

OXFORD UNIVERSITY EXPEDITION TO NORTHERN SPAIN.

SUMMER 1961.

After many months of hard work, and after the last week of hectic preparation, the twelve of us set off from Oxford at about 6 o'clock p.m. on Monday, July 31st. The night was spent in west London at the homes of two of our party, to whose parents we are very grateful, and the next morning we motored to Dover. The crossing was very calm and pleasant and we had little delay at the Calais customs. After three days of pleasant driving, though most of one day was spent on vehicle repairs, we arrived at our first destination, Montignac, where we were welcomed by the very friendly population. We spent the next day visiting cave paintings at Les Eyzies and Lascaux, the latter being particularly impressive. This day was notable for the intense heat, to which we were not yet accustomed. Two more days run brought us to the Spanish frontier at Hendaye. As there were no senior officials at the customs post at that time, we were forced to spend a rather uncomfortable night between the frontiers! But all was well and we left the next morning. As we drove through Spain we were flattered by the interest and friendliness of the people who gathered around us whenever we stopped.

We arrived at Cangas de Onis, a small town of about 12000 inhabitants, which was about 12 miles from our final base, on the following Wednesday evening, and we lost no time in meeting the mayor and the local policeman! Having obtained permission to camp in the National Park from the Mayor we drove on next morning to Covadonga, a small village centred around the Shrine and Basilica. After collecting our post, we began the 3000' ascent to the mountains and the mist. The track was steep, but the lorries took it well and we arrived at the Lago Enol in the early afternoon. Rain and mist set in, making it virtually impossible to find a permanent camp-site, so we stayed the night at the Refugio, a government run rest house for mountain travellers. The rain and thick mist prevented us from seeing more than fifty yards for the next three days, so we made a further trip to the mayor and gained permission to stay in the refuge, free of charge, for the duration of our stay.

The Refugio was a stone building with four smallish rooms, one of which was occupied by the caretaker/farmer, Sr. Ramos, and his wife, the other three being bedrooms. Alongside the house was a verandah, about 80' long and 15' wide, and it was there we made our base camp, using the bedrooms solely for sleeping in. The verandah was divided into sections for living, near the fireplace at one end, cooking, food-storage, equipment storage, working (drawing surveys etc.) and the chemical/photographic table. The local shepherds were very friendly and showed great interest in our work, showing us the positions of cave entrances known to them and also selling us rabbits and cheese.

The Refugio was situated a short distance from the bottom of a green valley leading to Lago Enol in one direction, and to the gorge of the Rio Dobra in the other. A spring at the bottom of this valley served our needs, and we had the most beautiful panorama of mountain peaks, "on our doorstep".

After five days, the archaeological party set off to do their work further West in Galicia. Stops were made at O Lledo, where the director of the museum was visited, and at the pleasant seaside towns of Luarca and Lugo, where again the museum was visited. The party stayed in Pontevedra for just under a fortnight, finding and mapping rock carvings and were greatly helped by Sr. Don Alfredo Garcia Alén, the Secretary of the Museum, and by his friend Sr. Don Carlos Paracha of Marín. The population were very hospitable, particularly the doctors at Pontevedra hospital. Visits were made to some of the neighbouring villages, among which may be mentioned Santiago da Compostella. On the return journey several days were spent near Lalin and Guntín. The party arrived back in the mountains on Tuesday, 12th. September, two days before our departure.

The rest of us had settled down to a rough routine of life. The day started at about 8 o'clock with breakfast, and after that the work began. Usually most of us were out all day until the evening so we took a cold lunch with us. Before and after the 8 o'clock p.m. dinner we plotted our results, wrote up the logs, drew our surveys, and so on, finishing up with discussion as to the next day's work around the log-fire.

The weather was, on the whole, very good apart from the first few days, with little rain and not too much cloud. Temperatures were often very high, necessitating a midday siesta for those working above ground. Luckily the lake was very suitable for swimming and diving to cool off. In fact, we were told that the weather this year had been the best within living memory.

A notable part of our stay was a five day trip up to the peaks by six of us in pairs carrying our tents and food on our backs. We camped about 7000' up, by the only surface water for miles, and spent the time climbing and studying the

geomorphology of the area. The scenery was extremely rugged with huge cliffs and rock basins, the highest peaks being unclimbable to all but experienced mountaineers with proper equipment. Of particular beauty were the huge patches of snow with herds of chamois running across them.

We left the refuge on Thursday 14th. September, and made excellent time through France arriving at Boulogne on Tuesday evening, leaving us a day to make final repairs to the lorries before crossing on Thursday, 21st. September at lunch time, rather sorry to have left the "sunny south", but filled with memories of a successful and enjoyable expedition.

K. J. M.

TRANSPORT.

Due to the large weight of equipment required by the expedition, it was decided to purchase two ex-Army lorries, in early April, and May. We bought a 3-ton Bedford OY and a 1-ton Bedford MW. Since they had been standing for several years they both looked rather decrepit and needed thorough overhauls.

Once Final Examinations were over, two self-styled mechanics and a team of eager helpers set to, and within a few weeks turned out a pair of shiny painted, smooth-running lorries. This would have been quite impossible, but for the generosity of paint and brush manufacturers and Gordon Toolworks Ltd. who kindly lent a complete tool kit which turned out to be of invaluable service.

The original tyres on the vehicles were all in an extremely poor condition and Messrs. Blue Peter Retreads of Basingstoke made a wonderful job of retreading them before we left.

Our load was so great that it was necessary to erect a roofrack extension over the cab of the three tonner, and this was made for us by Dexion Overseas Division. It did a lot of work carrying two spare wheels and at least half a ton of assorted caving and survey equipment. Dexion Limited also provided a beam, which was used when winching people up and down one very deep pothole.

We set off to Dover, cruising along with no trouble - two lorries, twelve people and four tons of equipment. It soon became noticeable that all was not well with the brakes of the 3-tonner, and so the drivers spent their first night in France reconditioning the brake master cylinder. Our next failure was at Rouen, where a rear wheel oil-seal broke, and we spent 24 hours removing oil from brake drums and adjusting the brakes.

We usually drove with the smaller lorry in front and the big one behind with the toolkit and spares (supplied by Messrs Vauxhall Ltd.).

On the long, straight roads throughout France we travelled at about 40 m.p.h. Both engines were running very sweetly, and consuming no oil to speak of. As we drove further South, the temperature steadily rose until at one point it was 130° F in the cab of the 3-tonner, the dress for drivers being boots, shorts and sunglasses. However, on no occasion did the oil pressure in either vehicle fall below 40 p.s.i. (Normal), and only on the steepest gradients did the 3-tonner boil.

Both vehicles were fitted with Solex carburettors, and averaged 11 and 13 m.p.g. fully laden. At Montignac we had to renew a rear wheel bearing, and repair a leaky rear wheel brake cylinder which was scoured using 'wet-and-dry' paper and a lot of sweat.

Once we left the main roads in Spain, the surfaces were extremely poor, either two inches of fine dust or littered with spring-breaking pot-holes.

Having arrived at the refuge the master cylinder and servo were completely overhauled, and gave us no further trouble.

The 1-ton lorry was used on the archaeological trip, covering a further 2000 miles, and during this time the effects of the 62-octane petrol gradually made themselves apparent with increasingly frequent attention to the tappets.

In order to catch our boat, we drove back 1500 miles in 48 hours, with our four drivers taking 4 hours on, and 4 hours off. At the end of this the 1-tonner gave up the ghost, and we had to put in 6 new exhaust valves at Boulogne to get us home.

D. A. H.

F O O D.

Under this important heading it is necessary firstly to thank all the many firms who gave such generous amounts of food for the use of the Expedition. Due to our isolated situation, the main camp was more dependent on these supplies than had been envisaged since stores could be brought from the valley only once every 10 days. Quantities consumed were enormous! 200 kilos of potatoes, 30 kilos of rice, 60 lb. porridge, 18 tins of crisps and 50 kilos of bread being a solid "backbone" on which menus were built. Ingenuity was at its greatest when in the mountains; an acceptable meal was constructed from a handful of rice, a clove of garlic, Marmite, Oxo and wild chives, as a chive "Payella".

Underground rations again posed problems of portability coupled with nourishment, and here lifeboat biscuits, tubed jam, Marmite, chocolate and other concentrated sweets were our staple diet. These proved very popular and eminently suitable for underground conditions. Several local Spanish delicacies were sampled.

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Of these, squid cooked in its own ink, and octopus tentacle were pronounced good.

Notwithstanding the considerable exercise, no one suffered any signs of malnutrition and our thanks must go to the manufacturers whose products enabled us to carry out our considerable programme so successfully.

I. R. G.

#### PHOTOGRAPHY

Amongst the twelve members of the expedition were five keen photographers, using between them three 2 $\frac{1}{4}$ " square reflex cameras, three 35 mm. cameras and two folding 120 roll film cameras. In addition several other members had cameras and took some pictures for themselves. Many pictures were taken under very difficult conditions, and all materials and equipment performed satisfactorily.

Altogether about 2000 exposures were made in colour and black-and-white, covering every aspect of our life and work in Spain. Although many of these are of a purely record character, we also took pictures for firms showing, where possible, their products actually in use on the Expedition.

A comprehensive record of rock carvings and caves was made both in colour and black-and-white, and it is hoped to publish series of these in due course.

Because of the bulk of material available, there is still much to do by way of printing the black-and-white pictures, a job still undergoing completion.

M. A.

#### ANALYTICAL

Daily records were kept of the Trema spring which supplied the Refugio with drinking water. These consisted in measurements of rate of flow, pH - using a B. D. H. "Nessleriser", temperature - using an alcohol thermometer and hardness by means of E. D. T. A. titrations.

These showed that the rate of flow was influenced by rainfall within 24 hours and fell off considerably during our stay because of the extremely dry weather. None of the other readings showed any dependence upon rainfall pH being in the region of 7.4, and temperature 50° F. Water samples for each day were brought back to England for analysis.

Samples of surface water and of cave pools were also tested for pH. These showed considerable local variation between 6.5 and 9.5, most samples being more alkaline than the Trema spring.

M. A.

#### GEOPHYSICAL

The aim of the geophysical surveys was to provide support for the main caving programme, and also to provide corroboratory evidence of the course of a cave where needed. The resistivity method using the Wenner configuration of electrodes was used in all cases.

The survey in a suitable dry valley over the pothole designated P.1 (Pozo Palomeru) located the passage in good agreement with a surface plot of the underground survey, and measurement of the depth by the expanding electrode method enabled the various theoretical formulae in use to be tested. A further survey across the dry valley beyond the furthest point reached underground indicated the presence of a cave, which may be an extension of the passages explored.

A survey across the floor of the enclosed valley at Las Reblagas was handicapped by marshy conditions, and a further attempt to locate the connection underground between Lage de la Ercina and Las Reblagas, proved by Rhodamine B testing, failed because of the inadequate depth reached by the depth survey.

The method may be regarded as a useful way of confirming the presence of a cave in a given point, and even of finding a new cave. The accuracy is however limited, and the restriction of the method to suitable flat stretches of turf of adequate length is a severe handicap among clint surfaces, which are likely to occur over many possible sites of caves.

Hydrological testing was carried out using fluorescein and the new method evolved by members of the Bradford Pothole Club using Rhodamine B. The main success was the tracing of the connection underground mentioned above, and a conspicuous failure to trace the course of the water from the sink in Las Reblagas was experienced, despite many tests using both dyes. The water tracing was handicapped by the prevalent drought. The flow, temperature and pH of two springs were recorded daily, and meteorological observations taken.

J. W.

#### GEOMORPHOLOGY AND CAVING

The Western massif of the Picos de Europas proved to be an excellent area for the investigation of limestone geomorphology, both on and below the surface. Apart from the survey of caves, the drainage of the area was investigated, details of the form of rock were described and photographed, and a weather record was kept.

Of the three large cave systems explored, the first, "Pozo Palomeru", was entered by a 140 foot shaft, giving access to over  $\frac{3}{4}$  mile of passages, most of which were surveyed. Although at the time there were only a few pools

of water, there was strong evidence that in times of flood, when the snow melts on the surface, that there must be a powerful river through the cave. In the "Cave of the Wind", so called from the strong icy draught blowing from the entrance, nearly half a mile of passages were surveyed. This system, which contains some fine formations, acts as an overflow for the large river at its inner end in times of flood. Cueva Orandi, into which the river flows which emerges at the Shrine in Covadonga, was explored to a depth of nearly four hundred feet, and further exploration and survey were only limited by time.

Five caves of moderate size were explored, of which the most interesting were P. 11, which was 160 feet, with very little horizontal extension, and the "Cave of the Snow", about 5500 feet above sea level, and so called because of the main chamber, 100 feet across, was filled to a depth of thirty feet by many years accumulations of snow. To keep an adequate balance between the large caves and the more frequently occurring small caves, about 25 of the latter were also surveyed; these varied from 150 feet to only a few feet in length. The small caves seemed to be older than the large ones, and the deposits in them were in a large majority in an advanced state of decay.

At higher altitudes many potholes were seen, some blocked by frost-shattered boulders, but others open, and often quite deep. There was insufficient time to permit the exploration of any of them, but they were an attraction for further work in the area.

The drainage of the area was very interesting, though many of the streams had dried up during the long spell of fine weather. Measurements of the rate of flow of two springs revealed a gradual diminution over the period of investigations. The lower of the two lakes near the camp received only a small trickle of water above the surface, and as more water flows out than in, it seems that there must be an inlet under the water. The inflow and outflow of the water of the upper lake were approximately equal, but the outflow was not through the valley at the lower end of the lake, but into a small cave at the upper end. A water tracing test was carried out, and the outflow was found to emerge in the next valley before once again disappearing underground.

Several rock surfaces, at altitudes ranging from 3500' to 8000' were studied for development of runnels, furrows formed by solution caused by trickling rain water. Two types, a deep one on the semi-horizontal surfaces, and shallow ones on vertical surfaces, were found to be widespread up to about 7500', above which frost shattering obliterated these forms. The weather record, which was geared to assess the conditions to which rock surfaces were exposed, will provide a useful correlation with these figures.

Finally, the overall impression of surface and drainage will form a good basis upon which future plans for research can be based.

W. J. C.

#### ARCHAEOLOGY

The object of the archaeological programme was to investigate the prehistoric rock-carvings of Galicia. These markings were believed to consist of three elements, one related clearly to the so-called "cup and ring" rock-carvings of the British Isles which may be roughly dated to the late Neolithic and early Bronze Age in England, another composed of animal designs, and a third called schematic motifs for want of a better term. It had been suggested that the animal-like designs could be connected with similar designs from caves and rock shelters, painted at an earlier date, and that the cup and ring motifs (incised dot-in-circle markings) might have originated in the British Isles, since they are found nowhere else in Europe. The interplay of different elements might, as it was hoped, be correlated with interplay of different cultures, since the most exposed rocks and boulders rarely have associations of value.

A party of four spent three weeks in Galicia examining the carvings - Michael Walker, Martin Trump, David Hukin and Martin Cummins. As many different types of carvings as possible were drawn to scale and photographed sectionally. Museum collections were also examined. The cooperation of Sr. D. Alfredo Garcia Alen, Secretary of the Pontevedra Museum and Sr. D. Carlos Paracha od Marin was invaluable to locate many of the carving. We must also thank Dr. Fermin Bouza Brey Trillo and Sr. D. Felipe Cordero Carrete of Santiago, Sr. D. Jose Goyanes of Lalín, Sr. D. Manuel Vázquez Seijas of Lugo Museum, and Sr. D. Francisco Jordá Cerdá of Oviedo Museum for their assistance. The services and hospitality of the staff of the Pontevedra Hospital were also invaluable when David Hukin contracted an appendix infection.

Thirty three rock carvings were drawn in the ayuntamientos of Guntin, Golada and Silleda (on the borders of the provinces of Lugo and Pontevedra) in the ayuntamientos of Cotobad, Marín, Moraña (near Pontevedra), near Santiago de Compostela, and in the museums of Pontevedra, Lugo and Oviedo. Most of these were also photographed in sections by David Hukin. An analysis of the motifs revealed that the picture is quite different to that revealed by earlier workers, and as a result our aims had to be revised with regard to investigating the animal paintings in the caves of Asturias. The majority of the carvings, as in the British

Isles, which we visited were simple cup-markings. The cup and ring markings likewise have a widespread distribution and are found occurring among the "schematic" designs and among animal and weapon motifs.

Our recordings of the weapon designs proved to be the most interesting discovery of the trip, although they had been reported before. They comprised halberds, tanged daggers, riveted daggers of well-known Early Bronze Age types, and stone axe-head markings. Associated with these at a site near Santiago are ladder designs and a face design with hair, eyes and ears. This is clearly related to the face motifs of the Passage Graves of the Iberian Peninsula and the painting at Peña Tu, near Llanes in Oviedo Province, which also appears among weapons and dots. Clearly these representational motifs are derived from Passage Graves cultures, and it is reasonable to assume that the representational animal carvings can be attributed to this source. However, other carvings cannot be attributed to Passage Grave influences altogether - labyrinth designs, the "schematic" markings, and some not unlike the Val Camonica (Italy) designs.

Summing up, it seems to us that the cup and ring carvings are typical when compared with British Examples, being essentially a prehistoric art of a geometric content on exposed rocks, to which no meaning can as yet be ascribed. This must already have been in existence on the arrival of the Passage Graves in Galicia for elements of their essentially funerary art and other objects to be transferred to rocks in the open. It seems that strong Atlantic relations existed and that the cup and ring element must have originated in the British Isles, for want of any other origin. It reinforces arguments for pre-dating British cup and ring rocks to Passage Graves of Boyne type, which show prolific funerary carvings. However, the most important successful result which has been achieved is a series of accurate records of the carvings, made to a standardised technique for future workers interested in comparative prehistoric art.

M. J. W.

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