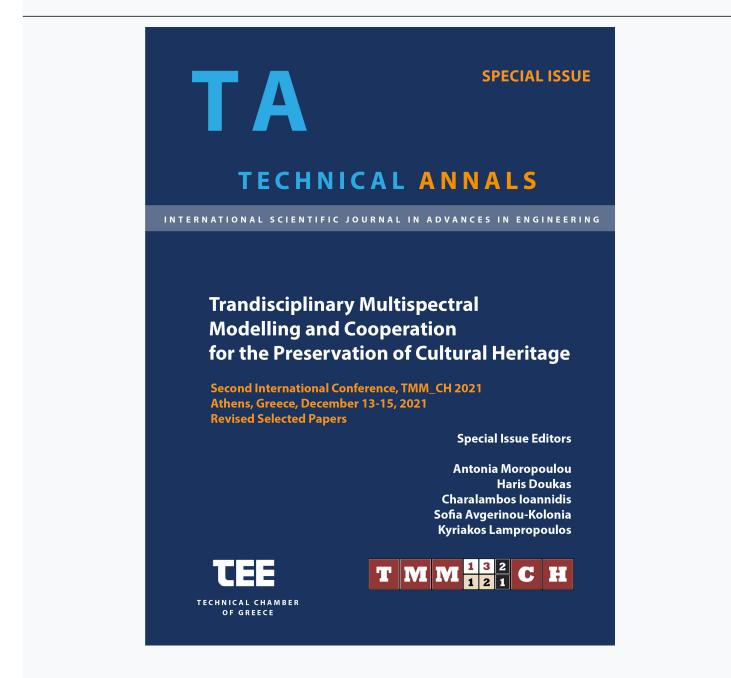




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SPECIAL ISSUE

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Trandisciplinary Multispectral Modelling and Cooperation for the Preservation of Cultural Heritage

Second International Conference, TMM_CH 2021 Athens, Greece, December 13-15, 2021 Revised Selected Papers

Special Issue Editors

Antonia Moropoulou Haris Doukas Charalambos Ioannidis Sofia Avgerinou-Kolonia Kyriakos Lampropoulos





ΤΑ

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Early Hellenistic Marble Statue Found In Alexandria, Egypt

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Abstract. On 4th of May 2009, in Shallalat Gardens of Alexandria, a marble statue was found, during the excavations held by H.R.I.A.C. (Hellenic Research Institute of Alexandrian Civilization). The statue represents a standing naked man in a form of classical contraposto, with one foot raised, possibly bent to a support. Head and body are in a very good condition, but the part of the legs under the knees is missing. The features of the statue, the attributes and the stylistic analysis are connected with the portraiture of Alexander the Great.

Keywords: Hellenistic Marble Statue, Alexander the Great, Alexandria, Excavations

During April-May 2009, in Alexandria of Egypt, in Shallalat Gardens, an excavation was held by the Hellenic Research Institute of Alexandrian Civilization (H.R.I.A.C.).

The reason for selecting this site for archaeological research is its position in the to-pography of Ptolemaic Alexandria; it was a part of the royal quarter according to the ancient sources and especially Strabo (Geography, 17.8). At this time, this area is easy to be excavated compared to all other parts of Alexandria.

This project started on 2007 by conducting a geophysical survey in cooperation with the National Institute of Astronomy and Geophysics of Cairo (N.I.A.G). The results were the location of anomalies in the underground, in three (3) sites of the park. In the two sites, excavation was held during 2007 and 2008 but, although there were serious evidences of archaeological finds, the appearance of water table stopped the project.

On April 2009, the excavation started in the third site after operating a drilling with significant results. The samples were concrete pieces of white limestone. Due to the fact that this area has not any limestone layers, according to geological surveys till now, this wasan evidence of a human construction.

Due to the existence of tones of debris, loose soil and, the most important, the wa-

ter- table that appeared again in a depth of 7,5 m, the project was progressing with difficulties. During the excavation, an architectural construction was found in a depth of 7 m, consisted of big stones of limestone, as well as a big quantity of roman and Hellenistic pottery. In the west sidewall of the trench, there was a part of a floor which was difficult to be uncovered, due to the big quantity of soil upon it.

On 4th of May, in a depth of 8 m in the same west sidewall of the trench, and among hellenistic and early roman debris, a marble statue was found (FIG. 1). The height of the stat- ue has been measured 0,80 m. Head and body are in a very good condition, except a slight damage in the nose. From the legs, the part under the knees is missing.

There is a part of the right arm of 0,16 m before the elbow, while the left arm is missing completely. Under the right arm there is a hole, possibly for metallic connection. In the left shoulder, there is an iron connection. In the back of the left shoulder, there is a small hole. The marble is Parian (Paros Island), according to the analysis of Democretus laboratory of Athens.

The statue represents a standing naked young man in a form of classical contraposto, with one foot raised, possibly bent to a support. The body is slightly turned to the right and there is a trace of a support in the right buttock. The left shoulder is raised as if it holds something and bents to it, possibly a spear. This is a hypothesis necessary for the symmetry of the pose.



Figure.1. Marble statue found in Shalalat Gardens (photo Limneos-Papakosta, 2009).

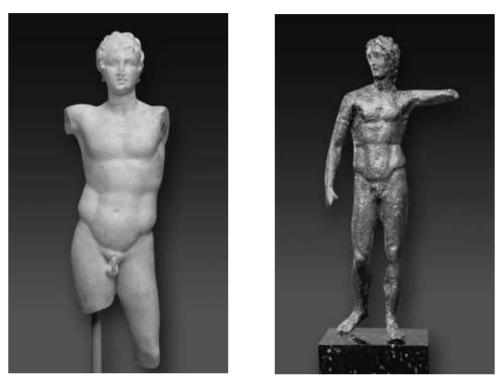


Figure.2. a. Malibu, Getty Museum AA17. Alexander with the Lance (FREL 1987, figs. 21-26); b. Paris, Louvre Museum 370. Alexander with the Lance (SMITH 1988, pl. 70, 3-4).

Smith³³ states, that standing naked figures were the most common type for royal statues. Although we don"t have any evidence to think that this type reminds one particular famous statue, some literary sources give us the information that it was used for Alexander the Great during his lifetime and after him.³⁴

Comparing the statue with two of the most important statuettes, which reproduce possibly Lysippos' ",Alexander with the lance", specifically a marble statuette in the Getty museum and a bronze one in Louvre, we notice that there are a lot of similarities (FIG. 2a, b).

The fact that the bronze one of Louvre was found in Egypt,³⁵ is a possibility that Lysippos has created the original one for the city of Alexandria.

As we know, besides standing naked king type there is another famous statue type, the 'Jason pose' or the "Sandal-loosening Hermes" an attribution ascribed to the Lysippan School. It represents the King bending to the front, with one foot raised to a base. The most famous statue of this type is of course Alexander «Rondanini»³⁶ (FIG. 3).

³³ SMITH 1988

³⁴ PlUT, *de Iside et Osiride* 24 (0.1481).

³⁵ SCHREIBER 1903, pl. vI L («ausUnteraegyp- ten»).

³⁶ Munich, Glyptothek (BIEBER 1964, pp. 25-26, figs. 6-8).

The statue has a unique, maybe, type; it has the right foot risen like the "Hermes" or 'Jason' type, but its torsion is standing, not bent. As it was mentioned before, there is a possibility of holding a spear. As a result, the statue has characteristics from both types of royal statues.

The statue has the following basic features that enable us to study, date and substantiateit (FIG. 4):

- Poise of the neck to the left
- Upward glance of the eyes
- "Anastole" on the hair
- Royal type diadem
- "Dionysus" type diadem
- Short hair
- Sideburns
- Proportions of the head & body
- Pose and movement of the statue.

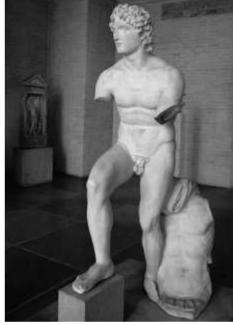


Figure.3. Munich, Glyptothek. Alexander«Rondanini» (BIEBER 1964, fig. 25, 6)

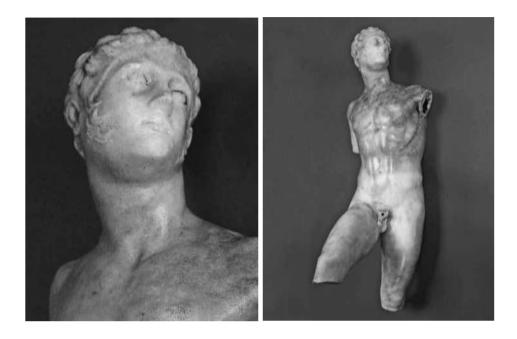


Figure.4. Head and body of the statue before restoration (photo Limneos-Papakosta, 2009).

The head has been measured 0,13 m and if we compare it with the total height of the statue (about 1,10 m), it is the 1/9. This analogy is typical of the Lysippan canon, and smaller than the previous canon of Polycleitos, which was 1/8. Pliny (nat., XXXIV, 65) states «Lysippos made the heads smaller than previous artists had done». The neck is turned to the left and the eyes look upward with an aspiring glance. Plutarch (Alexander, 4, 1), referring to Lysippos, comments: «For it was this artist who captured exactly those distinctive features, which many of Alexander"s successors and friends later tried to imitate, namely the poise of the neck turned slightly to the left and the melting glance of the eyes». He also states that «When Lysippos first modeled a portrait of Alexander with his face turned upward towards the sky, just as Alexander himself was accustomed to gaze, turning his neck gently to one side, someone inscribed, not inappropriately the following epigram: I place the earth under my sway; you Oh Zeus keep Olympus» (PIUT., De Alexandri Magni Fortuna, 2, 2, 3)

These two characteristics (neck and eyes) are very intense in the statue and give the appearance of *pathos* to it.

Moreover, the ears and the lips are sculptured perfectly.

The hair of the statue is short, but very well defined, in contrast with later portraits of Alexander with long hair, especially Roman copies; but it is more difficult to decide how closely these later works are with the Lysippean type. On the other hand, the monuments which are contemporary to Alexander, such as the Alexander Sarcophagus from Sidon (330- 310 BC)³⁷ and the Alexander Mosaic (copy of a painting of

³⁷ VoN GRAEVE 1970.

330-300 BC)³⁸, show us that Alexander was represented with relatively short hair (FIG. 5a, b).

The same short hair we see in Alexander of the painting frieze of the Philip''s Tomb in Vergina³⁹. Also in the famous "Lion Hunt" mosaic from Pella, Alexander has short hair⁴⁰. These representations, which refer to Alexander''s lifetime, give him shorter hair styles, while many posthumous portraits have longer hair that may have divinizing connotations (FIG. 6a, b)

It is a fact that the personality and the achievements of Alexander influenced and impressed so much the people of his time, as well as his successors and the Romans, and so, all of them, perpetuated his image, in many forms. But all of these were not contemporary portraits of him, so they can be idealized or divinized images. According to Ridgway⁴¹, physiognomic studies have demonstrated that in both Greek and Roman times, certain features were associated with certain traits of character and were therefore selected to confer to the subject of the portrait the qualities implied by them, regardless of whether they were truly part of his appearance or not. This seems to have been the case with Alexander in particular, according to many anecdotes available about his depictions: the leonine "mane" of hair hinting at strength and valor...

We have to point out again that the four monuments, more or less contemporary of Alexander, represent him with short hair.

But the most important feature in the hairstyle of the statue is the *anastole*, not in the usual form, but for sure it is a distinctive arrangement of the hair over the forehead, a quaff of hair standing up with a slightly off-centre parting. *This anastole* of the hair, Plutarch records, was the distinctive feature of Alexander's physiognomy (Pomp., 2, 1). It seems to be considered as Alexander's personal attribute and it is generally not used by later kings. The sideburns on the face of the statue are a feature not very common in the portraiture of Alexander. The most important monument, original of which was contemporary of Alexander, was, as mentioned before, the Alexander Mosaic (FIG. 5).

Alexander is shown bareheaded and armored, fighting on horseback. This picture whether made in Alexander⁴⁴ s lifetime or not, at least, pretends to be a representation of him in his lifetime. He is shown with long sideburns. Besides, a lot of portraits of Alexander like Azara herm⁴², Erbach⁴³, Dresden Alexander⁴⁴ and Capitoline head⁴⁵ have either sideburns or long hair in front of the ears (FIG. 7).

³⁸ ANDREAE 2003, pp. 62-77, fig. 67

³⁹ ANDRoNIkos 1984, p. 109.

⁴⁰ ANDREAE 2003, pp. 20-21, figs. 20-21; p. 22.

⁴¹ RIDGWAY 2000.

⁴² POLLITT 1986, p. 21, fig. 7.

⁴³ SMITH 1988, pl. 2.

⁴⁴ BIEBER 1964, pp. 7, 27, fig. 12.

⁴⁵ POLLITT 1986, p. 29, fig. 17.



Figure.5a. Istambul, Archaeological Museum, 72-74. Alexander Sarcophagus from Sidon(voN GRAEVE 1970, p. 28);



Figure 5b. Napoli, Museo Archeologico Nazionale, inv. 10020. Alexander Mosaic from Pompey, Casa del Fauno (COHEN 1997, pl. II).



Figure.6a. Alexander of the painting frieze of the Philip"'s Tombin Vergina (ANDRoNIKos 1984, pls. 65-66);
Figure 6b. Pella, Archaeological Museum. "Lion Hunt" (peble mosaic 4.90 × 3.20 m) (ANDRoNIKos, ELLIS 1989, fig. 83).

Due to this feature, it was necessary to study carefully some images from the portraiture of the Ptolemies, especially Ptolemy II, III and IV, who are usually represented (especially in coins - FIG. 8) with sideburns⁴⁶. The criteria of their identification are not the sideburns, but the form of round bulging eyes, as well as the puffy lips and the full cheeks. These features do not exist in this statue.

The most important attribute of the statue is the two - not one - headbands (diadems), one narrow band in the hair and another one in the forehead. In the beginning

⁴⁶ BIEBER 1961, fig. 308; SMITH 1988, pl. 75.

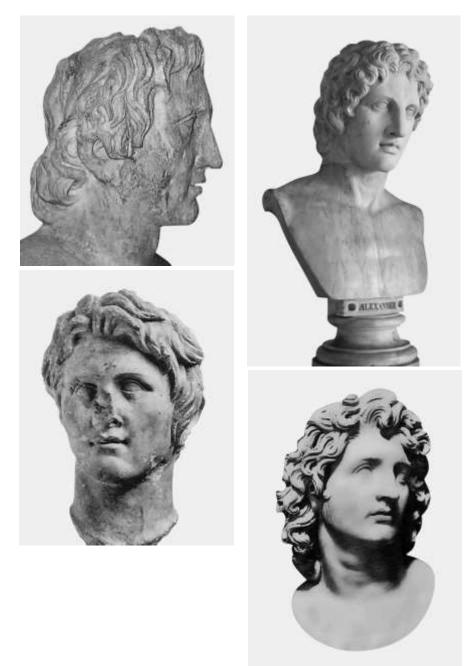


Figure.7a. Paris, Louvre MA 436. Azara Alexander (SMITH 1988, pl. I, figs. 1-6);
Figure 7b. Schloss Erbach, General Catalog no. 642. Erbach Alexander (SMITH 1988, pl. II, fig. 1-8);
Figure 7c. Dresden, Skulptureensammlung. Dresden Alexander (BIEBER 1964, p. 27, pl. 7, fig. 12);
Figure 7d. Rome, Capitoline Museum. Capitoline Alexander,Portrait of Alexander as Helios (Capitoline Museum, Alinari 5972).



of our study, we thought that the band in the forehead was not really a band, but the evidence of a second use of the sculpture. But the perfectness of the form, the extremely high level of the art and the non-existence of any remains or defects in the face, obliged us to reject this idea. Furthermore, there were traces of color in the band and we think that this should give more notice to the attribute, instead of softening or hiding a defect. The sideburns and the hair next to the band are so fine that, according to our opinion, it is evidence that we have theoriginal face.

A lot of literary sources attest that the diadem (*diadema*) is the main royal symbol of Hellenistic kings and that it was a band of white cloth worn about the head⁴⁷. Alexander was the first Macedonian king to wear it as an exclusive emblem of kingship. It became the symbol of his new status as "King of Asia".

Two sources, Diodorus Siculus (4, 4, 4) and Pliny the Elder (nat., VII, 191), say that the god Dionysus «discovered the diadem that he wore it to symbolize his conquests in the East and that Kings took it over from him».

⁴⁷ RITTeR 1965

However, the form of the royal diadem is not directly copied from that of Dionysus. The god wears his headband lowdown on his forehead, while the Kings wear it further back in the hair. For this association of the diadem, there is archaeological evidence. On Ptolemy's posthumous Alexander coin portraits the king wears an elephant head dress and a flat diadem precisely as worn by Dionysus. Alexander's and Dionysus' headbands are here clearly associated (FIG. 9).



Figure. 9a. Alexander coin portraits (Munich, Himer Fotoarchiv).

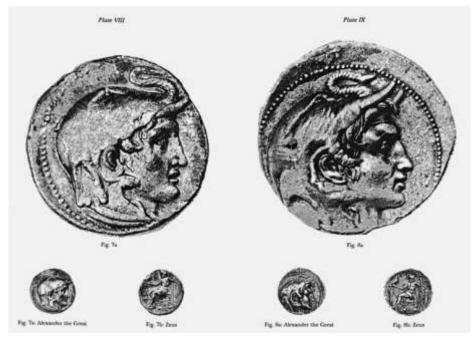


Figure. 9b. Alexander coin portraits (Munich, Himer Fotoarchiv).

Smith⁴⁸ states that, «Dionysus was important to Alexander and remained so, for the later kings. He was a conquering god and gave the divine model for the conquest of India and Asia. The similarity of the eastern conquest and of the headband's form to those of Dionysus promoted the additional meaning of association with that god. Dionysus' campaigns became a divine precedent and comparison for Alexander and this is thereason that he adopted the diadem as a royal symbol».

The body is slim, thus increasing the apparent height of the figure. The muscles are perfect and can be clearly seen; the backside is perfectly modelled as well as the side parts, so the statue can be seen by all sides. This issomething new that Lysippos first introduced in sculpture. Movement pervades the whole body and there is an obviousdepth. The knees are projecting out of the traditional closed squared canon and are intrud ing on the viewer's space.



⁴⁸ SMITH 1988, p. 37.



Figure.10. Alexandria, National Museum. Hellenistic statue with characteristic of Alexander the Great (photo Limneos-Papakosta, 2009).

All these features permit us to think the possibility of the connection of this statue with the portraiture of Alexander the Great.

The execution of the sculpture is of fine quality. There is a restrained realism and slight appearance of sfumato, combined with a post Praxitelean sensuousness. Besides, we notice the importance of proportion: more elongated with small head in relation to the body, as mentioned above.

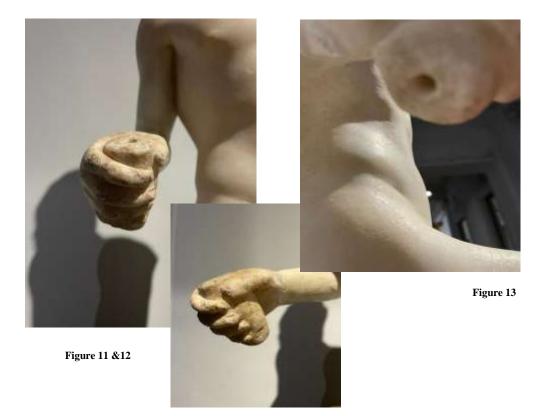
The anatomy is less detailed but impressionistic and powerful. There is no exaggeration in the anatomical features, and this excludes the possibility to have a "baroque style". It combines the beauty of the sculpture of classical times and the passion of the Hellenistic statues. It captures also the personality of its subject.

Last but not least the statue was found and possibly was standing inside the royal

Opalaces and for sure it could have not been sculptured by a simple sculptor. This fact in combination with its stylistic features that recalls the characteristics of the Lysippan School lead us to the possibility of having a work of this school, which was operating also in Alexandria. Our estimation for its dating is the early Hellenistic period. Seven years after the discovery of the statue, in 2016, its right hand appeared in front of us. It wasonly the palm holding a cylindrical part of an object, which will be our case of study (fig.11 & 12). This piece, made also by the same marble thestatue is made of, as well as the arm of the statue, have two connecting holes; one at the top and one at the bottom. This fact leads us to the conclusion that this object was extending up and down (Fig.13).

Thus, the question is what did the statue hold?

As described above, the statue falls into the type of either the naked king or ruler. Therefore, from what we have learned so far from the statue''s study, it would make sense for the statue to be the king with the spear or sceptre. Although this type is not traced back to any famous statue, we do know from literary sources that it was used to depict Alexander duringhis lifetime and certainly after his death. (Plut. De Iside et Osiride 24-0.1481).



In case the statue is holding spear, it is heldup by the right hand, rather thanthe left. But this fact does not occur for the first time. This detail can be also seen in the Bronze Spearbearer in Houston (fig.14). During the restoration and attachmentprocess of the hand of the statue, we had as a guide the engraving of an ancient Roman sculpture by the Italian sculptor and engraver Domenico de Rossi (1659-1730), which was depicting Alexander with Bucephalus (fig.15). We could assume that this picture has been inspired by the memory or tradition of an ancient statue.

On another note, the statue could be holding a sceptre instead. The sceptre and the diadem were constituting the main symbols of royalty.

The royal sceptre is not mentioned often in literature and appears only rarely on coins and gems(Theophrastus, On Royalty II). It is also an attribute of Zeus, in his "civic" role as the embodiment of supreme justice, connected of course, mainly with Alexander.

To continue, I believe that we should exclude the possibility of the statue holding a sword, due to the fact that the posture of the statue has noattacking tension at all.

I find it more probable that the statue applies to a "King with a lance", due to the construction of the marble piece, carrying the two holes that show an extension up and down, but also due to the similarities that this statue shares especially with the bronze statuettes of the Louvre and Getty Museums.



Figure 14 left (Bronze Spearbearer in Houston & Figure 15 right (Domenico de Rossi engraving)

It is essential to point out that the idea we have for the image of Alexander the Great, comes out from posthumous portraits of him made mainly by Greeks and Romans, who certainly had been influenced by his historical presence, his divinization and idealization. These works were notcontemporary and we must not insist that all of

them are copies of important prototypes, unless we seldom have some. So maybe, this excellent piece of art is closer to the "real face" of Alexander.

The continuation of the excavation will hopefully bring new evidence that will help to the complete substantiation of this statue (FIG. 16).

3D model of the statue of Alexander the Great, found at Shallalat Gardens of Alexandria by HRIAC. Executed by Dr. Jay Silverstein and Mohamed Abdelaziz, sponsored by National Geographic Society



Figure 16

3D model of the statue of Alexander the Great, found at Shallalat Gardens of Alexandria by HRIAC.



Figure 17: Created by Prof. A. Georgopoulos. Images acquired via Android smartphone 20MP, 5mins. SfM-MVS processing (10mins), 1.75 million points, 118000 faces, 60000 vertices (April 2022)



Figure 18: Executed by Dr. Jay Silverstein and Mohamed Abdelaziz, sponsored by National Geographic Society, https://sketchfab.com/3d-models/alexander-statued07a827e363e40f69587875f631e34b2 (August 2022)

Bibliography

- 1. ANDREAE B. 2003, Antike Bildmosaiken, Mainz.
- ANDRIANI A. 1948, Testimonianze e monumenti di scultura alessandrina, Roma. AN-DRONIKos M. 1984, Vergina The Royal Tombs, Athens.
- 3. ANDRONIKOS M., ELLIS J. R. 1989, Philip, King of Macedonians, Athens. BIEBER M. 1961, The scuplture of the Hellenistic age, New York2.
- 4. BIEBER M. 1964, Alexander the Great in Greek and Roman Art, Chicago.CHESHIRE A.W. 2009, The Bronzes of Ptolemy II, Wiesbaden.
- COHEN A. 1997, The Alexander Mosaic: Stories of Victory and Defeat, Cambridge. FRASER P. M. 1972, Ptolemaic Alexandria, Oxford.
- FREL J. 1987, Alexander with the Lance, in Lysippe et son influence, par J. Chamay, J.-L. Maier, Gèneve, pp. 77-79.
- (voN) GRAEVE V. 1970, Der Alexandersarkophag und seine Werkstatt, Berlin «Istanbuler Forschun- gen», 28).
- HAVelock C. M. 1981, Hellenistic Art, New York. KYRIELEIS H. 1975, Bildnisse der Ptolemäer, Berlin.MICHALowSKI C. 1932, Les Portraits hellénistiques et romains, Paris («Exploration archéologique de Délos, 13»).
- 9. MORENO P. 1995, Lisippo. L'arte e la fortuna, Milano.
- MUSCETTOIA S. A. 1981, Bronzetti raffiguranti dinasti ellenistici al museo Archeologico di Napoli, in Bronzes hellénistiques et romains, Traditions et renouveau, Actes du ve Colloque sur les bronzesantiques (Lausanne, 1978), Lausanne, pp. 87-94, pl. 34-4187-94.
- 11. POLLITT J. J. 1986, Art in the Hellenistic Age, Cambridge.
- QUEYREL F. 1985, Un portrait de Ptolémée III: problèmes d'iconographie, «RLouvre», 35, pp. 278-282. RIDGWAY B. S. 2000, Hellenistic Sculpture, II, The Styles of ca. 200-100 B.C., Madison (wI).
- RITTER H.-W. 1965, Diadem und Königsherrschaft, Untersuchungen zu Zeremonien und Rechtsgrund- lagen des Herrschaftsantritts bei den Persern, bei Alexander dem Grossen und im Hellenismus, Munich («Vestigia», 7).
- SCHREIBER Th. 1903, Studien über das Bildniss Alexanders des Grossen, Ein Beitrag zur alexandrini- schen Kunstgeschichte mit einem Anhang über die Anfänge des Alexanderkultes, Leipzig.
- 15. SMITH R. R. R. 1988, Hellenistic Royal Portraits, Oxford-New York.
- STewART A. 1993, Faces of Power. Alexander's image and hellenistic politics, Berkeley, Los Angeles, Oxford.
- 17. WACe A. J. B. 1905, Hellenistic Royal Portraits, «jhs», 25, pp. 86-1