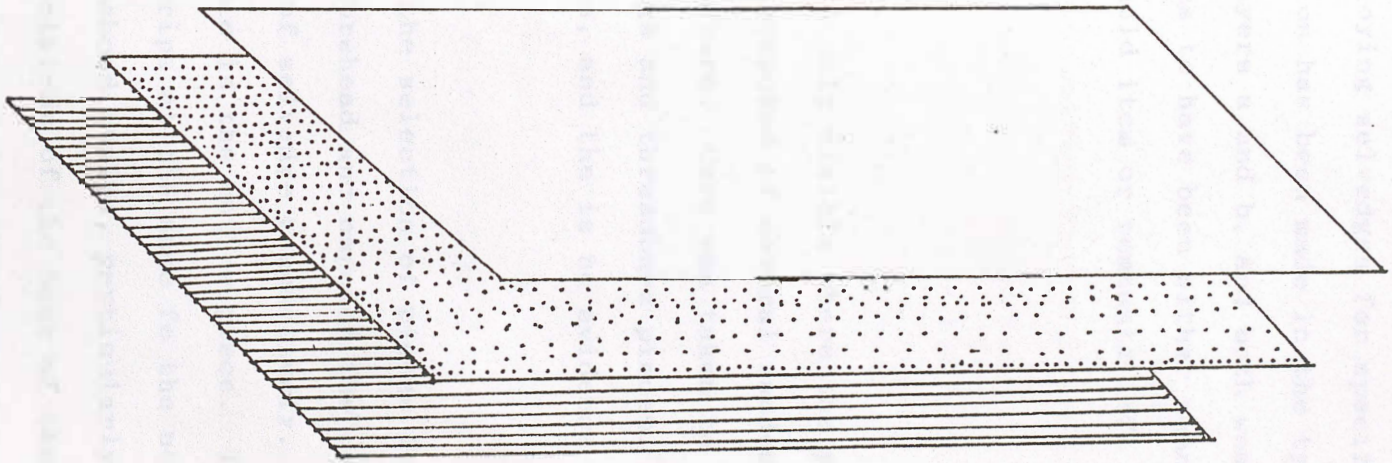
cloth, slightly overlapping one another, followed by slices, also slightly overlapping, placed across them at right angles. The whole is then covered with a thin absorbent cloth and beaten for 'an hour or two' (Lucas, 1962, 139) with a rounded stone or a wooden mallet. It is then placed in a press for several hours. As a result the slices are welded together with their own natural adhesive. The surface can be improved by burnishing.

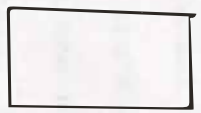
2.5.2. Construction of cartonnage associated with UCC mummy (fig 2 (overleaf); pl 1).

The head covering is the more damaged and for this reason its structure is more obvious. It consists of a covering for the crown of the head, a piece which stretches down the back of the head and neck, pieces with which each ear was covered, the face mask, and pieces which formed the lappets of the wig.

Two surfaces are immediately visible: inner (layer b) and outer, painted (layer a). This is visible only where the paint is damaged or missing. The papyrus layer is called layer c, and this is only visible where the layers have come apart. In dressmaking terms, layer b would be called the facing, layer c the interfacing.

Fig 2 Sketch of construction of cartonnage showing position of each layer.

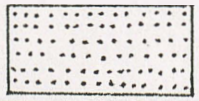




Layer (a) *This is the outer surface which was painted*



Layer (b) *This is the plain inner side or facing*



Layer (c) *This is the cartonnage layer or interfacing*

Linen

Apart from employing selvedges for specific purposes, no other distinction has been made in the types of linen involved for layers a and b, and both weaves are identical. The fabric seems to have been either remnants from a worn garment, household item or remnants left after a garment had been cut out.

Layer a

Although this is only visible where the paint is missing or broken, it is composed of several random pieces, some of which are threadbare. Care was taken to apply the plaster over the joinings and threadbare pieces. All raw edges seem to be contiguous, and the is no evidence of pieces overlapping.

However random the selection of pieces for the crown were, those for the forehead and nape of the neck consist of three and two strips of selvedge respectively. These are the only selvedges visible in the entire piece. It is not impossible that the two strips at the nape fo the neck are a continuation of the forehead strips, particularly as one of them only covers about twothirds of the base of the crown. Most of the pieces of layer a used for the face are no longer *in situ*;

those which are are not accessible, as the gold leaf covering and plaster surface to which it was applied are still intact and the adhesive used between layers a and b is still active, thus preventing noninvasive examination.

Layer b

The same remarks regarding random selection and threadbare also apply to this layer. There is no evidence of specially selected selvedges in this layer but that does not preclude the possibility of their inclusion.

An interesting feature is the presence of a relatively large portion of the face mask in one fragment. While it is obvious that this too is a reused fragment, two new incisions, one of 5 cm. and one of 6 cm. in length were made in it. The shorter occurs from the forehead towards the nose area, the longer from the forehead towards the area of the ear. It is obvious that these cuts were made deliberately as they are quite clean, in the sense that no fringe had formed on the cut edge in antiquity. The purpose of these incisions would almost certainly have been to allow 'easing', in dressmaking terms, between the greater curve of the forehead and the slightly smaller curve of the upper portion of the face. The subsequent folding back of small sections of these raw edges confirms this, and may also suggest that it is more likely that layer b or layer b/c was eased into the concave of layer a/c.

The shape of this fragment suggests that it may have been a remnant left after a garment had been cut out: the rounded shape of the piece in the crown, and the incipient u-shape behind the right eye could not possibly have been functional in the construction of the piece, and it is quite obvious that it was cut in that way deliberately

There is some evidence of overlap in this piece, where one continuous strip was applied over the original joint of two contiguous pieces. This is visible because the maker left a couple of millimetres completely free of the thick coating of plaster which was applied over the whole patch. The patch was quite ragged, and may have been applied after the mask was completed to cover up some flaws.

Another instance of overlap in this layer occurs where a piece which was not only too short but also too frayed for the purpose for which it was intended, was strengthened by a more robust piece. The width of this overlap where it is visible is approx.

It is almost certain that no bias strips were employed. Given the stretching properties of bias strips one would have thought that the manufacturer would have preferred them to intractable selvedges for curved surfaces such as the forehead and skull.

Layer c: Papyrus

As several of the exposed surfaces of layers a and b no longer have any papyrus attached to them, and some surfaces only have scraps still adhering to them, it is possible that it was applied in a random fashion, in the hope that this would be sufficient when the product was completed. On the other hand it is possible that this is the result of damage, because even very gentle handling can result in particles flaking off.

Perhaps the papyrus was applied only to those areas where it was felt that reinforcement was necessary. There is a large amount in the crown portion, and there does not seem to be any on the face. This could be explained by the moulding of the facial features requiring a more malleable quality of material than the inclusion of even a scant layer of papyrus would allow. Equally, the use of a large quantity in the crown would compensate for generosity in the allowed dimensions.[9] Furthermore, it would also act as a support for the

[9] There is at least one case cited in the literature where x-rays have revealed the positioning of the head covering in such a way that the forehead of the mummy was covered by the chin of the cartonnage. This could be explained as an attempt to compensate for loss of stature during the mummification process.

weight of the painted crown. For the same reason the use of what may have been actual sheets ofpapyrus in the left hand side and frontal tress of the wig is also understandable.

The papyrus was almost certainly recycled, and there seems to be a certain amount of inscription on it. It is clear that this is in neither hieroglyphic or Greek script, but may be either demotic or hieratic. The main concentration of writing is on the single piece which forms the left frontal tress of the wig and neck covering.

Adams (1967, 57) suggests a 'former' for the construction of the cartonnage coffins, as opposed to the previously held view that the cartonnage had been moulded around the body. It seems reasonable to postualte the use of one also in the case of this cartonnage, although Spencer (pers comm) says he is not aware of the existence of such an object. It may have been made of some highly perishable material such as wax, but may also have been made of mud and straw (Adams, 1967, 57). The evidence of this was available to him, as so much of it was still adhering to the coffin. Wood, clay or plaster would seem to be reasonable alternatives also. Irrespective of the material, it would have had to be prepared in such a way that the finished piece could be removed without damage.

If fat or beeswax[10] had been applied to the surface of the mould, pieces of dry linen would have adhered to it and could then be plastered over. On the other hand, if the mould had been of wood or wax, the pieces of dry linen could have been held in place by the contemporary version of dressmaker's pins, while it was being plastered.

There are two possibilities: (1) a single mould of the size and shape of the finished mummy's head to which the strips which make up layer b would have been applied first. These would then have been covered over with plaster, over which the papyrus would then have been placed. The linen strips of layer a would then have been placed over this, plastered and the whole allowed to dry.

Alternatively, piece moulds consisting for example of two pieces, one for the face and front portion of the head, the second for the back of the head and nape of the neck. The materials of the various layers could have been applied in the manner already suggested and the two pieces then joined with an extra patch of linen. This method is suggested on the basis of the position of the reinforcing patch already mentioned in connection with layer b.

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[10] Evans (pers comm) has detected by infra red spectroscopy the presence in a sample of the headcovering of a 'reasonable amount' of beeswax . However its function there cannot be identified, as it may have been used as a sealant instead of the way in which I suggest it may have been used.

As has already been said this layer acts as an interfacing. In the absence of any literature dealing with the manufacture of this type of cartonnage, and given (a) the damage sustained by the exposed surfaces of this piece, (b) the extremely fragile condition in which it now is , and (c) the probability that most of the papyrus is enclosed between layers a and b, it is impossible to say how exactly the papyrus was employed in the manufacture of this whole piece, without invasive investigation, and another similar piece with which it could be compared.

2.b. Coffin

2.b.1. Construction

The wooden coffin is an excellent example of the economic measures necessitated by the scarcity of timber noted by Aldred (1954, 685). Here he notes that planks cut from the same trunk were placed side by side, so that the convex edge of one fitted the concave edge of its neighbour. Internal edges were trimmed to make the fit closer - only the outside edges were sawn straight.

2.6.1.1. Lid (fig 3 (portfolio); pl 2)

The lid was probably formed from the trunk of one tree, which was split into five planks (fig 3). The curved outer parts were used to form the two slightly convex sides, and patches (in one instance at least, of hardwood pl 2) were dowelled on where irregularities occurred. Inner planks were dowelled together in the manner which Aldred suggests, forming an elongated S (plate 3). The plain undersides were smoothed with an adze, the marks of which can still be seen.

2.6.1.2. Floor (pl 4)

The floor of the coffin is made in a similar manner to the lid, an elongated S-shape, but although dowelled in a similar manner, these pieces did not fit so well together. Its length had to be augmented by two patches as indicated. This was corrected by pouring plaster over it and allowing it to act as a filler. As the centre panel is visibly lower than either of the other two, the weight of the contents and presumably subsequent malhandling caused the plaster to crack and break loose. The result was paint loss on the outer panels, to the extent that almost the entire right hand outline of the god's body has been destroyed.

2.6.1.3. Head and Face (pl 5)

The head and face are carved in the round. The wig was formed by five pieces of wood, which were dowelled together and then attached to the lid by dowels. The basic lid was also used as part of the wig, but was built up and moulded to the desired shape with plaster, most of which is now missing.

2.6.1.4. Canopy (fig 4 (overleaf); pl 6)

This is made up of six pieces of wood, three placed one on top of the other, three attached to the lid itself behind the head. The largest, piece a, seems to be the trunk of a very small tree, measuring 7cm in diameter. The second, piece b, was also the outer part of, most likely, another tree. On this it is possible to see the area from which a branch has been struck. The third, piece c, (10.5 cm.), is probably part of piece a. This was attached to the lid, behind the head. A hole was placed in piece a to receive its dowel. The fourth piece, d, is a patch which measures 11.5 cm, carefully shaped to fill the gap between the pieces on either side of it, e and f, which are attached behind the head. The idea of this construction presumably was to have interlocking pieces which would have provided more stability than merely resting the heavy head on a straightforward piece would have done.

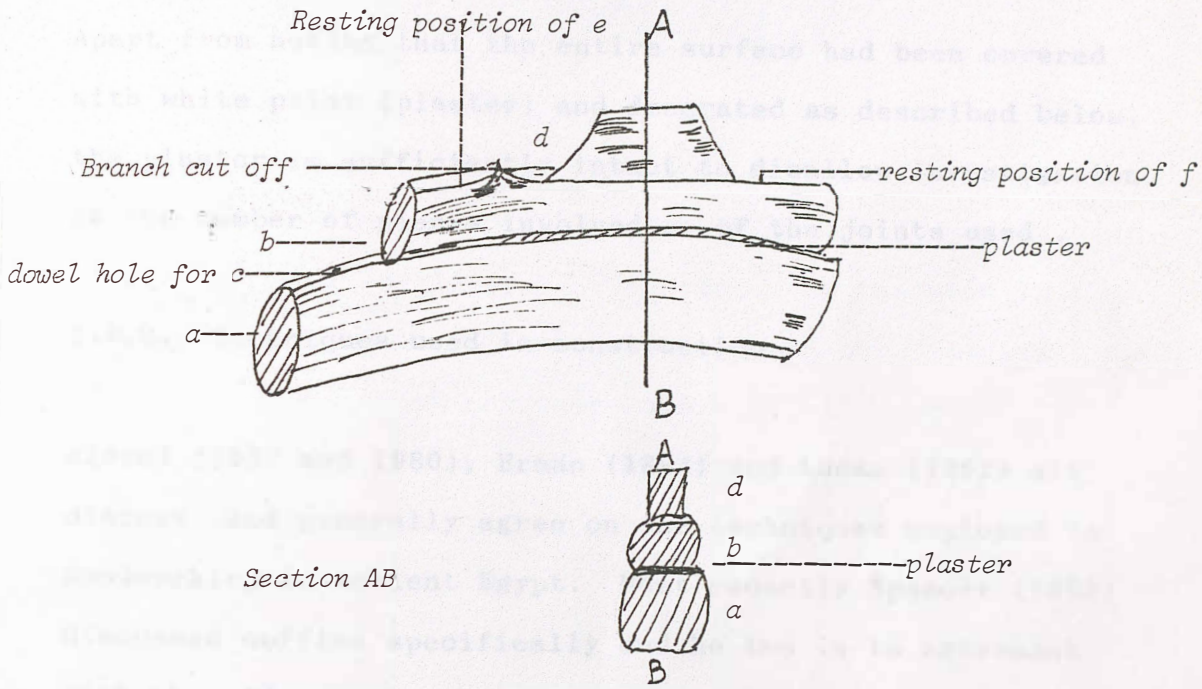


Fig 4 Sketch to show construction of lid canopy

2.6.1.5. Footboard (pl 7)

The footboard has been made of at least two pieces of wood dowelled together diagonally. It is not clear whether another piece was needed to patch one or both of these.

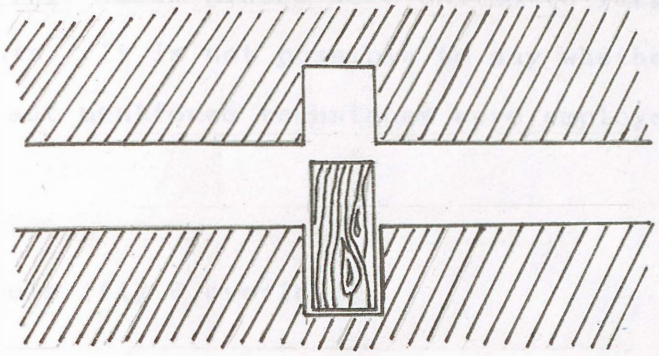
2.6.1.6. Sides (pl 8)

Apart from noting that the entire surface had been covered with white paint (plaster) and decorated as described below, the plaster is sufficiently intact to disallow investigation of the number of planks involved or of the joints used .

2.6.2. Techniques used in construction

Aldred (1957 and 1980), Erman (1894) and Lucas (1962) all discuss and generally agree on the techniques employed in woodworking in Ancient Egypt. Most recently Spencer (1982) discusses coffins specifically and he too is in agreement with the older works.

Mortise and tenon joints were very common, and were used to join boards together. The tenon was not carved in the board itself, instead, a mortise was cut in both boards and an independent tongue or tenon, very often of hardwood was set in one slot, thus forming a projection fig 5 (below) (after Spencer, 1982, 170), Pl 9.



In the UCC coffin four of these joints are used on each side to join lid and container. The tongue or tenon is in the lid and fits into the mortise in the container. At least one of these tenons is of hardwood, although most are of softwood. On the other hand, the headrest merely rests on the lid of the container, and there are no mortices on the footboard either.

Dowels again often of hardwood, were inserted at various angles, and used to fix sides to base boards and to each other as well as to keep tongues in position. Aldred (1957, 693) notes that these pegs were normally cut flush with the exterior surface and subsequently covered with plaster or paint. There are several instances of this in the lid of the UCC coffin, and planks in the lid and floor were dowelled together.

Corners were united by various means - *halving-joints*, *mitres*, *double shoulder mitres*, *mitre-housing*, and *dovetail mitre housing*. Small pieces were united to large pieces by *scarf joints*. It is not possible to say whether any or all of these last mentioned techniques were employed in this coffin.

2.6.3. Tools (fig 6 overleaf)

The saw as used in Egypt is known from several tomb paintings, and four models of carpenters' workshops. The cutting edge of the teeth is set towards the handle and the saw was pulled rather than pushed. One of the tomb paintings from Saqqara (c 2500 BC) fig 7 (over) (after Aldred 1957, 689) shows joiners at work. According to Lucas (1962, 449) the blades of the saws were initially of copper, which later gave way to bronze and 'at a very late date to iron'. Aldred (1957, 689) also suggests that quartz sand may have been used as an abrasive on harder woods.

The use of the bow drill is well attested from Ancient Egypt and Childe (1957, 189) points out that the bow drill was in use in Europe until supplemented by the brace in the Middle Ages. This tool consists of a bow with strap, cord or sinew attached to each end, and a spindle into which the bit fitted is made to rotate by moving the bow back and forth. To pro-

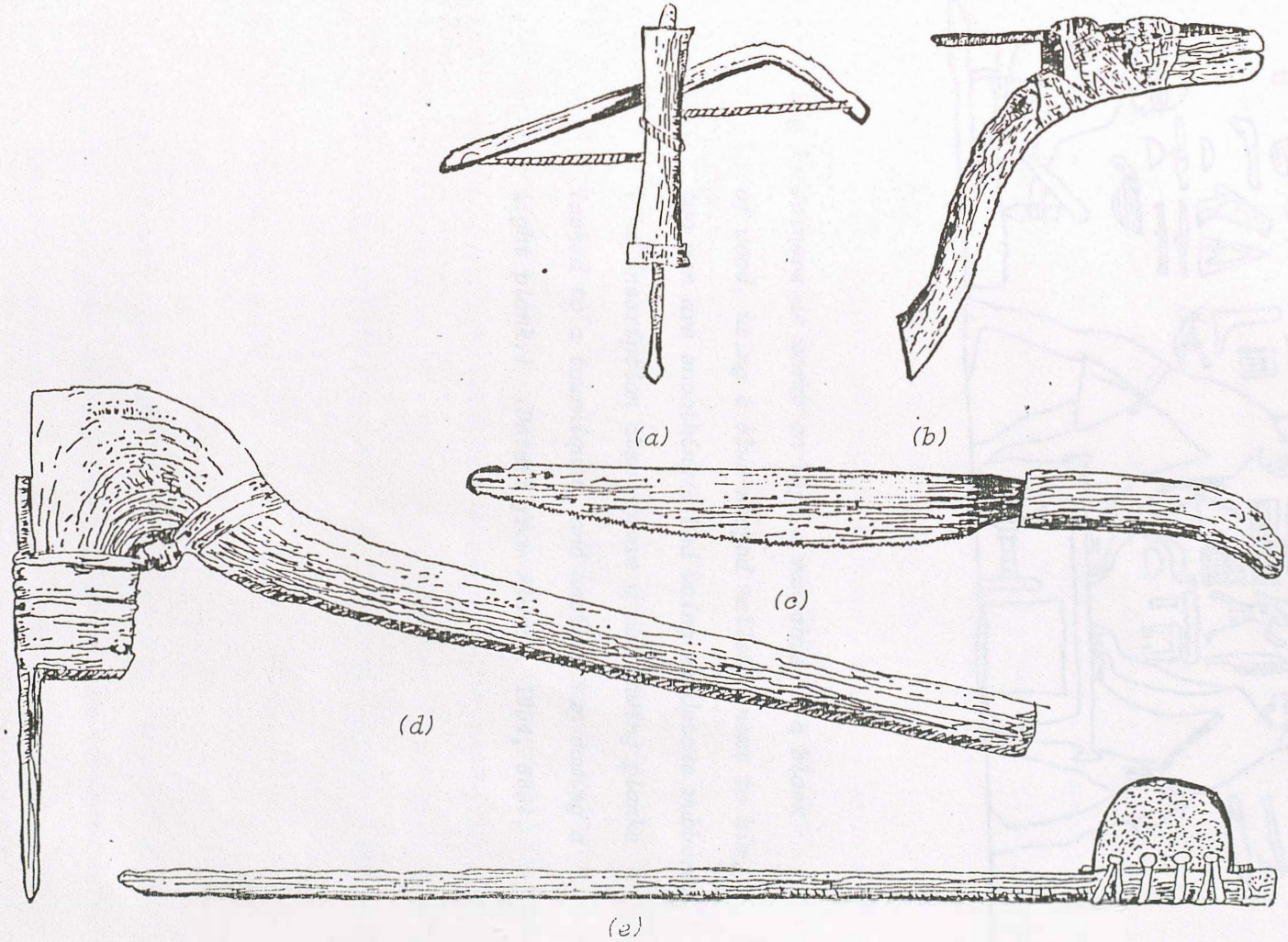


Fig 6 Tools used in Ancient Egypt: (a) bow drill; (b) small adze; (c) saw; (d) large adze; (e) axe. (After Aldred, 1954).

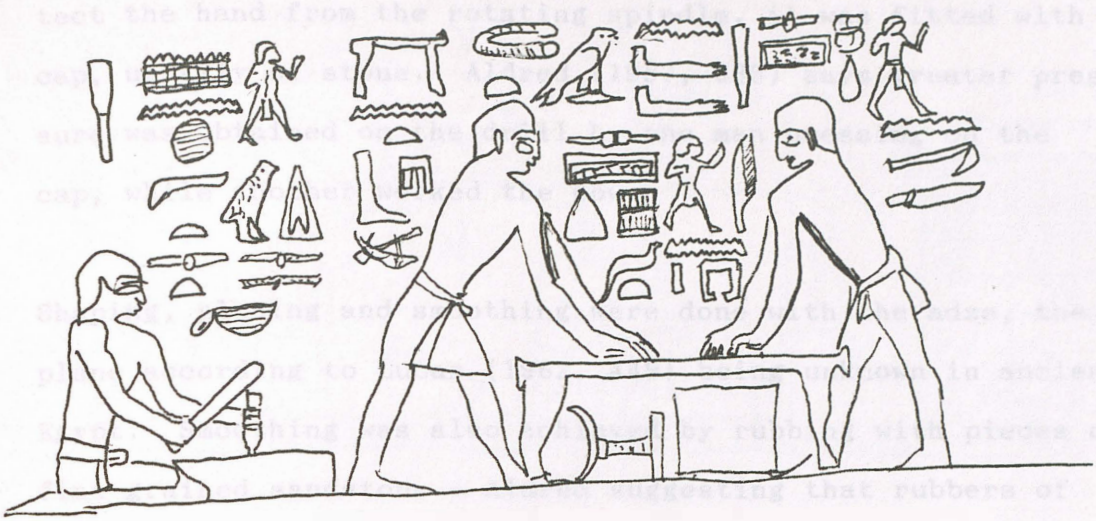


Fig 7 Joiners at work: on left a man chisels a block of wood, using a club-shaped mallet; next to him, two men are smoothing a bed using sandstone rubbers. (The inscription also covers a man sawing planks lashed to a tourniquet, and another man sawing a light plank.) (Detail from Aldred, 1954, 689).

tect the hand from the rotating spindle, it was fitted with a cap, usually of stone. Aldred (1957, 688) says greater pressure was obtained on the drill by one man pressing on the cap, while another worked the bow.

Shaping, planing and smoothing were done with the adze, the plane according to Lucas (1962, 449) being unknown in ancient Egypt. Smoothing was also achieved by rubbing with pieces of fine-grained sandstone - Aldred suggesting that rubbers of different degrees of fineness were used.
Chopping of wood into planks was done with an axe, and this too is illustrated in the tombs fig 8 (after Aldred, 1954, 689).

Aldred (1954, 689) and Lucas 1962, 450) mention the problem of the existence of the lathe. Although wood turning was known in the bow drill, Lucas, while agreeing (1962, 450) that archaeological evidence suggests the lathe is a Hellenistic innovation of the fourth century BC, feels the possibility of an earlier origin cannot entirely be discounted.

2.6.4. Types of wood

It is well known that Egypt is not richly endowed with large trees, and this has always been true of the historical period. Breasted (quoted in Lucas, 1962, 429) notes that on

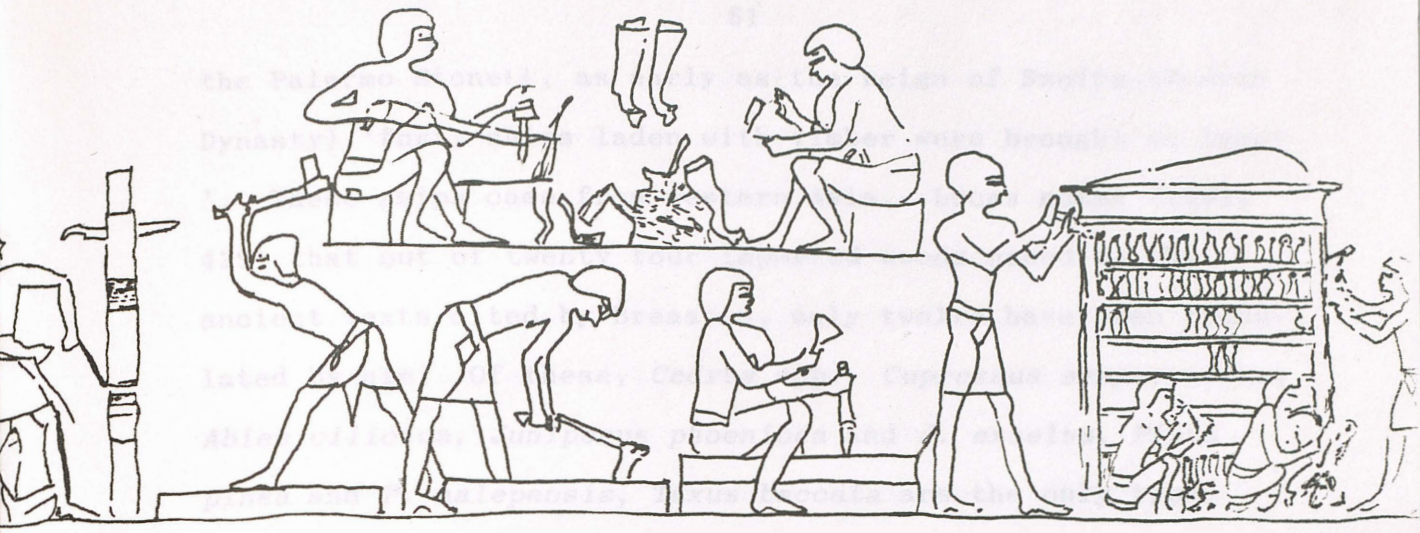


Fig 8 From left: a man relashes his plank higher up the sawing post (note saw jammed in plank); next to him, two men are splitting planks with heavy axes; next a joiner using a chisel with a mason's mallet; in background a man drills holes in a seat, while another smoothes down the legs of a chair he is making; on the chopping board in front of him are two adzes abd a square. On the right the two standing figures are fitting the openwork carved by the two squatting figures into the panels of a shrine. Of the standing figures, the one on the extreme right is using an adze, the one on the left a chisel and mallet. (After Aldred, 1954, 689).

the Palermo Stone[11], as early as the reign of Snofru (Fourth Dynasty) 'forty ships laden with timber were brought to Egypt '. These ships came from western Asia. Lucas notes (1962, 429) that out of twenty four imported woods named in the ancient texts cited by Breasted, only twelve have been translated by him. Of these, *Cedrus* spp., *Cupressus sempervirens*, *Abies cilicica*, *Juniperus phoenicea* and *J. excelsa*, *Pinus pinea* and *P. halepensis*, *Taxus baccata* are the only types positively identified in a coffin context. *Cedrus* is the one which has been most frequently identified, and occurs from predynastic times to the Late Period.

As well as these imported woods, there were also the smaller indigenous trees, some of which have also been identified in coffins. These are *Acacia arabica* and *A. nilotica*, *Ficus sycomorus* (this should not be confused with the sycamore of colder climates which is a species of maple - *Acer pseudo-platanus*), *Tamarix niloticus* and *T. articulata*. Lucas (1962, 429) and Aldred (1954, 685) point out however, that although these woods are fibrous, knotty and small, the blemishes were cut out and replaced by patches or plugs. The are several examples of this in the lid of the UCC coffin, (section 2.7.1 above).

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[11] The disjointed annals of the earliest kings of Egypt, now in the Palermo Museum

The most recent work on the identification of the wood used in Ancient Egyptian coffins is Brezinova and Hurda, 1976. However, for the purposes of this thesis, I have not attempted to have the wood identified precisely[12]. It is most likely that the wood is a softwood, belonging to the order *Coniferae*, and within this order is possibly of the *Cedrus* spp. Alternatively, it is at least equally likely that it is made of *Ficus sycomorus*, and the method of construction may point more to this native tree than to the imported *Cedrus*. However, only further investigation along the lines suggested by Brezinova and Hurda (1976) will reveal this. It is also evident that there was more than one variety of wood involved, and several of the tenons have been made from hardwood.

2.6.5. Paint

There was only one word for artist and scribe in Ancient Egypt *ss*. From the New Kingdom (1567-1085 BC) there is a rich documentation of scribal instruction, and the ancient texts testify to the importance of the role of the scribe. Williams (1972, 217) points out that a favourite theme was the glorification of the scribal profession e.g 'As for the

[12] In the absence of an expert on near eastern woods in this country, Professor Woodman has suggested that a fairly broad classification is sufficient at present.

scribe, in any position of his in the Court he will not be wretched'. In his *Satire on the trades*, Khety, an Egyptian scribe, decried all other careers, 'Look, there is no job free of a boss - except for the scribe: he is the boss!'

Painting materials

Lucas (1962, 133-134) says that painting brushes were made of pieces of 'fibrous wood bruised at one end until the fibres separated and formed bristles.' The wood for the larger brushes was often split palm leaf *(Phoenix dactylifera)*, for smaller brushes, halfa grass *(Desmostachya bipinnata)*, although other species were also used. Examples from a wide range of dates have been found, and the evidence shows that separate brushes were kept for different colours.

On the UCC coffin large brush marks are clearly visible on the subjects painted on the inside of the coffin, especially on the sundisk on the canopy and on the two goddesses Isis and Nephthys.

Wood was usually covered with plaster before being used as a painting ground. This is certainly the case in the UCC coffin. The plaster which was used to compensate for irregularities is of an inferior quality to the white plaster used as a background or whitewash referred to throughout this

thesis. This latter was a mixture of whiting (chalk) and glue (Evans, pers. comm). The linen of the cartonnage was coated in plaster of whiting and glue also to provide a surface for the paint.

The paints used are all tempera (Lucas, 1962, 351). Samples of the various colours were given to Mr. Edward Noonan of the Microelectronics Research Institute at UCC, who analysed them. The results were then sent to Evans at North East London Polytechnic who interpreted the results. These are discussed in section 4.5.3. below.

Schiaparelli (1924, 192) refers to the use of varnish in some of the coffins found here. Lucas (1962, 357) says that there are two examples of varnish known from the 26th Dynasty, i.e. the period of the coffin, but there is no varnish in evidence on this coffin.

Technique

Baines and Malek (1982) point out that preparatory drawing was the basis of the artist's work, and this was done a squared grids, which were founded on a square the size of the fist of the figure being drawn, which is related proportionally to all other parts of the body. While the grid

always should have been redrawn for each figure, some may have been drawn freehand. Artists seem to have worked in groups, and it will be seen that this is the impression given by the UCC coffin.

Writing materials

Lucas (1962, 362) notes that the ink used for writing was in the form of small cakes of solid material. Although red and black inks were used only black was used in the UCC coffin. He describes a method for making this ink which involves placing an inverted earthenware dish on three stones over a quantity of incense. The incense is ignited and a damp cloth placed over the bowl. Carbon deposited on the dish is scraped off and mixed with gum arabic and water. Pens up to the 3rd century BC were made from a rush, *Juncus maritimus* (Lucas, 1962, 365). These were cut to the required length and cut to a flat chisel shape. The fibres were split by chewing to produce a fine brush. Thicker lines were made with the flat side and lines with the thin edge. On the UCC coffin there are clearly three different thicknesses of pen used: the broader in the portion above the Anubis, the finer in the portion beneath. Within the Anubis scene itself the inscription looks as if it has been made with a small brush rather than with a pen.

2.6.6. Plaster

The various types of plaster used in Ancient Egypt are discussed by Lucas (1962, 353-355). Specimens of the plaster used in the UCC coffin were analysed by Mr Edward Noonan using the SEM and these were interpreted by Evans. The results are discussed below Section 4.5.3.

CHAPTER THREE

3.1. Introduction

This is basically an archaeological thesis, but given the subject matter it is not possible to exclude the vocabulary of Egyptology. Among the preoccupations of the ancient Egyptian people, religion, death and the afterlife figured largely, consequently their vocabulary is rich in symbolism, their symbolism rich in meaning. Much has been written on interpretation in primitive art - most of it speculative and from a modern point of view. There is no contemporary documentary evidence to which we may turn for a discussion on what the builders of Newgrange thought about the afterlife, any more than we can discover the cost of a Bronze Age urn burial by recourse to the contemporary evidence. This is not the case with Ancient Egypt. However primitive the technique of Egyptian art may be, however speculative its interpretation, there is a *corpus* of literature, sacred and secular, including archival, to which reference can be made and in this way interpretation in the science of Egyptology is a highly specialised pursuit. It is obvious therefore, that I am not in any way qualified to attempt any interpretation. My aim is to name the devices, motifs and concepts, insofar as this is possible. I have relied on the

help and advice of Dr. John Taylor, Curator in the Department of Egyptian Antiquities at the British Museum, but of course the application of the advice is my own responsibility.

To facilitate the reader who is not familiar with the terminology of Egyptology I have compiled a glossary, based on Lurker (1980), Davies (1987), Clark (1959), Thomas (1987). As it is essential to the reading of the text it is included here so that reference can be made in advance to the occurrence of the symbols.

3.2. Terminology used

Akhet

The modern translation of the word which used to be translated *Chut*. See Horizon.

Ankh

The hieroglyphic sign means 'life', and the symbol suggests divine, i.e. eternal existence. Gardiner (19.. cited in Lurker, *s.v. Ankh*) suggests it was a sandal-strap, but its 'original meaning is still debatable'. In this context, it is carried by the *Ba* bird on the cartonnage, and the hieroglyph occurs in several instances on the lid of the coffin.

Anubis

The god of the dead and of embalming, he was subject to Osiris and conducted the 'Weighing of the Heart' in the Hall of Judgement before Osiris and the 42 gods. He is depicted in canine form although the species, whether canine or jackal, cannot be identified. He guarded the mummy from evil forces at night. When the body was embalmed, a priest wearing a jackal mask acted as the representative of *Anubis.*

In this context, he is seen on the lid of the coffin embalming the deceased, and he is also mentioned on the cartonnage trunk inscription. His image and name occurs twice on the foot covering

Atef crown

Crowns were above all a symbol ofpower, and as rulers of the 'Two Lands', i.e. Upper Egypt and Lower Egypt, the kings wore the Double Crown - the White Crown of Upper Egypt and the Red Crown of Lower Egypt. The crown of double plumes was worn by the King from the time of Snofru (c. 2600 b.c.), and the *Atef*, worn usually by Osiris *(q.v.)*, was a combination of the White Crown of Upper Egypt and the Crown of Double Plumes. Instead of the blunted peak of the Whit Crown, it usually had a small solar disk on the tip.

On the UCC coffin, it is worn by Osiris in the procession of gods to the table of offerings, and also by Ptah-Sokar-Osiris *(q.v.)* on the floor of the coffin.

Ba

This word has been translated as 'psyche', but has very little similarity to the classical conception of the soul. It was a psychic force, which left the body at death, was free to travel from the tomb during the day, but at night returned to dwell with the mummy. From the New Kingdom onward the *ba* is shown in bird form hovering over the mummy of the deceased.

For present purposes, the *Ba* is seen bringing the *Ankh (q.v.)* and possibly *Peseshkef* (the knife with the blade like a fish's tail) to the mummy on the cartonnage trunk covering. It is also seen hovering over Anubis as he tends the mummy on the coffin lid. There is a study of the *ba* in Zabkar (1968).

Book of the Dead

Known to the Egyptians as *Going forth by Day*, the *Book of the Dead*, which dates from the beginning of the New Kingdom, represents the fullest form of funerary texts, beginning with the Pyramid Texts in the Fifth Dynasty (Old Kingdom, 2494-2345 B.C.) and also includes the Coffin Texts of the First Intermediate Period (2181-2133 B.C.) and of the Middle Kingdom (2133-1786 B.C.). A number of its Chapters are concerned with the protection of the deceased in the Netherworld, by thwarting various named demons *(q.v.)*. The

best known vignettes are the Ceremony of the Opening of the Mouth *q.v.* and the Weighing of the Heart in the Hall of Judgement before Osiris *(q.v.)*. It was usually written on papyrus and placed in the tombs of those who were sufficiently wealthy to make provision for one.
In this context, the *Book of the Dead* is the source of the scenes on the coffin and cartonnage.

Chut

This is an old-fashioned translation of Akhet; see Horizon

Coffin

The coffin was originally used to prevent the dead body from coming into contact with the sand filling of the grave, but the results were counter-productive (Spencer, 1982, 37). Schneider (1977, 65) points out that the anthropoid coffin was not merely protective in this sense but was also a reserve body, not merely the mummiform body of the owner but a human being who lives in eternity. Its inscriptions and scenes had the power to protect and nurture long after the daily offerings to the tomb had ceased.

Demons

Although demons are evil, by implication, there were good demons who guarded and protected entrances, and these are the ones depicted on the the cartonnage. The evil ones are the messengers of the evil goddess Sekhmet.

Falcon

The falcon is usually associated with Horus *(q.v.)*, who by the Early Dynastic Period was closely associated with the King. According to the *Blue Guide to Egypt*, 126, the identification of the species of falcon represented has been contentious. The Peregrine has been considered, but the Kestrel (*Falco tinnunculus)* is considered the more likely. Other gods were represented in this way also, e.g. Monthu the god of war and the mortuary god Sokar *(q.v.)*, who in the form of the composite god Ptah-Sokar-Osiris *(q.v.)* is depicted on the floor of our coffin. The *ba*-bird was usually depicted as a human-headed falcon.

Hieroglyphs

By the Late Period of Egyptian history three distinct scripts were in use for writing the Egyptian language, viz., hieroglyphic, hieratic and demotic - the first is the only one with which we need be concerned. It was the earliest and longest lived and comprised three types of sign, each of which performs a different function. Davies (1987, 30) calls these (a) 'logogram', which writes a complete word; (b) 'phonogram', which represents consonantal values; (c) 'determinative' which helps to indicate a word's precise meaning.

These categories are not mutually exclusive e.g. the logogram *pr* meaning house was used as a phonogram with the value *pr* in

such words as  meaning 'go'. The principles of the script are discussed in Davies (1987, 30-40).

Hieroglyphic inscriptions could be written either in columns or horizontal lines, both being used on our coffin. Orientation is usually rightward, although leftward is used in certain contexts, e.g. to provide balance or symmetry in a larger composition. Columnar and horizontal inscriptions, rightward and leftward orientations are represented on the UCC coffin. Hieroglyphs were not written in linear sequence, but for aesthetic or calligraphic reasons were grouped into imaginary squares or rectangles. (Davies 1987, 12-13).

Horizon

The device used to symbolise the Horizon is called the *Akhet*, formerly the *Chut*. This was represented as a mountain with two peaks between which the sun emerged. According to Davies (1987, 20) it allowed the deceased to 'witness and identify the sun's daily rebirth and thereby be reborn himself'. It is depicted, set in a naos on the cartonnage *usekh* collar *(q.v.)*. On either side of it the hieroglyphic sign *Rentet (q.v.)* is depicted.

Horus

For present purposes it is sufficient to regard Horus as the falcon-headed god, with the sun-disk encircled by the uraeus on his head, and in this form he is represented on the lid of

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the coffin, three times in all - twice with his wings protecting or offering, as it were, the *udjat*-eye of Horus, which offered protection to the deceased against evil. Lurker (1980, 67) treats this briefly. The Sons of Horus protected the body from hunger and thirst - their special charge was the inner organs, and these they protected in canopic jars. In the period with which this thesis is concerned they had the form of man-headed (Imsety), baboon-headed (Hapy), jackal-headed (Duamutef), and falcon-headed (Qebehsennuf). On the coffin they are in the procession of gods and on the cartonnage trunk covering they occupy the first two sections of the second register, where their names are written in hieroglyphs.

Isis

The goddess's name probably meant 'seat' or 'throne' - which sign was the hieroglyph for her name. She was mother of Horus *(q.v.)*, sister-wife of Osiris *(q.v.)*, sister of Nephthys *(q.v.)* and protector of the dead. She is represented on the right inner surface of the coffin, in the procession of gods and on the cartonnage trunk covering.

Kheperi

'He who comes into existence' is the meaning of this, the name given to the scarab beetle (*Scarabaeus sacer*). He represented a form of the sun and was associated with the concept of resurrection. This is painted on the crown of the cartonnage head covering but not on the coffin.

Khnum

The name of the person to whom the cartonnage trunk covering belonged as inscribed on it is Pa-Khnum. Khnum in this period was worshipped in the form of a man with a ram's head and was regarded as the creator, 'the father of fathers and the mother of mothers'.

Lion

The bier on which the mummy is laid on both coffin and trunk covering is lion-headed. As a solar animal, the lion symbolized not only death and destruction at night, but also resurrection and rebirth in the morning, hence the lion-headed bier. (See also Artistic conventions, Section 3.3. below.

Lotus

The lotus figures several times in both coffin and cartonnage. The flower itself is *Nymphus caerula*, the blue lotus. In Ch. 81 of the *Book of the Dead*, the deceased utters the desire to be transformed into a sacred lotus, which is an expression of the hope of rebirth.

Nephthys

Sister of Isis and Osiris *(qq.v)*, she appears as a protector goddess on coffins and canopic jars.

Netherworld

See Underworld.

Osiris

God of fertility and ruler of the netherworld, after the Middle Kingdom all transfigured dead became Osiris who was the symbol of resurrection. He had been killed by his brother Seth, and restored to life partly through Anubis's art of embalming, partly through Isis wafting the breath of life into him with her wings, and partly through Horus's giving him, his father, his eye to eat. He is represented on the coffin, wearing the *Atef* crown, in the procession of gods, and on the floor of the coffin as the composite Ptah-Sokar-Osiris *(q.v.)*, again wearing the *Atef* crown.

Ptah-Sokar-Osiris

Ptah, the local god of Memphis, represented in mummiform was known as a creator god who had first conceived of the idea of creation in his mind, and then brought about the creation by word. Sokar was also worshipped at Memphis at the edge of the desert, near the necropolis and so became a mortuary god. He assumed the form of the divine falcon. Early on he had been associated with Osiris and in the Late period became conflated with Ptah and Osiris. He is represented in this form on the floor of the coffin, wearing the *Atef* crown and holding the *was*-sceptre. He also appears on the lid of the coffin above the sloping foot section

Rentet

This is actually a tally-stick and is the hieroglyph which means 'year'. In its double positions on the *Usekh* collar (on either side of the *Akhet*), it symbolises eternity.

Shen

Originally probably a sun-disk encircled by a loop, it is no longer regarded as a representation of the sun. It symbolises eternity. The Scarab on the head dress holds a *shen* between his back claws.

Underworld

By day the sun travelled across the sky illuminating the land of Egypt and ensuring stability and order, but at night the god had to pass through the underworld on a dangerous and difficult journey to reach the next dawn. The sun descended into the underworld as Atum and re-emerged from the eastern horizon as Kheperi *(q.v.)* 'he who comes into existence'. The fate of the dead was associated with that of the sun-god. Several major Ancient Egyptian texts deal with this and are discussed briefly in Spencer (1982, 152-154). Netherworld is identical in meaning.

Usekh Collar

This collar was part of the dress of daily life (Schneider, 1968, 63). Its basic shape is cemi circular and consisted of several rows or bands of beads, flowers, seeds and pendants, all of which or combinations of which or even single elements of which could be included. As represented on the coffin it is made of rows of cylindrical beads.

Uraeus

This was represented as a rearing cobra with inflated hood. It was the symbol of kingship and was regarded as the eye of the sun-god, Re. When sculpted in the round it is shown as a single cobra on the forehead of the god or king with the sundisk. The conventions of Egyptian art, however, require that it be represented in full on either side of the disk when executed in a single plane. In the coffin it occurs on the sun disks, on the forehead of Osiris, and is coiled round the floor of the coffin. On the cartonnage collar it is on the winged sun disk *(q.v.)* and on the head of Horus on the back of the head covering.

Was-sceptre

The *was* consisted of a staff forked at the bottom and terminating at the top in an animal head. It was a popular symbol for the gods to hold, as they do in the procession of gods on the coffin lid, and was the symbol of dominion.

Weighing of the Heart

While this scene is virtually obliterated from the lid of the coffin, it can probably be deduced (Taylor, pers. comm). Anubis introduced the deceased into the Hall of Judgement, where his or her heart was weighed against the feather of Truth, Maat. Thoth, the scribe of the gods writes down the verdict, while the 'Eater of Dead' a composite crocodile, lion, hippopotamus waits nearby. The deceased recites the Negative Confession denying all sorts of crimes, some heinous, some mundane. Upon a satisfactory verdict, the deceased is led by Horus, or in the period to which the UCC coffin belongs, by Thoth to the offering table, where he is presented as a suitable candidate for the joys of the netherworld.

Winged disk

The wings of the falcon stretched out over the world were originally believed to be heaven. Later the sun disk was placed between the wings and the symbol belonged to Horus the Behdetite in his role as solar deity, whose epithet was 'he with the variegated plumage'. He had merged with Horus, who was identified with the king, and the two uraei which surround the disk were part of the royal symbolism. This occurs on the lid of the coffin and on the straight rim of the cartonnage collar.

3.3. Artistic conventions

It is also necessary to point out the more exceptional conventions of representation in Egyptian art as instance on the UCC group of subjects.

Schäfer (1974, 277-309) discusses the basic form in which the standing human body is rendered in two dimensions, and points out (p.299) that these figures should never be judged as human forms comprehended in one glance. He quotes Erman[1]

'In their attempt to show every part of the body as far as possible from the side which reveals it most characteristically, Egyptian artists produced a body whose strange contortions completely contradict nature. In general, the body is seen in profile, as is shown by the head, arms, legs, and feet. But a face-on [*en-face*] eye is placed in the profile head, and the torso in particular emerges completely confused. To enumerate: the shoulders are seen from in front while the thighs are in profile, and *the chest and abdomen have to provide a transition between them.* [Schäfer's italics]. With the chest this is achieved by making its back contour a face-on view and its front one a

[1]Erman, A n.d. [1885], *Aegypten und aegytpisches Leben im Altertum.* 2 vols. Tübingen: Laupp. [Tr. H.M/ Tirard, *Life in Ancient Egypt.* New York: Macmillan, 1894.

profile; the abdomen should be considered to be more or less a three-quarter profile...'(1974, 283).

His remarks concerning the eye (1974, 290-291), and hands (1974, 297-298) are particularly worth noting. Without exception the human eye is seen from in front, and the fundamental image of the human face includes a full view of one eye. The point on the outside where the lides meet is drawn out into a broad cosmetic line, which runs parallel to the eyebrows, but the caruncle is disregarded. The Ancient Egyptians probably retained this rendering of the eye because it is the only one in which the eye 'is felt to be alive and looking' (290). However, in Egyptian art the eyes never show emotion.

If the hand which is in front hangs down empty, its thumb is always turned towards the body, but the open-hanging hand behind the back is placed so that the thumb is turned away from the body. This poses problems only if the human figure is taken to be rendered in a single view, but Schäfer (1974, 298) says that it does the artist an injustice to consider his work in this way. His intention was to convey the impression that 'both hands are in the same posture', because he shows (1974, 299) that even in the Old Kingdom several pictures show that 'the thumbs (or palms) are on the same side towards the body'.

Clothing and jewellery covering human bodies are used to find a point of reference for determining the views in which its parts are represented (Schäfer, 1974, 286). He points out that although clothes covered the breasts symmetrically, the artist was not interested in rendering precisely what was there, becuase everyone who saw it would interpret that data on their own experience. This underlies his theory that 'as soon as a body is fixed on a picture surface, its meaning, as far as the determination of middle, front and back is concerned, changes as the work progresses' (1974, 287).

Baines and Malek (1980, 56) point out that Egyptian representation is not based on either of the two main principles of perspective (the use of foreshortening and the adoption of a single unified viewpoint for an entire picture). Figures are like diagrams of what they show, their aim being to convey information. The Egyptian method of representation is 'objective and mathematically precise' (Baines and Malek, 1980, 58), and very close to the visual image. They also feel that there are probably many reasons which have not yet been identified for this method, and while that of the recreative force of the representation is acceptable, its strength may have been over estimated.

Baines and Malek (1980, 58) state that in the Egyptian, colour, skin and nature are related words and a colourless figure would not be complete. Colour is as diagrammatic as

the figures, but light and shade are not necessary as they do not represent views.

3.4. Use of colour

During the history of Ancient Egypt the use of colour changed considerably, but it is outside the scope of this thesis to explore the history of its use. Schneider (1977) has presented a summary of the natural uses and magico-religious significance of colours, but he does not trace the history of the transition from the use of one to another.[2] Consequently I have not presented his summary here.

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[2] This is not a criticism of Schneider. His book (*Shabtis*) is not immediately concerned with this aspect except insofar as it concerns the shabtis themselves.

Chronological Table

of Ancient Egyptian History

Dynasties	*Years* B.C.	*Period*
	before 3100	Predynastic
I	3100–2890	Early Dynastic
II	2890–2686	
III	2686–2613	
IV	2613–2494	Old Kingdom
V	2494–2345	
VI	2345–2181	
VII–VIII	2181–2160	First Intermediate
IX–X	2160–2040	
XI	2134–1991	Middle Kingdom
XII	1991–1785	
XIII	1785–1633	Second Intermediate
XIV	1785–1603	
XV	1674–1567	
XVI	1684–1567	
XVII	1650–1567	
XVIII	1567–1320	New Kingdom
XIX	1320–1200	
XX	1200–1085	
XXI	1085–945	Third Intermediate
XXII	945–715	
XXIII	818–715	
XXIV	727–715	
XXV	747–656	
XXVI	664–525	Late
XXVII	525–404	
XXVIII	404–399	
XXIX	399–380	
XXX	380–343	
XXXI	343–332	
	332–305	Macedonian
	305–30 B.C.	Ptolemaic
	after 30 B.C.	Roman

Table 1 (after Spencer, 1982)

CHAPTER FOUR

4.1. The mummy

4.2. Textiles

4.3. Resin

4.4. Cartonnage

4.5. Coffin

4.1. The mummy

4.1.1. Introduction

When moved to the Lee Maltings from the Pathology Department, the mummy and coffin were contained in a large wooden box. Inside the coffin the mummy was covered with a quantity of rubble, all of which consisted of plaster and various pieces of woods from the coffin itself. Its head was placed on a small quantity of modern wood shavings, the idea of which seemed to be to prevent its banging against the walls of the coffin. All of this material was collected with help of several students of archaeology. It was placed in plastic

bags, each of which was labelled, describing the piece or pieces contained therein and the location in the coffin in which it had been found. This was done in the hope that at some future date the task of conservation and repair may be undertaken.

Great care has always been exercised during this investigation to avoid any further damage to the mummy and coffin, both of which are very fragile. The many trips to which they have been subjected have not enhanced the chances of preservation.[1]

4.1.2. Description

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[1]Obviously its journeys prior to coming to UCC cannot be accounted for. Apart from its transferral from an unidentified location to its hiding place beneath the floorboards of the Pathology Lecture Theatre, the first trip which can be accounted for (although not documented) is that from the main College Campus to the Lee Maltings store. Thereafter, ti was moved to the Library area of the Lee Maltings in October, 1976. The mummy was carried on a stretcher from the Lee Maltings to St Teresa's Clinic on the Dyke Parade to be x-rayed in January, 1978. On this occasion it was observed that the mummy was broken across the abdomen, and a support board was placed under it. This remains in position. In July 1982 the mummy was taken by car to the Regional Hospital, Wilton, Cork for CT scans. Its next journey (along with the coffin) was to its present location in the Basement of the Boole Library, UCC in March 1988, whence the mummy was brought by car to the Mercy Hospital, Granville Place Cork on June 29 1988 for further CT scanning. Its most recent trip has been to on a stretcher to the Department of Civil Engineering in the Basement of the Science Building, UCC ffor weighing. It was then brought into the Seminar Room in the Basement of the Boole Library to remove the toenail.

The mummy measures 1m 69cm from head to toe. At its widest point, around the chest it measures 1m 7cm; at its narrowest, around the ankles, 51cm. It weighs 24.2 Kg. Broken across the abdomen, it can be moved only when supported by the board which has been placed under it.

The bandages are torn at the neck in such a way that it is possible to see that four layers of bandages are discernible at once on the torso (Pl 10). The outermost layer (1) and the third (3) are sheet-like and may have covered the mummy from head to toe (Pl 12A). The other two visible layers (2) and (4) consist of strips of cloth 50mm wide, which had been wound round the body, (4) beneath (3), (2) over it. All visible layers are very tattered. The feet have also sustained a considerable amount of damage, so that the toes are partially exposed, and three layers of heavily resinified bandage are visible here (Pl 11A).

The evidence suggests that the bandages of face and head were ripped off so all that remains is a heavily resinified layer, next to the partially exposed facial bones (Pl 12). These bones are of a dark brown colour, probably the result of contact with the resin. These will be discussed in Section 4.1.4.1. below. Over these layers had been placed a painted cartonnage which consisted of 4 pieces. These are:

1. Head and face covering: this was thrown on top of the mummy and is very badly damaged indeed (Pl 1);

2. Chest covering, a D-shaped *usekh* collar 52cm long, 32cm deep, which is in a fair condition in that it is not broken or torn in a major way (Pl 13);

3. Trunk covering (or apron) which is of a truncated elliptical shape 30cm in length (Pl 14);

4. Foot covering which consists of a pair of sandals, with a t-strap (Pl 15).

The mummy, bandages, textiles and cartonnage will each be discussed in detail in Section 4.1.3, 4.1.4, 4.1.5 and 4.1.6. respectively below.

4.1.3. Mummification techniques[2]

4.1.3.1. Excerebration

The boney part at the base of the nasal septum is missing (X-ray 1). This may be due to its having been destroyed in the process of brain removal, but the CT scans of Sheet 1 suggest that some cerebral matter may be still present at the fossa posterior. This has led Professor Isherwood (pers comm) to

[2] I owe a great deal of the information from the conventional x-rays to the report which Dr Theo Van Schouten of Amsterdam wrote for me. Other observations have been made (as referenced) by Professor Isherwood, Dr Lovett and Dr Hurley.

raise the question whether the cranium was excerebrated at all. He feels that the shape of the deposit is too jagged to be resin. Only more detailed tomography through the orbitals could solve this. In Manchester Museum Mummies No 1976.51a and 1768 there is evidence of residual cerebral tissue.

4.1.3.2. Evisceration

The body was eviscerated, and there are no pelvic contents, but traces of what is probably lung tissue remain in the thorax (X-ray 2; HSp 14-22). The heart also seems to be in the thorax. This is suggested by the low density mass on the right side of the vertebral column. Leaving the heart in place was a common practice throughout the history of mummification, as it was regarded as the seat of intelligence and the will (Hamilton-Paterson and Andrews, 1978, 46). However only one of the seventeen Manchester mummies had its heart in place, while the lungs remained intact in seven of them. The rib cage has collapsed and the sternal bone is dislocated (X-ray 2; HSp 19-24).

The sacro-iliac joints are both dislocated (X-ray 3; FSp 1-6). The superior pubic ring has sustained a *post mortem* fracture. The thoracic cage is compressed and the spine is scoliotic - none of these conditions was caused by pathological disorder, and can only be attributed to the bandaging, bad conservation and bad handling. A high density

package overlies the right iliac wing, and a smaller one overlies the left. It may be that these are packaged viscera which were sometimes returned to the body.[3] There is no subcutaneous filling.

4.1.3.3. Other observations

The mandibula was dislocated *post mortem*, and teeth are missing from both upper and lower jaws (X-ray 1; HSp Sheet 2). Little soft tissue remains - the only tissue worth remarking on is that on the legs, which is in bad condition (X-ray 4; FSp 20-28). These are extended and lower left is rotated over the right (X-ray 5). Dr Lovett has noted that there are slight degenerative features such as mild scoliosis, and two osteophytes on disks 4/5 of the vertebral column, due to ageing. He regards the sockets of the femurs as 'good' (X-ray 2).

There is ample evidence for the use of prosthetic limbs and artificial eyes throughout the history of mummification (David, 1979, 6). Although there is no evidence of prosthetic limbs etc., this could not be properly ascertained without unwrapping. Artificial eyes, which were quite common are also absent.

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[3] This practice commenced during the 21st Dynasty (1085-945 BC) and seems to have been in vogue intermittently thereafter. There is no suggestion that this mummy dates to the 21st Dynasty.

4.1.3.4. Position of the arms and legs

The arms are extended in the pubic position - hands though crossed over the genitalia are also extended (x-ray 3; FSp 11-15). These positions of the hands and arms are noted in two of the Manchester mummies nos. 1767 and 1775. No. 1767 is an adult male from the Fayoum dated 100-200 AD. No. 1775, also an adult male from Hawara dated to 200 AD (Isherwood, Jarvis and Fawcitt, 1979, 28). Gray (1972, 200-204) notes many instances throughout the 21 and 26 Dynasties as well as in the Roman Period (30 BC - 200 AD) of the extended position of the arms. However, he notes that in this Period 'the majority by far have their hands resting on the outer aspect of the thighs', whereas in the earlier ones the position of the hands varies.

4.1.4. Bandaging

It is difficult to discuss the method of bandaging on the basis of CT scans alone unless there were several studies available with which to compare them. This however is not the case and of course only unwrapping can give the true picture. However, a limited amount of information can be gleaned from observation and CT scans, and analyses carried out by Evans also contributes to the suggestions. These are discussed in Sections 4.2.2. and 4.3.1. below

Torso

In Section 4.1.2. above it was observed that four layers of bandage are visible on the torso. These have been labelled (commencing with the outermost) layers (1), (2), (3) and (4). They seem to have been applied thus: layer (4) consisted of 50mm strips which overlaid bandages of some kind (pads or strips). Layer (3) is sheetlike and may have covered the mummy from head to toe. It was held in place by the 50mm strips of layer (2). Layer (1) is also sheet-like and may also covered the mummy from head to toe. It was intended that this should be seen as enveloping the entire body, but it was applied over it only. Fig 10 (overleaf) shows how the cloth was cut to allow strips be slipped in and secured under the bandages at the back (Pl 12A). The strips are still securely in place.

The manner of wrapping insofar as it can be seen at this level cannot be compared with the wrapping of the Manchester Mummy 1770 described by Tapp (1979, 86). Firstly, the wrapping there described has been shown to be a secondary wrapping placed over the cartonnage mummy case which had originally covered the body. Secondly, the body had been filled with bandages and mud at a much earlier date, and this cannot be known in the case of the UCC mummy.

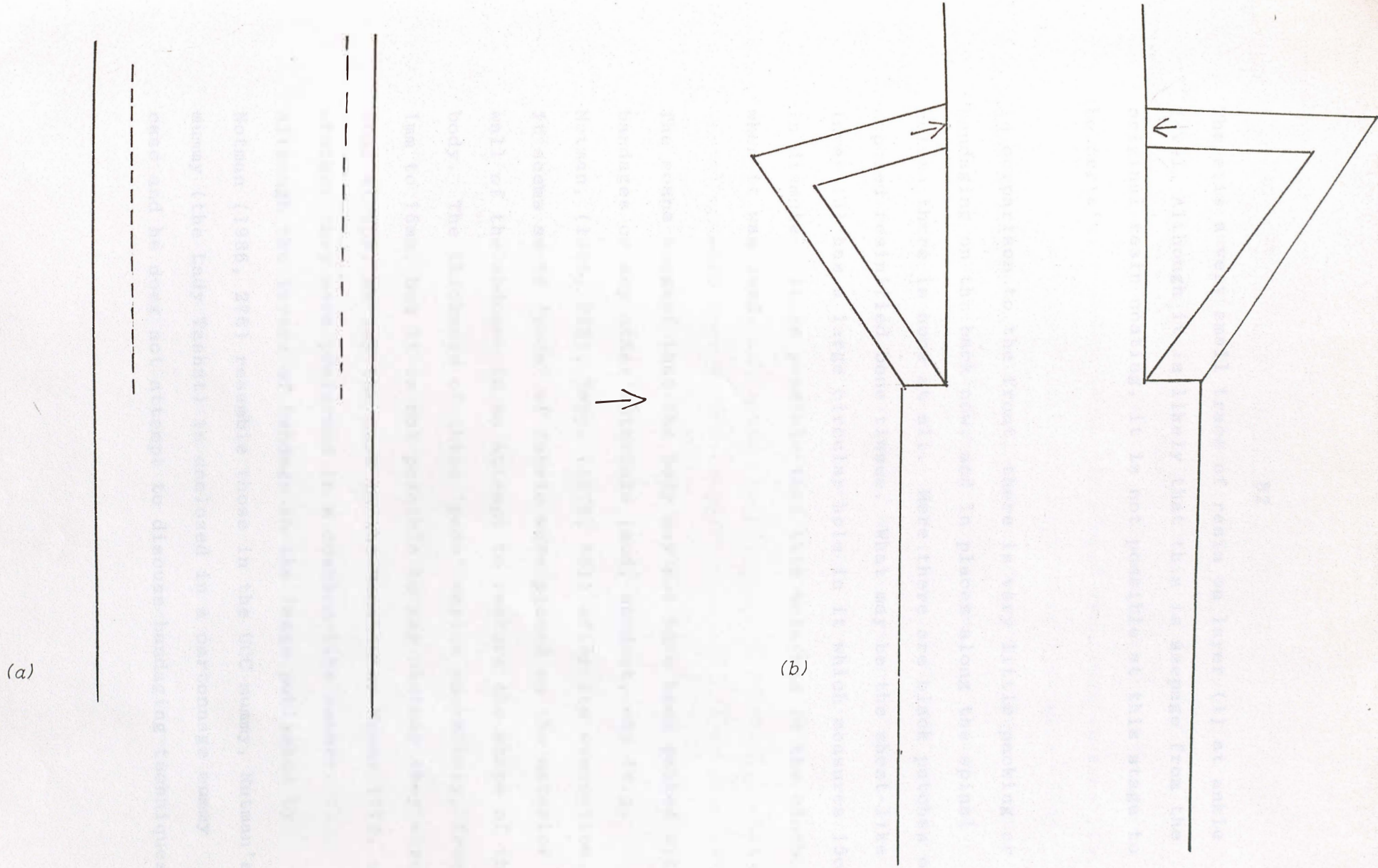


Fig 10 Sketch to show how outer sheet was cut to secure behind mummy (----- indicates cut)

There is a very small trace of resin on layer (1) at ankle level. Although it is likely that this is seepage from the original resin coating, it is not possible at this stage to be certain.

In comparison to the front, there is very little packing or bandaging on the back now, and in places along the spinal column there is none at all. Here there are black patches of exposed resinified bone tissue. What may be the sheet-like layer (3) has a large circular hole in it which measures 15cm in diameter. It is possible that this hole was in the cloth when it was used.

The scans suggest that the body may not have been packed with bandages or any other materials (mud, sawdust, wax (e.g. Notman, (1986, 253), Tapp, (1979, 86)) after its evacuation. It seems as if 'pads' of fabric were placed on the anterior wall of the abdomen in an attempt to restore the shape of the body. The thickness of these 'pads' varies enormously, from 1mm to 16mm, but it is not possible to say whether they were long strips, as was the case in the Manchester Mummy 1770, or whether they were preformed in a cushion-like manner. Although the layers of bandage in the image published by Notman (1986, 276) resemble those in the UCC mummy, Notman's mummy (the Lady Tashat) is enclosed in a cartonnage mummy case and he does not attempt to discuss bandaging techniques.

Head and face (Pl 12)

The present appearance of the head and face suggests that bandages were almost certainly ripped from them at some time. What now remains consists of strips about 50mm wide which have been wound around the head and forehead. These strips did not cover the face from the eyes down, but seem to have been brought down around the ears and knotted under the chin. The bandages of the face are so heavily resinated that it is impossible to say how many layers were involved.

The nose is now missing off the mummy, and the orbitals are partly visible beneath the resinified layers. It is possible that the entire face and head had putrefied, as had much of the rest of the body (section 4.1. above) so perhaps the nose had fallen off prior to wrapping.

Amulets

There were certainly some amulets placed within the wrappings and these became obvious by means of the CT scans. These occur in head wrappings HSp 8, 9, 10 and FSp 14, 18, 19. FSp 16 also has some dense object anterior to left leg.

Obviously it would be impossible to speculate on which of the hundreds of amulets used by the Egyptians had been used.

Hamilton-Paterson and Andrews (1978, 79-88) discuss some of the more common ones, as does Budge ([n.d.], 231-266).[4]

The male organ seems to have been emphasised in some way (FSp 11-15). Prof Isherwood has remarked that it is not possible to comment on this as it could have been wrapped in some special way (as in No 7B mentioned by Marx and D'Auria, 1986, 327-328) or it may be an amulet (as in the case of Manchester Mummy 1770, David, 1979, 160).

4.1.5. Dental examination

Most of the teeth were carefully removed from the mouth and throat by Dr V R O'Sullivan, Department of Anatomy, UCC. He reports that the mummy appeared to have a complete permanent dentition at the time of death. Some teeth were dislodged by the undertakers and were lying with the linen packing the mouth and pharynx. The teeth are very brittle and show extensive occlusal and interproximal attrition, the pulps of several teeth being exposed. This would have resulted in chronic abscesses on the affected teeth and is typical of Ancient Egyptian dentitions (see for e.g. Leek, 1972, 126-131; 1979, 65-77; 1986, 183-201; Puech and Leek, 1986, 239-243). There was considerable bone loss around the teeth,

[4] The information in Budge requires checking, but it is useful for the names of amulets.

resulting from chronic periodontitis, also commonplace in Ancient Egypt.

There is an abrasion groove beneath the contact area on the proximal surface of one molar which is probably the result of using a tooth pick. Such grooves have been the focus of some attention in the UCC Anatomy Department. They have been found in a number of preindustrial and industrial societies in Europe and North America, and this specimen looks as if it resulted from tooth picking.

No evidence of caries was present. This is not unusual and Leek notes (1986, 194) that the evidence for dental caries among the group examined by him (Cheops' courtiers) was 3.19% (38 cavities out of 1188 teeth). Allowing for the possibility that some of the teeth missing may have been carious, but taking into account that most of these were the self-cleansing front teeth, the true percentage of carious teeth of these people could be decreased rather than increased.

4.2. Textiles

4.2.1. Description

As will be seen below in Section 4.2.2., the bandages were treated with acidified alcoholic phloroglucinol to which the

samples gave a positive reaction, thus indicating a non-lignified cellulose, and consequently a flax origin. The macroscopic examination of the textiles is presented in summary form in Table 1.

4.2.2. Chemical analyses

A sample of bandage which had detached itself was removed and sent to Evans. The following is his report:

The bandages were of two types. Type I had been impregnated with resin or similar material and type II was apparently untreated. Samples of both types were examined by visual and scanning electron microscopy. This examination suggested that both I and II were made from flax fibres. One interesting observation was that no pollen or other extraneous material (except for a few fragments of mineral matter) was found in either bandage type.

I and II both gave a positive reaction to treatment with acidified alcoholic phloroglucinol which indicated that they were non-lignified cellulose, thus supporting a flax origin.

Samples of both types were extracted with a series of solvents of varying polarities (hexane, chloroform, 2 propanol and water). The extracts were then evaporated to dryness and examined, initially by infrared spectroscopy,

FIBRE: LINEN WEAVE: TABBY SPIN DIRECTION: S DEGREE OF SPIN: MEDIUM

[All cloth is rotten & moth-eaten & tears very easily]

NO	CONTEXT	YARN DIAMETER IN MM		NO OF THREADS PER CM		MUNSELL COLOR CHART	COMMENTS
		SYS 1	SYS 2	SYS 1	SYS 2	NO	
1	Wound around neck & knotted under the chin	00,18	00,20	11/12	33/34	IOYR 5-8 yellowish/ brown	There is a hem on this which measures 3cm long x 7cm wide
2	LAYER 1; Sheet-like outer covering	00,15	00,22	10	30-35	IOYR 6/6 brownish/ yellow	Ms Pamela Hardesty, textiles expert, has remarked that this feels like new, unwashed linen in comparison to no. 4, which is much softer. Weave is very uneven
3	LAYER 2; cross wrappings	00,20	00,21	10/12	33/34	IOYR 6/8 brownish/ yellow	Darn 35mm x 25mm. Edge rolled & held down by top stitching
4	LAYER 3; sheet-like (inner)	00,25	00,28	12	31	2,57 6/6 olive yellow	This is very soft & heavy in comparison to no. 2. Ms Hardesty remarked that it feels 'well used'
5	LAYER 4; cross wrappings;					2,57 6/6 olive yellow	A coloured thread has been woven into this band-like piece which is very much in evidence. The weave is much denser where the coloured thread has been woven in
	a) main colour	00,32	00,28	9-10	22	IOYR 4/4	
	b) coloured thread	-----	00,29	----	30	dark yellowish brown	
6	Head	00,20	00,25	11	40	IOYR 6/6 brownish/ yellow	
7	Cartonnage face mask	00,38	00,38	10	16/17	IOYR 5/6 yellowish/ brown	All linen in cartonnage looks similar - coarse, loose tabby weave

TABLE 2

followed by thin layer and high performance liquid chromatography. Both types gave residues with all solvents

The subsequent analysis of these residues showed that I contained resin, palmitic acid and traces of stearic acid. In the resin extract proteins were detected which on hydrolysis gave a series of amino acids that were representative of an animal glue or gelatin.

The extracts of the apparently untreated bandage II showed it to contain protein which on hydrolysis gave a similar amino acid system to I. No vegetable gums or resins were detected. Traces of a waxy material were found in the propanol extract that were most probably beeswax but insufficient material was separated to confirm identification.

Samples of the resinous material both on the bandage and extracted were investigated by emission spectroscopy. This showed the presence of traces of calcium, iron, silicon, sodium and copper. No vanadium, nickel or molybdenum were detected.

The conclusions reached by him were that the bandages were obviously made from flax fibres. The presence of animal glue/gelatin in both I and II suggests that the bandages were glued on and the resinous material in I either soaked through from the body or was applied afterwards. Alternatively it

may be that the glue migrated into the resin bandage at a later stage but this does not seem very likely.

The absence of Vanadium, Nickel and Molybdenum shows that no bitumen was used in the resin. Equally vegetable gums do not appear to have been used in the preparation and use of the bandages, only animal glue.

The presence of palmitic acid with traces of stearic acid suggests the use of palm oil at some stage in the embalming process. (The use of other oils would have been expected to produce additional fatty acids such as oleic and much higher levels of stearic.)

The presence of abeitic acid systems supports a vegetable origin for the resin. The additional presence of pinene suggests the possible use of a pine species producing turpentine. However it may well be that the pinene is the residue from the application of turpentine oil or other essence, the other volatile fractions of which have evaporated.

The suspected presence of beeswax was probably the result of a spillage of wax or a wax containing system used for some unspecified purpose. It seems highly unlikely that it was used as an adhesive for bandages or had any similar widespread application.

The absence of pollen and other materials in the bandages, especially the resinous ones, indicates that either the wrapping occurred at a time of year when the pollen counts were low or that the preparation of the corpse was carried out in a relatively still atmosphere. Additionally it suggests that the resin was tapped/prepared when no pollen was being produced by the tree.

These conclusions compare very favourably with those reached by Benson, Hemingway and Leach (1979, 119) in their discussion of the analysis of the wrappings of Manchester Museum Mummy 1770.

4.3. Resin

Evans also examined the resin using the techniques described in Section 2.4.3. above. This is his report:

4.3.1. Resin from toes

The resin was made up of 4 layers. Layers 1 and 2 (next to the skin) consisted of thin coatings of a resinous substance, whilst 3 and 5 contained bandage fibres. The bandages were made from flax. Microscopic examination of the sample showed some adhering pollen and fungal spores. Unfortunately it was not possible to separate the pollen for identification. The

pollen was only observed in layers 1 and 2. (As this fragment came from direct contact with the body it is difficult to see how it can be the result of later contamination. Equally if contamination had occurred on would have expected it to have affectedd the bandages as well).

The sample was split into three layers: 1/2. 3 and 4. Each layer was subjected to the scheme of analysis outlined above. The data obtained was very similar to that for the resinified bandages II. However the emission spectrum obtained for 1/2 showed enhanced levels for sodium (with respect to 3 and 4). The was most likely caused by their contact with the natron treated body. The amino acids detected in 1/2 also probably resulted from body contact, tissues being trapped in the resin.

The conclusions reached by him were that the body was treated with a vegetable resin, no bitumen was employed. The presence of pollen in layers 1/2 and its absence from 3 and 4 and the bandages suggests some time lapsed between the preparation ofthe body and its wrapping. Equally well the body may have been rewrapped at a later date. Only the archaeological evidence can clarify this point.

It is interesting to note that the only other study which has analysed the resin employed in the mummification of an

individual (Manchester Mummy 1770) found that bitumen may have been used, on the basis of the presence of Molybdenum and Vanadium. They point out however that the absence of Nickle renders this evidence incomplete (Benson, Hemingway and Leach, 1979, 119-131).[5]

4.4.1. Cartonnage[6]

As has been mentioned above the cartonnage is in four distinct pieces, two of which (trunk covering or 'apron' and collar) are in relatively good condition, one (head and face covering) very badly broken, and foot covering which is in a reasonable state.

Usekh Collar (Pl 13; Fig 10 in portfolio)

The collar is semi-circular in shape, and consists of two layers of linen impregnated with plaster. The linen is a tabby weave and has a rather coarse texture (see Table 1 Section 4.2.1. above).

The paint is applied to the upper layer only and the entire surface is covered.

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[5] In the opinion of Evans, Nickle is the essential element for the identification of Dead Sea bitumen.

[6] In the absence of a comparable study, I have discussed all aspects of this section with Dr John Taylor, Curator, Department of Egyptian Antiquities, British Museum.

It is very soiled - much of the soiling due to somebody perhaps attempting to remove it, with a wet or damp rag. This has left a stain on the paintwork. It is obvious that it was wiped rather than rubbed, the 'wipe' marks are clearly visible.

The upper rim has a falcon's head, facing toward each corner. These, although similar, are not identical. Between them is the winged sundisk and uraei. Beneath this a full-blown lotus bloom is surrounded by concentric bands, alternately plain yellow or white with geometric designs, which fill the remainder of the surface to the penultimate band which is of alternate single lotus blooms and buds. The outermost band is of pendant triangles, their apices pointing towards the lotuses. In the centre of the collar is the Akhet symbol, the sun rising in the horizon.

Description of the motifs

All sections are outlined in black unless otherwise stated. Attention has been drawn to instances where the outline is particularly strong, or may not be expected.

Hawks' heads (Pl 13; Fig 10 in portfolio)

Left

This is positioned to the right of the left corner, the area in front of and behind it is painted red. The hawk's head was drawn in well defined black outline on the yellow background obviously painted for this purpose, and used for the main colour of the face. The bill is a black triangle, and its sides are extended to form the outline of the eye. The pupil is black, as are the facial markings. Five bands, outlined in black and radiating from the back of the head, form the upperparts, which are not defined in black. Only three of these, i.e., 3rd, 4th, 5th were painted blue, superimposed on the yellow background which shows through between each band. Although another single black line had been drawn at the narrowest point, as if to include another band, it was ignored.

Right

Slightly larger than the left head, this is positioned to the left of the right hand corner. The area in front of it is red, but apart from a very small triangle of red made to complete it, the outermost line of the neck is formed by the extremity of the wing, thus obviating the need for the red area mentioned in the left hand one. The bill here is almond

shaped, the eye more circular. As in the previous one, the upperparts are composed of alternate bands of blue and yellow radiating from the back of the head, their black definition much stronger than that of the left. In this case there are six such blue bands, the seventh, though marked was not painted blue.

Sun Disk and Uraei

This device is placed in the centre of the upper rim, which is very slightly downward curving. The disk itself is painted in a red which is lighter and brighter than that already mentioned, and the uraei are painted yellow - all three were outlined in black. Three layers of wings surround these - the uppermost resembling a snake skin; the black-outlined scales with yellow-highlighted tips are on a white background. The second layer of yellow 'feathers' are more bird-like, and the outermost layer is brownish black, with layers of feathers drawn in black. This whole section is marked off by a yellow line, outlined above and below in black.

Lotus Flower

Placed directly beneath the last device, the damage sustained by the petals suggests that it was painted on a white background. It has nine petals, the three outermost blue,

the two interstices red, and the remaining four green. Only the three blue petals were outlined in black. The base of the flower head has not been aesthetically finished, no attempt being made to form a calyx. The yellow semi-oval which marks it off is interesting for two reasons: (1) on the outer black line the artist raised his implement before finishing it, so the left hand portion is slightly higher than the right; (2) this line has a crisper definition, as if in present day terms, it had been drawn with a freshly sharpened pencil - in comparison to all other lines, which have a flatter appearance, whether strong or light.

Akhet

This is placed slightly left of centre, with the red sundisk between the two dark blue mountain peaks. It is set in a naos which is drawn in black and painted yellow. On either side of it is a *Rentet*, a tally-stick, in thes positions symbolising eternity.

Geometric Motifs

These are all on a white background, which is used to separate each individual motif. Each band or group of motifs is delineated by a plain yellow band. In the first two instances these were outlined in black, thereafter the white is self defining.

In order of occurrence from the innermost out, these consist of: circles, rectangles, contiguous triangles (with a dot in the chevron between each pair); triangles, rectangles, 'stitching', triangles, rectangles, marguerites with red centres, triangles, rectangles, 'scallop shells', dot in circle, rectangles. The colour pattern is consistently blue, red, blue, green, but the green has been omitted from the final band of rectangles.

The penultimate band is of alternate single lotus buds and blooms. The twelve blooms resemble the one already described above, but here the calyx is present, painted in yellow, two black lines define three sepals. A blue stem projects from the calyx. A few slight inconsistencies may be noted: in the fourth bloom from the right (curved edge uppermost), the artist forgot to colour the fourth petal green. In the fifth bloom, the last blue petal crossed over the first blue petal of the sixth. The blooms are not all the same size, the first being the widest, the last the narrowest.

The buds are formed by a blue triangle, on a rounded yellow calyx, from which a stem also projects. Each bud is surrounded by a series of red dots, varying in number from fourteen to twenty, which follow its outline. These dots begin and end with one small circle outlined in black, infilled with blue.

It is interesting to note that the work seems to have been done from left to right with the curved edge uppermost. This is suggested because the last bud had to be squeezed in, so that there was no space for most of the red dots - and it has a token six.

The outermost band consists of triangles, their apices pointing towards the lotus flowers - the colour arrangement is different to all others in that it is three green, followed by three blue, three red, three green and so on. They were all outlined in black it seems, as there are two outlines which the colouring artist did not notice and made his own triangle alongside it.

All straight lines are drawn with the aid of a ruler.

4.4.2. Trunk covering (Pl 14; Fig 11 in portfolio)

This is a truncated ovoid shape depicting a different theme in each of three main registers: the first shows the Ba bird bringing the Ankh symbol and the Feather to the mummy who is placed on a lion-headed bier.[7] It is directed by the sister goddesses Isis on the right and Nephthys on the left, with their arms upraised, in a pose of lamentation. The second

[7] The purpose of the Feather is unknown (Taylor, pers comm).

depicts firstly the four sons of Horus, genii of the dead, viz., Imsety and Duamutef, the man- and dog-headed gods respectively; Hapy and Qebhsennuef, the ape- and falcon-headed gods. These are followed by six pairs of unnamed daemons, guardians and keepers of the portals and gates of the underworld. The third is of two single full blown lotus blooms. A hieroglyphic inscription runs down through the centre of the covering, and several geometric motifs delineate the various sections.

This has sustained much damage from 'cleaning' also. It is possible that friction from the cleaning medium erased the figure of Nephthys almost entirely. The 'wipe' marks which were mentioned in connection with the collar are again visible on the white background in particular, and certainly detract from the aesthetic appearance of the piece.

Ba-bird *(q.v.)*

The bird is human-headed with a green face, the head covering is blue. The facial features which now remain are small but clear - eye, eyebrow, nose and beard, the paint broken so the mouth has been obliterated. The wings are depicted in bands of red, blue, yellow and green, the plumage indicated by means of black lines. The underwing on the right is shown as white with red diagonal stripes, and a tiny portion of the left underwing is also shown. The bird's rump is painted

red, and the tail green with a red tail band. Black lines on the tail are vertical. It is not possible to say whether a hand may have been painted on the left underwing as the paint is too broken, but the *Ankh* is suspended by a double 'string' through its loop. Again as the paint is broken it is not clear whether the Feather was actually attached to the Ankh somehow, but both are painted in green. The midrib of the Feather is white, the herringbone design of its individual components black.

The recumbent mummy (in profile) is, as already mentioned, on a lion headed bier. The face is coloured green, with black nose, mouth, beard, eye and eyebrow. Its wig is black, and reaches down back and front to the base of the collar. The collar is white with three parallel black lines, black diagonal lines between each pair. The rest of the body is red.

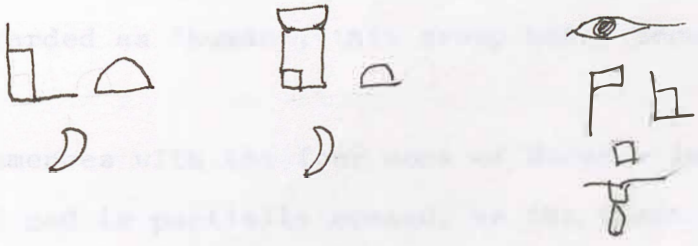
Black and green are the only colours used in the bier - the lion's face is green, its features black, as is its mane, which wig-like extends down the length of its forelegs. The closed mouth and raised tail are typical of Egyptian art, and symbolic of royalty (Section 3.3. above). Both legs and paws, as well as its 'back', which acts as the vehicle for supporting the mummy are also green.

Beneath the bier are five containers which had been used in the mummification of the deceased. Four of these are bags

tied at the top, probably containing natron. The central green vase shaped container is probably a jar.

Attention has already been drawn to the erasure of Nephthys on the left hand side. All that remains are her upraised arms (painted green, outlined in black), the lower portion of her above-the-ankle length red dress and her bare legs and feet painted green, outlined in black. Her name can be deduced from what remains of her symbol. Isis, in profile, on the other hand is completely intact - the uncovered parts of her body face, neck, arms, breast, legs and feet, painted in the same manner as those of Nephthys, her black hair reaching down her back to chest level. Her hair does not hang down over her shoulder. The straight, slender red dress follows the curves of the body closely. Both goddesses are in poses of lamentation (Taylor, pers. comm.).

There are three hieroglyphic inscriptions in this register - the names of the goddesses - that of Isis in full, that of Nephthys partially obliterated, and the name of the deceased in full.



The second register is divided into eight sections each of which has a pair of gods or daemons of the Underworld.

There are several feature which all, except Duamutef, the jackal-headed son of Horus, have in common, these are: all 'faces', whether human or grotesque, are painted in green, hands, where they occur, also; all wigs are black and come over the shoulder as well as down the back (an exception here is the god who looks backwards, whose wig is only over his chest which is behind his face); all have yellow collars, usually with two, three or four black lines, two, possibly three, have no lines. The bodies of all of these are painted red, with, in the case of those standing, a black strip of cloth in front. All, except the four sons of Horus who carry looped strips of mummy cloth, and the last human headed daemon, to whom the artist probably forgot to give one, carry a black knife. If the creature has hands, it is clasped in both, otherwise it is on its knee, as in the case of the four last creatures, who are squatting with both knees drawn up, unlike all the others who are standing. Where possible, a sundisk has been placed on the head - this is not possible where the creature has protruding ears, a pair of horns, a basket of food for a head, or three snakes for a head. Each group of four, has one human. If the god who looks backwards is regarded as 'human', this group has a second human.

It commences with the four sons of Horus. Imsety, the man-headed god is partially erased, as the linen is very torn here. However, a tiny portion of his green face, and his green hands clasping the bandage are visible as is the red

and blue of the lower portion of his body. His bandage is black on a white background. On his head he wears the red sundisk and his name in hieroglyphs, partially obliterated, is to the right of the disk. Behind him is Duamutef, his ears, face, the front portion of his wig, his hands and the pupil of his eye are black. The back portion of his wig is blue, however, and his bandage is red as are those carried by Hapy and Qebhsennuef. The only feature worth remarking in their case is that their names are inscribed and are intact.

The second section comprises obscure unnamed cat-headed, ram-headed, man-headed and vulture-headed deities. Next a creature with three snakes with sun disks on their heads, for a head accompanied by a man-headed god; their companion pair is another snake headed god, with the god who looks backwards. The fourth section has a god with an unidentifiable device which resembles a basket of food for a head, another with three snakes with sundisks, yet another snake-headed god and accompanied by human.

The lotus flowers *(q.v.)* in the remaining sector are constructed in the same way as those on the collar, but that on the left has five extra blue petals, inserted between the red and green. It also seems as if the three blue petals of the right lotus were originally painted yellow, in error perhaps, and the blue then superimposed upon it.

The geometric and floral motifs

The motifs used here are rectangles, triangles and marguerites, similar to those already mentioned in the *Usekh* collar. The outlines of all are in black, and each band of motifs itself delineated above and beneath by a slender yellow band, also outlined in black. These lines have been drawn with a straight edge or ruler. Here their use is functional as well as decorative, in that they delineate sections from each other.

The colour pattern is usually blue/red/blue/green, except where the artist got confused.

Fifteen marguerite motifs are used on either side of the vertical inscription. The background of one marguerite in the right column which should have been green, was either deliberately or accidently forgotten. This suggests that the motif was drawn first and the background then coloured in. Its being omitted in such a central place suggests, perhaps, that backgrounds of similar colour were done first, then the next colour and so on. On the other hand, perhaps the artist just decided to leave it plain.

4.4.2. Inscription

Apart from the names of the gods and mummy already mentioned, the central inscription, although badly written reveals the name of the mummy for which it was originally intended. It reads 'Hail! Osiris Pa Khnum son of Tkmy and born of the Lady of the House Wy'.[8]

4.4.3. Footcovering (Pl 15; Fig 12 in portfolio)

This continues the inscription on the trunk covering, and is too badly written to suggest a reading. It does not mention any name. Two jackals are depicted, perhaps reminiscent of those which guarded Tutankhamun (Desroche Noblecourt, 1963, 193). The feet are painted red and the toe nails are gilded. A coiled t-strap is painted in yellow and black on each instep. Both sandals have a chequer board pattern, the colours arranged in lines of green/white, blue/white, red/white, blue/white. The semi-circular back portion of the heel and front portion of the toes are painted green with one black line drawn mid-way across each. All lines are very carefully and errors are few. The artist got confused about his colours in the left sandal and used green instead of red in one row. Mid way in the row he missed one square and so

[8] Professor J R Harris, Department of Egyptology, University of Durham says that Jaromir Malek, one of the editors of Porter and Moss (1964) suggests the reading Pesmedu instead of Pa Khnum.

the pattern is out. He also forgot the stitching, which has been shown on the edges of the right sandal, on the left one. The sides of the sandals are indicated by the daisy motif and the space between them has been painted red.

Although the date of the piece may be Ptolemaic, the chequer board sandals may indicate a Roman date, as in the case of the Manchester Mummy 1770, but it is not conclusive, so a date for Ptolemaic-Roman Period is offered.

4.4.4. Head covering (Pl 1)

The outer surface of this is entirely covered in paintwork, some of Ancient Egyptian motifs, some undecorated. Each portion will be described in turn.

It seems clear that once the covering was completed and dried, a further layer of white plaster was applied over the entire outer surface. The object of this would have been to provide (a) a vehicle for the paint; and (b) a smooth surface which would cover all joints and flaws. It also frequently acted as white colouring.

Crown (Pl 16; Fig 13 in portfolio)

Although badly damaged, it is clear that the design consisted of a group of eight concentric circles. Commencing with the

outermost and largest, the first to fourth and the eighth circles are 1 mm wide and painted yellow on the white plaster background.
On this white background the geometric motifs which fill the circles have been drawn and painted.

In the innermost circle, the motif depicted is the winged dung-beetle *(Scarabaeus sacer) (q.v.)* called *Khepri* by the Egyptians. The body and legs are naturalistically represented, each wing consists of a single papyrus blossom *(Cyperus Papyrus)*. These are not identical. The creature is grasping the red sundisk in its front claws and is pushing it with its head. Behind him, and slightly to his left is what may be a papyrus bud, but it is too crudely executed to be certain. On either side of the bud there is what is probably a single upright feather.

The Beetle (Fig 13)

The body is outlined in black and the markings on the body and head are also indicated in black. The markings on the body consist of two concentric semi-circles, which mark the base of the head and shoulders. From these, six vertical and parallel lines form two groups divided by two contiguous and opposing arcs, which indicated the position of the folded wings. The central crest of the crown is clearly visible, and from it a group of three parallel lines is drawn to the

left and right outline of the head. In the right central section thus formed, a small balck chevron has been included, while in the left is placed a black dot. From the front of the head two minute vertical and parallel lines are also drawn.

Only the left front leg and claw are now fully visible, due to damage, but the tip of the right claw is also visible. Both back legs are apparent, the left damaged in such a way that only half of it is now present. It is clear however that the positioning of the left leg is more zoologically correct than the right, which may have been omitted originally.

Each wing is represented as a papyrus blossom *(Cyperus Papyrus)*, but clearly no attempt was made to reproduce it in a botanically correct manner in either case, as both are not identical. Petals are indicated in the manner in which they are represented in a lotus flower *(Nymphaea caerulea)*, whereas the corolla of the papyrus, although much larger, resembles that of the Meadow Thistle, *Cirsium dissectum*. In both, the convex shape of the corolla is exaggerated. In the left, eleven petals are indicated as partially overlapping chevrons, drawn in black on the yellow background of the corolla, but in the right, the petals were formed by lines radiating from the calyx towards the outer rim of the corolla. There were probably eleven or twelve of these lines, although only ten can now be seen due to damage.

In the left blossom, the calyx is roughly indicated by two parallel lines, in the right by two concentric arcs. Transverse black lines indicate the lower portion of the petals in each. These lines were applied over a rectangle of pale buff coloured paint between the lines of the calyx. The left one is interesting in that the portion from which the stem would normally emanate is indicated as an arc situated in the corner of the truncated calyx.

Sun disks

There are two sundisks represented. Both are ovoid in shape, outlined in black, and filled in with red. The larger is propelled by the head and front claws. A yellow band may have surrounded it as in the shen symbol, but as only part of it now survives it is difficult to be sure. The smaller, which is probably a *shen* ring rather than a sun-disk, is held by the hind legs.

Geometric Motifs

All geometric motifs are set in the white circular bands of the plaster background. Motifs are not contiguous, and each individual motif is punctuated by the white background. Each motif is outlined in black, and each pair of bands is separated by a plain yellow band. The bands consist of:

rectangles, stitching, rectangles, triangles and rectangles again. The colour pattern is generally the same as the collar, blue/red, blue/green, although the red was omitted from the band of triangles.

The application of the paint is rather clumsy. This is especially true of the blue which was applied in little lumps. Some of the lumps have now disappeared leaving a very vivid blue stain.

4.4.4.2. Covering for back of head and neck (Pl 16; Fig 14)

The areas included in this description are delineated by those lines which radiate in decreasing angles from the circumference of the yellow circle surrounding Band No. 5. They form part of the frontal tresses of the wig. In each of the outermost angles, which could be regarded as temples, a lotus bloom has been drawn in black lines only. The whole area seems to have had a wash of yellow paint applied to it prior to the black lines being drawn. Twelve lines were then drawn, forming eleven bands. Bands no. 1 to 7 inclusive, 9, and 11 are of roughly equal width, i.e. 5 mm. Bands 8 and 10 are roughly double this width 11-12 mm.

Commencing with the second band, ten were 'painted' in each of the three alternate bands, second, fourth and sixth. The colour order is blue, red, blue, green, each punctuated by

the yellow background. The remaining bands are undecorated, but the eighth and tenth were painted red and blue respectively. Although only the left hand segment ofthis portion is now relatively, sufficient of the right remains to see that both were identical.

Representational motifs

A sundisk radiating rays (Fig 14) and the falcon of Horus (Pl 17; Fig 17) are depicted between these two segments. The sundisk is positioned above the falcon, and divided from it by a band of rectangles.

Sundisk

This is ovoid in shape, and measures 57 mm at its widest, 45 mm at its narrowest point. It is painted in red on the white background of the plaster. It is evident that it was applied to the plaster and not achieved by the plaster acting as a negative stencil. There is no indication that it was outlined in black.

Its rays are depicted as nine oblique lines of red dots, some contiguous, some not, reaching from the lower edge of the sundisk to the yellow band which delineates the band of rectangles.

On either side fo the sundisk, red and yellow bands have been drawn parallel to those of the front lappets of the wig. The yellow bands were both outlined in black, whereas the red were not.

At irregular intervals throughout the white background a pale buff colour can be noticed. It is probably the result of slight 'bleeding' of the paint.

Falcon

This segment is completely severed from the rest of the head covering, but was obviously attached to it as some of the rectangle band and dots of the sun rays are painted on it. It is trapezoidal in shape, being narrower at the bottom (14 cm) than at the top, where I would estimate it could have measured 21 or 22 cm. On three sides it is outlined by the usual band of blue, red, punctuated by white small rectangle motif, set between the pair of yellow lines outlined in black. On the shortest side a plain red band is painted on the yellow band.

The falcon is presented from the rear, his head turned to the left. It is positioned 1 cm to the left of centre in its background. This has resulted in the creature's left wing encroaching on the band of rectangles, and displacing one, if not two of these. This in itself is interesting, as it shows

that the main motif was executed before the margins. The falcon was drawn in black outline on the yellow wash. The blue covering was then applied, forming a negative stencil.

The motif is interesting as initially, the flattened head, hooked bill, barred wings and spotted upperparts seem to resemble a kestrel (*Falco tinnunculus*). The eye and other facial markings are drawn in black. The semi-open, downward curving position of the wings suggests that the bird is about to either take flight or land. On them, a pair of coverts is indicated by the curving lines with transversals drawn across the wingspan. Three primaries of each wing are represented by elongated chevrons. This is unnaturalistic and seems to have been drawn to give a sense of finish than to represent a bird's wings correctly. Each wing is surmounted by a feather.

The rump is formed by two unequal arcs, infilled with spotting, the tail is indicated by five vertical lines. This last feature is unnaturalistic also, tails of all birds of this type are barred horizontally. The legs resemble those of Osprey, and show the thick feathers characteristic of this bird. The inscription reads to the right) 'Behdet';
to the left 'Lord of Heaven, variegated of feathers (?), who comes forth on the horizon' (Taylor, pers comm).

4.4.5. Face, neck and frontal lappets of wig (Pl 1; Fig 16)

The geometric motifs which cover this area, which only measures 7 cm. wide x 9.5 cm. wide, have all been described under the *usekh* collar. They are coloured circles, green, black, red, black, green, black, red, black, green; small rectangles black, red, black, green; pendant triangles of the same colour pattern; small and large rectangles, the small drawn but not coloured. Of the three large, two are black. Then follows the daisy motif, followed by opposing chevrons, followed by pendant triangles. The colour scheme for the last two is black, red, black, green. Next is a band of 'scallop shells' and finally small rectangles, the colour scheme of which is impossible to make out as this edge is rather worn. The lower part of the frontal tresses of the wig are painted a dark blue. The only adornments are a red and green band painted on a a yellow background 4 cm. from the end of each piece and a band of green, black and red rectangles interspersed with white also on a yellow background around the long edges. These are broken so it is not possible to gauge their original length. The left now measures 20.5 cm, the right 18 cm.

The face mask itself and upper portion of the neck had been gilded on white plaster, and the jaws and chin outlined in vivid blue. The kohl lines of the eyes (only one of which survives intact) and eyebrows (of which only one survives)

were also blue, and the pupils painted black. The positioning of the eyes is not correct, as they are too low on the cheeks. The mouth seems to be positioned correctly and the tarnish here suggests that some other paint must have been used to indicate the lips, which seem to have been open. The nose and ears have not survived.

4.5. Coffin[9]

4.5.1. History of the coffin

In 1903-4 the Italian archaeologist Ernesto Schiaparelli excavated several tombs in the Valley of the Queens at Thebes. Among them were the tombs of Khaemwas and Sethyherkhopshef, two princes of the 20th Dynasty. These contained a large number of intrusive burials of private individuals dating to the 25th and 26th Dynasties. These burials had been plundered and the coffins were found in great disorder but the inscriptions on them revealed that many of the dead were members of one family. (Schiaparelli, 1924)

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[9] This footnote is intended to replace the need for the reference Taylor (pers comm), as in the absence of a comparable study I have discussed the material presented here with Dr John Taylor, Curator, Department of Egyptian Antiquities, British Museum. As always the use of his advice is my own responsibility.

Of particular interest is coffin No. 11 in Schiaparelli's list (1924, 192), which belonged to a man named Hor, whose title was written in various ways but which is clearly the same as that found on the Cork coffin. The coffin of Hor's brother Harwa was also in the group (No. 10) The description of Harwa's coffin includes the names of his parents: Tjakhonsurud and the Lady of the House Tjaenhotep. The father bore the same title as Hor. Given the rarity of the names of the parents and the very unusual title (hardly attested outside this group of coffins) it seems inevitable to conclude that the coffin now in Cork is the same as Schiaparelli's No.11, and therefore, that it was found in the Valley of the Queens. Moreover Schiaparelli notes that the decoration of No 11 was similar to that of Harwa's coffin, No. 10. The latter is illustrated and the resemblance to the Cork specimen is unmistakable.

According to Schiaparelli, most of the coffins he discovered were sent to Turin Museum, but six, including No. 11 were retained in Cairo. (1924, 187,188, 192, 193). Porter and Moss (1964, 770) also cite it as being in Cairo Museum.

4.5.2. Description

(The most important conventions of representation have already been discussed in the Preface, and are not repeated here).

The coffin comprises 3 sections:

(1) the container, comprising canopy, footboard, floor and 2 sides, right and left;

(2) the anthropoid mummiform lid;

(3) the canopy for the lid.

4.5.2.1. The Container:

The outer part of the container has been painted/plastered white, and has 2 groups of parallel lines drawn on it, in red and yellow. In other coffins of this type, including that of Harwa, the owner's brother, (Turin Museum Sup. No.5229) there is a hieroglyphic inscription. Coffins No. 47975 and 22813A in the British Museum also carry inscriptions in this area.

The interior surfaces are all plaster/painted white also, but all surfaces have been painted with devices and figures as described below. In most cases it has been noted that outlines have been drawn in black. This means a light black guide line, which is quite unobtrusive, almost pencil like in quality, and not usually readily visible, having been covered with the colouring paint. Attention has been drawn

to cases where the black line is given higher profile, so to speak.

Canopy (Pl 18; Fig 17 in portfolio)

Arc shaped, on the inside, this was covered in white plaster and bears the symbol of the sun disk with uraeii *(q.v.)* on either side. The cobras are outlined in black, heads painted blue, their bodies yellow. The blue is now of a very pale shade, but fragments of a deeper blue especially on the left hand one suggest that this was much more vivid. The deeper shade survives in lesser quantity on the right hand one, and that mainly on and immediately inside the outline, but from the little that remains, there is no reason to suggest it was any different from the left hand one. The bodies are, as stated above outlined also in black. The artist's hand slipped a little on the right hand one and formed a triangle. The yellow paint was applied rather carelessly and often ignored the outline.

Painted red, and not a perfect circle, the sun disk has a light black line drawn through it, left of centre, from the top of the headboard almost to the bottom. One may have expected this line to act as diameter, but this was not intended.

On either side of this device are the hieroglyphs which form the word Behdet. This word is the name of a god, the name of

the 17th nome of Lower Egypt and an epithet of the god Horus in his solar manifestation. Dr. Taylor (pers. comm.) assures me that it is in the last of these meanings that it occurs here, rather than suggesting that the coffin may have been made in the 17th Nome of Lower Egypt. These hieroglyphs were all outlined in black and subsequently coloured: the knife-like symbol (an elephant's tusk) is coloured in blue and red; the blue in the upper section and red for the 'handle'-like part; the hand-like symbol is in red, the *niwt (q.v.)* blue and yellow, the cross yellow, the rest of the circle blue. The semi circle (a loaf of bread) is in blue only and is used here as the determinative - i.e. to indicate that the whole word is the name of a town.

Right hand side (Pl 19; Fig 18 in portfolio)

On the right hand side the figure of the goddess Isis is painted, in profile, facing away from the mummy towards the top of the container.[10] She is identified as Isis by the symbol of a stepped throne worn on her head. This is outlined in black and painted blue. Her name is also written in hieroglyphs near her face. In this case, the black outline has been emphasised for the outline of the goddess's face, shoulders, and left breast. Black has been used in a different way for the eye, eye brow and hair. For the eye

[10] By right-hand side here is meant the right hand side of the spectator.

and eyebrow it is obviously cosmetic, and the use of kohl as an eye cosmetic is well known from Ancient Egypt. The pupil of the eye is also black. Lips are indicated by the pencil type outline, and no attempt was made to colour them differently from the rest of the face. The hair is painted black , but may have been outlined first, given the manner in which it is dressed. A fringe covers the forehead, and has a red ribbon tied round it which is knotted behind. This ribbon extends to the nape of the neck. A small lock of hair is visible in naturalistic style in front of the ear, and a tress, held behind the ear falls over the shoulder, and over the right breast, which is typically not indicated. The remainder of the straight hair falls down the back to the waist and is visible behind the right arm. The history of this hair-style is discussed by Schäfer (1986, 288). The left shoulder is represented as a straight line, but the right shoulder slopes in a more naturalistic manner. The extended arms reach almost to the knees, and in the case of the left is of equal width from shoulder to wrist, but the right elbow is indicated with a slight curve, thus giving a more natural line. Hands are outlined, and as is common in Egyptian painting, both seem to be left hands. In each case the four fingers are depicted as of equal length. Both arm pits are shown, the left being filled with the curve of the left breast, which protrudes from the side in an unnaturalistic way and touches the left arm. The right arm pit is a small hook, formed by the slope of the body and

extended arm (Schäfer, 1986, 297).

The goddess wears a red, one piece, straight above-the-ankle length dress, with a v-shaped neckline which extends to the waist. This neckline and the cutaway armholes form slender shoulder straps. Curves of the hip, bottom, thighs and calves are clearly indicated . Blue bands encircle the wrists and ankles, and a blue collar is also depicted, although this is shown over the left shoulder only.

No footwear is indicated, but both feet are clearly represented and the goddess is standing on a pedestal, depicted by black stand, supported on bifurcated leg, painted in red, outlined in black, with a ladder effect 'reinforcement' behind it, painted in blue. Schäfer (1986, 12) feels that this probably expresses the desire to give prominence to 'what was now consciously intended as a work of art.'

Left-hand side[11]

The goddess Nephthys is depicted on the left hand side of the coffin and is almost identical to Isis. The symbol on her head which is a rectangular enclosure in plan with a wickerwork basket on top, the hieroglyph for 'lady of the temple/mansion'.

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[11] Left-hand side of the spectator

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The painting is slightly smaller than that of Isis, and the v-heck of the dress is not as perfectly formed.

These two goddesses, sisters of Osiris, occur here as protectoresses of the mummy, one of their chief roles.

Footboard (Pl 7; Fig 20 in portfolio)

Apart from the lid, this is the most soiled portion of the coffin. This is possibly because the coffin was broken here in antiquity and was the only section of the inside which was exposed to dust etc. Schiaparelli mentions hyenas living in the tomb (1924, 127), perhaps they made their lairs here on this coffin, but this requires further investigation which is outside the scope of this thesis.

While the representation on the footboard is obscured by the dirt, on the basis of BM Nos. 47975 and 22813A (Taylor pers comm) it is the symbol known as the *demedj*.[12] This consists of, in this case, a red disk surrounded by a yellow loop, with two crossed flails. The method of its execution seems rather extraordinary, and seems to have been accomplished thus: a preliminary sketch was first done by one person - the sketch should be inserted here so space is left. A

[12] Taylor (pers comm) has pointed out that there is no explanation for the occurrence of this particular symbol in this position on the coffin.

second person, or perhaps even the same, ignoring the upward stroke of the left flail, with yellow paint extended the vertical *concept* to the bottom of the board. He then created his own upward stroke and curved it across the outlined disk, to meet the horizontal black line. He then painted the yellow loop, more or less correctly, and must have intended to paint the usual red disk within it. The white margin all round it is irregular. The black line drawn across the disk, which was probably intended as the upward stroke of the right hand flail seems to have baffled him, as he took great care to respect it and left a slender white, albeit irregular, margin on either side of it (fig....) Apart from this, he seems to have accepted the original outline of the right flail to a large extent.

BM 22813A, 6667A and 6690A (Taylor pers comm) has a similar, though not identical symbol.

Floor (Pl 20; Fig 21 in portfolio)

The floor is quite stained around the sides, with what looks like possibly dirty water marks.

Despite this, as shown in the accompanying illustration, the floor has a mummiform representation in profile of the falcon-headed composite god Ptah-Sokar-Osiris painted on its full length. The body seems to have been outlined in the

faint manner already described. The foot profile is distinctly outlined, as is that of the wrist bands, and portion of the hands not obscured by the stain. On his head he wears the *Atef* crown, which was outlined in black. The ostrich plumes are painted pale blue, but the vertical section of each has a red outline, continuing that of the base of the crown. The main part of the crown is painted yellow, and the uraeus, outlined in black was filled in with yellow, the black hood superimposed upon it. This extended in a rather shakey line to the lower outline of the body. The falcon head is strongly outlined in black, and the upper down-curving portion of the bill is filled in with the black used for the hair of the goddesses as are the pupils of the eyes, and facial markings. The remainder of the lower face is white, as is the lower portion of the beak, and apart from the black outline is indistinguishable from the white paint of the floor. The white of the eye was outlined initially, as was the pupil. When the heavier black paint was applied, it was done in a careless manner which gave a 'splash' effect and did not fill the entire outline. Above the eye and immediately beneath the crown is a short red section. Taylor has pointed out that this is a mistake by the painter: there should only be a thin black line above tha pupil, completing the outline of the eye, but the painter has erroneously filled in the whole space with red.

The wig, which reaches down the back almost to the bottom of the collar, was outlined quite definitely in black and it follows the contour of the shoulder to hang down over the chest. It was painted with vertical stripes yellow, blue, yellow, red, yellow, blue, yellow, red, yellow, blue, yellow. In contrast, the collar is outlined separately and has horizontal stripes, yellow, red, yellow, blue, yellow, red, yellow, blue - all of which were outlined in black. Beneath the last blue line, the basic white has 9 pendant pear shapes outlined in black. Although only four of these are now coloured, all were probably painted blue, as there are tiny traces of blue pigment on the other five.

The lower part of the body was covered completely in red (over the white ground), and this was then criss-crossed in blue and yellow, the blue, drawn downward from right to left, obviously superimposed on the yellow. The wig, collar and body, though not the wrist bands, closely resemble coffin BM 22814A. In this (22814A) the lighter coloured lines in that go from right to left. Some similarity may also be noted to BM 22813A, although this is less marked - the wig is not extended over the shoulder, and the horizontal lines of the collar are much broader; the criss-crossing is much closer, and the god carries the crook, was sceptre and flail. In only one case does the yellow line extend noticeably over the outline, in most cases it is well within it, sometimes not even touching it.

In his hands, the god grasps the *Was* sceptre which is painted yellow, and has a bifurcated base as in BM 47975 and BM 22814A. He is standing on a plinth, which, though badly damaged, seems identical to that already described for the goddesses. Around the edge of the floor and commencing, [13] at the head of the *Was* sceptre, curling round near the base of this plinth, and passing from right to left behind it, up along the left hand edge of the floor, curling again at the head of the god, is the rearing uraeus. The hooded head in its usual position is directly in front of the *Atef* crown, It was outlined in black, and painted in yellow, but the head, as in those on the headboard, is blue.

There are several small splashes of the various paints visible all indicated on the accompanying illustration (Pl 20).

Rim of coffin (Fig 19)

On the two long sides this is decorated with marguerites, similar to, but much larger than those on the cartonnage. These are set in chevrons. The short sides of the coffin have only parallel lines drawn on them in red.

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[13] On the basis of BM 47975 and 22814 A (already mentioned), because it is otherwise obscured by stains.

4.5.2.2. Lid (Pl 3)

6 separate pieces in the lid may be distinguished in the lid

1. the main central panel which bears the mummiform head and left shoulder;
2. the left shoulder
3. right shoulder
4. canopy
5. part of left foot
6. part of right foot
7. square panel which should fit above the feet, on the basis of the similar coffins, viz. Turin Museum Sup. No. 5229, BM 22813.

Head and Face (Pl 4; Fig 22 in portfolio)

The face which was originally painted red, although this has now flaked off, has typically Egyptian features, the outlines and pupils of the eyes painted black, with whites clearly indicated. The treatment of the eyes is interesting. Ms Ann Paterson, who drew the portrait of this head, pointed out to me that it was very difficult to reproduce in pencil the effect achieved by the Egyptians, as the eyes are not replicas of human eyes in the way in which the mouth and nose are. The lids are ignored, as is the caruncle, and the eyeballs are almost spherical. Schäfer (1986, 292) also mentions this: 'The changing treatment of the surface of the

eyeball should also be studied. At the end of the Late Period the corners of the eyes are cut back much deeper, making the eyes almost spherical. Here a form which is also occasionally found in the Old Kingdom has been readopted.' The nose has been slightly damaged and the lips, which are painted the same red as the rest of the face, are full and slightly smiling. Schäfer (1986, 19) speaks of the 'subdued smile that plays on the lips of Egyptian statues as an expression of kindness, in comparison with the smiles in other art', and points out (p 292) that this expression is widespread throughout the Late Period, to which this coffin belongs. The ears are missing and were either removed or fell off. It is not clear how they were attached to the head as no dowels are evident, but they may have been made of plaster. On the other hand, it is clear that the chin had a beard, as two broken dowels are visible in the holes. The lower jaw and chin are outlined in black.

The facial likeness of this coffin to that of Harwa (the owner's brother) (Turin Museum Sup. No. 5229) is unmistakeable, although Harwa's expression is more melancholic.

The contours of the face are clearly visible and the surface well smoothed, probably by sandstone rather than an adze. These are better seen than spoken of, and the artist's impression accompanying this shows the contours achieved by

light and shade. The wood for the wig on the other hand was shaped by the adze and it is possible to see the marks where the plaster and paint are missing. The heavy wig is indicated by blue and yellow horizontal lines painted across the forehead and vertical lines of the lappets on the upper chest.

The *usekh* collar (Pl 5; Fig 23) is a series of concentric arcs with vertical transverse lines. The arcs fit into rough groups and each has its own set of vertical lines randomly spaced, formed by one stroke of the brush. The colours are not clearly defined, blue runs into red, green into white, etc. An arc of pendant pearshapes, outlined in black, with the colour scheme blue, yellow, green, red indicate the edge of the collar. This is quite dissimilar to that of Harwa, which seems to be decorated with floral motifs. On the other hand, the collar on the Cork coffin is reminiscent of the 'plain type' belonging to Tutankhamun (Br. Mus., 1972, item 41) which reproduced in gold five rows of upright cylindircal beads. The collar on BM 22813 is also similar.

Beneath this is the winged sun disk with two rearing uraei. There are some interesting inconsistencies here. It is not straight, being slightly higher on the left than on the right, and the dark markings on the yellow sections of the wings is on the right hand side only.

The procession of gods (Pl 22; Fig 23)

In the centre panel of the lid nine gods in single file stand facing right towards an offering table on which is placed a full-blown lotus flower covering 3 loaves of bread (Schäfer, 1986, 21 refers to the practice of covering food with a lotus flower). The leg of the table resembles the trunk of a tree, with roots and two opposing branches showing. Two plants in pots are upright beneath the table.

The procession towards the table is led by an animal headed god with horns, who with both hands carries the *Was* sceptre. Behind him is Osiris, also grasping the *Was* sceptre in both hands and wearing the *Atef* crown. Then follows Isis, wearing her symbol, her face shown in profile, her torso in full frontal view, the lower part of her body again in profile. Behind her, the four sons of Horus, led by Imsety, followed by Hapy, followed by what has to be Duamutef (his face is missing, but his upright ear is visible), followed by Qebhsennuf.

Behind the table damage to the paint and plaster, has rendered the subjects partially visible. The god farther right is seated in a shrine, and his tail is visible. He may be a baboon headed Thoth, observing the Weighing of the Heart in the Hall of Judgement. On the basis of the suggestion of an ear, partial head and 1 leg the device in front of, and

probably facing, him may have been the Eater of the Dead (explained *s.v.* Weighing of the Heart), awaiting a negative outcome. The individual farther left, and now immediately behind the table, has its left arm raised, bent upward at the elbow. Most of the headdress is missing, the face is painted red with black features, the torso is also red. The remains of a collar, similar to that worn by Isis can be seen, and a pleated skirt-like garment in green is tied at the waist. The two central pleats are indicated in light black lines, and it reaches to mid-calf. Both feet are indicated, but they seem to me to be unusually far apart. This is most likely to be Hor himself being led into the presence of the gods by Thoth, whose scribe's palette is just visible at the right hand edge of the main plank of the lid. Given the broken plaster, due to the original dowelled joint here, at least one other god could have fitted in there.

Between Hor and the Eater of the Dead is a vertical line in green and red. This is the suspension cords of the scale pan of the balance. The cords are red and the artist has filled in the intervening space with green paint.

Beneath the procession of gods, Anubis (Pl 23) is shown tending the mummy, which is lying on a lion-headed bier, over which the *ba*-bird is hovering, returning to the mummy. The sun-disk with two uraei sheds its rays upon the mummy's face and head, and beneath the bier are 3 unguent jars.

Sun-disk and rays are red, while the uraei are yellow. The mummy's face is red with black features, his beard and wig black also. The semi-circular collar is plain yellow without any indication of adornment, the body and feet are green. Green is also used for the lion's head, her upright tail, back, and legs; black for her eyes, closed mouth, nose and mane, which last, wig-like, extends to the knee of the foreleg. A 'mattress' between the mummy and lion's back is painted yellow (nearest the head), black and red.

Anubis, standing beside and behind the bier, tends the mummy - his right arm, bent at the elbow is extended along the body, his left arm also bent at the elbow, is raised holding a black jar containing oil with which he is anointing the mummy. The jackal-head and his neck are painted green, the wig (confined to the back only) red, collar and 'skirt' yellow. Torso, legs, feet arms and hands are black. Behind him, the *ba*-bird hovers returnign to the mummy. The human head of the bird is not readily recognizable, but it is painted red, like the mummy's face, and its wings are green, yellow and white. The body is basically white, although a little of the yellow paint from the outer wing has spilled over onto it. The tail of the *ba* seems to me to be more swallow-like than falcon-like, although the wings are falcon-shaped. The hieroglyph of Hor's name is also swallow-tailed in the texts.

There are three unguent jars beneath the bier. Each is coloured in blue red and yellow, although the significance of the colours is unknown. They probably contain oils and unguents used in the embalming of the body - or maybe natron.

To the left of the scene with Anubis and divided from it a column of hieroglyphs (which will be discussed below), the falcon-headed Horus extends his wings in th protective gesture, the *udjat* eye enclosed between them.[14] Very little of the falcon remains due to the absence of plaster. It is, however, possible to see his green face and head with the red sundisk upon it, and the black facial markings. It is not possible to say whether the uraeus was on his forehead or not. A reasonable amount of the outer portions of the wings survive - enough to show the blue, red and green sections, with the feathers indicated in the usual way, but not enough to see whether the inner section of the wings was yel low.

The only remarkable feature of the wing is that application of the red paint on the lower wing is a little careless and curved over twice onto the green.

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[14] The text gives the titles of the solar Horus 'Behdet, the good god, lord of heaven, who is over the gods' (Taylor, pers comm).

The blue *udjat* eye is rather messy and a blob of blue from the wing seems to have been spread over onto it. The brow, outer lids and markings are blue, the pupil black and the inner lid red. Under the eye the triangular are is yellow.

All of these figures are outlined in black. The paint work is mostly in good condition, but those areas which are painted with red have sustained most damage. It is not, I feel, realistic to suggest that anybody for any reason deliberately defaced these areas. It is much more likely that the paint itself was not as stable as the other colours - all of which are still intact. Where colours are absent, it is due to the plaster work breaking off, taking with it the superimposed colour.

The application of colour was reasonably careful, in that the drawn outlines were usually adhered to. The most noticeable exceptions are the lion's tail and hindleg where the green paint went over the outline, and the body of the *ba*-bird already mentioned.

Other sections of lid

On the basis of the coffin BM 47975 and the coffin of Harwa in Turin as prototypes, it can be deduced that a rectangular piece of painted wood (Pl 24; Fig 24 in portfolio) was placed horizontally above the two sculpted upright feet on the lid of the coffin.

There are two points about this to which attention needs to be drawn:

(1) Given the present shape of the coffin (illustrated), it is difficult to see where it fitted in, but if it did not, why is it with the coffin? The main features about it which makes me question whether it belongs to this coffin are (a) the quality of the artwork seems to be better than that of the rest of the coffin; and (b) the quality of the red paint seems to be better, in that, apart from the sundisk, it is not as worn as in the rest of the lid. If this particular piece did not belong, another piece of this shape did: tentatively therefore, this should be regarded as part of the lid of the coffin of Hor.

(2) This piece is very dirty. It is even fair to say that some dirt is actually caked on it, which makes description difficult, if not at times actually dubious. Gentle buffing, even discrete rubbing in an unobtrusive place, with surgical cotton wool did not make the slightest improvement

This is the mummified falcon god Ptah-Sokar-Osiris standing, in profile.[15] On his head he has the sun disk and uraeus. The sun disk is oval and painted red, the uraeus is black,

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[15] Taylor (pers comm) has pointed out that this is a common morif on the sloping foor section of some coffins, e.g. BM 22814.

and while its tail and part of its body are flush with the disk, it is difficult to decide whether the body curves round the disk on top or underneath. The hooded head seems to be seated on the god's forehead, with the head touching the sun disk. It makes one wonder whether this is why the disk is oval: if it were a circle, and the body curved under the disk, its head would not come sufficiently close to touch it.

The falcon's head is heavily outlined in black, as are the facial markings, pupil of the eye and upper portion of the bill. The face is green, but it is difficult to say whether the back of the head is white or green. The white of the eye is, despite the soiling, yellow. The *usekh* collar is too dirty to say whether it had actually been coloured; one noteworthy feature about it is that the lower portion of it is not outlined, although the pendant pear-shapes indicate it. As far as I can see, these are all black on white. The remainder of the body and tail are red and criss-crossed in blue. In front of the god's chest is a large pear shape device, outlined in black, and painted green around the inside, but yellow in the 'centre'. This is probably part of the necklace with the *menit*-counterpoise

To the left of this figure is the *udjat* eye. This is interesting in that the brow , eye lids and the lower left marking are outlined with a double light black line. Apart from the brow, which could have been blue, red or white,

between these slender pairs of lines, the colour seems to be green, but it could be yellow.

Yellow is certainly the colour used between the lower left marking and the extended eye-lid. The pupil seems to be blue, rather than black, and over the upper lid is red. Beneath it is what may be a hieroglyphic device: outlined in black, painted green, with a yellow and blue centre; it seems to me to be similar to the basket. Beneath it are probably two more hieroglyphs. Between the basket and the god is some other device which is obscured.

Immediately above the falcon-god is a group of 5 concentric arcs: these are coloured blue, red, green, red, blue. Beneath him, is another arc shape, this time filled with coloured chevrons, red, yellow, blue, yellow, red, yellow, blue, yellow (from the left); from the right, yellow, red, yellow, blue, yellow, red. The god and eye are delineated from these, and framed in a rectangle formed by four reasonably wide blue lines. Between the head of the god and the eye is a dividing band (?) of yellow. (Pl 25)

Feet (Pl 25, Fig 25 in portfolio)

Little can be said about the feet except that they probably belong to the coffin and the remains of the inscriptions are still on them

Canopy of lid (Pl 26; Fig 26 in portfolio)

The outer surface was smoothed, plastered and painted white. The symbol of the sun rising in the horizon is painted in red (sundisk) and yellow (horizon), but not outlined beforehand. Three concentric lines, one yellow, the second very pale green , the third and outermost, of red dashes was painted to form a border.

The inner surface was crudely smoothed and some plaster was applied which served to cover some of the roughness and to fill the gap between the bottom piece and the second.

Inscriptions

The most important elements in the inscriptions are the owner's name and title and those of his parents. These are indicated in fig 23. Hor's title and that of his father were written in various ways, and Porter and Moss (1964, 770) have translated it as 'lotus carrier (?)' (*sic*). For convenience, this translation will be used. Taylor has commented that this title is very unusual and is 'hardly attested outside this group of coffins'. He also notes that the names of the parents Tjakhonsurud and Tjaenhotep are rare, although Hor's own name 'was a very common name in the 26th Dynasty'.

The inscriptions are written both in columns and vertically. The three surviving columns to the viewer's left of the winged uraeus and sundisk are read from left to right. The second and third columns are the owner's title and name. There were probably three more columns to the left of these again, but the wood from this section is missing. On the viewer's right of the sundisk are five columns, read from right to left. Beneath the sundisk is a horizontal group which is a prayer for various kinds of offerings for the Osiris the lotus-carrier of the temple of Amun Hor. Then follows the procession of gods, and beneath it a horizontal inscription, which contains another prayer for offerings for the Osiris the lotus carrier of the temple of Amun Hor. Beneath this are twenty columns read from right to left. In the fourth and fifth columns from the left, are Hor's mother's name and title, Tjaenhotep, Lady of the House (i.e. married woman). Hor's own name and title also feature as indicated. There then follows another horizontal group, prayers that Hor will be in the company of the gods.

Under the Anubis scene is another horizontal column, which contains yet more prayers for offerings for Hor. Beneath this is another large group of columnar inscriptions. Fifteen columns now survive but there were probably twenty. In the four columns to the left of the large crack Hor's father's title and name are written. The remainder of the text contains more prayers for offerings and safety for Hor in the Underworld.

Prayers for offerings (chiefly food and drink) are very common in tombs, on coffins etc., as one of the fears of the Egyptians was lack of food, and consequent death, in the Underworld. To write something down was to give it substance, and the power of the written word enabled the texts to provide for the daily needs of the deceased long after the supply of daily offerings had lapsed. (Spencer, 1972, 70). There is ample evidence of this from contemporary texts (e.g. Spencer, 1972, 70-71). Furthermore, Spencer also points out (1972, 71) that for these people, the final key to eternal life was to have one's memory perpetuated and one's name spoken by the living. 'An often repeated sentiment in tomb inscriptions shows the value of having one's name preserved in writing:

"I made live the names of my fathers which I found obliterated on doorways...Behold, he is a good son who perpetuates the names of his ancestors"

On the other hand, if you destroyed a person's name you ended his existence in the Underworld.

4.5.3. Paint and plaster

4.5.3.1. Paint

Evans (pers comm) interpreting the results of the investigations described in section 2.4.2. above says that the pigments strongly indicate that the reds and yellows were iron oxide systems, i.e. inorganic pigments. Lucas (1962, 349) states that the colouring matter of the yellow ochre is due to hydrated oxide of iron, which occurs plentifully in the country, and was used from predynastic times right through Egyptian history.[16] The red Evans believes to be anhydrous oxide of iron rather than hydrated, both of which were widely used. While it would have been expected that the green pigments would have yielded a Cu peak, as this sample did not, it is not possible to determine its source. This is also true of the blue. Lucas notes (1962, 350) that the blue on the coffin of Tutankhamun had turned blackish brown, although it was almost certainly frit which had deteriorated. This is possibly the case with the blue on this coffin also, but further investigation is required.

The black used for outlining he suggests was probably obtained by using charcoal as the pigment.

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[16] Other yellow pigments known from Egypt are orpiment, a yellow derived from sandstone, a yellow derived from oxide of lead, and vegetal yellows are also known.

4.5.3.2. Plaster

The plasters used in Ancient Egypt are discussed by Lucas (1962, 353-355), and are identified by him as those based on clay, gypsum and whiting (calcium carbonate) mixed with glue, which last he says Egyptologists ambiguously call *gesso*. Evans (pers comm) says the plaster on the UCC coffin is a calcium carbonate system as only calcium is present on SEM scans. It appears to be a pulverised sample that has been reconstituted, but he has not so far been able to identify the glue/binder used. His experience suggests that this was not a lime (i.e. calcium hydroxide-slaked lime system) mixture, but definitely a carbonate system.

CHAPTER FIVE

The aim of this thesis is to make as full a record as possible of the mummy, textiles, cartonnage and coffin and to contribute this to the data currently being captured world wide on the history of mummification. It also seeks to establish the relationship between these four subjects.

At the outset, a series of research questions was posed; these were treated at length in Chapter Four. In this final chapter a brief summary of the answers to the questions is offered.

1. The mummy

a. Sex, age, date weight, name.

The mummy has been shown to be male, *ca.* 50 years of age at death, probably dating to the Ptolemaic Period (304-30BC)and weighs 24.2 Kg. His name and parentage cannot be established at present until it can be shown whether the trunk cartonnage which now covers him was originally made for him. The name Pa-Khnum, son of Tkmy and the Lady of the House Wy is inscribed on this cartonnage.

b. Medical observations *ante mortem*

It was observed that the individual was in a reasonably good state of health: he had no physical abnormalities and the only pathological conditions noticed were that he had suffered from slight spondylosis of the lumbar vertebrae (which is very common in mummies and has no direct correlation with age) and slight degenerative features of interconduleer eminence (due to aging).

There is no evidence of trauma, and while it is not possible to establish the cause of death without further investigation (and even then it may not be possible to do so), medical opinion suggests that death from natural causes is likely.

c. Dental observations *ante mortem*

The dentition was typical of the Ancient Egyptian population: while there was no evidence of dental caries, the surfaces of the teeth had been badly worn and the pulp exposed in several cases. This would have caused chronic periodontitis and abscesses which would have caused a considerable amount of pain. There is no evidence for prostheses, bridges or other dental work, and it is not possible to say at this stage of investigation whether any had been lost or removed *ante mortem*.

d. Procedures followed to achieve this state of mummification

The body was most likely in an advanced state of putrefaction prior to mummification. This was probably due to two main factors: delay in bringing the body to and in the *ibu* or *per-nefer* and/or the use of previously over-used natron. Limbs do not seem to have been lost, but damage sustained by the bones includes: luxation of the rib cage, sternum and both sacro-iliac joints and fractured superior pubic ring left. No prostheses are in evidence.

e. Treatment of body during mummification

Very little soft tissue has survived, but what has survived is on the thorax and legs and this is in bad condition. The pelvis was completely evacuated, the thorax may still contain residual lung tissue and heart. The cranial cavity may not have been evacuated completely or at all. It is not possible to say at present whether packing has been used in the pelvis, because no studies have been published in which density readings from CT scans have been discussed. The presence of high density masses overlying both iliac wings suggests that packages of organs may have been returned to the body. It is equally possible that these are merely bandages. The cranial cavity has some packing in it, but this has not been identified.

f. Condition of teeth, mouth and gums during mummification

Many teeth had fallen from their sockets but it is most likely that some of these had become loose in modern times. It is not possible to say which ones had fallen out during mummification.

g. Possibility of rewrapping

It is not possible at this stage to establish whether the body was rewrapped. The condition of layers (2) and (3) of the linen bandages and evidence from the resin suggest that the possibility of rewrapping arises.

h. Use of amulets in wrappings

Several amulets are visible within the wrappings through the CT scans. Obviously it is not possible to say what these are.

i. Attack by insects or rodents

An examination of this type could not reveal attack of this type, but it is most likely that flies would have attacked the putrefying body. The Manchester Project did not reveal attack by rodents and there is no information in the literature about such attacks.

j. Comparisons with other investigations

As shown in Section 4.1.4 above it is difficult to amke firm comparisons with other studies at this stage.

k. What inferences can be drawn from this data regarding the diet and socio-economic milieu of this individual?

This person when alive came from a fairly well-to-do socio-economic milieu. His bones show that his diet was adequate, as there are no harris lines and all are well formed and strong. The medical opinion is that he never had to engage in physical work, and the manner in which he was mummified suggests that his relatives could afford reasonably good treatment of his body.

2. Textiles

a. Textiles, their weave, colour, possible inscriptions

The textiles are all of flax origin, and are linen. The only weave noticed is tabby, but there are three different textures: the sheet-like layer (3) is a heavier cloth than layer (1), and the strips of linen are of a slightly coarser texture than the sheet-like layers. There is no evidence of dyes being used, and the darker thread used in some of the

strips is almost certainly the natural colour. The colour suggests that the flax was mature when picked. There is no evidence of inscriptions on the outer layers of bandaging, but the mummy's name was often inscribed on the inner layers. Obviously, it is not possible to say whether this was done or not.

b. Attack by insects or rodents

The wrappings were attacked by woodworm, this is evidenced by the holes which have been burrowed through layer (1) only. The pupae of moths are also visible.

c. Other materials identified in the resin, their composition, and use

CT scans suggest that layers of fabric were laid on the anterior abdominal and thoracic wall, in an effort to restore the mummiform shape. The quantity of fabric varied to compensate for luxation of the various bones.

The presence of animal glue/gelatin, resin, a waxy material (beeswax?) and palm oil were detected in the bandages. The glue/gelatin suggest that the bandages were glued on, the resin was applied to the body and may also have been applied to the bandages. There was an insufficient quantity of the waxy material available to confirm identification, but it may

have been used in the preparation of the body. The presence of palmitic acid with traces of stearic acid suggest that palm oil was used at some stage during the mummification process.

The tiny quantity of pollen found in the resin could not be separated for identification, but the quantity suggested that wrapping occurred when the pollen count was low or that the preparation of the corpse took place in a relatively still atmosphere. It also suggests that the resin was tapped/prepared when no pollen was being produced by the tree.

3. Cartonnage

a. What is cartonnage and how was it used?

The word cartonnage is applied to linen strengthened with plaster which was originally used to provide a close-fitting mask to cover the head and shoulders of the mummy during the Middle Kingdom (2134-1785 BC). During the New Kingdom its use was extended to make elaborate mummy cases and during the Graeco-Roman Period (305 BC- 200 AD) cartonnage was used extensively to make individual coverings for the head, chest, abdomen, legs and feet, as in this instance.

b. Composition of the cartonnage pieces

The chest and abdominal covering are made of 2 layers of linen which have been strengthened with plaster (calcium carbonate and glue). The head covering has been reinforced in several places with papyrus, on several pieces of which some word or text appears. Papyrus is also present in the moulded part of the foot covering (i.e. the instep), but the slippers contain no papyrus.

c. Subjects depicted on the cartonnage

There are eleven registers of decoration on the trunk covering: the are the Ba-bird visiting the mummy, with the goddesses Isis and Nephthys in poses of lamentation; the four sons of Horus (named); these are followed by various gods and daemons from the Underworld, who protect gates and portals. Two lotus flowers occupy the tenth and eleventh sectors. The edges are decorated with geometric motifs and the inscription down the centre of the panel gives the name and parentage of the owner: Pa- Khnum, son of Tkmy, born of the Lady of the House Wy.

The *usekh* collar is decorated mainly with geometric motifs, but also has the *Akhet* symbol, winged uraeus, falcon heads and lotus flower border.

The head covering has the winged scarab, the falcon, and sun disk depicted on it and is decorated with geometric motifs. The facemask has been gilded.

The footcovering has two representations of Anubis, the t-strap of the sandals and gilded toe nails while the sole of the sandals is of a chequer-board design.

It can probably be dated to the Ptolemaic-Roman period (305 BC-200 AD).

d. Attack by insects or rodents

There is no evidence of attack by insects or rodents.

4. Coffin

a. History of the coffin

Although its arrival in Cork cannot be accounted for, this coffin was found in the Valley of the Queens at Thebes in 1903 by Ernesto Schiaparelli, the Italian archaeologist. He says that it was one of a group of four belonging to one family of brothers, all of whom along with their father, held the same office at the Temple of Amun at Thebes. The title of this office is scarcely known outside this group of coffins, and Porter and Moss (1964) have translated it as

'lotus carrier'. Schiaparelli claims to have sent this coffin to Cairo Museum, where it was believed by Porter and Moss (1964) to have been.

It can be positively dated to the Saite Period, 26th Dynasty (664-525 BC).

b. Wood, construction and measurements

Although the wood has not been identified it is clearly a softwood and is either *Cedrus* or *Ficus sycamorus*. It was patched in several places to compensate for irregularities in the wood, and one piece at least is identifiable as a hardwood. The container and lid have been made from several planks of wood which have been dowelled together. Mortise and tenon joints were used to enable the lid and container to fit together, and it is possible that other joints were used, but they are not visible as they have been covered with paint and plaster.

c. Decoration and Inscriptions

The registers of decoration on the lid consist of the winged sundisk, surmounted by uraei; the procession of the gods to a table of offerings, behind which the owner Hor was led from the Hall of Judgement (this last scene is very fragmentary); beneath this the god Anubis tends the mummy lying on a lion-

headed bier. On either side of the coffin are the *udjat* eyes of Horus.

The long inner side of the container show the goddesses Isis and Nephthys, one on either side; the head board has the sundisk and uraei, the footboard the *demedj*. On the floor of the coffin is the composite god Ptah-Sokar-Osiris.

The inscriptions are columnar and horizontal and are basically prayers for food and drink for the dead person for all eternity, and the hope that he will live forever and ever.

d. Infestation

The coffin was attacked by woodworm and the wood itself had been attacked by a beetle probably before the wood was ever used.

5. Relationship of the subjects.

As the date of the coffin has been established, and as Schiaparelli stated that the coffin was empty when found, it can be unreservedly claimed that mummy and coffin do not belong together. It can also be stated that the cartonnage did not bear any relationship to the coffin in antiquity.

6. Comparison with other studies

Studies of Egyptian material of this kind are usually undertaken by archaeologists who are also Egyptologists. The only study of a coffin which I have been able to obtain (Jones, 1984) is mostly concerned with the philological aspects of the inscriptions although he gives a general idea of the construction of the lid and container. The paints and plaster are not analysed and the presence of patching cannot be discussed as the coffin is in too good condition. The discussion does not include a detailed description of the scenes and subjects depicted upon it either. The coffin belonged to the Lady Shepenhor of the 25th Dynasty, and can be dated to no later than 700 BC.

Finally it may be reiterated that this is a preliminary investigation. It would be wrong to attempt to draw any definite conclusion about the relationship of the cartonnage pieces to each other. It would be equally wrong to draw conclusions regarding its relationship to the mummy, which after all, may date from approximately the same period. Further investigation of these subjects is required, but comparable studies are also needed.

One conclusion emerges clearly: the mummy and cartonnage do not belong to the coffin. The coffin's provenance has been established, and the entry in Porter and Moss (1964) can now be corrected.

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