

Soares dos Reis' plaster models: technical production and the challenge of the conservation and restoration

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Abstract

Soares dos Reis' natural gifts for the fine arts and the knowledge obtained during his academic career provided him with the tools for teaching and executing his work, considering clay models as a transitional material and original plaster models. The Museu Nacional Soares dos Reis (MNSR) houses among other works of art a great number of original plaster models. Nowadays, they are a source of technical information due to the execution marks left on the support. In a work project delineate between MNSR and José de Figueiredo Laboratory (LJF), six plaster sculptures were selected, with problems of alteration, to start the intervention process of conservation and restoration of the body of work authored by the sculptor.

Keywords

Soares dos Reis, Plaster models, Technical production, Conservation, Restoration

Introduction

As a brief introduction to the artist, we can refer to some topics somewhat related to the main subject that our colleagues are about to expose. António Soares dos Reis was one of the most promising names in Portuguese sculpture with great impact on the second half of the 19th century (Figure 1). After his academic career in Porto, he was a government scholarship holder in Paris and Rome, where he performed his greatest work - *O Desterrado*. With this marble, a late-romantic work of nostalgic inspiration, he was distinguished with a title of Academic Merit at the Academia Portuense de Belas Artes and by the Academia Real de Belas Artes de Lisboa.

Throughout his fruitful career - but very short as it reduces to about twenty years - some religious works are known. Always taking advantage of his solid artistic education, these kinds of pieces are based on the study of the model, although the classical influence in terms of characterization persists. One of the best examples of this concept can be illustrated by the image of *Nossa Senhora da Vitória*, a plaster from the mid-1870s that was intervened years ago by the Sculpture team from the Instituto José de Figueiredo. Moreover, it has been to this reference *Laboratory* that our Museu Nacional de Soares dos Reis has delivered most of its restoration work in Sculpture, seen as a whole.

Returning to said model of the Virgin from our parish of *Vitória*, its dot marks of a fixing point of pantograph still can be seen in the plaster. It has a unique value since the final work, carved in polychrome wood, was adulterated to the great displeasure of the young

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Figure 1 – Portrait of Soares dos Reis in his artist's smock by Marques de Oliveira, 1881. MNSR ©DGPC/ MNSR

sculptor. In fact, this was one of the first cases of unsuccessful work that create in him the revolt of a misunderstood artist. By the way, the same kind of marking can be seen in other religious *specimens* such as the plasters of *S. José* and *S. Joaquim*, which will be analyzed here from this point of view.

On a monumental scale, Soares dos Reis will stand out with the statue in honour to the philanthropist *Conde de Ferreira*, destined for the of Agramonte cemetery, another dedicated to *Brotero* for the Coimbra Botanical Garden and finally the colossal bronze in memory of *D. Afonso Henriques*, the first king of Portugal which rests on his monument in Guimarães. Among his most creative works we can see the busts *Cabeça de Negro* and *Flor Agreste*. It's worth noting the posthumous success of this prototype in the history of Portuguese

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reproduction sculpture. The marble of this iconic figure dates to 1881, when the artist reached his peak: this is the year in which he won the competition for Professor of Sculpture at the Academia do Porto with the nude male *Narcissus*, showing a clear French influence.

Soares dos Reis' natural gifts for the Fine Arts and the knowledge obtained during his academic career provided him with the tools for teaching and executing his work. Here we must consider clay models as a transitional material and original plaster models. Some of them, including the impressive plaster model of *Brotero*, can be seen in a photograph taken still *in situ*, that is, the studio of the ill-fated artist (Figure 2). We are talking about his house-atelier in *Santa Marinha*. In the local Archive there is the demand filed on October 17, 1877, with request for this construction on Soares dos Reis' land on Rua Nova da Serra do Pilar corresponding later to 33 *Rua Luís de Camões V. N. de Gaia*. This is equivalent to the initial plan of the studio, showing a window and side entrances including the confrontation of the land and indication of a tank for preparing the clay and a well with a pump (Figure 3); the plan is a pen drawing on vegetal paper which seems very interesting for our theme (Figure 4).

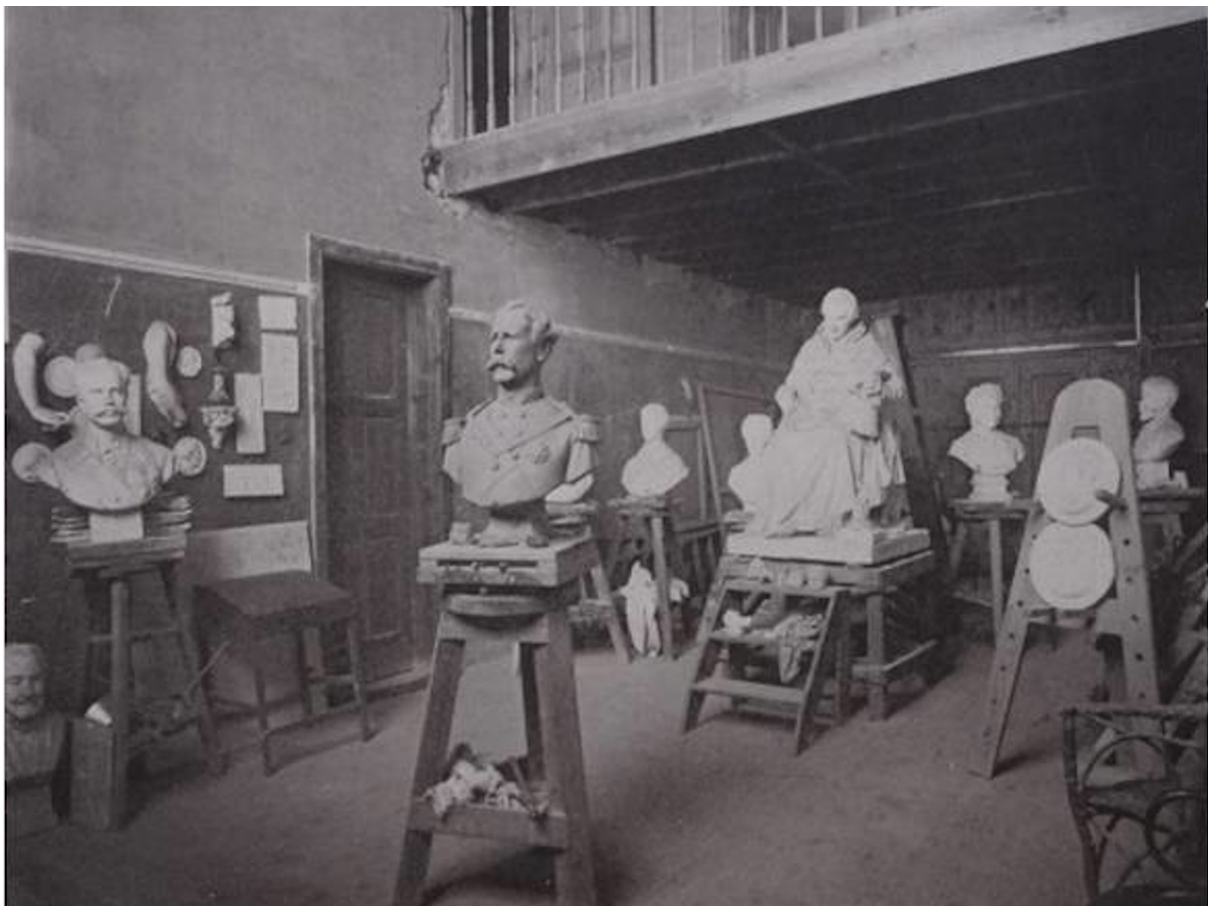


Figure 2 – Soares dos Reis' workshop in Rua de Camões (Gaia) photographed for the *Álbum Fototípico e Descritivo da Obra de Soares dos Reis*, 1889. ©DGPC/ MNSR

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Figure 3 – Detail of the *Project for the Artist's atelier on Rua Nova da Serra do Pilar*, c. 1877, MNSR. ©DGPC/ ADF

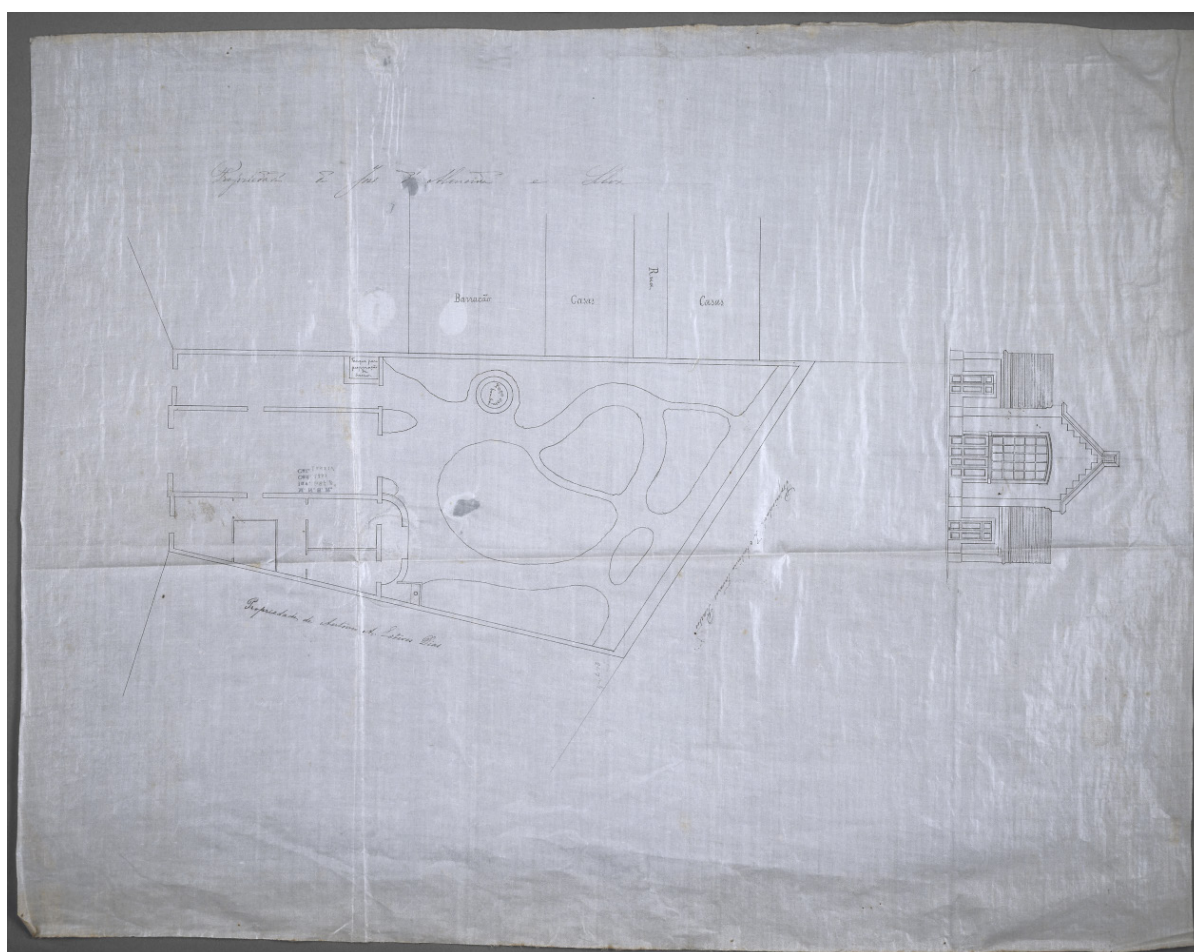


Figure 4 – *Project for the Artist's atelier on Rua Nova da Serra do Pilar*, c. 1877 MNSR. ©DGPC/ ADF

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The Museu Nacional Soares dos Reis (MNSR) houses among other works of art a considerable number of original plaster models. Nowadays, they are a source of technical information due to the execution marks left on the support. In a work project delineate between MNSR and Laboratório José de Figueiredo (LJF), six plaster sculptures were selected, to start the intervention process of conservation and restoration of the body of work authored by the sculptor who gave his name to the Museum. In this context the plaster models *Cabeça de Negro* (83 Esc MNSR), *Bust of Fontes Pereira de Melo* (Dep. 18), *Narciso* (3 Esc MNSR), *São Joaquim* (8 Esc MNSR), *São José* (7 Esc MNSR) and *Brotero* (58 Esc MNSR) were selected.

The plaster models by Soares dos Reis are the original that were transposed to stone or metal and take part of the constructive process, seen as a transitory phase, with considerable historical and artistic value. They go through various stages of the creative process and technical execution and all of them are valuable testimonies. The work normally starts with a drawing (Figure 5), then the making of a clay *maquette* to be approved by the commissioner as we can see in the catalogue *Soares dos Reis, Memória e Reconhecimento* (1988), followed from a natural size clay model that ends up being lost in the mould's execution. The transitions to the plaster models and later to sculpture in metal or stone works are made from a mould, that also ends up being lost. For example, in the work dated c. 1886, which portrays *Félix Avelar Brotero*, a distinguished Portuguese Botanist and professor, one can see the various stages carried out by the sculptor (Figures 6, 7). Diogo Macedo Júnior mentions that he sent a portrait on a canvas that did not impress the artist; therefore, a live model seated was also used, a Galician boy, neighbour of him. In the transition from plaster to marble, the model was distorted by the moulders, did not come out as wanted and the artist had to correct it, believing on the mentioned Diogo de Macedo (Cf. Santos Triães, 1988, p. 52).

The plaster models often end up being deposited or stored in studios, museum reserves, incorporating collections or among other places. The importance of conserving the models is because they are true testimonies of the author himself, who often signs and dates the work (Figure 8), as in *Cabeça de Negro* "A. S. dos Reis 1873" (Figure 9) and as in *Narciso* "A. S. dos Reis 1881".

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Figure 5 – Brotero's statue study, ink on paper, in *Soares dos Reis, Memória e Reconhecimento*, 1988, p. 88



Figures 6 and 7 – Plaster model of *Brotero*, 1886, front and back, during the intervention. ©LJF/DGPC

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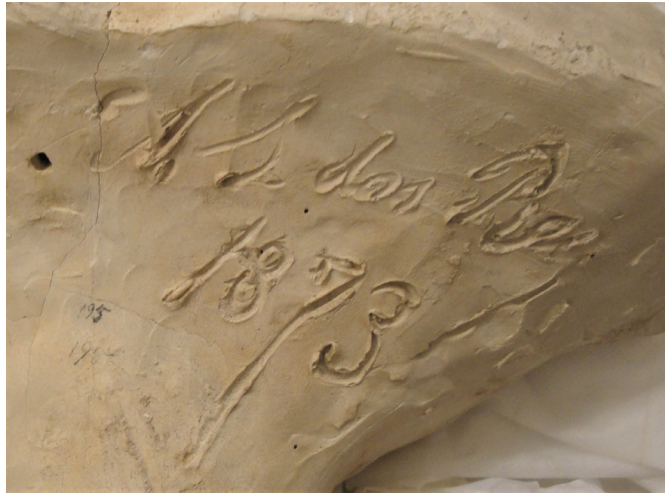


Figure 8 – Artist's signature in *Cabeça de Negro* ©LJF/DGPC



Figure 9 – *Cabeça de Negro* ©LJF/DGPC

It is important to know not only the materiality but also the execution techniques, to define the intervention methodology. The plaster shows marks of the execution process such as incisions, textures, and different first tinted mould release layers, due to their function as a transition model. In general, they were in good condition, showing some superficial alterations mostly due to direct physical causes.

The conservation work carried out followed the principles of minimum intervention. The aim was maintaining the authenticity of the works of art, the patina, and the integrity of the academic testimonies of the technical execution. Our challenge was not altering the original material but keeping the marks of the execution process.

Plaster

The use of plaster can be traced back to Ancient Egypt, though presumably it must have existed before then (Mills, 1990a, p. 172). The name plaster of Paris, as it is often called is calcium sulphate hemihydrate ($\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$), before it is mixed with water, and calcium sulphate dehydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) after setting. It was named so because there are large deposits of gypsum below the city of Paris where it was first produced commercially in large quantity, to a reliable standard (Basset and Fogelman, 1997, p. 43). However, its extraction can be done in several countries. Originally in Portugal, plaster was found in the following deposits: *Porto de Mós*, *S. Martinho do Porto*, *Óbidos*, *Monte Real*, *Serra da Arrábida*, *Leiria (Parnelhas)*, *Soure (Alencarce)*, *Pombal (Mouriscas)* and *Alcântara (Lisboa)*. Currently, we can still find it in Óbidos and Soure (Frade, 2018, p. 31).

Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) is a crystalline solid matter that occurs in nature, when heated and finely grind makes a white powder. In the preparation of plaster of Paris, the gypsum mineral is heated at moderate temperature, 150°C to 200°C, to remove some of chemically bound water (Torraca, 2009, p. 47). It is used in the form of a fine light-coloured crushed powder. When this powder is mixed with water forms a paste that solidifies by chemical reaction, physical and mechanical processes named rehydration. The amorphous gypsum produced during the firing of the gypsum stone crystallizes again, constituting the setting gypsum. It re-crystallizes to make a hard solid and brittle material, fine-textured, easily mixed and applied, relatively quick-setting and inexpensive.

The gypsum qualities are plasticity after mixing with water and solidify after drying, depends on the gypsum stone used and the way it was mixed with water (Baudry, 1984, p. 96). The normal proportion is equal parts by volume of water and gypsum, but this ratio may vary. The gypsum powder is poured into a container of water and then stirred. The process of change is from a dense opaque liquid to a denser state, gradually becoming stiffer in consistency till it solidifies and hardens. The action of re-crystallization is rapid and causes the plaster mass to become warm (Mills, 1990b, p. 36). Gypsum becomes solid after cooling.

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It is a material used in sculpture modelling and moulds technique, as well as in the composition of *stucco*, can be worked fresh or after setting. In the sculpture process, it can be used to reduce or enlarge volumes. Gypsum may thus be used without fillers, but its mechanical properties are weak, with low hardness may be scratched by a fingernail. It's a hygroscopic material, slightly soluble in water and its weak mechanical strength is further reduced in a damp environment.

The use of gypsum plaster for reproductions of stone and bronze sculpture became increasingly common in the XVIII and XIX centuries, to reproduce famous classical works of art. In art schools, these plaster models were available for studying and copying. In the XIX century, artists increasingly produced gypsum plaster reproductions of their own compositions (Basset and Fogelman, 1997, p. 44).

Sculpture execution process

The process of making a sculpture is quite complex and sometimes difficult to understand. The various execution techniques that the artist should master are not perceptible in the final work.

The clay modelling process imprints marks from different origins such as fingerprints, textures left by tools and spatulas, damp cloths, blade lines to separate *tacelos* and cutting tool marks. In the transition to another more resistant material, those marks may remain on the models. Other different marks that result from the passage of the mould into plaster, stone, or metal, besides being visible, are definitive in the form of holes and crossed marks (Figure 10). Detailed observation of the plaster surface was made, and it was possible to detect these marks on the models. The artists covered their works with wet cloths to keep the clay moist, soft, and easy to work with. The texture left by the cloths sometimes ends up being visible on the plaster model, as can be seen in the bust of *Fontes Pereira de Melo*.

From the clay model, moulds are made and divided into *tacelos* that give rise to the plaster model (Figure 11). The first layer applied consisted of a pigmented plaster, or sometimes shellac, which had the function of releasing and helping to separate the mould from the model. In the sculptures that were submitted to intervention, we can superficially observe traces of yellowish and greyish colorations, which we believe to have been left by these substances (Figure 12).

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Figure 10 – Detail of Child's head. *São José's sculpture*. Holes and cross marks ©LJF/DGPC



Figure 11 – Detail of *Narciso's* head. Blades and *taceiros* ©LJF/DGPC

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Figure 12 – Bust of *Fontes Pereira de Melo*, yellowish and greyish releasing agents' colorations. ©LJF/DGPC

In the academic publication *Tecnologias da Escultura* by the master sculptor Pedro Anjos Teixeira (Teixeira, 1980, p.19), he explains extensively the materials and instruments that can be used in the making of a sculpture from the clay work till the mould and model. Metal blades were used to help separate the *tacelos* from the clay model, by overlapping the blades against each other (Figure 13), so that the plaster could be easily removed without prejudice of the original shape as described in Anjos Teixeira's publication (Figure 14). We present in parallel the tools and the marks found. For example, in the *Cabeça de Negro* (Figure 15) there are cross and hole marks of a fixing point of pantograph and compasses (Figure 16). Also visible marks of fingerprints (Figure 17) imprinted on the clay. The sculptor's fingers were considered a tool. Anjos Teixeira says that clay tools replace the fingers (Figure 18) where the tools cannot reach (Teixeira, 1980, p. 42).

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Figure 13 – *Cabeça de Negro*, overlapping blades against each other. ©LJF/DGPC

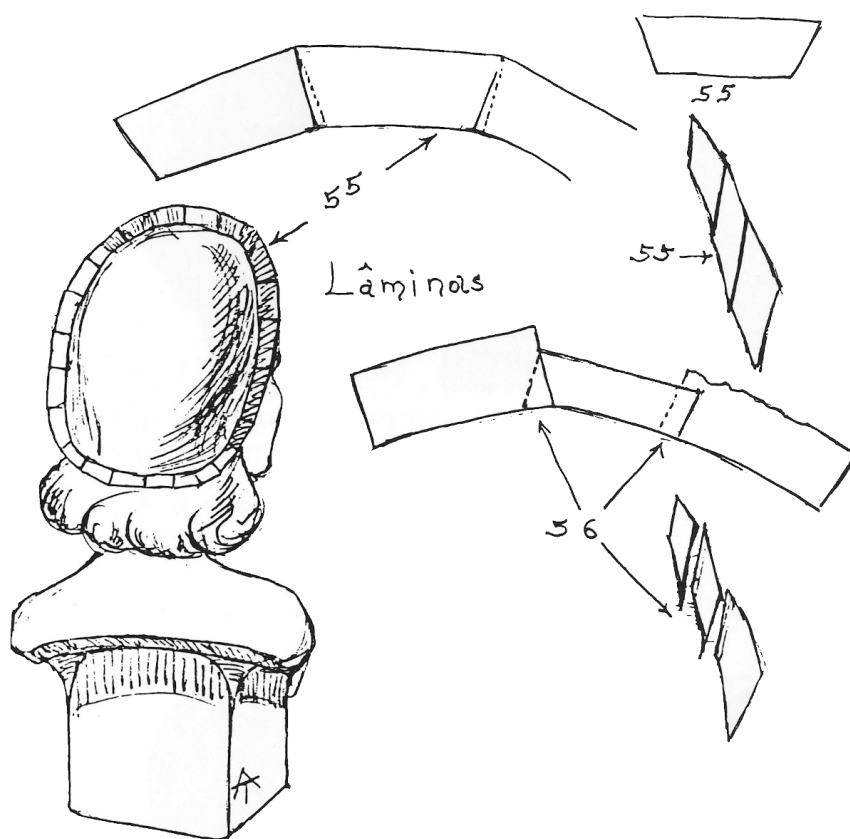


Figure 14 – Overlapping blades, in *Tecnologias da Escultura*, 2006, p. 55

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Figure 15 – *Cabeça de Negro*, cross and hole marks of a fixing point of pantograph and compasses. ©LJF/DGPC

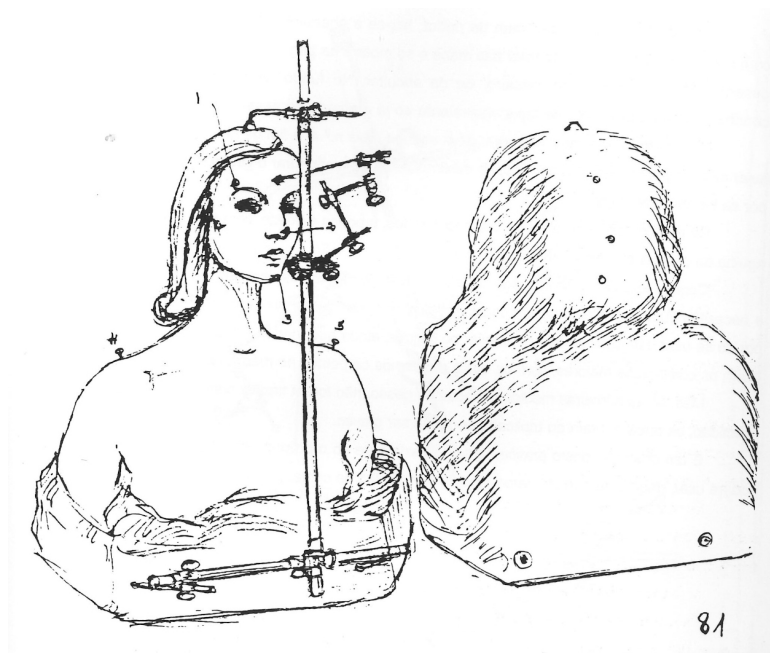


Figure 16 – Pantograph, in *Tecnologias da Escultura*, 2006, p. 85

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Figure 17 – *Cabeça de Negro*, marks of fingerprints. ©LJF/DGPC

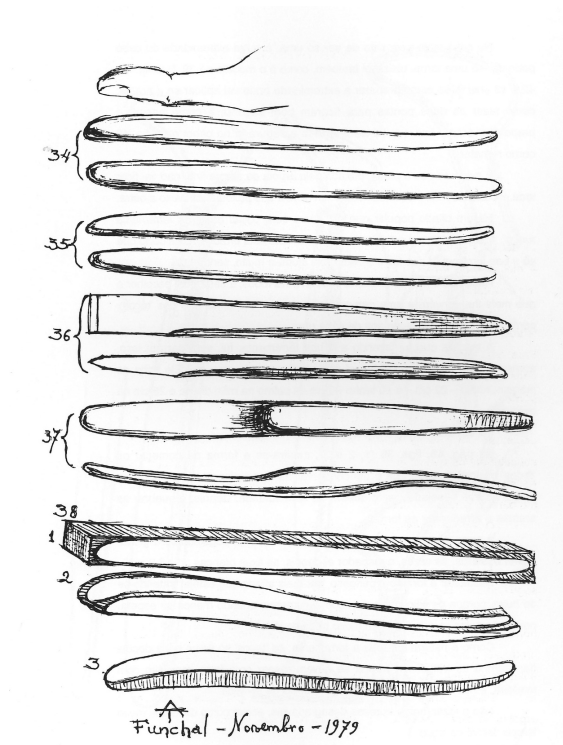


Figure 18 – Tools, in *Tecnologias da Escultura*, 2006, p. 43

In the sculptures of *S. Joaquim* and *S. José*, the *tacelos'* union are evident. The blade marks of the transitional material clay models (Figure 19) were kept visible. Like what Anjos Teixeira demonstrated, the pantograph fixation point was left on both heads (Figure 20).

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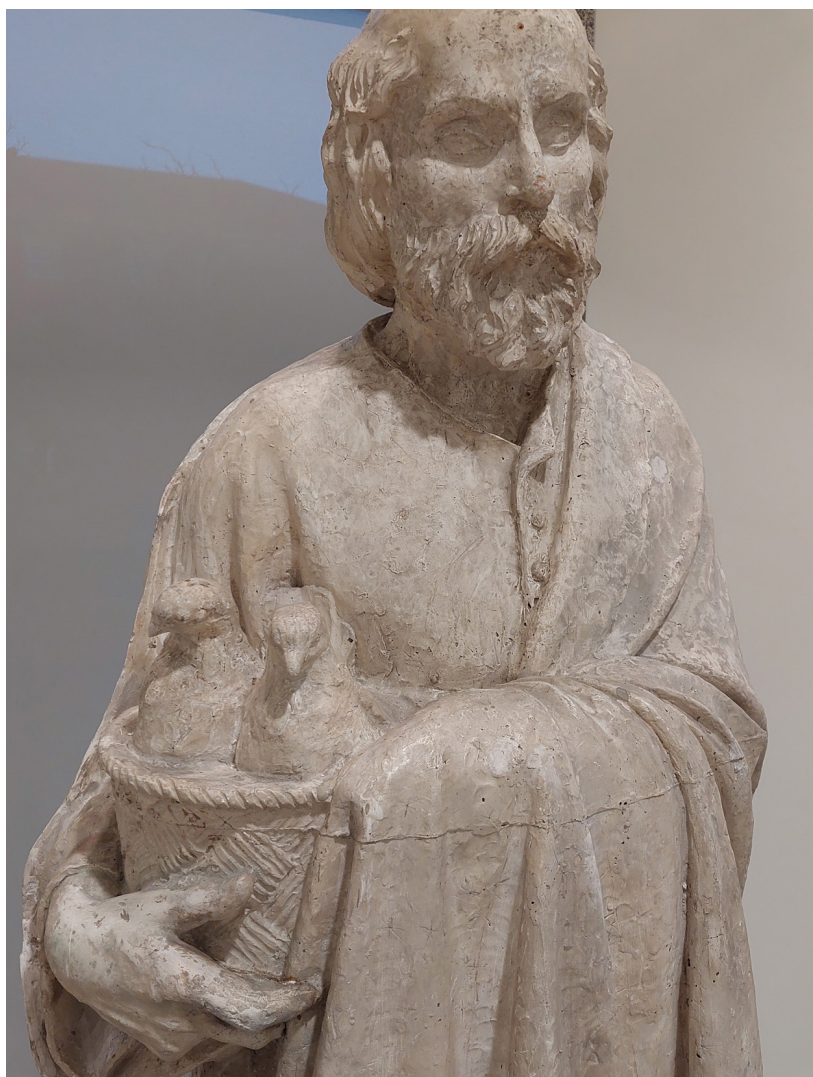


Figure 19 – *S. Joaquim*, *tacelo cut*. ©LJF/DGPC



Figure 20 – *S. José*, *pantograph fixation point*. ©LJF/DGPC

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The sculpture *Brotero* presents a tarnish grey wash over another brown colour not seen on the other sculptures. It shows that the plaster would have been intentionally patinated. The use of *patina* was recurrent since plaster is a transitional material, as it does not have the desired finish and for a better perception of shape. It was common to isolate the plaster with shellac, and then tint it by adding earths – burnt Sienna, ochre, and the carbon black pigment (Teixeira, 2006, p. 102).

The table 1 summarizes the data of which plaster models, by Soares dos Reis, were transposed to stone and bronze with the respective dates and location.

Table 1. Transposition to stone and bronze from original plaster.

Title	Material	Date	Owner
<i>Cabeça de Negro</i>	Original plaster	1873	Museu Nacional Soares dos Reis – Inv. 83 Esc MNSR, Porto
	Carrara marble - first quality	1874	Private collection
	Bronze - Foundry L. Gasne 1904, Paris		Museu Nacional de Arte Contemporânea, Chiado, Lisboa
<i>São José</i>	Original plaster	1880	Museu Nacional Soares dos Reis – Inv. 7 Esc MNSR, Porto
	Granite		Chapel of Divino Coração, Palacete dos Pestanas, Porto
	Bronze – sand casting		Museu Nacional Soares dos Reis – Inv. 52 Esc MNSR, Porto
<i>São Joaquim</i>	Original plaster	1880	Museu Nacional Soares dos Reis - 8 Esc MNSR, Porto
	Granite		Chapel of Divino Coração, Palacete dos Pestanas, Porto
	Bronze – sand casting		Museu Nacional Soares dos Reis – 53 Esc MNSR, Porto
<i>Narciso</i>	Original plaster	1881	Museu Nacional Soares dos Reis – Inv. 3 Esc MNSR, Porto
	Bronze – sand casting		Museu Nacional Soares dos Reis – Inv. 171 Esc MNSR, Porto
<i>Brotero</i>	Terracotta model maquette		Private collection
	Original plaster	1886	Museu Nacional Soares dos Reis - 58 Esc MNSR, Porto
	Carrara marble – second quality	1887	Botanical Garden of Coimbra
<i>Fontes Pereira de Melo</i>	Original plaster	1889	Museu Nacional Soares dos Reis - Dep. 18 ACP, Porto
	Bronze cast by José Joaquim Teixeira Lopes		Palácio da Bolsa - Porto

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Narciso's plaster model, which consisted in his exam for the competition for Professor of Sculpture at the Academia Portuense de Belas Artes, later cast in bronze, both sculptures integrate nowadays the collection of the Museu Nacional Soares dos Reis at Porto.

State of conservation

In general, the plaster models *Cabeça de Negro*, bust of *Fontes Pereira de Melo*, *Narciso*, *S. Joaquim* and *S. José* are in a good state of conservation, kept at the MNSR collection. The *Brotero* plaster model is the only one that it's on permanent display in the museum. They were selected to be shown at the permanent exhibition in the remodelled room dedicated to sculptor António Soares dos Reis.

The damages and degradations shown in the plaster are caused by factors of chemical origin, such as the irregular environmental conditions, dirt deposits, traces of iron oxides; or from or physical mechanical origin such as lacunae due to mutilations, fractures, longitudinal cracks due to mechanical shock and scratches.

Other minor alterations are late interventions, superficial adherent dust, stains from different origins such as cast release materials and a gray wash. This evaluation was made based on direct observation with naked eye and magnifying glasses.

The technological examination reveals the technical structure of the work, the technique used by the artist and identifies the alteration witch this structure has undergone. However, this *in situ* examination of changes is not enough. It must be complemented by point and area analysis methods of examination, adapted to the type of the support materials.

General principles for the intervention

Gypsum is a very complex material given its physical-chemical nature. The dehydrated gypsum is soluble in water, so plaster is a material which has poor resistance in a moisture atmosphere or in direct contact with water (Torraca, 2009, p. 49). It requires a transversal approach to the conservation restoration technical domain and should avoid the humid procedures. The traditional methods to clean plaster can be grouped into three categories: dry methods (use of electric rubber, laser), wet methods (enzyme and use of volatile solvent mixtures) and use of agar gels (stain). Conservative character was used through minimally invasive interventions.

The intervention methodology of a plaster work cannot in any way neglect the specific characteristics of the material: its low hardness, which translates into weak resistance to uncontrolled mechanical actions, high hygroscopicity and porosity, technical models' execution, the materials used, the surface finish, the use of patina and the principle of minimal intervention. These were the preponderant choices of the intervention methodology (Bonetti, 2016, p. 59).

Conservation and restoration

The intervention was quite similar in all sculptures, starting the surface cleaning with vacuum up dust; in the three cases *Cabeça de Negro*, *Fontes Pereira de Melo* and *Narciso*, the interventions used light abrasive methods such as soft rubber manually and controlled electric eraser. The inaccessible areas, as well as in more persistent stains, were applied cotton swabs slightly humidified with weak solvents. Finally, a chromatic reintegration with tempera technique was applied and a protection layer of a non-ionic penetrating consolidant of cellulose ether, was employed to avoid gypsum powdering. In both sculptures *S. Joaquim* and *S. José*, were made consolidation of detachment fragments, with an aqueous synthetic resin and filling of small gaps with calcium sulphate or carbonate fillers. After cleaning, the sculpture of *Brotero*, one original uneven grey wash was chromatic reintegrated with tempera technique and was applied a cellulose ether as a protection layer of the friable material.

Conclusion

The constituent material, gypsum, is characterized by being friable, high porosity, hygroscopic, vulnerable for physical damage, and susceptible to biological colonization. Its hygroscopic nature results in the attraction of moisture and dust, which often leads to soiling of the pores at the surface.

This work has raised some important issues and the goal was to maintain the authenticity of the works of art, the patina and the integrity of the academic testimonies of the technical execution. The patina wear causes a discontinuity which alters the surface layer and, consequently, the depth of the surface tones and the spatial unity of the sculpture. With a conservation and restoration intervention, the disturbance caused by wear disappears, the forms recover their continuity and by improving the sculpture image, they allow the restorer to judge losses properly and to decide in what measure it is possible to reconstruct them.

To treat a friable material keeping the execution marks for the final transition material, the plaster model, leaving it as a testimony and valuing it as an original work, signed by the artist himself, proving the authenticity of the work, was the challenge of the intervention.

References

- Basset, J., & Fogelman, P. (1997). *Looking at European Sculpture. A guide to technical terms*. London: Getty and V&A Publications.
- Baudry, M. T. (1984). *La Sculpture – Methode et Vocabulaire. Principes d'analyse scientifique*. Ministère de la culture et de la communication – inventaire général des monuments et des richesses artistiques de la France. Paris: Imprimerie Nationale.
- Bonetti, S., Giordano, A., Saladino, M. L. & Traina, G. (2016). Problematiche conservative Indagini di diagnostica e interventi di pulitura, in G. Cipolla (Ed.) *La Gipsoteca dell' Accademia di Belle Arti di*

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Palermo conoscenza, conservazione e divulgazione scientifica (pp. 58-65). Palermo: Accademia di Belli Arti di Palermo.

Frade, M. C. (2018). *Conservação e Restauro de Esculturas em Gesso. Valorização, Metodologia, Ensino*. Vol. I. Lisboa: Universidade de Lisboa. Tese de Doutoramento.

Macedo Júnior, D. J. (1937). *Soares dos Reis (Recordações)*. Porto: Marques Abreu – Editor.

Mendes, A. (Dr.) (1889). *Album phototypico e descriptivo das obras de Soares dos Reis precedido d'um perfil do grande artista*. Edição do Centro Artistico Portuense. Porto: Typographia Occidental.

Mills, J. W. (1990a). *Encyclopedia of Sculpture Techniques*. London: B. T. Batsford Ltd.

Mills, J. W. (1990b). *The Technique of Casting for Sculpture*. London: B. T. Batsford Ltd.

Mora, P., Mora, L., Philippot, P. (1984). *Conservation of Wall Paintings*. Butterworths Series in Conservation and Museology. ICCROM.

Santos Triães, P. (1988). In "Fotobiografia e catálogo de obras". In *Soares dos Reis - Memória e Reconhecimento*. Baldaque, M.; Almeida, B. P. (coord). s/l: Instituto Português do Património Cultural.

Teixeira, A. T. (1980). *Tecnologias da Escultura*. Madeira: Instituto Superior de Artes Plásticas da Madeira.

Teixeira, P. A. T. (2006). *Tecnologias da Escultura*. Sintra: Câmara Municipal de Sintra.

Torraca, G. (2009). *Lectures on Materials Science for Architectural Conservation*. Los Angeles: The Getty Conservation Institute.

Authors' Curriculum Vitae

Elsa Murta is a conservator-restorer specialized in sculpture. She has a Bachelor in Conservation and Restoration of polychrome sculpture, and a Master Degree in Decorative Arts by the Universidade Católica de Portugal (2010). Since 1986 she has worked at the Laboratório José de Figueiredo in Lisbon and has tutored curricular internship students from national and international universities. She also participates regularly in seminars, congresses, lectures in the field of conservation and restoration of polychrome sculpture and architectural decoration. She is author of written works, either individual or in co-authorship edited in peer reviews, book chapters, preprints and post prints of congresses of specialization in the field of conservation and restoration.

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Michèle Portela is a conservator-restorer with an extensive experience. She has a postgraduate in Museology and Museography by the Faculty of Fine Arts of the University of Lisbon (2012), a Bachelor's degree at the Instituto José de Figueiredo, Lisboa (1986) and a Course of Fine Arts at the Escola Superior de Belas Artes de Lisboa (1979). She has also participated in several professional courses such as Mural Painting Conservation Course (1992), ICCROM, Rome (Italy), and a Conservation and Restoration of Mural Paintings (1986), F. R. of Yugoslavia. She has worked at the Instituto José de Figueiredo (1984-1995, 1999-2002, 2008-2021) and at Instituto Cultural de Macau (1995-1999). She has been involved in conservation and restoration projects, training and mentoring of trainees, workshops, tutorial of curricular internship students, participation in seminars, and posters, among others.

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the challenge of the conservation and restoration**

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