

## Orio IV: The Archaeological Investigation of an Ore Carrier (patache venaquero) from the 16<sup>th</sup> - Century

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Gipuzkoa is a Historic Territory of the Basque Country and the Oria is its longest and largest river. Its source lies in the eastern part of Gipuzkoa bordering on Navarra which in turn is the divide between the Cantabrian and Mediterranean slopes; it ends at the fishing port of Orio.

This river was navigable up to the shipyards of Aginaga, six km upstream from its mouth. Over time, a good number of ironworks and shipyards were established along its path and its tributaries, as the ships built on the estuary were able to navigate it, and it allowed the inland transport of iron ore, predominantly from Bizkaia, and the exportation of manufactured iron to the most important ports of the coast.

Throughout history, the biggest problem in navigating this river has been the moving shallow sandbank at its mouth. During storms it is practically insuperable, leading to a high number of shipwrecks occurring even up to today.

### The Finds

During dredging of the estuary of the Oria in 1991, remains of a wooden boat were found on the riverbed. Learning of this find through personal communication with the diver working on the river clearing, it was clear that in order to continue with the dredging, the discovered wreck would have to be destroyed. In view of these circumstances, the author developed an emergency excavation and recovery project with the financial support and authorization of the Regional Council of Gipuzkoa for this find, which was named the *Orio I*.

The emergency excavations were carried out simultaneously to the dredging, as the dredging company refused to halt their work during the archaeological interventions, for purely economic reasons. This meant that the dredger continued its work from the surface whilst the archaeologists investigated the riverbed below without maintaining any safety buffer zone between the two activities.

During the excavation, a second wreck named the *Orio II*, dating from the beginnings of the 16th-century, was located. It too was at great risk of destruction by the dredging, and therefore its investigation and recovery also became necessary before further dredging took place.

As a result, the following year, the *Orio II* was excavated under identical circumstances, which is to say by the same team of archaeologists, with the authorisation and backing of the Regional council and simultaneous to the dredging of the river. During this excavation, the presence of yet another wreck was noted, the *Orio IV*. However, as it was located outside the dredging perimeter and its physical integrity was

therefore not endangered by the works, it was considered preferable to preserve it *in situ*.

A year after the excavation of the *Orio II*, during the periodic monitoring carried out by the Society for Underwater Investigation (INSUB) of the commercial sand dredging project in the Oria river, a shipment of iron ingots dating from between the mid 15th- to mid 16th-centuries was found, probably manufactured in one of the area's ironworks. In the excavations that were carried out, no further ship remains were found associated with this cargo.

### Legislation

According to the Basque Cultural Heritage Law, archaeological remains can be protected under three different legal regimes: declared sites, inventoried sites, and areas of potential archaeological interest.

In all three cases, in order for an archaeological intervention to occur, the proposing entity must solicit authorization from the Department of Culture of the Regional Council of the historic area concerned on the basis of plans for the archaeological project.

The estuary of the Oria, where the above-mentioned works were carried out, does not benefit from legal protection in matters of archaeology, despite the fact that five wrecks have been discovered there since 1992 and that it constitutes a historically important navigable route.

### Impact and Archaeology

In 2000, the Basque Government's Department of Public Works and Transportation, promoter of the dredging works, drew up a project for the construction of a fishing port on the left bank of the Oria. Due to the absence of archaeological protection, an archaeological survey was not included in the project. The Regional Council of Gipuzkoa, aware both

**Figure 1: View of the point where the metallic bulkhead of the pier cuts the structure of the boat without damaging the rest of the architecture**





**Figure 2: Given that the stern is located closer to the center of the river, it was more exposed to fluvial abrasion than the rest of the wreck and consequently was further damaged; the stern was, however, significant enough to be able to clarify the typology and chronology of the wreck**

of the scope of the proposed works and of the underwater archaeological record in the area, alerted the promoting department of the Basque Government with regards to the necessity of developing an archaeological component.

It was estimated that the archaeological impact created by the proposed works would include the total destruction of the *Orio IV* wreck discovered in 1992. The archaeological project drawn up by the author proposed the investigation of the site, its complete salvage and its subsequent conservation. In this respect, it is worth noting that the philosophy followed by the author in all archaeological projects he has so far proposed is the preservation of wrecks *in situ* and to proceed to their excavation only to avoid the destruction of the archaeological remains, or when it is the only means available to uncover a significant body of knowledge.

After ten days of survey work through dredging, with no signs of the wreck, the company considered the locating efforts over and thus the archaeological investigation was closed.

However, once all of the infrastructure works for the port were complete and eight months after the archaeological survey had been terminated, the excavating equipment brought up the first pieces of the wreck, twenty meters beyond the limits of the previous survey area.

From this moment on, the archaeological excavation was initiated as previously projected, this time with no interferences by other works.

## Sequence of the Work

Once the archaeological excavation begun and during the first three days, work focused on the removal of extra material foreign to the wreck. As and when the first pieces of the naval architecture emerged from the sandy riverbed, they were labelled to anticipate any possible displacement by the water currents.

The entire interior of the boat was covered with iron ore deposits. These were bagged in m3 sacs and raised to the

surface, together with the remains of the wreck's structure, for transport to the desalination reservoir. For this purpose, the 18th-century fluvial reservoir of the Agorregi ironworks was used, today restored and in activity, situated some eight km away. This location is possibly the same ironworks to which the minerals were destined in the 16th-century before the boat capsized.

It has to be emphasised that the area excavated corresponds approximately to only two-thirds of the entire site, since the rest was cut vertically by the exterior metal bulkhead of the new pier construction under which the remaining one-third of the boat remains.

As with previous wrecks, during the final stages of the construction of the pier, the same excavation equipment brought up the remains of a new wreck, named the *Orio V*, composed mainly of bar stocks and other basic derivatives of iron ingots, giving an indication of the archaeological potential of the area. This new wreck lies intact on the riverbed and the Basque Government refuses to initiate any archaeological investigation prior to the continuing dredging of the river. Once again, their preservation will depend on a private initiative.

## Description of the Wreck

The fundamental characteristics of the *Orio IV* are similar to the other two boats found in 1992 in the same estuary, representing Renaissance ore carriers.

*Orio IV* was a coastal transport employed in the transportation of ore along the coast. Its maximum length from the sternpost to the actual exterior bulkhead of the newly constructed pier – that is to say the boat's visible area – is 7.40 m. Its maximum existing width, which corresponds to the area closest to the bulkhead, is approximately 5m.

It is a wooden boat constructed using a floor-futtocks system, with a hull strakes 3 cm thick and an interior lining using loose ceiling planks of oak that cover a space slightly larger than the space covered by the morticed frames.

The keel is sculpted such that in section, it exhibits a T-shaped cross section amidships, tending to a V-shape towards either extremity. This makes for a better attachment of the respective garboard strakes.

The only mast step that has survived is represented by a mortice cut into the keelson amidships. In the same area there was once a mast of which we have no trace. This does not mean that the boat could not have had another mast set on a possible floating mast step, of which we have no trace either.

The stern is flat and its sternpost is joined to the keel with two iron bolts.

The vessel's cargo consists of iron ore, mainly goethite, with a purity of 75%, while the rest is limonite and other minerals. The estimated load of ore, taking into consideration the quantity extracted from the ship and its surroundings, and setting aside the quantity that theoretically must remain

buried under the pier, can be calculated as between 30,000 and 33,000 kg, which is between 600 and 660 hundredweights. This tonnage is within the maximum carrying load typical for this type of ore carrier in the port of Muskiz, which is hypothetically the point of origin of the ore.

### Movable Archaeological Material

Among the few remains found in the wreck, it is worth emphasizing:

- Ceramic shards from three different ceramic vessels. One of the types is glazed green, possibly from Saintonge, France. Another type corresponds to the clear ceramic with caramel glaze, and the third group of fragments belongs to a piece of earthenware, also of foreign origin
- Two fragments of the same rope
- Pine tar pitch in mass
- Caulking between strakes with vegetable remains, possibly hemp
- Leather footwear: This has been investigated in the laboratories of Parks Canada by Stephen Davis. A clear relationship has been found to the shoe from the excavations of Red Bay, dated to 1560 and 1570

### References to the San Juan

Regarding the architecture of the boat, we can point towards very interesting analogies to the Basque whaleboat *San Juan*, sunk in 1565 and investigated and excavated by Parks Canada in Red Bay, Labrador, Canada, as well as to the three other large whaling vessels found in the same bay since 1980. The two fundamental reasons for this relationship are:

These are both vessels built in the Basque Country at around the same time. Although the lengths and uses of these ships are different, the conceptual essence of design and the traditional building method define and base the different manifestations of a unique vernacular architecture, such as:

- The union between floor and futtock by means of a mortice-and-tenon dovetail joint
- The outermost ceiling plank on either side being notched out to receive filler planks set between neighbouring frames, the purpose of which was to discourage water and debris from entering the bilge
- A sculpted keel of varying cross sections

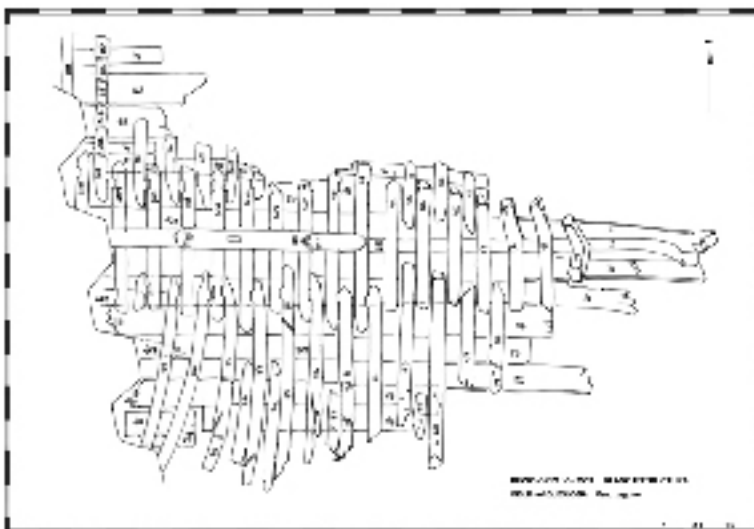
The data that can be provided by the *Orio IV* make it a precious scientific complement for the investigations into 16th-century Basque naval architecture being carried out in Canada, as the naval typology of the ships found in the *Orio* does not exist in Canada. Moreover, the scant equipment found in these boats provides valuable comparative archaeological material for the Canadian investigation, as for example the footwear mentioned above, so far the only example found in the Basque Country.

### Conclusion

This paper addresses the emergency safeguarding actions and investigations that took place, with both physical and administrative difficulty, of several wrecks from the 16th-century affected by works instigated by the Basque Government in a river area lacking legal protection for archaeological remains, in spite of its history and tradition as one of the most navigable fluvial ways of the Historic Territory of Gipuzkoa.

It represents the long voyage of a ship, which in 1530 transported a load of ore to be transformed into iron by the ironworks in this area of the Basque Country, to be then exported around the world. However, a mishap interrupted its journey close to the final destination and since then the ship has remained hidden like a mute witness to history.

Thanks to archaeological science its remains have been brought back to life 475 years later. Its cargo, initially consisting of ore, has now been considerably enriched with all the precious information it has yielded, the product of investigations carried out thanks to private initiative. The ship's short voyage that never came to an end has thus become an infinite course around the world.



**Figure 3: Sketch of the ship without the sheathing to better view the arrangement of the structure and of the hull of the boat; to the left one can see the wall of the newly built port**