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Etruscanning

Digital Encounters with the Regolini-Galassi Tomb

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Etruscanning is linked to V-MusT.net, an EU FP-7 funded Network of Excellence (Grant Agreement 270404) that aims to provide the heritage sector with the tools and support to develop Virtual Museums that are educational, enjoyable, long-lasting and easy to maintain. Evaluation and presentation activities have been conducted with the support of V-MusT.net.

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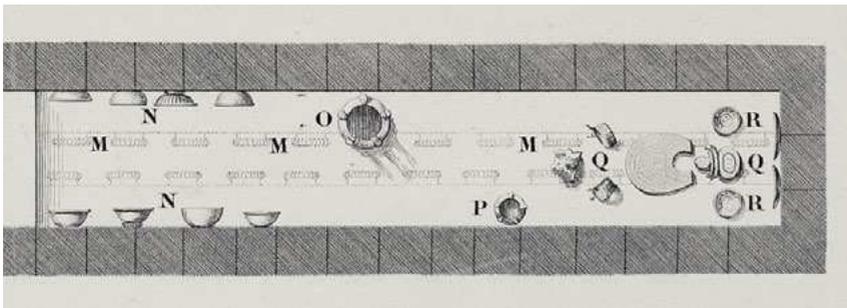
The Regolini-Galassi Tomb Revisited

3D Reconstruction as a Research Instrument

WIM HUPPERETZ, EVA PIETRONI, DANIËL PLETINCKX, MAURIZIO SANNIBALE

The Regolini-Galassi Tomb is one of the most remarkable Etruscan tombs we know, not only on account of its rich contents but also because so many of the 327 objects date from the orientalisising period. Moreover, the grave goods are varied in character and many of the items are of outstanding quality. The tomb was found in 1836 by Archbishop Alessandro Regolini and General Vincenzo Galassi, who wrote several accounts of their discovery. The first publication on the tomb appeared in the same year, in 1836; the first drawings were produced by L. Grifi, a qualified architect.

Although the tomb has been studied by a large number of scholars, certain mysteries remain unsolved. There is still a great deal of uncertainty regarding the precise positions of the objects in the tomb and how we should interpret the totality of grave goods.



Detail of the plan of the Regolini-Galassi Tomb by Grifi, drawn in 1836 but only published in 1841. It shows the burial chamber, the private space in which the princess was interred with all her personal possessions around her. Far right is the huge gold disc fibula, then the gold pectoral and the two bracelets (Q). The two bronze cauldrons or *lebetes* (P and O) also come from the Near East / display influences from the Near East and underline the aristocratic character of this tomb.

During our 3D reconstruction of the Regolini-Galassi Tomb we were forced to ask ourselves very practical questions about the placement of the objects and their original location. We re-evaluated and reinterpreted all available sources in an effort to find answers to difficult questions. The tomb was discovered and documented a long time ago, but never methodically excavated, and the excavated objects were purchased by the Vatican Museums just a year after the tomb's discovery. As a result, a great deal of information about the precise location of the objects in the tomb was lost. This also explains the many, often contradictory reconstructions.



The provisional virtual reconstruction of the *anticamera*. This space between the main burial chamber and the two side chambers functioned as a public space in a home and recalls the atriums in later Roman atrium houses. This is where objects such as the empty bronze bed, the small trolley, and two tripods, enclosed by small bucchero figures of mourners, were found. Hanging on the wall were bronze shields and on the ceiling bronze dishes. There are two triangular windows, one towards the burial chamber of the princess with two silver cups on the sill and a hanging *situla* (a bucket-like vessel), the other, to the right, in the wall to the side room in which the cremated remains of the man were interred in a cinerary urn, also surrounded by small bucchero figures of mourners.

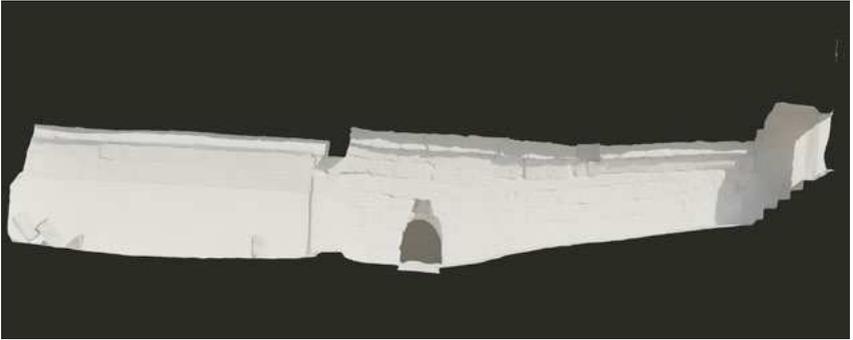
3D Reconstruction

In many respects, the increasing deployment of 3D visualization techniques has created a new research instrument. To keep this instrument as transparent as possible, we presented the major steps in the 3D visualization of the Regolini-Galassi Tomb in an online blog, at <http://regolinigalassi.wordpress.com/> (see also page 27). This has been a practical way to document the interpretation, indicate possible revisions in the process, present the uncertainties in our reconstructions, record the information and, finally, enable or facilitate multidisciplinary research. We applied four stages in our formalized approach: the identification, assessment and correlation of sources, and the construction of a hypothesis in the form of a tree diagram.

The innovative 3D visualization techniques we employed also encompass three-dimensional virtual reconstruction. This means that we endeavoured to recreate historical structures, built by human hands, in this instance, the Regolini-Galassi Tomb and the objects within. The purpose was not to reconstruct the past, but to create an image of what we know of this past. In other words: a virtual reconstruction constitutes a consistent visualization of structures built by people, based on the available sources, such as information from archaeology, anthropology, history, the natural sciences. As such, creating a virtual reconstruction should be viewed as a multidisciplinary activity, constantly subject to change.

3D Scan of the tomb

The project methodology can only be described as complex, from the gathering of existing data to the integration of this data via topographic digital measurement. We used various types of data: point clouds from a 3D scanner, photogrammetric data and GIS-data. A ‘time of flight’ 3D-scanner (Riegl z390i) measured the tomb in 3D as a high-resolution model (with 6 mm spaces between the dots) and with maximum precision (3-4 mm). Once the 3D scanner had measured objects as three-dimensional point clouds, triangulation was employed to ascribe three-dimensional volumes, determined by surface areas. We then worked the 3D model of the tomb in its present state into a representation of the tomb as it may



Cross-section of the tomb obtained using a laser scan, made in June 2011. This shows that the passage slopes downwards, although it is possible that the slope was not always as steep. It also shows the remains of the window to the right side room; to the left, in the main chamber, are the stones which formed part of the wall that closed this chamber off from the *anticamera*.



Laser scan of the *anticamera*, with view of the left side chamber and the burial chamber with female interment directly ahead. The latter was closed off by a wall whose stones can be seen to the rear.

have looked in Etruscan times, with the objects in their context, based on historical sources and archaeological interpretations.

The floor plan illustrations

The various floor plans we consulted from publications relating to the Regolini-Galassi Tomb display a large number of significant and substantial differences. Two excavation reports were published immediately after the excavation in 1836 – which only took five days. However, the first drawings were not published until five (Grifi) and ten (Canina) years later. Various authors have noticed the differences between the two 1836 reports and have pointed out disparities between the nature of the objects as we now know them and what is recorded in the excavation reports.

If we compare the two drawings with the actual tomb, it is clear that these could not have been made inside the tomb. For example, neither represents the ceiling correctly. Canina's rendering of the tomb's architecture and size of the objects is better, perhaps because he was trained as an architect and an archaeologist. However, the most significant difference is that Canina depicts more objects in the tomb than Grifi, probably because interpretation of the archaeological finds was still on-going in Grifi's time.

The tomb

The original tumulus was constructed in the seventh century BC and covered by a second tumulus in the sixth century BC, which created space for additional tombs, probably intended for descendants of the same family. Although these tombs around the outside of the mound proved easy prey for tomb robbers, they protected the older tomb at the centre from almost inevitable plundering.

The tomb has a short *dromos* in the form of a narrow passage, with rectangular blocks rising to form a corbel vault. The most important space at the rear of the tomb was closed off by a wall incorporating a small window. There are also two oval side chambers, carved from the tuff. The lower part of the tomb is cut from the tuff bedrocks, the upper half built of square blocks which have been used to create a wedge-shaped corbel vault.

We have used the five spaces as the starting point for our consideration of the tomb: the entrance passage (*dromos*), the *anticamera* (antechamber), the right side chamber with the interment of the prince, the left side chamber and the closed area where the princess was interred. We intended to present all five spaces in our reconstruction, based on evaluation and integration of the source material.

According to Pareti, who has compiled the most comprehensive catalogue of the tomb, the objects were distributed as follows:

- ▶ objects numbered one to 226 came from the chamber where the princess was interred;
- ▶ objects numbered 227 to 233 came from the right side chamber where the prince was interred;
- ▶ objects numbered 234 to 328 came from the *dromos*, the *anticamera* and the left side chamber (the storeroom).

The passage (*dromos*). The *holmos*

In the entrance passage were three bronze objects: a *holmos* (a cauldron stand), and two large cauldrons, one somewhat smaller than the other. On drawings of the tomb the *holmos* stood at the beginning of the *dromos*. In daily life, a ceramic *holmos* was used to prepare food and keep this warm. Charcoal was burned in the conical foot, so heat would rise to the bell-shaped element supporting the cauldron of food. The top of the bronze *holmos* from the Regolini-Galassi Tomb is closed, however, so it could not have been used in this way. This may mean that it was a replica, a model of a domestic implement made especially for the tomb. The material is also unusual, for such stands are almost exclusively made of ceramic and few bronze examples are known.

The *anticamera*. The empty bed as ceremonial focus

In the small *anticamera*, before the wall with a window, which closed off the burial chamber where the princess was interred, there was a bronze bed, accompanied by a series of small bucchero figures of female lamenters or mourners and two iron tripods. Beside the bed was a small cart on wheels, interpreted as an incense burner or food trolley. Also in this space

were various bronze and iron skewers; beneath the keystones of the corbel vault hung two rows of *paterae* (libation dishes) on nails.

Although the Romans did not consider themselves descendants of the Etruscans, they adopted a number of their practices, such as certain funerary traditions and tomb architecture, from a shared indigenous ancestor. In Etruscan culture, as in many ancient civilizations, tombs represented the home in the hereafter. On this premise we may regard the entrance to a tomb as the *vestibulum* (hall), which leads to the atrium. In ancient Latin households the atrium was the symbolic bedroom of the mother, and the bed, the *lectus genialis*, faced the main entrance. In Roman wedding ceremonies, the marriage was consummated in the *lectus genialis*, in honour of the ancestors, the *gens*.

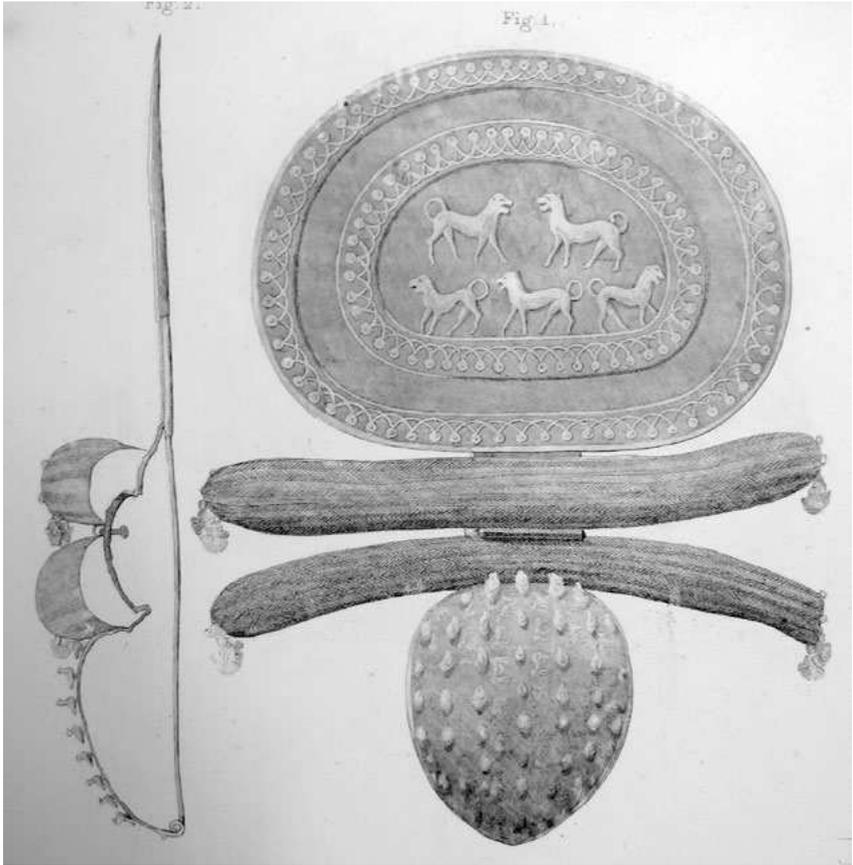
There were no objects or other traces found on the bronze bed to suggest that human remains had ever lain there. If the bed was indeed empty, this would fit the hypothesis that the bed symbolized the sanctity of marriage. The mourning figures around the bed and the urn in the right side chamber, containing the cremated remains of the man, may also support the symbolic meaning of the empty bed.

The right side chamber. The interment of a prince

In the right side chamber there was a large cinerary urn containing cremated remains that have been interpreted as that of a prince. Around this urn were several of the 33 small bucchero figures of mourners found in the tomb. Given that these figures also stood around the (empty) bed in the antechamber, there must be a connection between the two. The side chamber also contained a number of metal objects. Pareti also places the two-wheeled chariot (*biga*) found in the tomb in this chamber, together with two iron fire-dogs and an iron dagger. The *biga* must have been taken apart before it was brought into the tomb, as it would otherwise not have fitted through the entrance to the side chamber.

The left side chamber. A storeroom

The left side chamber was probably a storeroom, as it was full of ceramic and bronze vessels, including large bronze cauldrons. Several interpreta-



Side view and frontal view of the gold disc fibula from the burial chamber of the princess, drawn by Canina (1846). This fibula comprises three components. The disc represents the world (and the sun?), the hinged parts represent the water or river which give entry to the underworld, represented by the lowest element of the fibula, on which a tiny head of Hathor appears. There are also images of Hathor on the necklace pendants. Hathor is the Egyptian sun goddess and mother of Ra who pilots the solar boat. As a fertility goddess, a bringer of life and an underworld deity, she represents a clear allusion to the hereafter.

tions also place some silverware in this chamber, although this is uncertain. A bronze biconical urn, often used as a cinerary urn, may have been one of the objects found in the tomb, symbolizing the ancient origins of the deceased's family.

The closed chamber: The *lebetes*

The closed chamber contained the majority of the gold and silver objects found in the tomb, all associated with the interment of the princess. This space was separated from the rest of the tomb by a wall incorporating a window in which two silver cups stood. It is also possible that a wooden *situla* (a bucket-like vessel), decorated with silver, hung in the window.

Further orientalisising influences are evident in the three *lebetes*, the bronze cauldrons also found in similar form in the Near East. Two *lebetes* are virtually identical, with five lion heads on long necks around the rim. The third *lebes* is smaller and has six griffin heads. There were also decorated silver chargers, probably from a Phoenician workshop, affixed to the wall, and two rows of more than ten bronze *paterae* (libation dishes) nailed to the ceiling.

Evaluation

3D visualisation of the Regolini-Galassi Tomb has not only proven to be an essential tool for obtaining more knowledge about the tomb and Etruscan funerary customs, it also provides an attractive way to present research results. In our multidisciplinary approach to the realization of this 3D visualization, we re-examined and reinterpreted earlier publications on the find context, and reached new conclusions regarding the location of the objects in the tomb. We were able to place the objects virtually in the tomb, allowing us to identify inconsistencies in the source material and to determine the most plausible configuration. Using 3D visualization as our research instrument, we were able to study the tomb on another level. The final result takes the form of an innovative, interactive 3D experience, based on natural interfaces (bodily movements and gestures).