well away from the lush pastured dinosaur country below. However, there is now strong evidence for marine influence in at least one fissure (Tytherington); marine microfossils (acritarchs and dinoflagellates) occur, kerogen derived from marine algae is abundant¹ and a glauconitic clay mineral has been found which could indicate brackish conditions². This fissure at least must have been located near the coast with its base below sea-level. This would permit mixing of the meteoric waters that washed the debris into the cave with saline waters from the sea.

We must now view the fissure animals as representing a sample of a lowland fauna rather than a peculiar upland fauna. Very large animals are excluded — like the five-metre long dinosaur *Plateosaurus* which is found widely in Europe at the same time. However, many single bones of its smaller relative *Thecodontosaurus* have been found in various fissures. The most abundant animals, however, are lizard-sized, from 10–50 cm in total body length. A detailed study of the ecology of an assemblage of these small animals from Slickstones Quarry has just been published⁴, and it gives us a unique impression of the fauna scuttling around beneath the shadow of the dinosaurs.

The Slickstones fauna consists of 12 or more forms, and includes abundant remains of six different sphenodontids. Most of these probably ate insects and other invertebrates, as does the living *Sphenodon*, but one form at least may have been herbivorous — a conclusion suggested by patterns of tooth wear. The authors go on to suggest that differences in the composition of the 'faunas' found in different fissures were caused by inter-specific competition for food resources⁴. This seems to be stretching the evidence a little far, unless we assume that the beasts actually lived in the caves. The sphenodontids were preyed upon by dinosaurs and other archosaurs which are represented in the fissure fossils by a variety of jaws and isolated sharp knife-like teeth.

The Bristol fissures should produce a great deal more important information. Many of the fissure reptiles have yet to be described and the careful collecting techniques being used should also yield much new information on their palaeoecology. There is a rare satisfaction in finding out about some of the *small* reptiles that have now been shown to have lived during the Age of the Dinosaurs. □

Archaeology

Stonehenge comes alive

From Julian Richards

THE antiquarians of the seventeenth and eighteenth centuries, the barrow diggers of the nineteenth, and the excavators, fieldworkers and astronomers of the twentieth have all been drawn to the Stonehenge area to observe, to dig and to speculate. To many it has long been apparent that the visible remains, barrows, henges and cursus monuments, while evidence of intensive and consistent activity during the Neolithic and Bronze Ages, provided only a partial picture of prehistoric society. Ideology and death left their enduring traces, but if we could see the dead, then where were the living?

'Stonehenge and Its Environs' (Edinburgh University Press) is the title of the survey carried out by the Royal Commission on Historic Monuments which has started to provide clues in the hunt for the living. Traces of now flattened prehistoric fields, small enclosures and boundary ditches point to an organization of the landscape beyond ritual and burial and provide an invaluable framework on which the next phase of investigation could be based. In 1980, the Trust for Wessex Archaeology began a programme of survey in the area of some 2,500 hectares studied by the Royal Commission. The overall brief of this Stonehenge Environs Project, commissioned by the Inspectorate of Ancient Monuments, was the location and evaluation of areas of prehistoric activity and the provision, by sample excavation, of firm indications of preservation for specific monuments.

With the exception of rare pockets of old grassland and woodland, and areas recently returned to grass by the National Trust, the arable landscape immediately dictated the most suitable field survey approach: surface collection 'field-walking'. The systematic collection of artefacts from the weathered surface of ploughed fields is becoming increasingly recognized as a major field survey technique. The use of flint and similar lithic material for tools throughout prehistory provides one enduring component of a total artefact assemblage that may also have included bone, metal and pottery.

The two-stage surface collection strategy used in this and other Trust for Wessex Archaeology projects aims initially to locate widespread patterns and anomalous areas. These are assessed in the light of localized topography and soil changes. Collection is initially by means of transects within hectare squares based on the national grid and provides an initial surface sample of approximately 8–10 per cent. The second stage of more detailed gridded collection tends to be reserved as an intensive pre-excavation sampling technique when it is carried out in con-

junction with geophysical and geochemical surface surveys.

Over the past three winters more than 1,000 hectares have been examined and patterns of prehistoric activity have been recorded. Far from being a 'ritual landscape', devoid of inhabitants, the recent survey has shown areas of intensive domestic and industrial activity contemporary with the major ceremonial centres. Even within the relatively restricted study area, the patterns represented by the surviving monuments can be seen reflected in shifting zones of domestic activity culminating in the developed agricultural and territorial landscape of the later Bronze Age, c. 1000 BC.

Survey and sample excavation have thus provided a spatial, functional and chronological framework for prehistoric activity around Stonehenge, the only missing component being evidence for environmental change. The potential of upland chalk areas to provide environmental evidence is limited largely to land snails within protected contexts, particularly in buried soils and within ditch deposits. The palaeoenvironmental potential of the Stonehenge area, with its barrow mounds, ditches and other potentially dateable earth works, is thus extremely high and has been exploited in tandem with the main project. Research funding from the Society of Antiquaries, the British Academy and the Prehistoric Society has facilitated the investigation and analysis of a number of overlapping dateable environmental sequences.

The field aspects of the project are now almost complete, with only a short season of surface collection and recording of field monuments remaining. The project will then progress to a phase of full-time analytical work intended to produce both management strategies and a full synthetic publication of the projected results.

It is hoped to continue research in the area, particularly on the aspects of the prehistoric environment, but this will now depend on the availability of research funds other than from the UK Department of the Environment.

It is only by moving beyond empirical observations that we can hope to comprehend the societies in which Stonehenge was built. These must be understood if we are to preserve in a sensible manner their tangible, if ephemeral, remains. It is hoped that the Stonehenge Environs Project will not only have added to our understanding of the area, but also provided the means by which it can be both preserved and explained. □

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