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NORTH QUEENSLAND NATURALISTS CLUB

Founder, Presd. The late Dr. HUGO FLECKER.

OBJECTS - The futherance of the study of the various branches of Natural History and the preservation of our heritage of indigenous fauna and flora.

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BONE DEPOSITS IN CHILLAGOE-MUNGANA CAVES.

The recent discovery of extinct marsupial bones in cave deposits of the Chillagoe–Mungana limestone series has again highlighted the rich potential of this interesting but so far little investigated area. Deposits of animal bones occurring in limestone caves can provide a valuable clue to past and present inhabitants of the limestones and surrounding country. Not only are the usual dwellers of the limestone bluffs represented in bone collections from caves, but also those that have died after inadvertently falling, and some whose bones have been washed in from outside.

The high rate of decomposition of animal matter in the dry tropics and the ravages of predators ensure that surface bone deterioration is rapid. Yet in the caves both temperature and humidity remain surprisingly constant, considering the extremes reached outside, throughout summer and winter, Wet and Dry, day and night. In this stable environment, aided by the preservative qualities of the limestones and carbonate-impregnated soil, bones may remain in a remarkably good state of preservation over long periods of time.

This may make their age at times difficult to determine, particularly where they do not occur in stratified deposits, as happened with the thylacine discovered in October 1966 in a cave (now known as Thylacine Hole) on the Nullabor, 68 miles west of Eucla. Age estimates for this animal, which still retained some body parts such as hair and skin, ranged variously from 1 to 2, 000 years!

The belt of limestone comprising the Chillagoe-Mungana series, with which this article is concerned, has not yet produced such an important find as that on the Nullabor, but possibilities of comparative finds certainly exist.

Nevertheless, random collections of bone remains have already resulted in some interesting finds. These include new records for the area, as well as some of animals which are believed to have disappeared following the early intensive settlement of the district for mining purposes.

A wide field of research still remains open into the collection, dating and classification of bone deposits and bone breccia, and in the

investigation of bone and skeletal remains in secondary floor deposits of limestone.

A rough classification of bones so far collected from caves in the Chillagoe-Mungana area, and for the most part identified by the Queensland Museum, yields the following groups:-

Mammals, mostly eutherian and marsupial mammals.
Aves.
Reptilia.

Of these the mammals form the largest and most diverse group. Many of the larger mammals lie up in cave shelters during the heat of the day. Others, as in the case of the dingo, may also bring prey to be consumed there. Some venture right into the cave system or make their way in and out over debris left by collapsed roofs. In one case a whole litter of young piglets was found together with the mother in a cave where they had died after falling in and being unable to escape. In another case, a friend investigating a shelter on the side of a bluff was suddenly startled to find an equally startled wallaby land in his arms on its hurried departure from the shelter.

Apart from pigs and the dingo (Canis dingo), larger mammal bones include the wallaroo (Macropus robustus), brush-tailed rock-wallaby (Petrogale penicillata), red-legged pademelon (Thylogale stigmatica), and indeterminate wallaby remains, probably including those of the sandy wallaby (Wallabia agilis).

Smaller mammals live around the bluffs or in the caves where the many holes and crevices afford them shelter from both humans and predators. On the dusty floors of many caves their tracks criss-cross one another, but they are seldom seen by unwary humans. However after death their skeletal remains are left behind, or washed into cave deposits through many openings from above. Jawbones and teeth are the most important parts used by the naturalist in their identification.

This group includes Rattus sp., marsupial mice (Sminthopsis sp.), short-nosed bandicoot (Isoodon macrurus), giant naked-tailed rat (Uromys sherrini), northern native cat (Satanellus hallucatus), sugar glider (Petaurus breviceps), black-tailed phascogale (Phascogale tapoatafa), the last not previously recorded from this district.

Bats form an interesting-some would say fascinating - subgroup within the mammalian cave fauna. The extent and variety of caves within the optimum climatic conditions and the comparative isolation and freedom from interference, tend to encourage a large and varied bat population. A number of species are believed to occur not only in the caves but in the surrounding open forest country, but so far only limited research has been carried out. The very factors which encourage large bat populations - isolation and distance from large human centres of population - discourage their long-term intensive study by naturalists.

Bat remains so far identified include white striped mastiff bat (Tadarida australia), false vampire bat (Macroderma gigas), freetail bat (Saccolaimus sp.), North Queensland long-eared bat (Nyctophilus bifax.) little bent-wing (Miniopterus australia) known to breed in the district, horseshoe bat (Rhinolophus philippinensis) and little brown bat. This last, together with Nyctophilus bifax, were collected outside the caves and are not necessarily cave-dwellers.

Bird remains are sometimes found in the caves although their fragility makes them less durable than bones of mammals. The barn owl (Tyto alba) and

boobook owl (Ninox boobook) have been identified, and the grey swiftlet (Collacalia francica) nests high on cave walls in many large colonies. Although Peregrine falcon and nankeen kestrel are known to nest in and around the bluffs, only one diurnal bird of prey has so far been found actually living within the caves. This was a small hawk discovered by the Cassels family inhabiting a ledge high up near the entrance to the Royal Arch caves. Bone remains from the meals of this bird were later identified as mostly Rattus sp. with some remains of the long-nosed bandicoot (Perameles nasuta).

Among the reptiles, bones of blue-tongue lizards (Tiliqua scincoides) including complete skeletons, are most often found. The blue-tongues frequent the bluffs and open chambers, and sometimes fall victim to the bottles of water left under dripping stalactites and used for carbide lights.

The brown tree snake (Boiga sp.) and carpet snake (Morelia sp.) have also been recorded from in and around the bluffs.

This account is by no means definitive. It is no more than a summary of random collections and observations made of the vertebrate dwellers in the Mungana-Chillagoe limestone area, from the record left by their skeletal remains. The work in this fascinating and almost untouched field has hardly begun.

JO TREZISE.

PERIPATUS - A BIOLOGICAL ENIGMA.

Of the many biological oddities discovered in the early 1800's, few have shared the interest aroused by the Peripatids. From fossil evidence it appears that the group has remained almost unchanged since the Cambrian, about five hundred and fifty million years ago. This, coupled with a unique combination of anatomical characters, suggests that Peripatus, or a very close relative, could have played an important role in the evolution of the Annelid worms and the myriapoduos Arthropods. Thus, Peripatus has gained popularity as both a "living fossil" and a "missing link".

The Reverend Lansdowne Guilding collected the first recorded speci mens in the West Indies in 1825 and, upon observing the strangely meandering gait of this small animal, named it Peripatus (Greek: PERIPATOS wandering about). Guilding included his new find in the Phylum Mollusca because of its slug like appearance and coarsely textured skin; he ignored the presence of a number of pairs of legs. Understandably there was soon some dispute over the correct classification of Peripatus. Finally, after a varied career as a Mollusc, a Platyhelminth, an Annelid and a Myriaped, Peripatus was given a class of its own -Class Onychophora, generally included as an appendix to the Arthropoda. The Class Onychophora was later elevated to Phylum level and at present includes a number of related genera and some seventy species.

Anyone acquainted with Peripatus will appreciate the difficulties involved in precisely designating the animal to any previously established taxon. Externally, the body is elongate, superficially segmented and has a soft, velvety skin. The skin is flexible, and on close examination is covered by small papillae. Apart from the latter, these are all Annelid features. The anterior antennae, pair of simple eyes, mouth with two pairs of chitinous jaws, segmental arrangement of the legs and a pair of terminal claws on each leg are essentially Arthropod features. Internally, Peripatus has an Arthropod blood system, heart, body cavity and

respiratory system. On the other hand, the metameric (serially repeated) arrangement of certain internal structures is more Annelid than Arthropod, and is strong evidence supporting the overall primitive nature of Peripatus.

The Peripatids reproduce sexually, having distinct male and female individuals. Adult size varies according to species, but usually the male is smaller than the female. An extended adult male ranges from sixteen to seventy millimeters in length, while an adult female may attain a length on one hundred and twenty millimeters or more.

Although there are no recorded observations of sperm transference, three possible methods have been suggested. Firstly, small packets of sperm (spermatophores) are deposited by the male on the body of the female. The sperm then penetrate the skin and make their way to the oviducts and fertilize the eggs. Secondly, the spermatophores are deposited near the female and she picks them up herself. Thirdly, the spermatophores are deposited directly into the female genital aperture.

Following fertilization, embryonic development may take as long as eight months in some species. At the end of gestation, up to twenty live young are produced over a period of a few days or even weeks. At birth, the young resemble adults in miniature but are almost translucent; pigmentation takes from four to ten days. At least two Australian species do not bear live young, but lay large, sculptured eggs. The eggs lie in the soil or leaf litter until they hatch. On an average the young are five millimeters in length at birth and, at a growth rate of around one millimeter per month, reach sexual maturity in two years or so. They may remain with the female parent for the first few weeks of life.

Peripatids occur over a range of environmental situations, but limitations on distribution are probably set by the amount of free water in the surface soil layers, together with humidity. Peripatids cannot prevent vital body water from evaporating through the small respiratory openings (tracheal pits) in the skin, and if exposed to dry conditions for only a short period of time, quickly dessicate and die. Therefore the animals are usually found in moist situations, for example, in or under fallen logs, under stones, in the bases of tree-ferns and in the leaf-litter on forest floors.

Most Onychophorans are nocturnal, emerging from their resting places at night to search for food. They are very mobile, walking by means of short, clawed legs. The legs, which are extensions of the body wall, are not jointed but are nonetheless flexible and move in a synchronous rhythm similar to that of a centipede.

Although they will eat dead animal material, Peripatids more often hunt small invertebrates such as termites, spring tails and amphipods. The method of food capture is unique in the animal world. On either side of the mouth is a large papilla, and situated at the tip of each of these is an opening of the greatly enlarged slime glands. When confronted by a possible meal, Peripatus raises the anterior portion of the body from the ground and, by muscular contractions of the body wall, directs two streams of slime over the prey. On contact with air, the slime hardens to form a tough, viscous net which holds the food firmly and enables Peripatus to eat a leisurely meal. Slime ejection is also an effective deterrent to predators.

In Australia, Peripatids have been recorded from Cape York to Tasmania in the east and from south-west Western Australia. There are two genera and seven described species, but in the light of recent work this species list could be extended by

as many as ten or fifteen new members. The two existing Australian genera are:

(1) PERIPATOIDES, which includes live bearing (ovoviviparous) forms with 14, 15 or 16 pairs of legs.

(2) OOPERIPATUS, which included egg laying (oviparous) forms with 14 or 15 pairs of legs. The female bears a fleshy ovipositor between the last pair of legs.

Much work still remains to be carried out on this unusual group, particularly in Australia. However, as a consequence of the cryptic habit and environmental requirements of Peripatids, specimens are not readily available and are often difficult to maintain for long periods under laboratory conditions. Despite these obstacles, Peripatus will retain the interest of biologists for some time to come simply because there is so much more to learn regarding its habits and structure.

Robert Hardie,
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(A large pregnant female Peripatus sent to the author by our Club produced sixty-four live young. After this magnificent effort, she quite understandably passed away. Ed.)

HONOUR TO CLUB MEMBER.

Congratulations to Dr. John H. Barnes on being awarded the M. B. E. in the recent Queen's Birthday Honours for his research into marine stingers.

IS THERE A QUEENSLAND MARSUPIAL TIGER?

Ellis Troughton, former Curator of Mammals at the Australian Museum,' is a foremost authority on Australian marsupials. In his book "Furred Animals of Australia", published in 1946, he discussed reported sightings of the "Striped Marsupial Cat of North Queensland". However in the 1967 edition of his book he states: "The discovery of skeletal remains (of the Thylacine or Tasmanian wolf) in the Territory of New Guinea ... evidently supports my suggestion (P.49) that early accounts of a large striped marsupial cat inhabiting the dense rain forests of North Queensland may have indicated the presence of a few Thylacine survivors. "

No specimen of a Queensland Marsupial Tiger has yet been examined and taxonomically described by a biologist nor has one yet been kept in captivity. Yet reports of sightings have been accumulating for over 100 years. In recent months, more evidence of the Queensland tiger has been assembled than ever before, and much of this information is not consistent with sightings of either Thylacine or feral (bush) cat.

In the proceedings of the Zoological Society of London in 1871 and 1872, six accounts of sightings were recorded. One of these was from a surveying party camped in tropical rainforest on the banks of the Mackay River, and it included a drawing of a spoor left in soft ground after a nocturnal visit by the unseen animal. This creature emitted "a loud roar" and was heard on several nights. The foot structure, as seen from the imprint, was markedly different from felines, and was different from all other described marsupials (although bearing a resemblance to the Tasmanian wolf).

Dr. Maurice Burton, writing about the Queensland Tiger in "Oryx," journal of the Fauna Preservation Society, in 1952, argues that there is a definite niche in the Australian ecosystem for a tiger-like carnivore to complement the other known native animals.

Similarly in 1959 Dr. Bernhard Heuvelmans in his book "On the Track of Unknown Animals", drew attention to the Thylacosmilus, the extinct "sabre toothed tiger", a marsupial of South America. There are parallels in the ancient marsupial fauna of that continent and the past and present native fauna of Australia. From similar stock, therefore, it may be supposed that Australia would produce such an animal also. Thylacoleo, a sub-fossil from the Darling Downs, may be that animal and, as Heuvelmans says, "It would be quite natural to find a smaller species of the same group on the same continent."

The fossil skull of Thylacoleo, found on the Darling Downs many years ago, is believed by mammal experts to be the remains of a large lion-like marsupial. The skull is 7" to 8" across, and the highly specialised teeth structure suggests a diet both carnivorous and herbivorous (the experts are still arguing this point). Unless it was a monstrous creature (and the Australian Museum believes it was the size of a leopard only), its head must have been disproportionately large for its frame.

Following are exerpts from some of the recently collated reports from farmers, bushmen and others, many of them people who have spent a lifetime in remote areas and who have placed no more importance on their sighting than they would upon the sighting of a platypus or a dingo.

"Most of the tiger cats which I have killed were about four feet long and of fawn colour, with black stripes running across the body, which was fairly long, unlike an ordinary cat." Kuranda, 1910.

"I can remember shooting one about the year 1915. They would be slightly taller and heavier built than a domestic cat, with large head and strong shoulders. Also striped rings around the body. This specimen had a young one on each teat, approximately ten in all." Tiaro, 1915.

"... an animal about as large as a medium-sized dog rushed out and climbed a nearly tree. The animal was very savage. Its coat was beautiful and striped like a tiger." Bellenden Range, 1925.

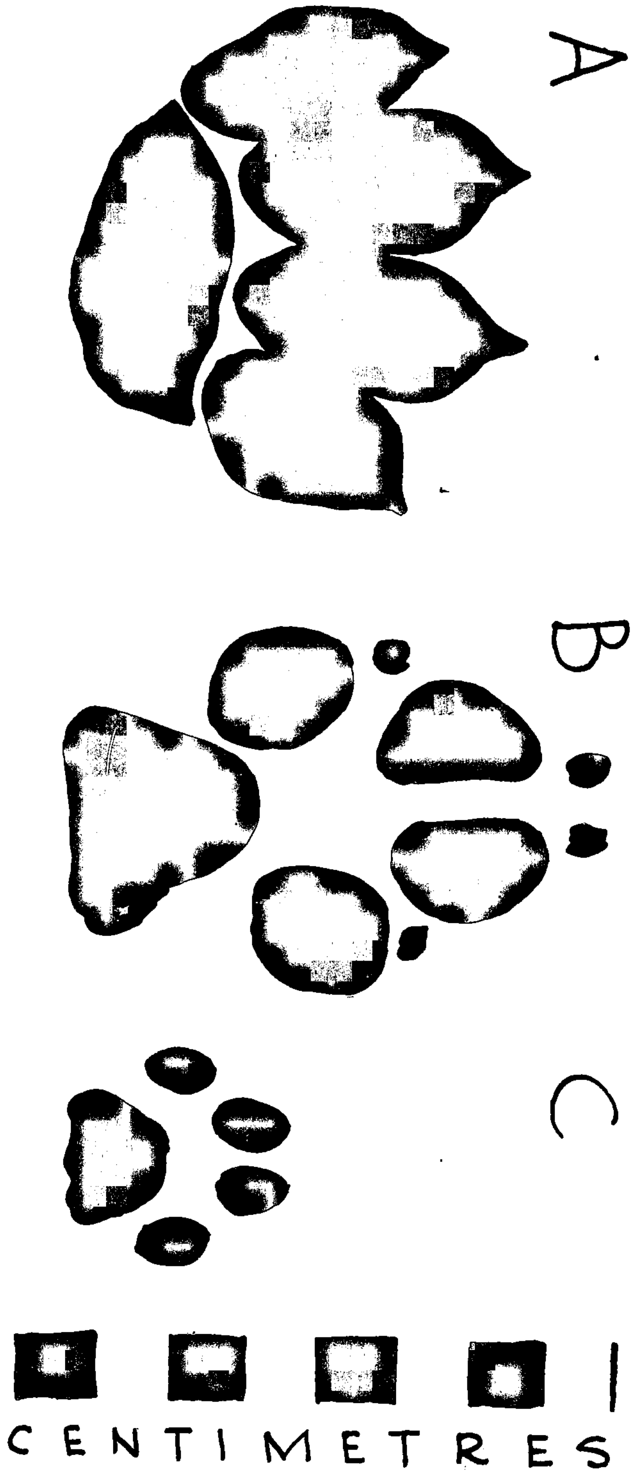
"It was as big as a fairly large dog, striped, and appeared to have a large head." Sarina, 1950.

"The head was a good deal larger than an old tomcat, with teeth a lot like the extinct sabre toothed tiger (not size but shape)." Mt. Molloy, 1953.

"... head appeared round and broad, its nose shorter and broader than a dog's. Some of its teeth appeared to protrude out and upward like tusks." Mt. Bartle Frere, 1968.

"The creature defying him had a round face and four exposed "tiger teeth'. ... the other salient point in my opinion was the fact that big savage pig dogs were terrified of it." Kuranda, 1945.

(Prepared from article by Peter Makeig on the work of naturalist researcher, Janeice Plunkett. Miss Plunkett will welcome any help in finding and positively identifying this animal.)



Comparison of spoors: A, the Mackay River "tiger"; B, a labrador kelpie dog standing 21" at the shoulder; C, a large domestic cat standing 12" at the shoulder.