

# SEULO CAVES PROJECT

## Report on work undertaken in 2009

### Background to the project

Rarely has it been possible to evaluate ideas about the ritual transformation of persons, objects and caves using a range of modern scientific techniques on an entirely new and potentially high-quality archaeological dataset. Such an opportunity was recently provided by the discovery (by Dott.ssa Giusi Gradoli, COMET – Valorizzazione Risorse Territoriali) and initial contextualization (by Dr. Terrence Meaden, Department of Continuing Education, Oxford University, UK) of an extraordinarily large and well-preserved group of at least nine ritual caves in the territory of Seulo, situated in the deep interior of Sardinia.

Each cave contains rich later prehistoric ritual deposits and one has rare cave paintings. The majority of this material can be assigned to between the Late Neolithic and Bronze Age, although the human use of these caves has continued to the present day. The utilized caves range from wide rock-shelters to small chambers, long corridors, and large complex cave systems with elaborate speleotherms. They are distributed along valleys formed by tributaries of the River Flumendosa. These watercourses dissect an extensive limestone plateau, which may have formed a focus for settlement and subsistence in later prehistory, to judge by the presence of scattered structures and surface remains.

This research programme, funded by The British Academy, the Fondazione Banco di Sardegna, and The Prehistoric Society, and directed by Dr. Robin Skeates (Department of Archaeology, Durham University, UK), seeks to clarify the research potential of the Seulo caves in relation to four key research aims. These are to establish: (1) the diversity of natural caves and their human uses in the territory of Seulo, over space and time; (2) how some of these caves and their natural features were selectively and variously modified from natural spaces into sacred places, especially during later prehistory; (3) the character and variety of rites of passage performed and experienced in these caves by different members of society; and (4) the degree to which these persons and the material dimensions of their cave ritual traditions were connected to (or marginalized from) wider patterns of life on different geographical scales, and transformed over time from prehistory to the present.

The work is being undertaken with the permission of the Direzione Generale per i Beni Archeologici (Roma), in collaboration with the Soprintendenza per i Beni Archeologici per le Provincie di Sassari e Nuoro, and with the assistance of the Comune di Seulo.

Having established the research potential of the Seulo caves (2009-2010), a second phase of research (2011-) is likely to involve larger-scale field-survey and excavation, and more extensive scientific research, including landscape characterisation, cave sediment analysis, palaeoclimatic analysis of speleotherms, and isotope and DNA analyses of human and animal bones.



*Seulo landscape*

## **Work undertaken during Summer and Autumn 2009**

### **1. Field survey on the Taccu de Ticci plateau**

In order to begin to establish an above-ground archaeological record for the Seulo territory, a small-scale field survey of the 2km<sup>2</sup> Taccu di Ticci plateau was undertaken. 50 'sites' have so far been identified.

A few prehistoric structures were identified on the plateau. The remains of a later prehistoric nuraghe with corbelled walls, known as 'Su Nuraxi de Taccu 'e Ticci', lies on the Western edge of the plateau (at an altitude of 760 metres). It offers an extensive view to two more nuragi (Nuraghe Pauli & Nuraxeddu) situated on the other side of the Riu Narbonienniga valley. Local informants speak of related round-house structures at 'Su Brecca 'e sa Mela'. The remains of a later prehistoric dolmen, with megalithic stone slabs forming a 12 metre long corridor, destroyed in the 1960s, were also identified at Loc. Su Telloseddu, at 786 metres. The site of the dolmen is currently threatened by new forestry work on the plateau, and requires immediate scheduling and/or archaeological excavation.

Prehistoric artefacts were found as a semi-continuous scatter on Pissu is Ilippas hilltop and on the flanking Fundu 'e Meu hill-slope, between about 810 and 870 metres. They may indicate the presence of a large later prehistoric settlement site on the hill, although no related structural remains have so far been identified. Obsidian found here includes hundreds of small flakes, as well as small cores, bladelets/blades as fragments and occasional whole pieces, (?) scrapers, tang-and-fins arrowheads, and points. A blade fragment and flake of chert with thick patina were also found, as well as some heavily abraded sherds of medium-coarseware.

Historic and recent features identified on the plateau include dry-stone field boundary walls, clearance cairns flanking relatively flat grazing areas, related herders' shelters and artefact scatters, and a network of roads, trackways and footpaths.



*Fundu 'e Meu*

## 2. Cave survey in the upper Riu Narbonionniga catchment

In order to contextualize the known Seulo caves of archaeological significance, an extensive cave survey was undertaken within the catchment of the upper Riu Narbonionniga. 17 caves have so far been recorded in three sample areas.

Six caves are known in the **Foresta di Addoli**. Along the Riu Longu Fresu, a group of three South-facing caves lies along the bottom edge of a limestone outcrop flanking the North side of the stream, at altitudes of between 733 and 749 metres. 'Grutta I de Longu Fresu' (containing Neolithic ritual features and deposits - see below) and 'Grutta II de Longu Fresu' comprise relatively straight corridors, measuring 11 to 15 metres long, with short lateral niches. The third cave is accessed via a small hole which leads to a large chamber. Another small cave lies on the opposite side of the stream. 'Grutta de is Janas' is a large cave complex with two interconnected branches, and two entrances, located on an upper-middle hill slope at 797 metres. The North branch is about 100 metres long, and the West branch about 75 metres. The cave contains numerous speleotherms. The North branch has consequently been adapted for use as show-cave, although it is currently closed to the public. Later prehistoric ritual deposits have been found throughout the complex. Special surface finds include a bone point, a perforated sea-shell pendant, a chert blade fragment (93 mm long), obsidian artefacts, and a pair of sherds decorated by incised triangular zones filled with point impressions in a Bonu Ighinu or Ozieri style (see below). 'Su Stampu e su Turrunu' is a large rock-shelter with a spectacular waterfall running down through it, situated near the bottom of the Riu Trassadioni gorge. No cultural remains have been found here.

Nine caves were recorded at **Su Cannisoni**, a highly visible area of cliffs situated on the North end of the Pissu is Ilippas hill. Most have been adapted in recent times as shelters for herds of goats by the addition of dry-stone walls across their entrances, some of which cut into prehistoric deposits containing human bones and a few pottery sherds. Eight are North-facing rock-shelters, situated in a band between 775 and 808 metres altitude. The majority of these are 3 to 13 metres wide. The largest, 'Riparo sotto roccia Su Cannisoni', is 40 metres wide, and also contained prehistoric deposits (see below). Above the main band of rock-shelters, at 826 metres altitude, just below the summit of the rocky spur, lies a small single-chambered cave (8 metres wide and 6.5 metres deep), known

today as 'Su Grutta de is Bittuleris' (and in the past as 'Sa Omu 'e is Ossus'). It is well known as a prehistoric burial cave, and contains rich archaeological deposits (see below).

Two more rock-shelters were recorded on the **Taccu de Ticci** plateau. Both have been used in recent times as animal shelters. One is formed by a fissure situated on the top of the plateau. A human long-bone was found in the rock here. The other is known as 'Su Disterru'. It is a 128 metre wide rock-shelter situated on the edge of the plateau. A coarseware lug-handle was found here.

Elsewhere in the Seulo territory, two more caves containing rich prehistoric mortuary deposits have been identified. 'Su Stampu Erdi', situated at Loc. Tornulu, is an 86 metre long cave complex, containing speletherms, human and animal bones, and prehistoric pottery. And 'Sa Forada de Gastea', situated in Loc. Monte Gastea, is a very small cave (2 metres wide by 2 metres deep) containing substantial quantities of human bones.



*Bones lying on the surface of Sa Forada de Gastea*

### **3. Recording and test-excavation of four contrasting cave sites**

A sample of four of the cave sites known to contain prehistoric deposits was selected for further recording and for test-excavation (Su Grutta 'e is Bittuleris, Riparo sotto roccia Su Cannisoni, Grutta I de Longu Fresu, and Grutta de is Janas).

Tiny Tag dataloggers were installed in all four caves, to record temperature and relative humidity levels, at half-hourly intervals for up to one year. Laser scans were produced (by Archeogeo di Atzeni Antonello & C. s.n.c.) of the entire interiors of the first three caves, and of one corridor and chamber in the West branch of Grutta de is Janas.

Recording grids of 1 x 1 metre squares were then laid out on the floors of selected areas of these caves. Disturbed deposits were cleared from the surfaces of these squares. A few of these grid squares were then selected at each site for further excavation in 10 centimetres spits. All deposits were excavated carefully, using brushes and fine tools, then sieved and also sampled for environmental analysis.

At the close of the excavations, protective covers were placed over the exposed areas, and a locked metal grill was installed (by the Comune di Seulo) across the entrance of Su Grutta 'e is Bittuleris.

Following cleaning, preliminary analysis and temporary storage of the finds in the Scuola Media di Seulo, all of the labelled plastic bags and crates of excavated artefacts and bones have been transferred to a more secure repository provided by the Comune di Seulo, accompanied by full documentation. This material will ultimately be deposited with the Soprintendenza per i Beni Archeologici per le Provincie di Sassari e Nuoro at Nuoro.

**(a) Su Grutta 'e is Bittuleris**

A 1 x 1 metre grid square was excavated in the North-East corner of the cave.

Completely disturbed deposits were found right down to bedrock, to a depth of 0.22 metres, and against the foundations of the recent dry-stone wall. The soil matrix comprised a mixture of recent dark brown organic soil, finer grey soil (probably derived from the now-disturbed prehistoric mortuary deposits), and yellow-brown silt (probably derived from the erosion of the cave walls).

Cultural material included substantial quantities of human bones (ranging from large to highly fragmented pieces), a few animal bones, 34 small fragments of medium-coarseware, 1 fragment of medium-fineware, 16 obsidian artefacts, including an asymmetrical tang-and-fins arrowhead with parallel pressure-flaking on one side (31 mm long), a trapezoidal bone pendant (25 mm long), a (?) shell bead (10 mm long), a bronze button with radial and zigzag decoration (17 mm diameter), and a ceramic bead (17 mm long). The majority of these finds look later prehistoric in style, but the ceramic bead (and possibly the button) could be medieval.

Specialist study of the human remains points to successive primary inhumations in this cave, of adults and children, males and females, followed by significant disturbance and fragmentation of the bones.

Two human adult long-bone fragments were taken from the lowest deposits for radiocarbon dating. 74 human teeth and bone fragments, and one animal bone, were also obtained for DNA analysis. DNA fragments have so far been extracted from three teeth, and have been assigned to Haplogroups H and J.



*Excavations in Su Grutta 'e is Bittuleris*

### ***(b) Riparo sotto roccia Su Cannisoni***

A key feature found towards the Eastern end of the rock-shelter is the remains of an artificial pile of stones, piled up against the back wall of the rock-shelter, and cemented by flowstone derived from a now extinct spring. Prior to excavation, a few fossilized human bones were identified towards the bottom of this pile.

Two 1 x 1 metre grid squares were excavated immediately in front of this pile. They clarified that the pile of stones had been constructed over a secondary burial deposit. In the excavated squares, this intact deposit (Context 2) comprised: a pair of poorly preserved adult human skulls, and an adjacent artificial semi-circle of stones containing a large group of poorly preserved, disarticulated, human bones (especially long-bones, but also fragments of a child skull), some animal bones (sheep/goat), five relatively large sherds of medium-coarseware, and some fragments of charcoal. Overlying disturbed surface deposits (Context 1) also contained 22 flakes and a blade fragment of obsidian, and some heavily eroded pieces of bone and pottery.

Specialist study of the human bones conforms that only selected body parts, especially skulls and long-bones of adults and children, were deposited here as part of secondary burial practices, and that they were later affected by severe weathering, due to the exposed position of the rockshelter.

Further evidence of secondary burial practices, and more specifically of the movement of bones between caves, is represented by a human vertebra found in the upper deposits, which appears to derive from the same arthritic individual as another vertebra found in Su Grutta 'e is Bittuleris.

A sample of the jaw bone from one of the skulls was taken for radiocarbon dating. Three human teeth were also obtained for DNA analysis. Fragments of DNA extracted from one tooth have been assigned to Haplogroup H.



*Excavations at Riparo sotto roccia Su Cannisoni*

### ***(c) Grutta I de Longu Fresu***

Two important features lie close to the innermost end of this cave.

The first is a small group of paintings (extending over an area of at least 30 x 30 cm), covered by flowstone, situated in a niche just to the side of a now extinct spring and right above a hole (possibly recently enlarged) that leads down to a narrow lower tunnel in the cave. The paintings are difficult to decipher (indeed everyone who sees them has a different interpretation), but the general consensus is that at least two schematic linear representations of anthropomorphic figures can be seen, with legs, arms and either an elongated head or horns. The style of these paintings seems to fit within the Central Mediterranean corpus of Late Neolithic cave art. However, in an attempt to add scientific precision to their dating, the flowstone overlying these paintings was sampled for Uranium-series dating (by Dr. Peter van Calsteren, Department of Earth Sciences, The Open University, UK).

The second feature is a human skull, also covered by flowstone. Prior to the start of this project, a sample of bone was obtained from this skull and submitted by Dr. Terence Meaden to the Oxford Research Laboratory for Archaeology and the History of Art for AMS radiocarbon dating. The result is: OxA-X-2236-44 5315±36 BP (1 sigma 4231-4056 BC, 2 sigma 4258-4006 BC). In other words, this late fifth millennium BC date places the skull in the first half of the Sardinian Late Neolithic Ozieri culture. This skull lies against the North-East side wall of the cave, above a layer of loose – and possibly introduced – small to large stones that covers the entire floor of the cave.

Additional bones have been found on the cave floor, in other niches and holes, including a second adult skull coated with flowstone, a possible red deer antler coated with flowstone, child skull fragments, and a juvenile long bone. The latter has been taken for radiocarbon dating.

A group of four 1x1 metre grid squares was excavated at the innermost end of the cave, adjacent to the flowstone-coated skull and paintings. The main feature to be uncovered was a semi-circular structure (0.9 metres long by 0.9 metres wide). It is formed by a group of stalagmites, modified by the addition of one or more large stone blocks on top, now fixed in position by drip water. It contained some bones.

Close to the North-East side wall of the cave, in a potentially disturbed lower surface deposit of loose stones situated between the skull, the stone circle and the painting, a greenstone axe-blade was found. It is trapezoidal, with a curved blade and butt (79 mm long, 34 mm wide at the blade, 19 mm wide at the butt, and 14 mm thick). It has imperfectly smoothed (not polished) surfaces, the blade being the most smoothed part.

Underlying basal deposits (Contexts 8 and 7), comprising compact deposits of stones, soil and microfauna, can probably be interpreted as mainly natural cave deposits.



*Greenstone axe found in Grutta I de Longu Fresu*

#### **(d) *Grutta de is Janas***

##### Chamber 1

Two 1x1 metre grid squares were placed in the centre of a low but wide chamber (11 metres long by 5 metres wide, and between 1.0 and 1.5 metres high) containing rich deposits marked on the surface by large quantities of dark soil, pottery sherds and animal bones, situated at the inner end of the entrance corridor in the West branch of the cave complex. Following the clearance of the potentially disturbed looser surface deposits (Context 1), the underlying compact and intact deposits (Context 2) were then excavated down to bedrock in one of the squares.

Considered together, these deposits comprised a homogeneous, 12 to 24 cm deep, intensively and extensively burnt layer, composed of stones and fine dark grey ashy soil. This contained 119 relatively large pottery sherds, animal bones, seven obsidian artefacts, a perforated bivalve sea shell ornament (27 mm long), and a polished red (?) stone bead (10 mm long). Many of the artefacts bore signs of having been heavily burnt, with either hard carbonized concretions or – in the case of the pottery sherds – strongly decomposed surfaces and edges (indicating that they were fragmented before and during their burning, rather than afterwards). Even the bedrock was burnt in places. The pottery, which included the rim of a large jar and a few ring handles, was predominantly of coarseware, some of which had smoothed surfaces, a couple possibly also decorated with finger impressions. However, three sherds of a relatively thin (6-7 mm thick) medium-fine burnished ware were also found. Amongst the obsidian artefacts were three tang-and-fins arrowheads (25 to 37 mm long), and a flake, all originally deposited with very sharp (and potentially unused) edges.

One animal bone from Context 1 and another from Context 2 were taken as radiocarbon samples. Four more animal bones were also taken for DNA analysis.



*Excavations in Chamber 1, Grutta de is Janas*

##### Inner Chamber

This small chamber, lying towards the innermost end of the North branch of the cave complex, was divided into six 1x1 metre grid squares. Underlying some loose surface deposits (Context 1), which

had been disturbed by modern cavers, more intact deposits (Context 2) contained an animal bone, 18 fragments of prehistoric pottery (the majority belonging to a single vessel), and the remains of microfauna. The animal bone has been submitted for radiocarbon dating.



*Excavations in Inner Chamber, Grutta de is Janas*

## On-going work

1. Completion of field survey of the Taccu di Ticci plateau [Skeates & Gradoli].
2. Completion of cave survey within the upper Riu Narbonionniga catchment [Skeates & Gradoli]
3. Continuation of excavation of the chambers connecting the West and North branches of Grutta de is Janas [Skeates & Gradoli]
4. Continued photographic recording of the four caves, using digital still & video cameras, then computer-based image processing & enhancing [Sardinian photographer & Veitch]
5. Completion of monitoring of temperature and relative humidity by automated dataloggers (including replacement of Tiny Tag stolen from Su Grutta 'e is Bittuleris), then data retrieval and analysis, to characterise and contrast each cave environment [Skeates & Clogg];
6. Completion of specialist study of animal bones from excavations [Vickers]
7. Completion of specialist study of environmental remains from excavation soil samples [O'Brien]
8. Specialist study of obsidian provenance [Oddone]
9. Continued DNA assessment of samples of excavated human bones [Cooper] and animal bones [Larson]
10. Completion of AMS radiocarbon dating of 10 samples of excavated human and animal bone [Higham]
11. Completion of Uranium-series dating of samples of flowstone overlying cave painting in Grutta I de Longufresu [Van Calsteren].
12. Continued GIS-based manipulation of digital map data from laser scanning, cave survey and field survey [Howard]
13. Desk-top survey of Sardinian cave archaeology and the landscape history of Seulo [Skeates], and of the speleology of the Barbagia di Seulo, including 'domus de janas' ethno-history [Gradoli]
14. Continued synthesis of project results [Skeates].
15. Continued publication of project results, including: preliminary reports for project collaborators and sponsors [Skeates & Gradoli], press release [Skeates & Gradoli], abstract for *Fasti Online* [Skeates], development and up-dating of project web-site, hosted by Durham University [Skeates & Veitch], presentation of preliminary results at UK Italian Neolithic Seminar [Skeates], presentation of project results to the residents of Seulo [Skeates & Gradoli], and 10,000 word paper submitted to *The Journal of Mediterranean Prehistory* on 'Journeys to the Underworld: Ritual Transformations of Persons, Objects and Caves in Neolithic Central Sardinia' [Skeates].

Dr. Robin Skeates

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