ROSALIA VAROLI-PIAZZA*
Former ICCROM
Rome, Italy
rosalia.varoli@gmail.com
www.iccrom.org
MARIE BERDUCOU
Université Paris 1
Paris, France
marieberducou@yahoo.fr
http://esup.univ-paris1.fr
VALERIE MAGAR
Coordinación Nacional de Conservación del Patrimonio Cultural – Instituto Nacional de Antropología e Historia (INAH)
México D.F., Mexico
valerie.magar@gmail.com
www.conservacionyrestauracion.inah.gob.mx

GAEL DE GUICHEN
Former ICCROM
Rome, Italy
gaeldeguichen@libero.it
*Author for correspondence

TUNING VOICES FROM DIFFERENT PROFESSIONS. INTERDISCIPLINARY DIALOGUE AROUND THE SARCOPHAGUS OF FREDERICK II IN PALERMO (ITALY)

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ABSTRACT

This article deals with the interdisciplinary nature of conservation. Focusing on the case of the Sarcophagus of Frederick II in Palermo, the decision-making process around its opening in the 1990s is analysed, considering the points of view of various professionals around the research, conservation and use of burial remains of three bodies found inside. Only one of these was fully identified as being Frederick II, and there was a hypothesis for another of the bodies. The third one, however, was unknown. Opening the sarcophagus was considered as an opportunity to assess the state of conservation of the remains. This was also seen as an opportunity to analyse and conduct research to better understand the life and death of these three persons, and possibly to identify the unknown body. However, a series of questions was raised regarding these possibilities, including ethical and technical considerations, which are explored and reassessed.

RÉSUMÉ

Cet article traite de la nature interdisciplinaire de la conservation-restauration. En se penchant sur le cas du sarcophage de Frédéric II à Palerme, les décisions prises autour de son ouverture dans les années 1990 sont analysées, en considérant le point de vue de différents professionnels à propos de la recherche, la conservation-restauration et l'usage des restes funéraires des trois corps trouvés à l'intérieur. Un seul d'entre eux a été identifié avec certitude comme étant Frédéric II, tandis qu'un autre corps a donné lieu à des hypothèses. Le troisième, en revanche, était inconnu. L'ouverture du sarcophage a été considérée comme une opportunité pour évaluer l'état de conservation des restes, ainsi que pour mener des analyses et des recherches afin de mieux comprendre la vie et la mort de ces trois personnes,

INTRODUCTION

This article will consider the current points of view of four different disciplines (archaeology, art history, conservation and physics/chemistry) on the subject of the case study of the Sarcophagus of Emperor Frederick II (+ 1250 A.D.), which was opened in 1998 and was assessed with regard to its state of conservation.

In the past, openings like this would have largely been under the responsibility of a historian or an archaeologist; history recalls the damage and sometimes the complete destruction of large parts of the evidence (e.g. the tombs of the German Emperors in Spyer in 1900) when such an operation was led by a specialist of a single discipline.

In this particular case, the decisions were the result of lengthy and extremely complex discussions between the various stakeholders, including conservators, art historians, medical doctors and the clergy, among others.

This case study will illustrate how each profession, taken in isolation, would lead to very different and sometimes partial solutions, with the loss of an opportunity to better understand materials, and possibly with serious alterations.

THE PROJECT FOR THE CONTROLLED OPENING OF A MEDIEVAL SARCOPHAGUS: THE BURIAL OF FREDERICK II AT THE CATHEDRAL OF PALERMO

Frederick II, the Emperor of the Holy Roman Empire, died in Castel Fiorentino, very close to the town of Foggia in Southern Italy, on the 13th December of the year 1250. He was buried in a splendid porphyry sarcophagus in Palermo Cathedral, within the 'Kings' Cemetery', in February 1251 (Figure 1).

This sarcophagus was opened three times; twice in the following century, in 1338 and in 1342, to bury two other bodies, and a third time between 1781 to 1799, during the 'restoration' of the Cathedral of Palermo, undertaken by the architect Ferdinando Fuga. At that moment, the 'Kings' Cemetery' was transferred from the transept of the old Norman Cathedral to the right entrance, where it is still located today. On this occasion, an accurate and precise inspection with descriptions and drawings was undertaken

voire d'identifier le corps inconnu. Toutefois, des questions se sont posées à propos de ces possibilités, notamment des considérations déontologiques et techniques, qui sont explorées et évaluées une nouvelle fois.

RESUMEN

Este artículo aborda la naturaleza interdisciplinaria de la conservación. Se centra en el caso del Sarcófago de Federico II, en Palermo, y analiza el proceso de toma de decisiones sobre su apertura en los años 1990. Para ello se consideran los puntos de vista de varios profesionales vinculados a la investigación, la conservación y el uso de restos funerarios de tres cuerpos encontrados dentro del sarcófago. Solo uno de estos cuerpos fue identificado como Federico II, y para otro de los cuerpos existía una hipótesis. El tercero, sin embargo, era desconocido. La apertura del sarcófago fue considerada como una oportunidad para analizar y dirigir una investigación que permitiera entender mejor la vida y la muerte de estas tres personas y, posiblemente, identificar el cuerpo desconocido. Sin embargo, surgió una serie de preguntas respecto a estas posibilidades, incluyendo consideraciones éticas y técnicas, que se exploran y re-evalúan.

Figure 1
Sarcophagus of Frederick II, under its baldachin

by Francesco Daniele, the official historian of the Bourbon Kings. All the measurements for those drawings were carried out by Lieutenant Manganaro, the King's topographer.

Following Daniele's description and looking at the engravings he produced, we can observe that the Emperor's body had been embalmed, which was common for people of high rank at the time, given that at the time of their death, bodies were exposed for extended periods. Inside the sarcophagus, the vestments of Frederick II were also very well preserved (Figure 2). His head, with an open crown, was placed on a leather pillow; on one side there was a metal globe filled with earth. The body was dressed with a long tunica with ornaments on both sleeves, embroidered with an Arabic inscription. He also wore a dalmatic and a pluvial, both made of light red silk, and the latter embroidered with many small eagles and other ornaments, and closed with an amethyst brooch. The legs and feet were covered with a linen trouser-leg; he also wore silk boots and shoes with an embroidered figure of a small doe, and metal spurs. On the left side he had a sword, placed in its sash.

Daniele made the hypothesis that the second body, which was also embalmed, was that of Peter II of Aragon, dressed with a royal mantle embroidered with eagles and with a sword. The entire body was wrapped in a sack.

The third body only had the remains of bones and a worn-out cloth. It was not clear whether it belonged to a woman or a young man given its smaller size.

The sarcophagus was reclosed in 1799.

At the occasion of the eight-hundredth anniversary of the birth of Emperor Frederick II, many conferences were organized. During one of these, the idea to open the tomb was suggested in order to guarantee and ensure further conservation of the bodies and contents of the sarcophagus and eventually carry out possible treatments. In addition, this would be an excellent opportunity to gain further knowledge of the three sets of remains (including a better understanding of their age, ways of life and the illnesses they suffered), as well as the objects (origin and technology of the various materials).

A Scientific Committee (SC) composed by historians, art historians, architects, scientists specialised in metal and an anatomist was set up. It was presided over by the Archbishop of Palermo or his representative. The coordination of the conservation work was the responsibility of the Central Institute for Restoration (ICR, now known as Istituto Superiore per la Conservazione e il Restauro – ISCR), based in Rome.

First questions raised by the Scientific Committee (SC)

Taking into consideration the importance of the site, the historic stature of the character, the previous studies undertaken in 1781–1784 and ethical aspects, the members of the SC raised the following five questions:

1. Why open this sarcophagus?
2. Could the opening be made from a legal point of view?
3. Could the opening be made from an ethical point of view?
4. Were there modern techniques that could provide answers to question 1 without a need to raise the cover of the sarcophagus?
5. Which other stakeholders and specialists should be called?

Figure 2
Drawing of Frederick II by Daniele

In this article, a few of these questions will be studied in more detail, in order to illustrate several of the situations that arose.

To answer the first question ("Why open the sarcophagus"), after long discussions, the Archbishop, historians and art historians decided that the opening was necessary to verify whether the sarcophagus had been emptied during the Second World War, as some presumed, or, if the remains were still intact, whether they could provide any new knowledge.

To the second and third questions ("Could the opening be made from a legal and ethical point of view"), the Archbishop had sole responsibility for issuing authorisation.

To the fourth question on whether there existed modern techniques that could tell us if the sarcophagus was full or empty without the need to open it, the SC needed to refer to additional expertise from external physicists. These answered that neither X-rays nor other non-intrusive methods could detect the contents of the sarcophagus. The SC therefore suggested the use of endoscopy to explore the insides of the sarcophagus. Consequently, the SC decided to call a conservator-restorer as well as an endoscopy specialist.

Second series of questions by the SC

In order to introduce the probe, a small cavity would have been necessary. A small opening was already present between the sarcophagus and its lid, as it will be seen below. Without it, it would have been difficult to propose the use of an endoscope, as creating a cavity would not have been acceptable. This also resolved the potential following questions, raised by the conservator-restorer:

1. In the present situation, is it possible to use an endoscope?
2. Would a new air entrance – created by a small cavity to introduce the sound for the endoscope – lead to a climatic disequilibrium and possible damages to the eventual remains?

Historical information provided by one of the historians in the SC showed that, in 1799, the lid of the sarcophagus had not been properly replaced and there were areas which did not match anymore, creating the required opportunity for the endoscopic analysis. This also reduced the risk of any abrupt environmental change, given that the remains had been exposed

to open conditions in the 18th century, and, furthermore, the lid had not been completely sealed after that.

It was therefore possible for the endoscope technician to find an already existing small hole, through which the sound was entered under the control of the conservator-restorer.

The endoscopic observations allowed the initial team to verify that the sarcophagus was not empty, but that, on the contrary, it was filled almost to the top (Figure 3). These observations created great expectations. The SC decided to study the conditions to open the sarcophagus.

Figure 3
Image of the inner part of the sarcophagus through an endoscope

Figure 4
Building the white chamber

Third series of questions raised by the Scientific Committee (SC)

1. What organisation would agree to finance a project as important as this?
2. Could the lid of the sarcophagus resist removal?
3. How should it be opened?
4. How should the burial materials be conserved during the study period?
5. How to avoid researchers coming into contact with diseases?
6. How to avoid the transmission of pollutants to the burial materials?
7. Which type of documentation would be required?

At this stage, it became evident that the number of members of the SC had to be increased. Other types of specialists, including engineers, micro-climate experts, biologists and virologists, should also be called on request. These new specialists formed various sub-groups within the project.

As a first step, the cost of such a holistic project had to be financially covered. Maecenas Cultural Promotional Services, an Italian agency which puts researchers in contact with sponsors, was contacted; they identified Meissener + Wurst Zander from Stuttgart, a company specialized in the design of "white chambers" (dust-free environments, usually used for the production of computer microchips). They agreed to design and build a double white chamber for this specific project (Figure 4). The remaining funds were provided by the Palermo Cultural Department of the Region of Sicily.

Regarding the lifting of the sarcophagus' lid (questions 9 and 10), an engineer was contacted in order to assess the state of its conservation (which was fractured) by means of ultrasonic tests. The results indicated that the fractures were only partial and that a lifting could be undertaken. A specific project was therefore developed.

However, it was extremely important to carefully consider the conservation conditions of the remains (question 11). Negative experiences with

damage to the artefacts, known to have occurred in the past when opening a tomb, had shown the importance of maintaining stable environmental conditions. Measurements were therefore made to evaluate the relative humidity and temperature inside the sarcophagus. A specialist in measuring micro-climates was called to monitor and record the environmental conditions both inside the sarcophagus and its immediate surroundings for a period of at least 12 months.

Figure 5
Lifting of the sarcophagus' lid

With this in mind, Meissener + Wurst Zander were requested to design the double white chamber around the tomb, preferably large enough for five people to work in.

In order to find a solution to questions 12 and 13, a series of meetings involving the SC and ad hoc specialists including biologists, virologists, climatic control specialists and conservator-restorers took place.

The final decision of the SC was to lift the lid, in order to allow direct observation of the contents, and to proceed to its accurate documentation and conservation if necessary.

Fourth series of questions

Given that the sarcophagus (143 cm × 236 cm × 92 cm) was placed under a baldachin (ca. 365 cm × 360 cm × 245 cm), it was only possible to raise the lid around 40 centimetres.

However this was enough to see the numerous contents. As it had already been observed with the endoscope, the sarcophagus was completely filled. Unfortunately a red mantel was covering all the remains except the bag, which contained the presumed remains of Peter II of Aragon (Figure 5).

The SC therefore faced a series of new questions.

1. Should some of the remains from the sarcophagus be removed?
2. If not, how could more information be extracted?

The interest of the different disciplines in the remains became very apparent at this moment. For example, one of the members of the SC was extremely interested in analysing the bones, particularly those of Frederick II. However that would have implied removing for some time one of its femurs, as this would enable him to study various possible illnesses suffered by the Emperor. Other members of the SC were in favour of removing some of the objects and presenting them in a museum. After lengthy discussions, the majority of the members of the SC agreed that it was best not to disassemble any of the remains.

In view of the extreme fragility of what was visible, the considerable work necessary to consolidate the items, the amount of time estimated and particularly the limited funds available to secure the long-term continuation of the project, the SC reached the following decisions. Although a series of micro-excavations could have provided a large

amount of new information, the SC decided that with the exception of a few micro-samples, nothing would be moved and a very accurate documentation, using the most up-to-date instruments possible, would be undertaken. In particular, photogrammetry was seen as an adequate method to complete the documentation made in 1784 by Daniele. The SC decided to call upon a private firm (F.O.A.R.T.) for photogrammetric documentation, as well as a photographer and a specialist in X-rays.

Figure 6
Photogrammetry of the whole inner part of the sarcophagus

Fifth series of questions

1. Who should undertake the photogrammetric documentation and its interpretation?
2. What new information could be provided by micro samples?
3. How should this micro sampling be carried out and the results interpreted?
4. Which non-destructive methods could provide more information?
5. Did the opening in 1781 damage or alter any evidence?

For the photogrammetric documentation, a private firm was called in. F.O.A.R.T. originally dealt with documentation on oil platforms, but they later developed a branch focusing specifically on cultural heritage. They did one survey above the red mantel and one below it. This confirmed the accuracy of the drawings made in 1784. The new documentation and technology now offered the advantage of digital formats, including the possibility of developing a 3D view of the sarcophagus which could continue to be explored and used even if it was closed again. The new documentation also revealed that the state of conservation was now much worse than in 1784 (Figure 6).

The whole contents of the bag were X-rayed and indicated the presence of a man with a height of 1.78 meter, who had a deep fracture in the neck.

The micro sampling of the textiles confirmed their extreme fragility and the difficulty of treating them. The micro sample taken from one of the emperor's bones did not provide any results, according to the medical doctors who were called.

With the analyses and conservation measures taken to this point, the limited funding for the project came to an end. Given that the possibility of finding more funding was limited, that the risk of damaging the sarcophagus' contents was great and in the hope that, in the future, new research and conservation methods could be used, the SC decided to re-seal the sarcophagus.

Final series of questions

The sarcophagus was hidden by the "white chamber" from the eyes of the local community and the tourists for a period of three months. In the meantime, the works carried out raised a lot of interest, particularly

among the German visitors and media, who still consider Frederick II to be one of theirs and for whom they still feel a great deal of fondness. It was therefore important to answer three additional questions:

1. What information should be given to the local community?
2. Which strategy should be used with the media and in particular with German journalists?
3. What information should be given to the tourists?
4. How should information be disseminated within the scientific community?

An important consideration throughout the entire project was to avoid creating any disturbance to the numerous ceremonies celebrated within the Cathedral. A special silent extractor was used for the white chamber.

Constant information was provided to both locals and tourists through the media, and panels relating the development of the works were also posted in Italian and English. The project's staff were also encouraged to answer questions raised by the people they met.

The media was closely informed, both through weekly press releases and the SC's regular liaison. One member of the SC specifically dealt with journalists, including German ones.

The main moments of the project, namely the opening and closing of the sarcophagus, were transmitted live on local television.

For the scientific community, an interim meeting of the ICOM-CC was organized one year before the opening of the sarcophagus to ensure that the most updated knowledge, especially in the field of textiles, would be collected.

At the end of the project, a three-volume publication was printed, including 566 pages and technical sheets.

Figure 7
Drawing of Frederick II's head by Daniele

Figure 8
Photogrammetry of Frederick II's head

Questions to which it has not been possible to obtain an answer

Who was the unknown figure?

What was the method of embalming used?

Which diseases had the three bodies suffered from?

What was the technology and origin of the textiles and the other items?

FINAL REMARKS

By comparing the documentation from 1784 with that of today, it was obvious that the contents of the tomb had greatly suffered and that some evidence had been lost (Figures 7–8). This could be due to the four years of uncontrolled study undertaken at the end of the 18th century followed by the 16 years in which they were kept in unknown conditions until the lid was replaced.

Table 1

Various disciplines whose knowledge was essential in the different steps

Questions/Stakeholders	Archbishop	Historian	Art historian	Architect	Anatomist	Physicist/Chemist	Endoscope specialist	Conservator-Restorer	Micro-climatologist	Sponsor	Engineer–geologist	Biologist	Virologist	White chamber specialist	Photogrammetry specialist	Photographer	X-ray specialist
1	■	■	■	■	■												
2	■																
3	■	■	■	■													
4						■											
5	■	■	■	■	■												
Decision-making																	
6							■										
7								■	■								
Decision-making																	
8	■									■							
9											■						
10				■							■						
11								■	■								
12												■	■	■			
13														■			
14															■	■	■
Decision-making																	
15	■	■	■						■								
16						■									■		■
Decision-making																	
17															■		
18		■	■		■	■		■				■					
19		■	■		■	■		■				■					
20					■	■						■					
21		■														■	■
Decision-making																	
22	■	■	■														
23	■	■	■														
24	■	■	■														
25	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

It was not possible to answer all of the questions initially raised, nor to proceed with the consolidation and restoration of textiles, metal and leather because the funding was unavailable.

For this project, it is important to underline that the initial group of five different disciplines rapidly expanded to 18 in order to deal with the various problems encountered and to provide answers (Table 1). Given that the contents of the sarcophagus were not touched for the various reasons mentioned above, no archaeologist was called.

At each phase of the project, answers were provided by a combination of several disciplines that varied in number. Only exceptionally did the responsibility for providing answers lie on the shoulders of a single stakeholder.

REFERENCES

DANIELE, F. 1784. *I regali sepolcri del Duomo di Palermo riconosciuti ed illustustrati.* Napoli.

CENTRO REGIONALE PER LA PROGETTAZIONE E IL RESTAURO E PER LE SCIENZE NATURALI ED APPLICATE AI BENI CULTURALI SICILY (ITALY). 2002. *Il sarcofago dell'Imperatore. Studi, ricerche e indagini sulla tomba di Federico II nella Cattedrale di Palermo 1994–1999.* Officine Grafiche Riunite SpA: Palermo.