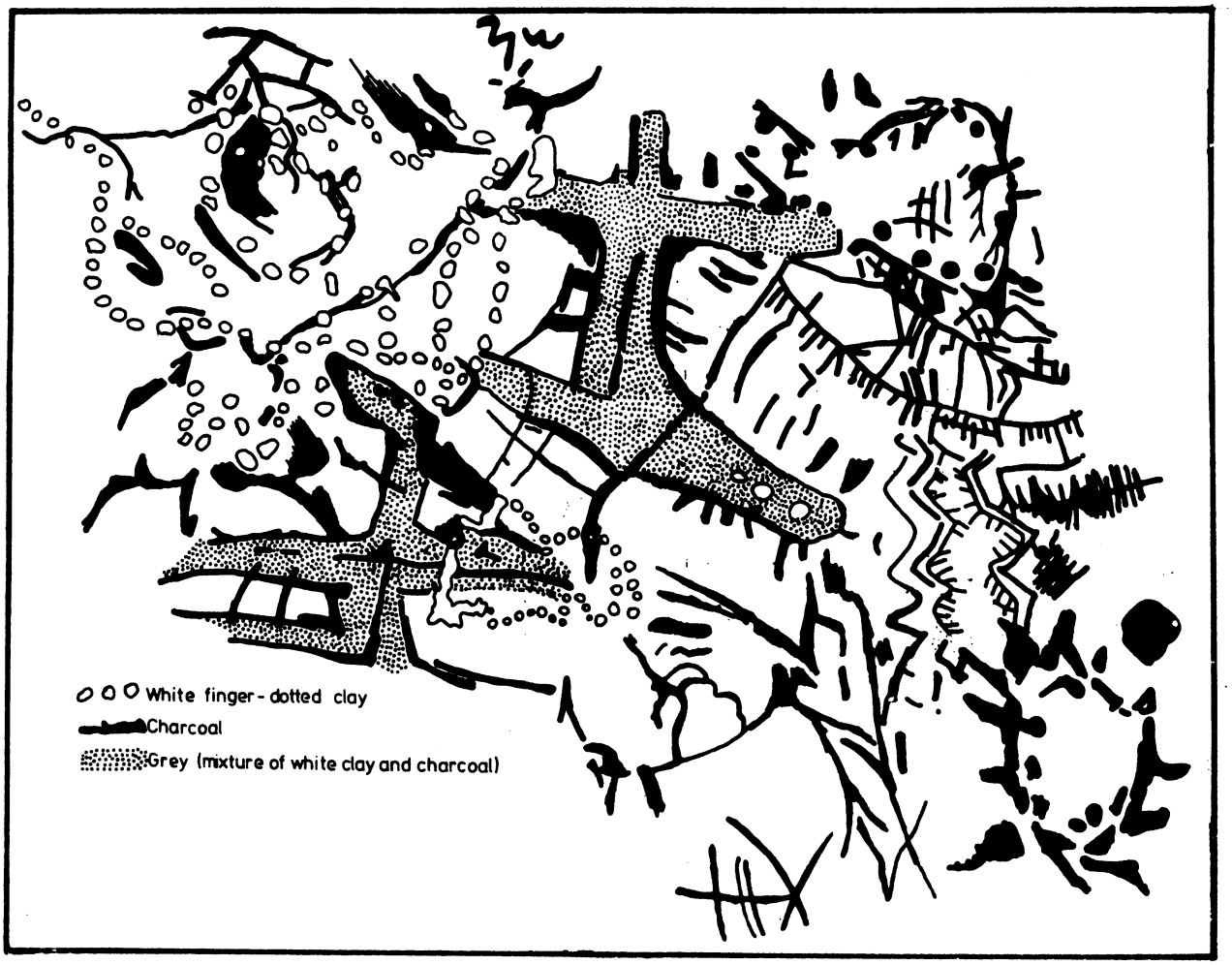
10th BIENNIAL CONFERENCE
AUSTRALIAN SPELEOLOGICAL FEDERATION



K. A. Wilde

ABSTRACTS

27 - 29 December 1974

University of Queensland

LIST OF PAPERS TO BE PRESENTED AT THE 10TH ASF CONFERENCE

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GEOLOGY AND GEOMORPHOLOGY - LIMESTONE KARST

1. A new speleological feature - recognised at Yanchep National Park, Western Australia. A. Doernberg
2. Geology and geomorphology of the Marble Arch Caves. R. Nicoll
3. The Eagles Nest Cave System. A.J. Pavey
4. Cave and Karst Areas in Fiji, Samoa and Tonga. J. Dunkley
5. Hydraulic Engineering, applied to speleology. M. Pound

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GEOLOGY AND GEOMORPHOLOGY - PSEUDO KARST

6. Pseudokarst - Definition and Types. K.G. Grimes
7. A review of non-limestone caves in N.S.W. A.J. Pavey
8. Pseudokarst caves of the Gazelle Peninsula, New Britain, P.N.G. R.M. BOURKE
9. Pseudokarst caves in duricrust-granite terrain, Banana Ra., C.Q. H. Shannon
10. Investigation of Sea Caves. P. Toomer and B. Welch
11. Mt. Suswa lava caves, Kenya Rift Valley. J. Dunkley

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12. A recent bone deposit at Marble Arch, N.S.W. L.S. Hall
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14. Notes on the rock art of Aibura Cave, Kaimantu, Eastern Highlands, P.N.G. K.A. Wilde
15. Visitor access and facilities, Carlsbad Caverns, USA and Chillagoe Caves, Qld. H.S. Curtis
16. Cave exploration and caving potential in the Chillagoe area. T.W.L. Robinson
17. Observations of the geomorphology of the Chillagoe Limestones. P.A. Wilson

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THE NATURAL RESOURCE AND CONSERVATION

18. How well off is Australia for caves and karst? A brief geomorphic

Abstracts of 10th Conference of the ASF, 1974

SECTION 1

GEOLOGY AND GEOMORPHOLOGY LIMESTONE KARST

1. A new Speleological Feature - recognised at Yanchep National Park, W.A.

Amnon Doernberg

ABSTRACT: A new speleological phenomen was recognised early in 1974 in several caves in the Yanchep National Park, W.A. This paper outlines the morphology of these features and presents an hypothesis for their genesis. The evidence suggests that they formed during the early stages of karst development and predate the caves.

2. GEOLOGY AND GEOMORPHOLOGY OF THE MARBLE ARCH CAVES

R. NICOLL

The Marble Arch Caves are located 35 km. south of Braidwood, New South Wales, in the coastal ranges which form the eastern border of the Southern Tablelands. Although the area of limestone is relatively small there are a number of complex, well developed caves.

Reconnaissance geologic studies of the Marble Arch Limestone reveal a complex structural and stratigraphic setting. The sediments are believed to be of late Silurian age but paleontologic evidence is lacking. The limestone appears to lie conformably within a clastic sequence, bounded on the east by sandstone and on the west by interbedded, dominantly clastic, sediments that are nearly vertical. The entire sequence of sediments is nearly surrounded by granites or granodiorites. The limestone is partially dolomitized and completely recrystallized.

The caves are found within the main body of limestone and are restricted to the less dolomitic portion. The base level of Moodong Creek appears to have been the limiting factor on downcutting and all cave features point to a vadose origin. Paleostream gradients have been measured, using ceiling levels and meander niches, and are compared with measured gradients of Reedy and Moodong Creeks.

THE EAGLES NEST CAVE SYSTEM

ANDREW PAVEY

A relatively little visited cave at Yarrangobilly has recently been shown to be in the "top ten" deepest and longest caves in Australia. The cave is a complex system illustrating a "classic" stream capture. A brief history of the cave is followed by a detailed description of the system and its mophological features and an attempted analysis of the speleogenesis.

CAVE AND KARST AREAS IN FIJI, SAMOA AND TONGA

J. DUNKLEY

HYDRAULIC ENGINEERING (as applied to Speleology)

Malcolm D. POUND

This paper deals with the application of hydraulic engineering principles to the hydrology of a limestone area in the headwaters of Stockyard Creek and Warbro Brook, both southern tributaries of the Macleay River in northern coastal New South Wales.

Sources of available hydrological data are outlined, and data from these sources is analysed to determine the amount of runoff to be expected from any catchment at any time in the Stockyard Creek area. This theoretical runoff has been computed with data from mostly non-limestone catchments and is compared with observed runoffs from the limestone areas. Discrepancies are discussed with reference to our present knowledge of the geology and toporgraphy.

Underground flow connections which have been proven using water tracing are discussed and proposed future work on the hydrology of the area is described.

Special techniques required in this area for water tracing experiments are demonstrated and the future application of these techniques to other areas is discussed.

SECTION 2

GEOLOGY AND GEOMORPHOLOGY PSEUDOKARST

PSEUDOKARST - DEFINITION AND TYPES

K.G. Grimes

If a karst landform is one characterized by features such as karren, dolines, subterrainian drainage, and caves, and if the main karst process is the removal of material in solution, then pseudokarst is a karst landform produced by some process other than solution.

Under this definition, some features e.g. volcano-karst, laterite-karst and granite and basalt lapies would be considered as true (solution) karst.

As more than one process can operate in a given case, the feature should be classed according to the dominant process.

Pseudokarst processes can be grouped according to the phase in which the material is removed -

1. in the solid state, e.g. piping (alluvium caves), hydraulic action (sea caves), mining and burrowing, tectonic fissures, wind and weathering (rock shelters).

2. in the liquid state, e.g. lava tunnels, glacier caves and thermokarst.

3. in the gaseous state, (seldom a dominant process), e.g. ablation hollows in ice and snow.

REVIEW OF CAVES IN N.S.W.

NON-LIMESTONE

ANDREW PAVEY

Non-limestone caves can be classified in terms of this:-

mode of formation. A few examples each known type, found in N.S.W. are discussed.

PSEUDOKARST CAVES OF THE GAZELLE PENINSULA, NEW BRITAIN, PAPUA NEW GUINEA

R. MICHAEL BOURKE

ABSTRACT: Volcanic pumice ash deposits blanket much of the north east lowlands of the Gazelle Peninsula of New Britain. Ten pseudokarst caves are known in this area, nine occuring in the volcanic ash and one within an active volcano. Clay or rock layers have been noted at about floor level in some of the caves. It is postulated that cave formation occurs when rainwater moves more rapidly through the coarse sand ash layers than it can through the denser lower beds. Lateral movement of water occurs and tunnels commence forming where the water effluxes. A carbon sample from one cave was dated by radiocarbon age determination as 1475 ± 80 years B.P., thus indicating maximum cave age. Other areas in Papua New Guinea where similar cave development is possible are noted.

PSEUDOKARST CAVES IN DURICRUST / GRANITE TERRAIN, BANANA RANGE, C. QLD.

HENRY SHANNON.

Three enterable through caves, ranging up to 67m in total passage length are described from the Barfield area. The caves occur in and under a sandstone duricrust resting on weathered granite. The sandstone is an indurated colluvial deposit derived from the surrounding granite and accumulating as sheets in low gradient sections of gullies. Induration to mottled sandstone occured later in a lateritic weathering regime. The rock is very resistant and forms cliffs and waterfalls.

Cave development is initiated along disconformity surfaces; most commonly the granite / sandstone contact but sometimes an internal disconformity in the sandstone.

The clay component of the rock can be dispersed into colloidal suspension. The process mimics true solution, and provides a close analogy to true karst.

INVESTIGATIONS OF SEA CAVES.

P. TOOMER and B. WELCH

Over the past few years members of Peninsula Speleological Group have been systematically documenting sea caves in the area of coast between Newcastle and Seven Mile Beach (south of Wollongong). Most of the work has been of a purely documtative nature, the principle aims being a cursory examination of the cave, the recording of a description and location of each cave and the assigning of a number.

Investigations of Sea Caves (contd.)

As a result, this work has also involved the development of a numbering system, techniques for locating and marking the caves and application of the ASF cave record sheet to the storage of the data collected. Although the examination of each cave has not been particularly involved it has been possible, in a general way, to relate structural control and lithologies to the form which the cave finally takes. Features covered in the paper include:

1. Joint control of caves in; Sandstone
   Conglomerate
   Igneous rocks
2. Dyke controlled development in; Sandstone
   Conglomerate
3. The relation of cave debris to rock type and the effect of debris on cave development.
4. Relationships between fresh water influence in the caves and the development of speleothems.
5. Problems encountered in the locating, tagging and numbering of sea caves and techniques used to overcome them.

MT. SUSWA LAVA CAVES,
KENYA RIFT VALLEY

J. DUNKLEY

SECTION 3

PALAEONTOLOGY, BIOLOGY, ANTHROPOLOGY

A RECENT BONE DEPOSIT AT MARBLE ARCH, N.S.W.

by LESLIE S. HALL

CSIRO

Division of Wildlife Research

ABSTRACT: Investigations of a recent bone deposit at Marble Arch, N.S.W. revealed the presence of twenty three species of small mammals, several of which are now extinct and others which are not found in the area. The deposit is the result of an accumulation of a large number of regurgitated pellets, believed to be from Masked Owls, Tyto novaehollandiae. Changes in food selection or availability for the owls are shown and some comments on the possible age of the deposit are made. A key for identification of the dentaries of small mammals in south-eastern Australia is presented.

ROOST SELECTION BY THE EASTERN HORSESHOE BAT, RHINOLOPHUS MEGAPHYLLUS

by LESLIE S. HALL

CSIRO
Division of Wildlife Research
and

R.A. YOUNG

Darling Downs Institute of Advance Education

ABSTRACT: The distribution of the Eastern Horseshoe bat, Rhinolophus megaphyllus, is described and the known maternity caves for this species are recorded.

Temperature and humidity readings from a large number of caves and mines show that this species of bat has a definite preference for roosting in areas exhibiting high temperatures and humidities. These caves, cave chambers or mines are usually of small dimensions, often containing rock-falls or dirt-fill.

The importance of temperature, humidity and size of the roosting site is discussed in relation to the bats distribution, both on a local and extended scale.

Recognition of roose selection is essential in the conservation and management of this species.

NOTES ON THE ROCK ART OF AIBURA CAVE, KAINANTU, EASTERN HIGHLANDS DISTRICT OF PAPUA NEW GUINEA.

K.A. WILDE

A detailed account of the rock art of Aibura Cave, near Barapiua Village, in the Kainantu Sub-district of the Eastern Highlands of Papua New Guinea is given. Techniques used are described in detail, and the form compared with Kundiawa sites. Dating difficulties are discussed, but it may be assumed two periods, 4000 - 2000 BP and 1000 - 600 BP are present, with two distinct styles and techniques. The paper does not attempt to detail the purpose and symbolism of the art. Brief notes on the pre-history of the area, a local legend associated with the cave, and an account of its more recent uses are provided.

SECTION 4 CHILLAGOE
AREA, AIMS and ACTION

VISITOR ACCESS AND FACILITIES
CARLSBAD CAVERNS (U.S.A.) AND CHILLAGOE CAVES (QLD.)

H.S.Curtis
National Parks Branch, Queensland Department of Forestry

Carlsbad Caverns in the United States contain some excellent features in the work done to provide visitor access and facilities and especially in the standard of illumination provided. Some aspects of this work are discussed. Mention is also made of work being done at the Chillagoe Caves in Queensland.

CAVE EXPLORATION AND CAVING POTENTIAL IN THE CHILLAGOE AREA

T.W.L. Robinson

The Chillagoe caving area lies 130 km west of Cairns. Because of its inaccessibility and distance from the main centres of population, it is still relatively unknown.

This paper will describe the extent of exploration to date, and some of the known caves, give an account of present local activity and assess the potential of the area for exploration.

(Continued

Cave Exploration and Caving Potential in the Chillagoe Area (contd.)

Documentation of caves was begun in the early 1960's by a few interested individuals and the Queensland Forestry Department (National Parks section). Between 1966 and 1970 Sydney Speleological Society produced several surveys, an area map and their occasional paper "Chillagoe Communications". The formation of the Chillagoe Caving Club in 1973 enabled local cavers to co-ordinate their activities.

As yet only a small section of the limestone belt has been intensively explored and large areas are completely unexplored.

Several small groups are engaged in scientific work but the need is great for long-term studies.

"OBSERVATIONS OF THE GEOMORPHOLOGY OF THE CHILLAGOE LIMESTONES"

PAUL A. WILSON B.Sc.

Cave Guide, Queensland Forestry Department.

This paper is an assemblage of field observations relating to the morphology of the Chillagoe limestones. It is not intended to advance any theories but rather to fill in some details where previous observations have been incomplete.

The town of Chillagoe is approximately 130 km west of Cairns, North Queensland, and the limestone lies in a belt about 5 km wide and 45 km long. The climate is seasonally arid with an average annual rainfall of 800 mm.

The area is described as an "aligned tower karst" as the vertical bedding causes the limestone to protrude above the plain in long narrow ridges. Pedimentation occurs and some pavements can be seen. The towers exhibit many surface solution features. Numerous complex cave systems have developed by solution and collapse, along strong joints within the towers.

Observations of water levels made during the exceptionally heavy wet season of 1973-74 have cast new light on the process of cave development in the area.

SECTION 5

THE NATURAL RESOURCE AND CONSERVATION

How well off is Australia for caves and karst? A brief geomorphic estimate.

J.N. JENNINGS

Australian National University

ABSTRACT: The cave provinces of Australia are discussed in terms of the geological physiographic and climatic factors which limit karst development. The optimum terrain for karst is mountainous, wet and with abundant limestone. Australia is generally deficient in limestone, dry and flat, hence caves are comparatively rare. This overall scarcity of caves makes proper conservation all the more necessary.

MT. ETNA CONSERVATION - A HISTORY OF ARBITRARINESS.

LEX BROWN

ABSTRACT: The caves of Mt. Etna and Limestone Ridge in Central Queensland, collectively known as the Mt. Etna Caves, are being quarried for limestone by Central Queensland Cement Company. The case for the inclusion of Mt. Etna and Limestone Ridge in a National Park is briefly outlined. The history of quasi-protection, pseudo-protection, proposed protection, promised protection, and destruction of this cavernous area is traced. Though originally gazetted as Recreation Reserves, mining leases now cover these areas. In 1968 a Queensland State Government Committee recommended a National Park over 31 acres of Mt. Etna. Present indications are that a National Park may soon be announced over at least part of Limestone Ridge but that Mt. Etna will be destroyed. The arbitrary basis of this action is challenged.

The conflict is not insoluble, but no solution can be contemplated which would allow any further violation of either of Mt. Etna or Limestone Ridge.

SECTION 6

CAVE DOCUMENTATION

GENERAL CAVES AREAS OR THE NUMBERING OF CAVES NOT FOUND IN SPECIFIC CAVE AREAS

P. TOOMER and B. WELCH

Following active interest in the caves of the smaller limestone deposits and the non-limestone caves of New South Wales, a new numbering system was devised to encompass this development.

A series of "General Caves Areas" has been created, with the boundaries of each 1:250,000 topographic sheet delineating the Area. The area codes are derived from the map identification number.

The numbering of each General Caves Area will be controlled by interested individuals and the Cave Numbering and Nomenclature Committee will oversee general administration.

Numbers will be allocated arbitrarily in each General Caves Area with specific emphasis on grid references for the location of caves.

The system is sufficiently flexible to be used throughout Australia and it is for this reason that it is brought to the attention of the Federation as a whole, in the hope that others may see in it the solution to their problems.

CAVE DOCUMENTATION -

a training session on methodology

P. MATTHEWS

SECTION 7

PUBLICITY AND PROMOTION

THE PRODUCTION OF A CAVING MOVIE

ANDREW PAVEY

The University of New South Wales Speleological Society produced a 25 minute 16 mm colour caving movie of a general nature, showing most aspects of cave exploration and with a conservation biassed commentory. Production techniques and the many problems encountered during shooting are analysed. The final product "The Crystal Kingdom" will be shown and comments called for.

SECTION 8

YARRANGOBILLY SEMINAR

An Interim Report

A. SPATE, A.J. PAVEY, R. NICOLL

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