

Ironworking in the Mediaeval site of l'Esquerda – Technology for an Agrarian Economy

Imma Ollich, Montserrat de Rocafiguera

*l'Esquerda (Catalonia, Spain); medieval deserted village; settlement structure;
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The site and the archaeological research

The Iberian and mediaeval site of l'Esquerda is situated in Catalonia, south of the Pyrenean mountains, next to the village of Roda de Ter and 70 km north of Barcelona. The site occupies a meander of the river Ter where it crosses the Plana de Vic, an oceanic plateau surrounded by mountains, before leaving the region on its way to Girona and the Mediterranean coast.

The settlement is placed at the top of a meander that forms a peninsula of 12 ha, only accessible from the North. The highest part near the Romanesque church is occupied by the mediaeval site. A large fortification is situated on the north side, where the sedimentary accumulation has preserved the Iberian and prehistoric sediments. The archaeological excavations give us a large chronological sequence, from the later Bronze Age (8th century BC) to 14th century AD (Ollich/Rocafiguera 1990). The last excavations show important Iberian remains, an *oppidum* (some houses and a long street from the wall and towers that close the North side) that is dated by C14 at 5th–4th century BC.

Since 1977 the site has been dug out annually by a team from the University of Barcelona, with a licence from the government of the Generalitat de Catalunya. The team is multidisciplinary, with archaeologists, geologists, anthropologists and biologists, who collaborate with archaeology-students working and practicing their field by digging directly on a medi-

aeval deserted village, and on an Iberian *oppidum*. So, during 3–4 weeks each summer, about 25 people work on both areas of the site: the Iberian and the Mediaeval one. The rest of the year the team works on the analyse, catalogue and restauration of archaeological finds, using a Workroom-Laboratory, provided by the council of Roda de Ter and installed next to the site.

The mediaeval deserted village

The ruins of the mediaeval town of l'Esquerda are in the highest part of the peninsula, and they can be dated between 11th–13th centuries. The mediaeval town was placed over the Iberian *oppidum*, reusing the ancient urban plan and also some structures and materials. Last excavation had shown some structures, houses and streets, work rooms and furnaces, common and private spaces (Ollich/Rocafiguera 1994).

Since the last 8th century, Carolingians had used it as a fortification, *Roda civitas*, mentioned in first at 826, when it was destroyed. In 927 documents mentioned some houses constructed around the church of Sant Pere de Roda. In the mid 11th century a new Romanesque church was constructed, to replace the ancient one. The mediaeval town has grown mostly around it, looking for the protection from the sacred place of 30 feet around, called *sagrera*.

The old mediaeval cemetery is also placed around the church, with the necropolis of an-

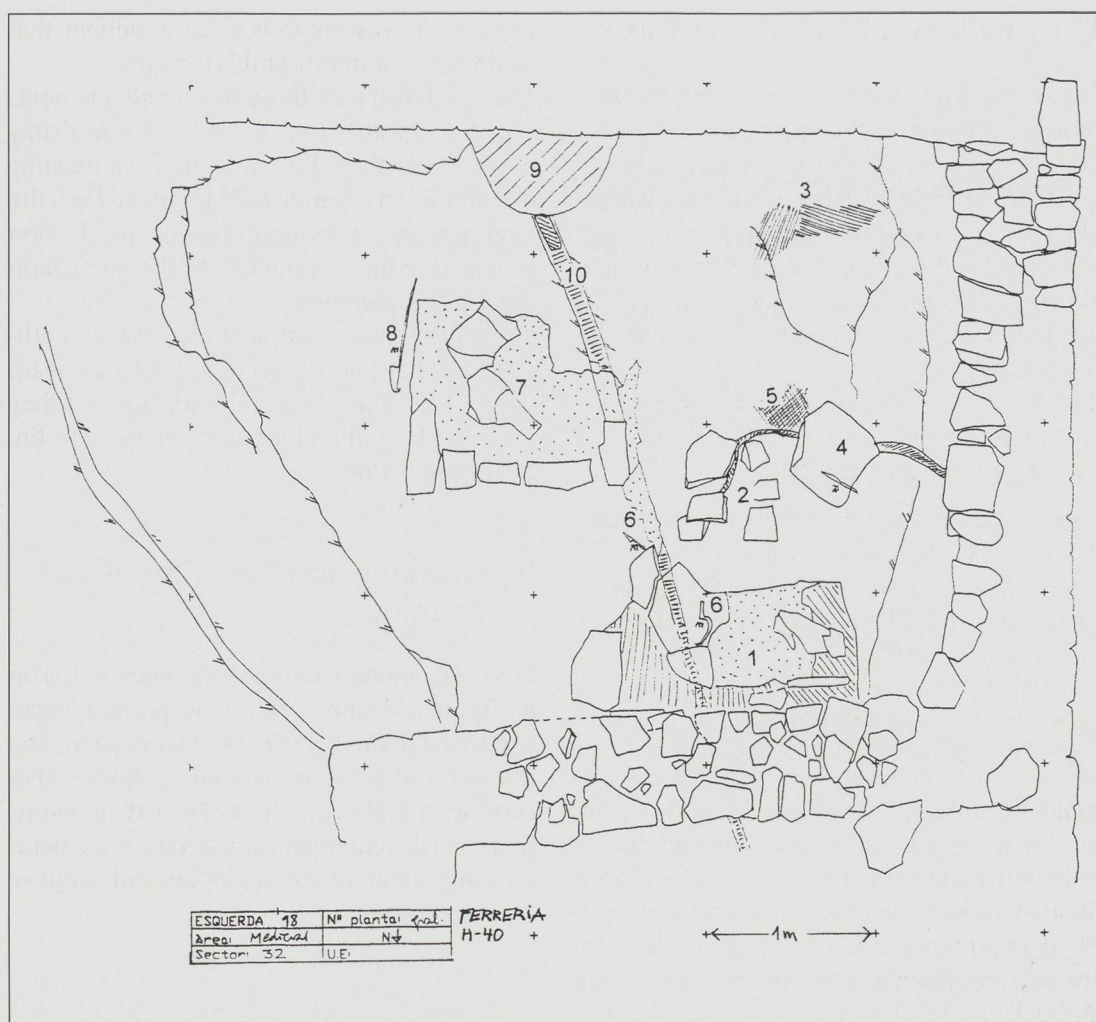


Fig. 1: Map of the blacksmith's forge in the medieval village of l'Esquerda.

thropomorflal graves, dug up in the rock. They are dated between the 9th and 10th centuries, and were covered by another layer of tombs made from flagstones, corresponding to the Romanesque church.

At the north side of the church there is a wide space, like a public square, with workshops and workrooms, where the long street begins which is 2 metres wide and crosses the town and the peninsula and goes to the main door at the walls of the Iberian *oppidum*. The excavations have shown too, some other streets that go across the main street and make a symmetrical planimetry following the ancient patterns of urbanisation (Ollich/Rocafiguera 1992). Generally, houses and workrooms are little squared places, built out of unfashioned country stone and jointed with mortar. The stone walls are 1 metre high and then follow with adobe. The wood timbers, generally oak sup-

port the roof, which is covered with tiles. Rooms are mostly ground level, but someone could have had living space under the roof.

We also found some structures that seem to be dedicated to specialised technological work and craft industry. They are placed at each side of the street: at the east side there are structures for agrarian technology (a granary, a mill, a press, a threshing floor, a haystack, and a haycover). At the west side of the street there are workrooms for ironworking and the production of other metals.

One of these workrooms where they worked with metals is especially interesting, because a fire had burned all the complex: which was the workroom and the craftsmans house that lay in front. Many metal pieces had been found and the structures with which to work were yet *in situ*. So, we can describe this room H-40, as a complete 13th century blacksmith's forge.

The mediaeval blacksmith's forge

During the excavation of 1998 a blacksmith's room was found and dug out in l'Esquerda. The structure was found to be placed in the western lower part of the mediaeval village. This is a small irregular building whose walls were made of a stone and mortar base, and adobe at the top. As was common in the site, the building had been burned out and destroyed.

But, apart from the destruction levels, there are three special elements that make the building special and singular:

- next to the northern wall, there were some stone layers around a fire place,
- in front of the fire place, there were some stones that could have supported an anvil, or have been the anvil itself,
- in the south western corner, there were the carbonized remains of a circular shaped timber piece (probably a water tank).

Apart from these three essential finds in the blacksmith's, were found: a stone bench in front of the anvil, the remains of a natural fibre braided basket, and a lot of iron material – finished and unfinished pieces – like billhooks, knives, scissors, crossbow points, etc. Long and flat iron pieces ready to be worked, and slag remains there have also been found.

All of this material seems to show a very special craft: that of iron forging. So, the house can be interpreted as a mediaeval blacksmith's where domestic implements, agriucultural tools and weapons were produced. It can be dated as 13th century.

Moreover, some other elements were found in this small room showing that not only iron tools were made, but also minerals were prepared in the same place.

– A three-sided stone structure in a U shape, surrounding a low clay platform where high temperatures were reached. Next, a long knife with a hook on one edge.

– Opposite the furnace, against the southern wall, there are the remains of a roasting furnace, with the remains of slag and charcoal still there.

– The roasting furnace is situated on a deep and narrow natural diaclasis, artificially remodelled, that links the outside below with the roasting furnace and the blacksmith's wall, and that supplies an air draught straight to the

furnace. It was controlled by a pebble that could open or interrupt this draught.

The relationship of these three new elements allows a hypothesis to be made: that probably this area of the room was an iron smelting place, used to separate the iron metal from the slag. We are in front of an iron production centre from the raw mineral to the fabrication of usable implements.

In the blacksmith's, some objects made in other metals have also been found. Bronze, lead, pewter and brass. That can indicate that they were working in melting basic alloys with tin, copper, and zinc.

Ironworking and Experimental Archaeology

Experimental Archaeology has been carried on at l'Esquerda since 1991. The project began due to the discovery of a mediaeval granary on the site. The structure had been burned full of seed in middle or either the 13th century, since a paleocarpological analyses documented some different species of ancient seeds of



Fig. 2: L'Esquerda, a general view with the blacksmith's in front.



Fig. 3: The blacksmith's in process of excavation.

cereals and legumes (Ollich/Cubero 1989; 1990).

In the Experimental Area of l'Esquerda next to the site, some projects are being developed, in conjunction with Dr. Peter J. Reynolds, director of Butser Ancient Farm in England. We are carrying out three kinds of experiments together at l'Esquerda: agricultural cycles, grain storage (construction of a granary and subterranean pits) and earthworks (Ollich et al. 1998). The first part of the research was an ethnoarchaeological study about agricultural implements, in wood and iron tools (Ocaña 1998). One of the most recent experiments in l'Esquerda Experimental Area is ironworking. After the identification of the mediaeval blacksmith's, we tried a new experiment, this time

with metals and ironworking. In the Open Air, near the medieval reproduction of a granary, we constructed a very simple structure: on the floor; we made a round stone furnace. We put in some charcoal to burn and had a bellows to pump air in it. Near, on the floor too, an iron anvil could be used to beat iron pieces and form artefacts by forging. The third element necessary was some water to temper the iron for dousing and cooling the tools when they were finished.

When the work was done, little things remained there to testify to ironwork: just some burned stones, that could be easily confused with an ordinary fire. So, it is very important for archaeologists to identify such remains, by testing with experimental archaeology.

Bibliography

- Ocaña 1998 M. Ocaña, *El món agrari i els cicles agrícoles a la Catalunya Vella (s. IX–XIII)*, tesi de licenciatura Universitat de Barcelona, Departament d'Història Medieval, Documenta 1, Barcelona 1998.
- Ollich 1998 I. Ollich, "El Ter, la primera frontera dels carolingis al comtat d'Osona, segles VIII–IX", in: *II Congrés d'Història dels Pirineus*, Girona, novembre 1998, forthcoming.
- Ollich 1999 I. Ollich, "Roda: l'Esquerda. La ciutat carolíngia", in: *Catalunya a l'època carolíngia. Art i cultura als segles IX i X*, catàleg de l'exposició al MNAC, Barcelona 1999, 84–88.
- Ollich/Cubero 1989 I. Ollich/C. Cubero, "Paleocarpologia i agricultura a l'Edat Mitjana: l'excavació i estudi d'un graner medieval a Catalunya", in: *III Congreso de Arqueología Medieval Española*, Oviedo, març 1989, Actas Comunicacions, 1989, 73–85.
- Ollich/Cubero 1990 I. Ollich/C. Cubero, "El graner de l'Esquerda: un conjunt tecnològic agrari a la Catalunya Medieval", in: *La vida medieval a les dues vessants del Pirineu*, 1r i 2n curs d'arqueologia d'Andorra, Andorra 1990, 33–47.
- Ollich/Rocafiguera 1990 I. Ollich/M. Rocafiguera, "Les etapes de poblament al jaciment de l'Esquerda Les Masies de Roda de Ter, Osona (s. VIII aC–s. XIV dC)", in: *Tribuna d'Arqueologia*, 1989–1990, 101–110.
- Ollich/Rocafiguera 1991 I. Ollich/M. Rocafiguera, *L'Esquerda, poblat ibèric i medieval. Guia del jaciment i del museu*, Roda de Ter 1991.
- Ollich/Rocafiguera 1992 I. Ollich/M. Rocafiguera, "Ancient Patterns in Settlement and Urbanism. The Medieval Site of l'Esquerda, Catalonia", in: *Rural Settlement (= Medieval Europe 1992, Pre-Printed Papers 8)*, York 1992, 131–137.
- Ollich/Reynolds/Rocafiguera 1993 I. Ollich/P. J. Reynolds/M. Rocafiguera, "L'Earthwork de l'Esquerda. Un experiment en processos de formació", in: *IV Congreso de Arqueología Espacial (Procesos Postdeposicionales)*, Teruel 1993, 342–352.
- Ollich/Reynolds/Rocafiguera 1994 I. Ollich/P. J. Reynolds/M. Rocafiguera, "Agricultura medieval i arqueologia experimental: el projecte de l'Esquerda", in: *IV Congrés d'Arqueologia Medieval Espanyola*, Alicante 1994, III 701–709.
- Ollich/Rocafiguera 1994 I. Ollich/M. Rocafiguera, *L'oppidum ibèric de l'Esquerda (Roda de Ter, Osona) (= Generalitat de Catalunya, Departament de Cultura, Memòries d'Excavacions Arqueològiques 7)*, Barcelona 1994.
- Ollich et al. 1995 I. Ollich/M. Ocaña/M. Ramisa/M. Rocafiguera, *A banda i banda del Ter, Història de Roda (= L'Entorn 30)*, Roda de Ter 1995.
- Ollich et al. 1996 I. Ollich/P. J. Reynolds/M. Ocaña/M. Rocafiguera, "Experimentació arqueològica sobre sistemes de conreu medievals. Primers resultats de projecte ... de l'Esquerda", in: *XIV Jornadas d'Estudis Històrics Locals: La Mediterrània, àrea d convergència de sistemes alimentaris (segles V–XVIII)*, Palma de Mallorca 1996, 153–168.
- Ollich et al. 1997 I. Ollich/P. J. Reynolds/M. Rocafiguera/M. Ocaña, "L'Esquerda: ecology, environment, and agricultural productivity", in: *Environment and subsistence in Medieval Europe (= Papers of the 'Medieval Brugge 1997 Conference' 9)*, Zellik 1997, 143–150.
- Ollich et al. 1998 I. Ollich/F. Blancafort/A. Caballé/R. Costa/P. Espona/J. Martí/M. Ocaña/P. J. Reynolds/M. A. Rincón/M. Riu/M. Rocafiguera/D. Serrat, *Experimentació arqueològica sobre conreus medievals a l'Esquerda, 1991–1994. Arqueologia experimental: aplicació a l'agricultura medieval mediterrània (DGI-CYT PB90-0430) (= Monografies d'Arqueologia Medieval i Post-medieval 3)*, Barcelona 1998.
- Ollich/Rocafiguera 1998 I. Ollich/M. Rocafiguera, "L'Esquerda. Un projecte de recerca arqueològica a Osona", in: *Memòria del Congrés de Cultura d'Osona (Vic, gener 1997)*, 1998, 278–281.

- Ollich/Rocafiguera 2000 I. Ollich/M. Rocafiguera, "El poblat ibèric i medieval de l'Esquerda (Les Masies de Roda, Osona). De l'excavació a l'experimentació arqueològica", in: *Tribuna d'Arqueologia* 2000–2001, Barcelona 2000, forthcoming.
- Reynolds 1988 P. J. Reynolds, *Arqueologia Experimental. Una perspectiva de futur*, Vic 1988.
- Reynolds 1997 P. J. Reynolds, "Mediaeval Cereal Yields in Catalonia and England. An empirical challenge", in: *Acta Historica et Archaeologica Mediaevalia* 18, 1997, 495–507.
- Reynolds/Shaw 1999 P. J. Reynolds/C. Shaw, "The third Harvest of the First Millennium A.D. in the Plana de Vic", in: *Actes del Congrés internacional Gerbert d'Orillac i el seu temps: Catalunya i Europa a la fi del 1r. mil.lenni (Vic/Ripoll, 10–13 novembre 1999)*, Vic 1999, 339–352.
- Rocafiguera 1995 M. Rocafiguera, *Osona ibèrica: El territori dels antics ausetans* (= Osona a la Butxaca 16), Vic 1995.
- Rocafiguera 1998 M. Rocafiguera, "Arquitectura ibèrica ausetana", in: *II Congrés d'Història dels Prineus (Girona, novembre 1998)*, forthcoming.
- Rocafiguera/Ollich 1998 M. Rocafiguera/I. Ollich, "Evolució del sistema de construcció al jaciment de l'Esquerda de l'època ibèrica a la medieval", in: *I Symposium d'Arqueologia Medieval*, Homenatge al Dr. Manuel Riu (Berga, 26–28 març 1998), forthcoming.

Addresses

Imma Ollich, Montserrat de Rocafiguera
 Dept. d'Historia Medieval
 University of Barcelona
 Baldri i Reixac, s/n, E-08028 Barcelona
 ollich@trivium.gh.ub.es