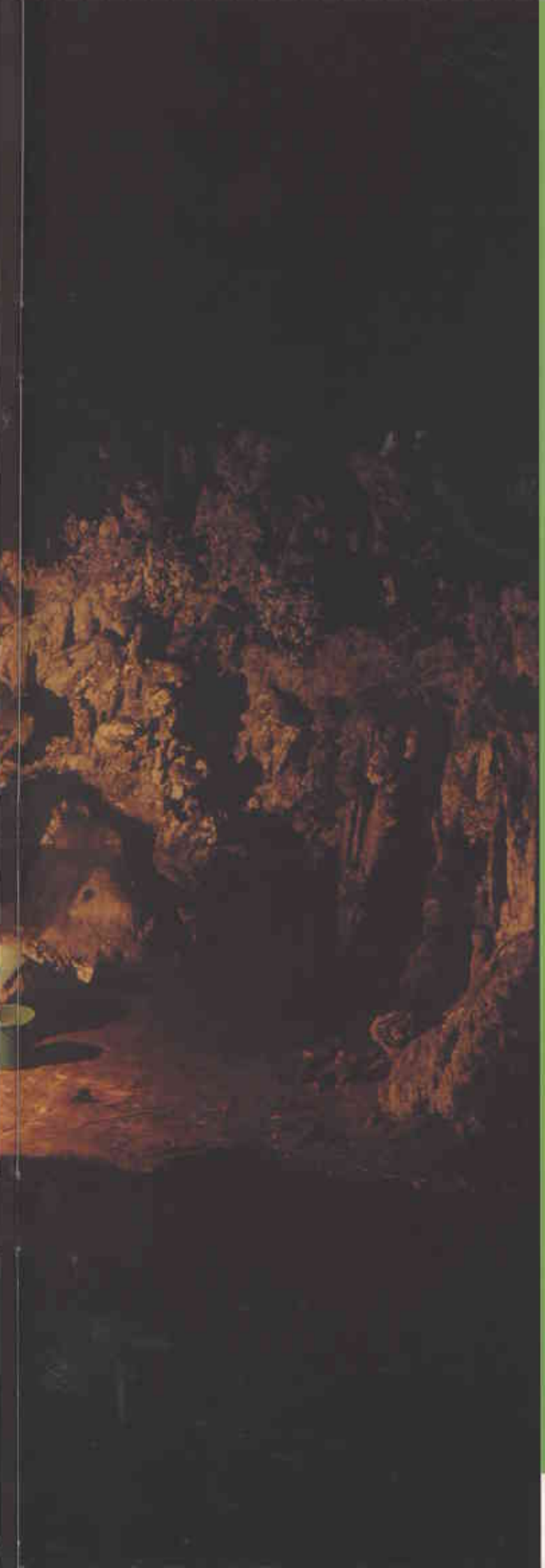


History from the caves

50,000 years of Aboriginal occupation in the Leeuwin-Naturaliste region

by Joe Dortch and Charles Dortch

Limestone caves and rock shelters in the Leeuwin-Naturaliste National Park, in Western Australia's south-west, have yielded a wealth of information relating to ancient Aboriginal occupation, dating back around 50,000 years.

Information about Aboriginal occupation of the Leeuwin-Naturaliste region derives mainly from excavations and other investigations carried out by archaeologists, palaeontologists and other scientists. This prehistoric record is beginning to shed some light on the complexity of past Aboriginal populations' interactions with the south-western Australian environment, from more than 47,000 years ago until relatively recently.

EXCAVATIONS OLD AND NEW

Archaeology, the study of past human life, and palaeontology, the study of plant or animal life in the past, rely on excavation and study of fossils or artefacts in their stratigraphic and geological context. The dating methods used are techniques based on the decay of radioactive isotopes (e.g. radiocarbon dating) or the accumulation of a radioactive dosage in ancient sediments from natural background radiation (e.g. luminescence dating). Artefacts (objects made or modified by people) constitute the major difference between archaeological and palaeontological evidence.

The palaeontological importance of limestone caves in the Leeuwin-Naturaliste region was recognised a century ago when abundant vertebrate remains, including extinct 'megafauna' species, were excavated from the floor of Mammoth Cave, near Margaret River. The archaeological potential of the caves was only recognised in the late 1960s, with the identification of a human tooth and stone tools collected a decade earlier during palaeontological sampling of the Devil's Lair cave. At about this time, probable artefacts were recognised among the bones recovered from Mammoth Cave.

IN THE DEVIL'S LAIR

In 1970, following the Devil's Lair finds, a team from the WA Museum undertook archaeological excavations

in the cave's floor deposit. Within a few years, the team had compiled a record of radiocarbon-dated stone and bone artefacts, intact hearths (campfire beds) and enormous quantities of mammal and other bone. This showed that Aboriginal groups had first occupied this cave more than 30,000 years ago (in radiocarbon years, 'before present' or BP).

Most recently, the Devil's Lair deposit has been 're-dated' in a project using several new radiometric dating methods. As a result, the estimated age of first human occupation of the cave has been significantly revised from 31,000 years to 47,000 years BP, making Devil's Lair one of the oldest, and probably the most reliably dated, early occupation sites in Australia.

Previous page
Main: Recovering archaeological material by sieving sediment excavated from a Leeuwin-Naturaliste region cave.
Bottom right: Recording the positions of campfires and archaeological remains in an excavation.
Photos – Noel Holly/Illustrations
Small inset: Stone artefacts recovered from excavations at Devil's Lair.
Photo – Douglas Elford/Western Australian Museum

Top: Profile of the Tunnel Cave excavation. The white bands above the excavator are ash layers from campfires.
Photo – Joe Dortch

Left: Archaeological excavation at Tunnel Cave. The sandbags protect water run-off from entering the excavation.
Photo – Noel Holly/Illustrations

BONE POINTS

Bone points are common finds in prehistoric excavations in many parts of the world. In Australia, points were typically made on the fibulae (smaller lower leg bones) of kangaroos and wallabies. The process was simple: the fibula shaft was snapped in half and the broken ends were then whittled or ground down, in this way converting each half of the shaft into a sharp point.

In historic times, Aboriginal people in southern Australia used bone points as pegs for stretching macropod and possum skins being processed for use as cloaks and bags, and as awls or bodkins in stitching skins together for cloaks and 'dilly' bags. Bone points were sometimes used as cloak fasteners. In coastal districts of south-eastern Australia, small, double-ended points served as barbs on fishing spears. Some tiny points were probably used as ornaments.

In many parts of Australia, bone points were used for piercing the septum of the nose, which was part of male initiation. Points or non-pointed lengths of limb bone fitted into the septum were ornamental and also indicators of status. The bone points from Devil's Lair (shown here), and those from Tunnel Cave, could have been variously used for any of the above practical, ornamental or symbolic purposes.

Bone points from Devil's Lair, dated 12,000 to 40,000 years BP.
Photo – Douglas Elford/Western Australian Museum

NEW SITES, NEW EVIDENCE

During the 1990s, this record of prolonged cave occupation at Devil's Lair was supplemented by similar evidence from excavations at other prehistoric sites among the region's hundreds of limestone caves and rock shelters.

Several exceptional ancient Aboriginal occupation sites have now been recorded within or on the boundaries of the Leeuwin-Naturaliste National Park. All of the best preserved sites are in caves or rock shelters formed in the Tamala Limestone. This limestone caps the Proterozoic granitic gneiss of the Leeuwin Block, running from Cape Naturaliste 100 kilometres southward to Cape Leeuwin (see 'Caves of the Cape', *LANDSCOPE*, Summer 2000–2001). The sandy floor deposits in limestone caves are chosen for excavation because they are alkaline, allowing good preservation of animal bone and mollusc shell. Much of this material is identifiable as Aboriginal food remains, since it is charred and occurs in undisturbed hearths. Many of the larger mammal bones have been deliberately smashed.

Excavation inside the wide entrance to Tunnel Cave, located within a small stand of karri forest growing around the cave's doline, revealed numerous hearths, stone artefacts and animal remains derived from many episodes of human occupation. Charcoal samples collected from the lower two metres of the three-metre-deep deposit are dated by conventional radiocarbon method. The 'dates' obtained from these samples range in age from 22,000 to 8,000 years BP. This record supplements the far longer but much sparser occupational record from Devil's Lair, which provides the earliest evidence of human occupation of the region. One small hearth at Tunnel Cave is dated 1,400 years BP. It is not associated with many artefacts or food remains, and suggests only a fleeting visit.

Nearer to the coast, at Witchcliffe Rock Shelter and Rainbow Cave, archaeologists identified more hearths, and collected quartz artefacts, vertebrate remains (including those of fish), and marine and freshwater mollusc shell. Each site features a charcoal-rich deposit radiocarbon-dated to less than 800 years BP. Such sites show that in recent centuries Aboriginal people were still using the Leeuwin-Naturaliste caves as overnight and meal-time camps.

Top left: Karri forest in the Tunnel Cave doline.
Photo – Joe Dortch

Other regional caves have so far yielded only limited evidence of prehistoric human occupation. Stone artefacts and human skeletal material have been recovered from a cone-shaped deposit at the base of the vertical shaft at Skull Cave. A few human bones have also been collected from the sediment cone below the vertical entrance to Strong's Cave near Devil's Lair. Most tantalising is the possibility that limb bones among the remains of megafauna excavated from Mammoth Cave early last century were cut, broken or burnt by people, though that cave has yielded no other archaeological evidence.

Left: View over an Aboriginal campsite in the Leeuwin-Naturaliste National Park. When the site was occupied, 18,000 to 10,000 years ago, sea levels were significantly lower. The site's occupiers would have overlooked an expanse of land to the west.
Photo – Joe Dortch

Below left: Excavation in progress at a Leeuwin-Naturaliste region cave.
Photo – Joe Dortch

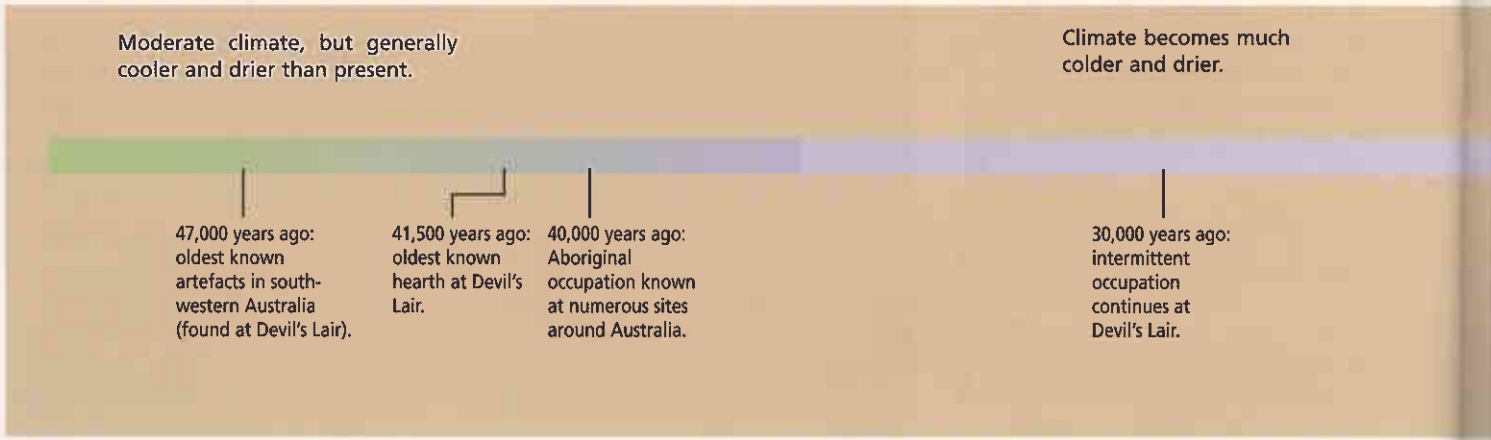
STONES AND BONES

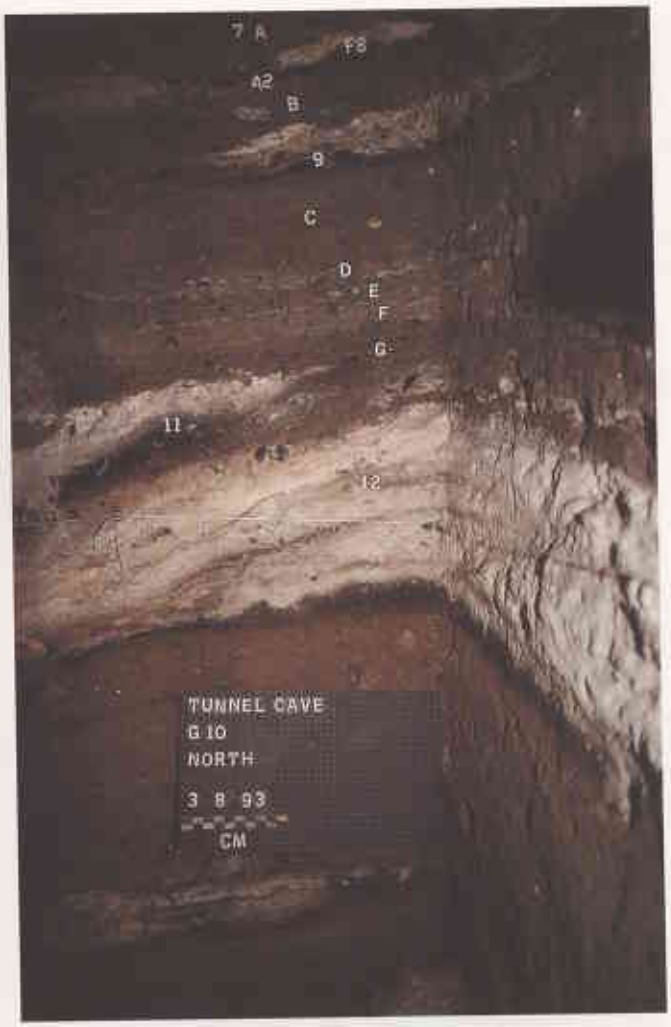
Several dozen retouched (that is, purposely edge-trimmed) stone artefacts from Pleistocene layers at Devil's Lair were probably used as tools. The presence of these tools indicates that the families or other groups occupying the cave were preparing food, making wooden implements and carrying out other 'hearthside' activities.

Three bone beads, made from polished sections of naturally perforated limb bone, and a perforated marl (lacustrine limestone) object, believed to be a pendant, have also been excavated from these layers. For reasons unknown, almost no formal tools are present among approximately 1,500 mostly very small flakes and other stone artefacts associated with the numerous hearths at Tunnel Cave. One group of hearths in this cave, radiocarbon dated at 16,000–17,000 years BP, did yield four 'points' shaped on macropod fibulae. These resemble some of the dozen bone points from Devil's Lair, dated 12,000 to more than 40,000 years BP.

Megafauna remains are absent from the archaeological sequences at Devil's Lair and Tunnel Cave, though a handful of bones derived from large macropods and other extinct marsupials were recovered from the basal part of the Devil's Lair deposit. This part of the deposit, radiometrically dated from more than 47,000 to approximately 55,000 years BP, is lacking in archaeological remains.

Rock engravings and paintings are almost unknown in the Leeuwin-Naturaliste region, although some have been recorded at a handful of other places in the south-west. Yet, the region is not entirely lacking in rock art. Twenty years ago, two cavers identified a pair of very faint, adult-size hand marks outlined in red ochre near the entrance to one cave. Hand-stencils of this kind are commonly found at art sites elsewhere in Australia and in many other parts of the world.





Above: Uncovering campfires dating to 12,000 years ago. The layers are revealed by carefully scraping the surface with a small trowel.

Right: Close-up view of campfire ash-beds in section. The lowermost thick white layer is dated to the approximate time of the last glacial maximum, 17,000 years ago.
Photos – Joe Dortch

OCCUPATION PATTERNS

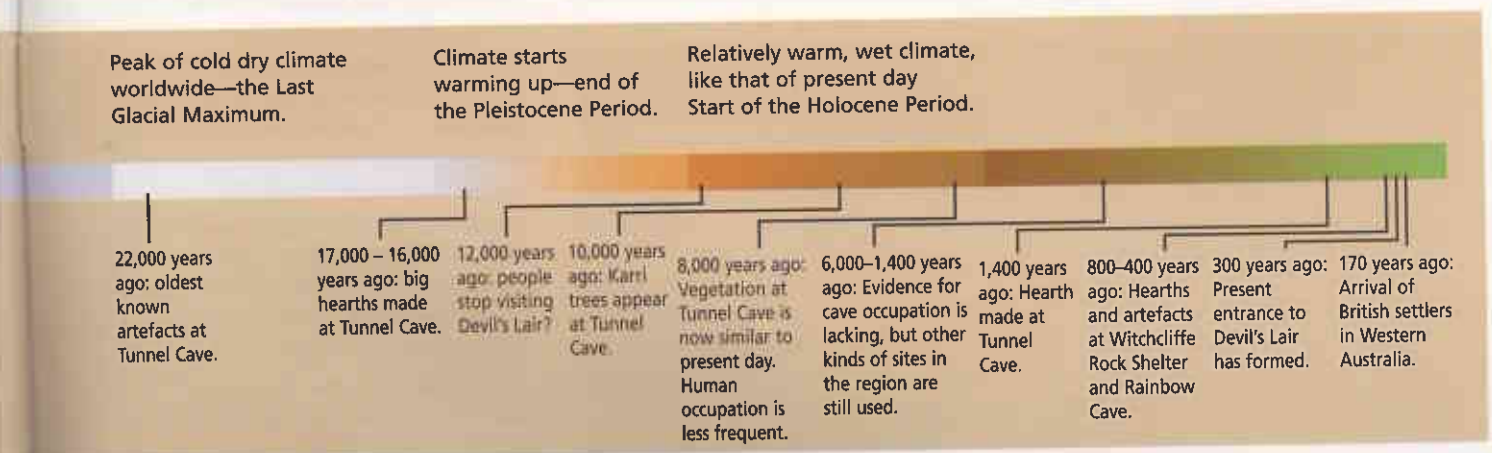
Occupation at Devil's Lair and Tunnel Cave seems to have been very occasional, perhaps taking place only during wet or cold weather. Numerous fragments of emu eggshell present in many layers in the floor deposits at both sites are evidence of repeated occupation in winter or early spring. Occasional human juvenile teeth recovered at both caves imply that the human occupiers were sometimes in family groups.

Despite many thousands of years of intermittent use, cave occupation sites may never have been crucially important within regional hunter-gatherer land-use systems. Over many thousands of years, Aboriginal foragers probably exploited a wide variety of environmental zones both within and outside the Leeuwin-Naturaliste region. During the last glacial period, when expansion of polar ice caps led to lower sea levels, human groups almost certainly occupied the emergent continental shelves to the north, west and south of the region.

Presently available radiocarbon dates show a gap of several thousand years between the mainly Late Pleistocene occupational sequence at Tunnel Cave (22,000–8,000 years BP) and the most recent occupational evidence for this site. It is not clear whether the apparent gap in Aboriginal occupation at Tunnel Cave of more than 6,000 radiocarbon years is regionally significant.

Several open-air sites in the Leeuwin-Naturaliste region—including at Calgardup Brook, Dunsborough and Ellen Brook—have yielded radiocarbon dates ranging between 4,000 and 5,000 years BP. These dates show that human groups were present in the region during the period when evidence for cave occupation is lacking. Yet it should be remembered that the region's archaeological record is still very limited, and that absence of evidence for any aspect of past activities or occupation patterns may not be significant.

The Devil's Lair occupational sequence has no bearing on this question as, sometime after 12,000 years ago, a former entrance became blocked, preventing people from entering the cave chamber. Devil's Lair



Left: Many caves in the Leeuwin-Naturaliste National Park are located in deep dolines, or sinkholes. They act as pit-traps, collecting the remains of plants and animals that lived around them. Cave conditions then preserve the remains for millennia.
Photo – Brett Dennis/Lochman Transparencies

may have remained entirely sealed until a few centuries ago, when roof collapse created the present doline, again opening up the existing chamber. Nor do the occupational histories recorded at Rainbow Cave and Witchcliffe Rock Shelter throw any light on this problem, since both sites were in use only during the past millennium.

Aboriginal artefacts flaked from European bottle glass, have been found at Ellen Brook and elsewhere in the region. A number of British and French accounts, mainly dating to the early 19th century, and one 17th century Dutch account describe encounters with Aboriginal people in the Leeuwin-Naturaliste region. These accounts are complemented by an oral tradition of the sightings of 19th century or earlier European sailing ships recounted by Aboriginal elders still living in the region.

OCCUPATION AT 50,000 YEARS AGO?

On the basis of the radiometric chronology from Devil's Lair, we think that people were in the Leeuwin-Naturaliste region as early as 50,000 years ago. Radiometric years in the age range 40,000–50,000 years BP are 1,000–2,000 years 'younger' than their equivalent in astronomical years.

The lowermost stone artefacts in the Devil's Lair archaeological sequence are in an eroded zone, which is overlain by a very thick, apparently uneroded layer. The half-dozen artefacts in the eroded zone are older than those in the uneroded zone and may be re-deposited from an even older part of the deposit. However, this suggested older deposit would not seem much older than the oldest part of the eroded zone, since absolutely no stones or bones resembling artefacts have been identified in the fairly extensive excavations carried out in the underlying layers.

Devil's Lair almost certainly is not the oldest occupation site in the region. How likely is it that the cave deposit chosen for excavation in 1970 would be the region's very oldest site? In short, Devil's Lair is simply the oldest known site yet investigated in this region or anywhere else in WA.

INTERPRETING THE ANCIENT PAST

Historic accounts, mainly dating to the early decades of the 19th century, attest to the wide variety of plant and animal foods eaten by Nyoongar hunter-gatherers at the time of European colonisation (see 'Hunters and Gatherers', *LANDSCOPE*, Spring 1992). These accounts provide an intriguing picture of Aboriginal life in the western and southern fringes of the jarrah forest and in the woodlands of the coastal plains. In contrast, there are few historical accounts of Aboriginal activities in the karri or jarrah forests further inland. Thus, the only way to assess past Aboriginal use of these forests is to investigate non-literary records. This is best done through excavating archaeological sites where people lived and carried out their daily activities. The information thus obtained has the potential to reach back tens of thousands of years (see timeline on pages 44 and 45).

Above left: Excavating a campsite floor in Devil's Lair.
Photo – Alex Baynes/Western Australian Museum

Above: Some of the bones recovered from a single layer at Devil's Lair. As many bones as possible are identified to species level, so that researchers can infer past environmental conditions.
Photo – Jenny Porter/Western Australian Museum

Left: A bone point, made on macropod fibula, recovered from the sieve during the Tunnel Cave excavation.
Photo – Joe Dortch

Three decades of archaeological investigation has shown that cave occupation sites were components in hunter-gatherer land use systems in the Leeuwin-Naturaliste region from Late Pleistocene times until recent centuries. One of the benefits of this development is that, since the early 1980s, Nyoongar communities in the south-west have come to regard sites like Devil's Lair and Tunnel Cave as highly significant components of their cultural heritage. A number of young people from these communities have participated in the excavations at Devil's Lair, Tunnel Cave, Witchcliffe Rock Shelter and other sites in the lower south-west.

The Devil's Lair and Tunnel Cave investigations are good examples of inter-disciplinary investigations aimed at reconstructing the prehistoric past, based mainly on the findings of archaeologists, palaeontologists, geologists and radiometric dating specialists. Excavations and other investigations in limestone cave and rock shelter sites, such as the ones in the Leeuwin-Naturaliste region, should continue to make a significant contribution to the nation's cultural and natural heritage.

Joe Dortch, an archaeologist, carried out some of the work described here while a doctoral student at the Centre for Archaeology, The University of Western Australia, Nedlands.

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The authors are grateful for the support and assistance of Nyoongar communities in Busselton and other south-west towns. They also thank the Australian Institute of Aboriginal and Torres Strait Islander Studies, the Western Australian Museum, The University of Western Australia, and the South-Western Development Commission, who financed field work and radiocarbon analyses. They acknowledge the help and support of Department of Conservation and Land Management rangers and park managers who facilitated many of the archaeological surveys and excavations in the Leeuwin-Naturalsite region caves.

Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting

LANDSCOPE

VOLUME SEVENTEEN, NUMBER 1, SPRING 2001

Within 40 years, the numbat has risen from near extinction to endangered with 10 populations in WA and interstate. See 'Numbats Forever' (page 17).

The forces that shaped the geology and landforms of the south-west began more than 3,500 million years ago. Read the facinating story on page 10.

The Marine Community Monitoring Program is a new and ambitious program to involve the community in keeping our oceans clean. See page 35.

Shark Bay Marine Park provides spectacular opportunities for divers and snorkellers. No wonder it is called Bay of Delights. See page 23.

The history of Aboriginal occupation in the Leeuwin-Naturaliste region spans 50,000 years. Find out more in 'History from the Caves' (page 40).

FEATURES

REGULARS

COVER

Leschenaultias are some of the most widely known and recognisable plants in Western Australia. They have fantastic horticultural value and provide glorious floral displays. The wreath leschenaltia is a favourite with visitors during our wildflower season. See page 23.

Cover illustration by Philippa Nikulinsky

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