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Oral Presentation

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The Mouruás Sword: Cultural Heritage, Digital Humanities, and Ancient Metalcraft between the Iberian Peninsula and the Legacies of the Rhine

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The Mouruás Sword is a metallic artifact, primarily characterized by the casting process, in this case, using bronze, a metallic alloy primarily composed of copper and tin, with variable proportions of other elements such as zinc, aluminum, antimony, nickel, phosphorus, and lead, followed by forging, hammering on an “anvil,” or pressure applied by another tool to shape the piece after it is removed from the mold, usually a ceramic or refractory clay mold.

Regarding the "Mouruás Sword," it is a weapon, apparently of an honorary type or belonging to a person of a certain social status, integrated into the communities occupying the territories of Northern Spain, Northern, Central, and Southern Portugal, Southern Spain, and other places, between 1000 and

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900 B.C. This fascinating archaeological artifact is held at the restoration and conservation services of the Archaeology Museum of Ourense, under inventory number CE003942.

The so-called Mouruás Sword was discovered in November 1968, exactly 55 years ago this month, at a site called Portela do Alto de Cerdeira (Peneda dos Castros), near the Navea River, where it meets the Sil River, in the village of Mouruás. The discovery was made during the explosion of a drill while extracting stone from a quarry close to Mouruás for road construction.

The artifact measures 68.5 cm in length, has a maximum thickness of 1.1 cm, and a maximum width of 5.7 cm. The sword weighs about 820 grams. The sword consists of a long blade with two edges and a tripartite, perforated hilt. It features a lenticular blade with smooth ridges and a pronounced central ridge at the proximal end for reinforcement.

At the junction with the hilt, there is a decorative motif resembling a fishbone on one of the corners. The hilt would consist of a guard, a grip, and a pommel, with the grip being rectangular, with lateral flanges and three longitudinally arranged holes.

The sword was cast in a bivalve mold and subsequently forged, likely on an anvil. The holes were made by drilling, although it is possible that a thinner area was formed in the mold to place them. The perforations in the guard show traces of metal displacement due to drilling on one of the faces.

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The blade was worked by forging, forming a smooth central ridge and a simple bevel on the edges, and it is naturally possible that the thermal treatment after successive forgings was insufficient to homogenize the metal, leading to various transverse striations on the blade. The overall finish is polished, and the surface shows significant longitudinal abrasion. The sword is classified as “pistiliform,” resembling the pistil of a flower. This designation is closely related to other swords from various parts of the Iberian Peninsula and Europe. These artifacts are closely connected to the communities of the Bronze Age in central Europe.

Although the topic of Bronze Age swords is somewhat controversial and complex, the typology of the Mouruás Sword leads us to Central Europe, to the border between Germany and Switzerland, near the Rhine, at the Hemigkofen site, an “apparent origin” of this type of artifact. This region near the Rhine River is an area with significant archaeological remains from various periods.

Although the literature mentions an intrinsic connection between pistiliform swords found throughout Europe and the Iberian Peninsula and the Hemigkofen region, the cultural component of these artifacts lies within the so-called Hallstatt archaeological contexts or horizons in Austria, specifically the "Hallstatt A" culture, an archaeological culture based in Hallstatt, Austria.

The Hallstatt site, a Bronze Age cemetery with over 1000 burials, was excavated in the 19th century by the Austrian Johann Georg Ramsauer. It

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generally represents the apparent starting point for the so-called Urnfield culture, closely related to artifacts like the Mouruás Sword.

The three sites discussed here (Hemigkofen, Hallstatt, and Mouruás) are, in a simplified manner, naturally framed within the contexts of the major watercourses and natural and environmental features of Europe. Despite its limited presence in Iberian archaeological literature, the Rhine River is where several of Europe's most interesting archaeological cultures developed. From Hallstatt to the village of Mouruás, there is a distance of approximately 2000 km, a journey on foot that would take about 479 hours, or about 60 to 62 days. This was, during the Bronze Age, a dangerous, extreme, and exhausting journey, even if made in groups. Naturally, this journey was not made as we would imagine today. Depending on needs, conflicts, trade, ways of life, and demographic, climatic, and other issues, these groups gradually made incursions into other territories, leaving material evidence of their culture wherever they settled.

Discussing such artifacts is generally a challenging and complex task. As mentioned, they are spread over a vast and dynamic area; they involve complex archaeological contexts and, in some cases, are nonexistent or scarce. They are exceptional, beautiful, and artistically imposing pieces whose stratigraphy is very deficient. However, efforts have been made to understand these realities.

One of the most comprehensive works on this type of artifact was conducted by Gonzalo Meijide Cameselle in his work on "Las espadas del Bronce Final

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en la Península Ibérica," an exceptional study that provides insight into the state of research on this type of artifact.

Among the most relevant and interesting swords in the Iberian Peninsula are: 1 and 2 "Rio Ulla" in Pontevedra; 3 "Carcabuey" in Cordoba; 4 "Zaragoza"; 5 "Espluga de Francoli" in Tarragona; 6 "Dos Hermanas" in Seville; 7 "Mouruás" in San Xoan de Rio, Ourense; 8 "Vila Maior" in Guarda, Portugal; 9 "Sobrefoz" in Asturias; 10 León; 11 "Solacueva de Lacozmonte" in Alava; 12 "Carboneras" in Cuenca; 13 "La Cabrera" in León; 14 "Montijo" in Badajoz; 15 "Verguellina de Orbigo" in León; 16 "Alama de Aragón" in Zaragoza; 17 "Évora" in Portugal; 18 "Évora" in Portugal; 19 "Rio Ulla" in Catoira, Pontevedra; 20 "Rio Ulla" in Catoira, Pontevedra; 21 "Menjibar" in Jaén; 22 "Segovia"; 23 "Rio Esla" in León; 24 "S. Estebo de Rio Sil" in Ourense; 25 "Rio Ulla" in Catoira, Pontevedra; 26 "Tabernas" in Almeria, 27 "Alconetar" in Cáceres; and 28 "Rio de Huelva."

This represents a vast artistic and craft heritage from an ancient era. Each sword is undoubtedly unique. The molds used would typically be destroyed after the casting. In addition to this process, the sword would be further shaped through forging and hammering on an “anvil.” Finally, the hilt would be made of wood or bone, fixed with bronze nails. The final result is not just of historical, archaeological, and museographic interest but also a work of art over 3000 years old.

The small contribution we bring here involves using non-intrusive methods that allow for the precise documentation of this type of artifact or others. As previously mentioned, this recording work was first requested from the

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Museo Arqueolóxico Provincial de Ourense, where Dr. Ana María Veiga, a museum technician, provided all the information and assisted us with the procedures for obtaining the necessary legal authorizations and access to the artifact through museum technicians and conservators.

On May 30, 2023, photogrammetric surveys of the artifact were conducted using two reflex cameras and lighting through a ring with diffuse light and measurement of lighting conditions. Photogrammetry techniques were used, followed by digital processing of each photograph, removal of high contrasts, and subsequent processing in Autodesk Recap. This 3D model is currently being finalized and will soon be uploaded to the Heritage Department at the University of Minho, who provided their unconditional support for this initiative, and we thank them.

The work was led by Gerardo Vidal Gonçalves, in collaboration with Dina Borges Pereira, who supervised the implementation of photogrammetric methods for recording the artifact. This recording aims to document, exhibit, and share through online databases and the Archaeology Museum of Ourense. Our mission is to preserve, promote, and exhibit this cultural heritage, ensuring it reaches a wider audience and remains accessible to future generations, researchers, and scholars.

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