


Tutankhamun's Unseen Treasures: **The Golden Appliqués**





Introduction

In this exhibition the decorated golden appliqués from the tomb of king Tutankhamun are displayed in public for the first time. These appliqués once adorned rich horse-trappings, bow-cases and sheaths of the weapons associated with the king's chariots. Decayed and broken when they were discovered, these treasures remained unseen for nearly a century after their excavation.

Introducing these objects to public view crowns a project which has restored them to their former glory. Painstaking restoration revealed the unusual beauty of their stately and playful designs. The objects, combining pharaonic Egyptian and Levantine motifs, attest to the network of social and cultural inter-connections which characterized the eastern Mediterranean from antiquity to the present day. Scientific analyses, using the latest technology, have revealed the sophisticated composition of these artifacts which rank among the products of ancient high-tech craftsmanship.

Adding to the appreciation of the iconic discovery of archaeology worldwide, the tomb of Tutankhamun, is an achievement – an achievement which could be attained only thanks to wide ranging co-operation. The Egyptian Ministry of Antiquities, the Egyptian Museum Cairo, the Institute of Near Eastern Archaeology of Tuebingen University, the Roemisch-Germanisches Zentralmuseum Mainz, the German Archaeological Institute Cairo, all joined forces and combined their wide range of expertise to make this result possible. Essential funding provided by the German Bundestag and the German Federal Foreign Office as well as by the German Research Foundation (DFG) offered the basis for the work. As a member of the project team I am happy to extend our heartfelt thanks to all partners and to all institutions who lent us their support. In particular we extend our thanks to H.E. the Minister for Antiquities, Professor Dr. Khaled Elanany and the former Ministers of Antiquities Professor Dr. Mohamed Ibrahim and Professor Dr. Mamdouh Eldamaty.

Sharing the fascination for Ancient Egyptian art and working together to preserve the cultural heritage of Egypt, so essential a component of the cultural heritage of mankind, we experience and we strengthen the bond of mutual trust and sympathy between Egypt and Germany.

Stephan Seidlmayer, Director of the German Archaeological Institute Cairo

The project is indebted to many persons for their contributions and support. In particular we extend our thanks to the director and staff of section one (Tutankhamun) in the Egyptian Museum Cairo: Hala Hassan, Gehan Hassan, Sanaa Fouad, Zeinab Faris, Abeer Abdel Aziz, Marwa Shehata, Fatma Zidan, Hosam Mohamed and Mohamed Hassan; to the director and staff of the restoration workshops in the Egyptian Museum Cairo: Momen Othman, Eid Mertah, Ahmed Orabi, Salah Elfar, Mohamed Abdel Aziz, Hala Achmed, Raghda Mahmoud, Elshimaa M. Eid and Doaa Eid. And to the following colleagues: Anja Fügert (Museum of Near Eastern Art and Archaeology, Berlin), Thora Gerster, Guido Heinz (RGZM), Anja Cramer (RGZM), Matthias Heinzel (RGZM) and Katarina Stövesand (DAI Cairo).

Scientific committee: Stephan Seidlmayer, Peter Pfälzner, Falco Daim, Sabah Abdel Razek, Mahmoud el Hawagy and Sayed Amer.

Exhibition: Katja Broschat, Christian Eckmann and Julia Bertsch.

Authors: Julia Bertsch, Katja Broschat, Christian Eckmann, Salima Ikram (AUC), Nicole Reifarth, Florian Ströbele and André Veldmeijer (AUC).

Graphic design: Vera Kassühlke, RGZM

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Inside view of the antechamber in Tutankhamun's tomb.
Photo: H. Burton © Griffith Institute, University of Oxford



Carter No. 122w

The discovery of the tomb of Tutankhamun (Valley of the Kings 62) by Howard Carter in 1922 revolutionised our understanding of Egypt's past, bringing to light, for the first time ever, a virtually intact royal tomb. Carter and his team meticulously documented the position and appearance of approximately 5400 objects, including furniture, weapons, clothing, vessels, food, chariots, and cultic items.

However, he did not have time for a comprehensive technological analysis of all that he discovered. This is especially true for a group of exquisitely ornamented gold-sheet and leather appliquéés that were found scattered on the floor of the antechamber and the treasury, close to the royal chariots. The appliquéés' locations suggest that they were associated with the chariot and horse trappings, and are, based on parallels, portions of quivers, bow cases, blinkers, and parts of the chariot coverings themselves.

Exhibition: Julia Bertsch, Katja Broschat and Christian Eckmann
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The Project

Due to their delicate condition and relatively poor state of preservation, as noted by Carter, this group of golden objects had been kept in a storage magazine of the Egyptian Museum in Cairo for some 95 years. They had neither been restored nor scientifically examined since their arrival in the museum.

In 2014, a joint project of the Egyptian Museum in Cairo, the German Archaeological Institute in Cairo, the University of Tübingen and the Römisch-Germanisches Zentralmuseum Mainz (Germany) was established. Key aspects of the project are the archaeological, technological, scientific and iconographic analysis of this important but previously largely ignored group of objects. This exhibition introduces the gold-sheet appliqué to the public for the first time, as well as presenting some of the actual research and results of this interdisciplinary project. After their study and conservation, the objects will be moved to the Grand Egyptian Museum in 2018, for eventual display there.

The project as well as the current exhibition were generously supported by the Deutsche Forschungsgemeinschaft and the Foreign Office of the Federal Republic of Germany.



Carter No. 122cc



The fragments were stored in Howard Carter's original transportation box for almost 95 years.

Interconnections

The reign of Tutankhamun (1335–1325 B.C.) and the period of the 18th Dynasty as a whole (c. 1549–1298 B.C.) are marked by Egypt's intensified contacts with the regions of the Eastern Mediterranean and the Near East. Apart from military disputes and territorial conflicts, the various empires and city states were part of a broad Late Bronze Age network of cultural exchange and communication.

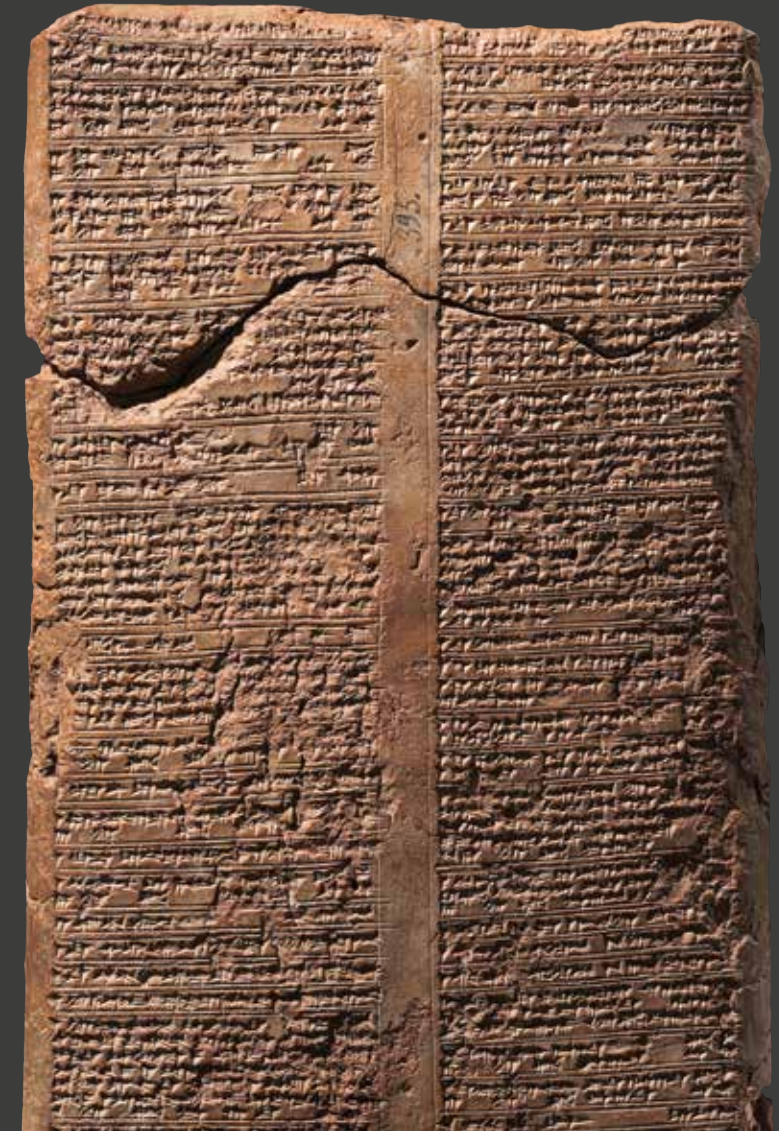
The well-known letters written on clay tablets found at Tell el-Amarna in Middle Egypt, for instance, attest to an active correspondence between the Egyptian king and foreign rulers, which was accompanied by gift exchange and tributes. Tutankhamun's predecessors married princesses from the Mitanni empire and Kassite Babylonia, who were accompanied to the Egyptian court by their retinues and possessions.



Asian and Nubian representatives worshipping Pharaoh's cartouches (Carter No. 12000).

Furthermore, Egypt was part of a wide-ranging trade network, which incorporated the nearer and farther regions of the Near East and the Mediterranean and even extended into parts of Middle and Western Europe. Raw materials, food products, and luxury goods were traded and transported along different routes both by land and by sea. All these long-standing international relations clearly had a huge impact on Egyptian culture, especially on technology and art, a fact evidenced by Tutankhamun's tomb equipment.

Cuneiform tablet found at Tell el-Amarna showing a letter from Tushratta, king of the Mitanni state, to the Egyptian king. It lists wedding gifts sent to Egypt when Amenhotep III married Tushratta's daughter, Tadu-hepa. (© Staatliche Museen zu Berlin – Vorderasiatisches Museum, Foto: Sandra SteiB)

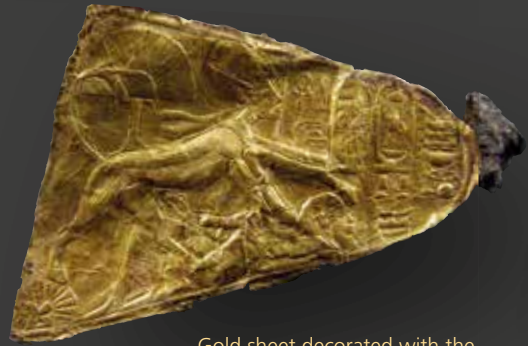


Egypt and its neighbours around 1350 B.C.



Syrians carrying tributes to the Egyptian king. Wall painting from the tomb of Huy, viceroy of Kush during the reign of Tutankhamun. (After Davies / Gardiner, Tomb of Huy, Pl. XIX).

Images of Royal Power



Gold sheet decorated with the image of the king as a sphinx trampling a captive from Near East (Carter No. 122ee).



Gold sheet adorned with the royal titulary framed by a spiral border band. (Carter No. 122zz)



Open work shield from the tomb of Tutankhamun showing the king smiting two lions with a scimitar. The lions represent the king's enemies here (Carter No. 379b).
(© The Griffith Institute, University of Oxford)

The gold-sheet appliqué from the tomb of Tutankhamun are decorated with an extensive repertoire of figural and ornamental motifs. One group of objects depicts traditional Egyptian motifs while a second is decorated with motifs which were widespread throughout the Eastern Mediterranean during the second half of the second millennium B.C., and are therefore often ascribed to a so-called 'international style'. A third group combines both traditional Egyptian themes and certain elements from this 'international' repertoire.

The appliqué with Egyptian motifs were mostly executed in the typical style of the post-Amarna period and display images of royal power and the king's dominion over Egypt's enemies. They show Pharaoh smiting his enemies or, in the shape of a sphinx or a lion, trampling them. Both motifs are ancient symbols of Egyptian royal ideology attested since c. 3000 B.C. Several gold sheets depict the king driving over enemies in his chariot, while shooting at a target in the shape of an oxhide copper ingot, or show kneeling Nubian and Asiatic representatives adoring the royal cartouches. Others are decorated with images of the enthroned king, or are simply adorned with the royal titulary, the latter often being combined with 'international' elements such as spiral bands or small volute plants.

Amenhotep III in his chariot accompanied by Nubian captives. Photo: Jürgen Liepe



Gold plaque from the royal tomb at Qatna, Syria, depicting a volute plant flanked by two goats. (© Qatna-Project, University of Tübingen)



Golden dagger sheath from the tomb of Tutankhamun with volute plants and animal combat scene (Carter No. 256dd).



‘International Style’

The ‘international’ motifs circulating in the Eastern Mediterranean during the Late Bronze Age are often found on small scale objects such as boxes, vessels, toilet articles and furniture inlays, as well as seals, weaponry, and jewellery. The motifs include animal combat scenes, symmetrically arranged caprids nibbling on trees, volute plants and spiral bands, and show diverse iconographic traits from the Near East, Egypt and the Aegean. A group of gold sheet appliques from the royal tomb of Qatna (a city state located in modern Syria), for instance, offers particularly good comparisons to those from Tutankhamun’s tomb as the objects are very similar in decoration, shape and function.

Small scale objects decorated with ‘international’ motifs are attested in Egypt since the end of the 17th Dynasty (c. 1650-1549 B.C.) and become increasingly frequent during the time of Tutankhamun’s predecessors, a period of intense international connections. Tutankhamun’s gold-sheet appliques together with the decorated chariots themselves and various other objects from the tomb represent a paramount example of how originally foreign iconographical elements were integrated into Egyptian art, combined with traditional Egyptian themes and transformed into local traditions.



Semi-cylindrical carved wooden box with animal combat scene. (© Staatliches Museum Ägyptischer Kunst, Foto: M. Franke)

Chariots

Chariots were the racing cars of the ancient world. They became a significant part of Egyptian military and civil life during the New Kingdom. Hundreds of chariots must have existed at any given time, however, only a handful of these vehicles has survived.



One of Tutankhamun's ceremonial chariots (Carter No. 122). (© Griffith Institute, University of Oxford)



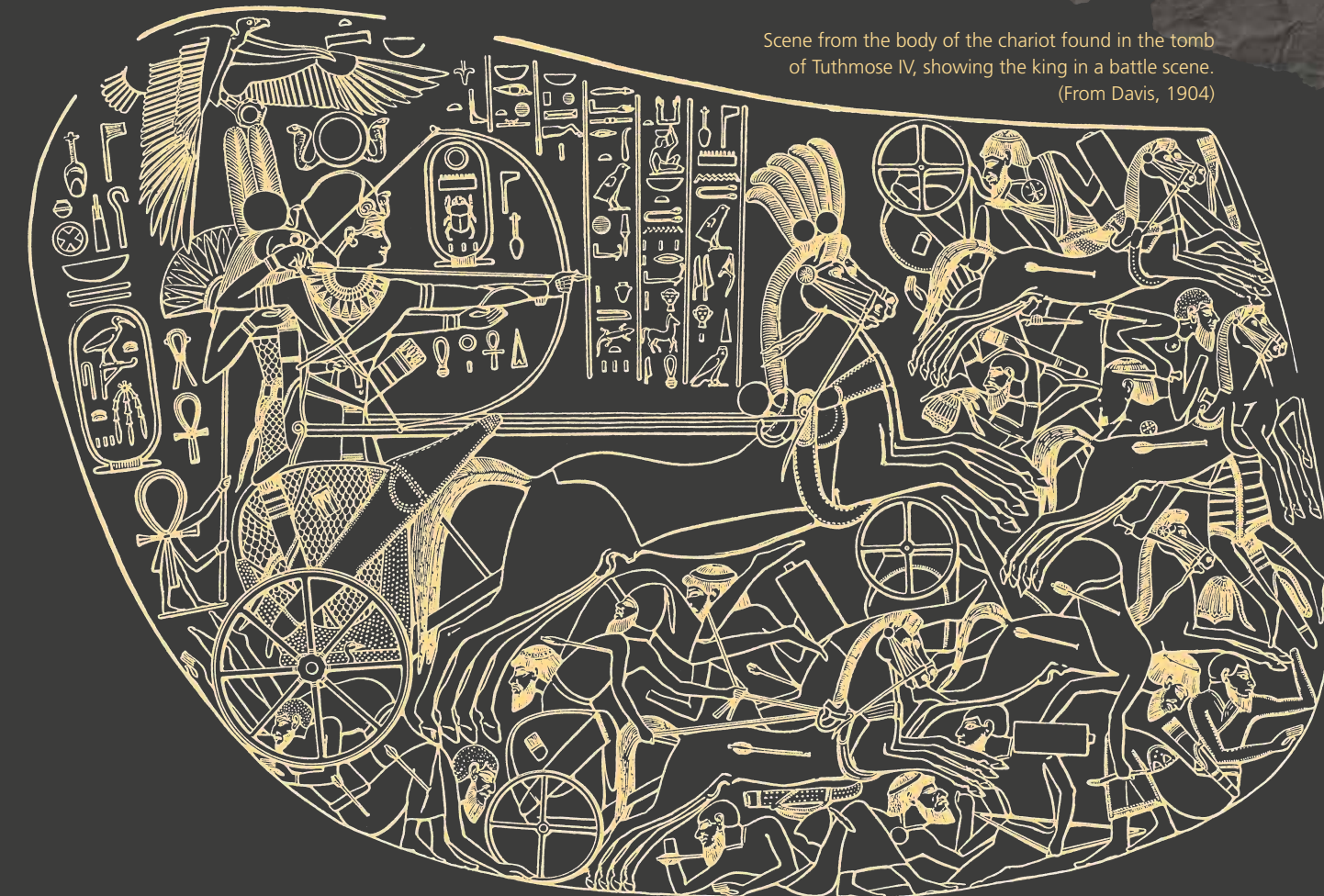
Scene from TT56, Userhat hunting in the desert. (From Beinlich-Seeber & Shedid, 1987).

Although almost all chariots were drawn by a pair of horses, there is a rare image of Nubian royalty riding in a chariot pulled by cattle. Scene from TT40, Tomb of Huy. (From Davies & Garis Davies, 1926)



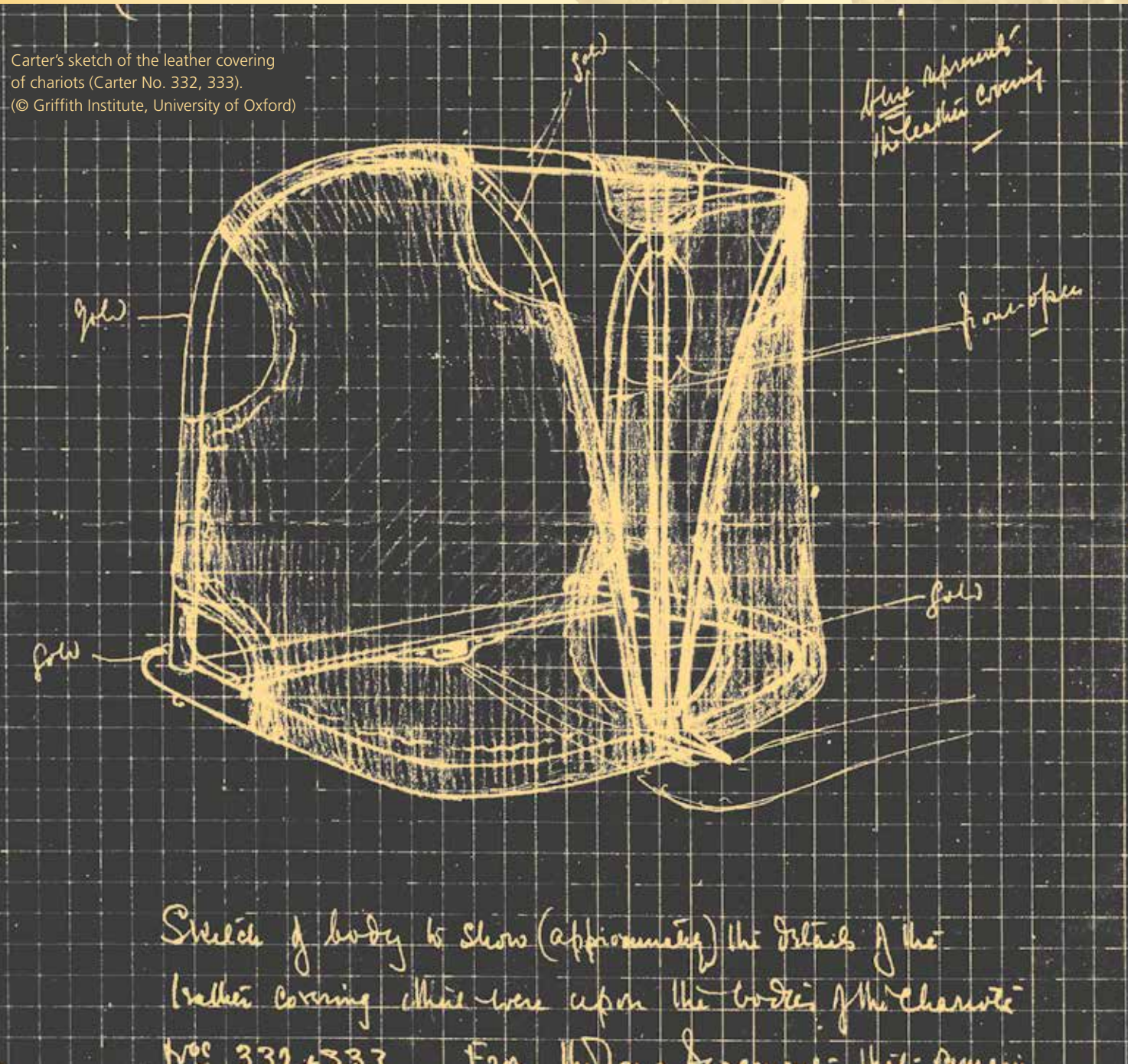
Introduced by the invading Hyksos (c. 1630 B.C.), the Egyptians further developed and fine-tuned them, turning the vehicles into extremely agile and efficient machines. Chariots were initially used for warfare, but soon became an integral part of military parades, state processions, hunting excursions, and finally provided a more general means of transport for the elite.

Chariot design reflected their different uses. War chariots were light and manoeuvrable, with the body made of a wooden frame with a leather cover. Hunting chariots were similar in design, but did not always have a complete leather casing, and ceremonial chariots seem to have been made entirely of wood, covered with moulded and gilded gesso, formed into elaborate scenes showing the king and gods. Bow cases and quivers could have been attached to either side of the chariot for easy access.



Scene from the body of the chariot found in the tomb of Tuthmose IV, showing the king in a battle scene. (From Davis, 1904)

Carter's sketch of the leather covering of chariots (Carter No. 332, 333).
(© Griffith Institute, University of Oxford)



Golden Appliqués

Leather coverings of chariots, the leather of horse harnesses and trappings, and that of weaponry containers are rarely found, and most are known only from images. The finds from Tutankhamun's tomb are therefore of great significance. Thus, these gold-sheet- and leather-appliqués provide us with a rare opportunity to study these parts of the chariots and their associated equipment.

Howard Carter found that the leather was in very poor condition due to the variable temperature and humidity in the tomb over time. Indeed, most of it had melted into a glutinous mass.

Despite the deteriorated state, the surviving remains tell us a lot about the different technologies used to create these remarkable artefacts. A few of the better preserved appliqués demonstrate that they were made of leather, gesso, textile and gold. Different leather and gold technologies, as well as a specific joining technique were used, depending on the items; some of these are unique to this assemblage.



Glutinous remains of a leather shoe from the tomb of Tutankhamun (Carter No. 270a), courtesy of the MSA/EM. (Photo: A.J. Veldmeijer, AUC)



Profile view of the backing construction with different layers in detail.

Manufacture 1

Much of the leather was impressed with different images including geometric designs, vegetal motifs, animal combat scenes, the king hunting or slaying enemies, as well as inscriptions including the royal name and titulary.

In all probability the leather was pressed and formed in molds or templates, or possibly stamped, simultaneously with the appropriate gold-sheet and subsequently backed with textile and gesso in order to strengthen it. The use of moulds or stamps allowed duplicating of motifs and doubtlessly speeded up the decoration process.

The manufacture was completed in most instances by sewing the foil, the leather and the backing together using fine sinew, and maybe also linen thread. A few examples show that thicker, probably coloured or dyed leather threads were stitched on the framing and thereby functioned as a decorative element as well. One fragment shows remains of an attachment loop on the reverse. In this case, the decorative element could be fixed simply by sliding it onto a strap, such as the reins.

'Inlaid' thread from leather or sinew, sewn onto the leather frame by means of diagonally orientated running stitch. (Carter No. 122ddd)

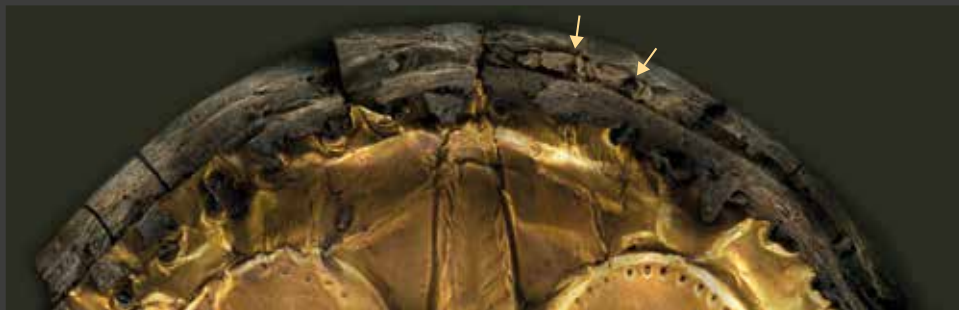


The leather backing of an inscription showing impressed motifs. (Carter No. 122oooo)



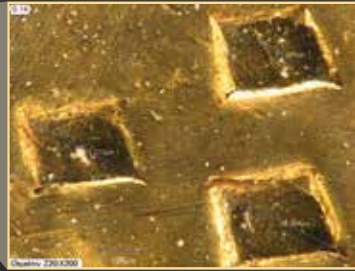
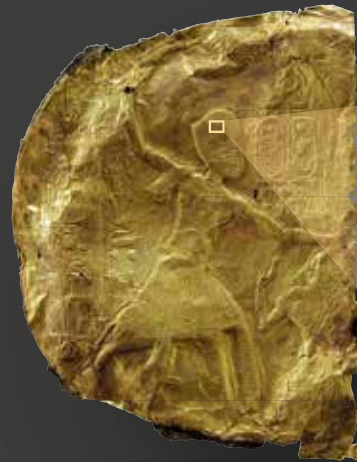
Broken and lost attachment loop on the reverse of a small appliqué (Carter No. 333)

Drawing of horse and harness by Howard Carter (© The Griffith Institute, University of Oxford)

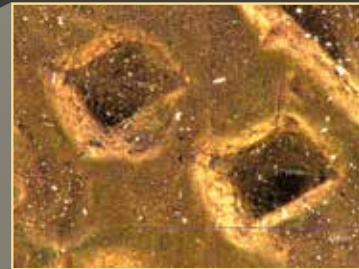


Manufacture 2

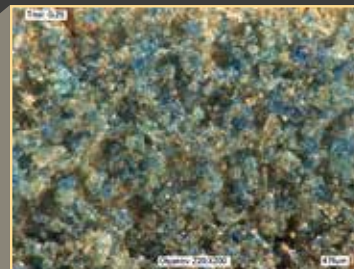
Animal combat scene showing exquisitely defined details of decoration (Carter No. 122yy).



Identical traces of tools (chisels) visible on different gold sheets suggests that they were produced in the same workshop or by the same craftsmen (Carter No. 122ii und 122y).



One of the best preserved examples showing the blue coloured leather framing of the gold sheet. The detail shows the crystalline structure of the pigment (Egyptian Blue) under high magnification (Carter No. 122ss or tt).



Sheet gold was commonly produced in ancient Egypt (and still today!) by hammering small portions of gold, probably while sandwiched between thin animal skins until the desired thickness was achieved. The gold foils feature an average thickness of 15 to 45 microns only. The outlines of the motifs as well as ornamental details were defined precisely by chisels and punches. In some cases the use of the same chisel was detected, based on its specific shape and wear marks. This enabled the identification of distinct groups of objects that must have been manufactured in the same workshop, and possibly by the same individual.

There are even examples where the leather was covered with blue and white pigments. Indeed, the combination of leather, gesso, linen, gold, and paint is unique to the Tutankhamun assemblage, setting it apart not only from elite chariot leather, but also from other royal chariots. Interestingly enough the only depiction of gilded leather in combination with painted blue frames is seen on an object from the tomb itself: on the two sides and lid of the famous painted box, found in the ante-chamber of the tomb. It depicts Tutankhamun in a chariot either hunting wild animals or fighting his enemies and most attachments on the harness and decorative elements on the weaponry are shown with golden decoration framed with blue.

Scene from the famous painted box of Tutankhamun depicting the King hunting lions. Interestingly, most of the golden decorative elements on objects such as bow cases, quivers and horse-trappings illustrated here, are likewise framed in blue colour (Carter No. 021).
(From Nina M. Davies, 1936)



Textile

First Group: Embedded Textiles

Most of the textiles can be considered as a functional part of the backing construction that is characterized by a remarkably uniform structure for most of the objects:

1. A dark, compact layer of leather/skin lies directly beneath the gold sheets. It has taken on the impression of the decoration made on the gold sheets.
2. A textile layer is located below the leather.
3. A plaster (gesso) layer follows.
4. Another textile layer is located beneath the plaster.
5. The last layer is comprised of leather coloured red.

The embedded textiles are simple linen fabrics of medium quality. The frequent presence of spliced threads is notable. This is a common technique for joining threads in ancient Egypt.

Second Group: Secondary Adhering Textiles

A few gold sheets reveal secondary, post-depositional adherences of textiles. This second group comprises highly elaborated cloth featuring warp-faced weaving patterns, different dyeing techniques, and the use of ultra-fine yarns.

Back of gold-sheet with adhered backing construction, comprising alternating layers of leather, textile and gesso.



Fabric embedded in gesso, directly below the dark leather base of the gold-sheet.



Joining two lengths of yarn by splicing, a very common feature among the embedded fabrics.



Detail of red dyed yarns, made of flax fibres.



Backing with remains of an extremely fine woven fabric along the edges.

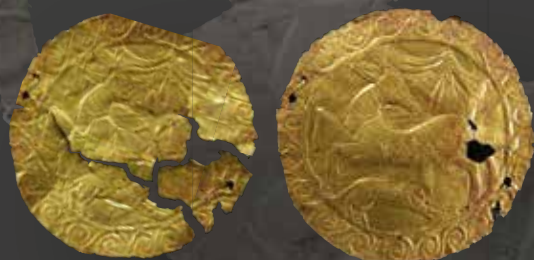


Secondary adhered fabric with interwoven multi-coloured, geometric patterns.

Restoration/Conservation

Since the gold foils and the surviving backing-fragments, which were packed and stored in a wooden box by Howard Carter, had disintegrated into thousands of fragments over time, it was essential to carry out extensive sorting and joining. The overwhelming numbers of fragments showed cracks and fissures, distortions and wrinkles. Thus, a substantial part of the reconstruction work was to reconcile the legibility of the damaged depictions in order to make them accessible for further archaeological and scientific study. A research-orientated concept of restoration/conservation formed the basis for this work.

A detailed description of the objects together with a comprehensive cataloguing of the frag-ments, as well as the photographic documentation of its actual condition constituted only the first steps of the treatment. Technological characteristics, such as tool marks of manufacture, marks of use and traces of wear had to be identified, recorded and interpreted. Subsequently, the delicate gold foils were carefully unfolded by means of wooden tools and fragmented pieces were joined together. In addition, the numerous cracks and fissures had to be supported in a time consuming procedure using tiny strips of Japanese paper that were glued onto the reverse with acrylic resin.



Circular appliqué before and after restoration (Carter No. 122cccc).



Gold-sheet exposed to transmitting light with visible fissures and cracks (Carter No. 122II).



Fixing of fissures and cracks by means of Japanese paper and acrylic resin (Carter No. 122v).



Examples from a group of gold-sheets with comparable style, details of manufacture and gold composition.

Scientific Analyses

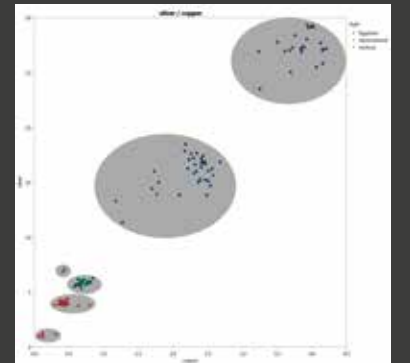
The scientific analysis of the gold sheets, using portable XRF (X-ray fluorescence), provided analytical results that identified the different alloys of gold used to make the sheets. This helps in the interpretation of the original function of the different pieces, and also in establishing if the gold was made by the same metallurgical facility or, from different batches.

The quite remarkable results display six distinct clusters of gold-sheets consisting of different (Au-Ag-Cu) alloys. It is striking to see that, with only a few exceptions, each cluster is composed exclusively of decorated sheets belonging to one of the three stylistic groups established by the iconographic analysis: one decorated with 'traditional' Egyptian motifs, another decorated exclusively with motifs of the so-called 'international style', and a third in which both styles are represented. The clusters depicting motifs of the so-called 'international style' show the highest gold content (95 wt.% in average).

Since these analyses delivered convincing results in identifying the different groups, it is now planned to examine the gold-sheets covering the chariot bodies and other corresponding parts. In doing so, it is hoped to assign groups of gold-sheet appliqués to their, possibly, original chariots.



The analysis of the gold sheets by means of portable X-ray fluorescence. This fast and reliable analytical tool is specialized in distinguishing all kinds of metal alloys.



As can be seen on the diagram, the metal sheets form distinct clusters. Sheets decorated with 'International style' motives are high in gold whereas sheets displaying 'traditional' Egyptian motives have a much lower gold content.

