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APRIL-JUNE, 1934.

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Gouldian Finches.

THE AUSTRALIAN MUSEUM

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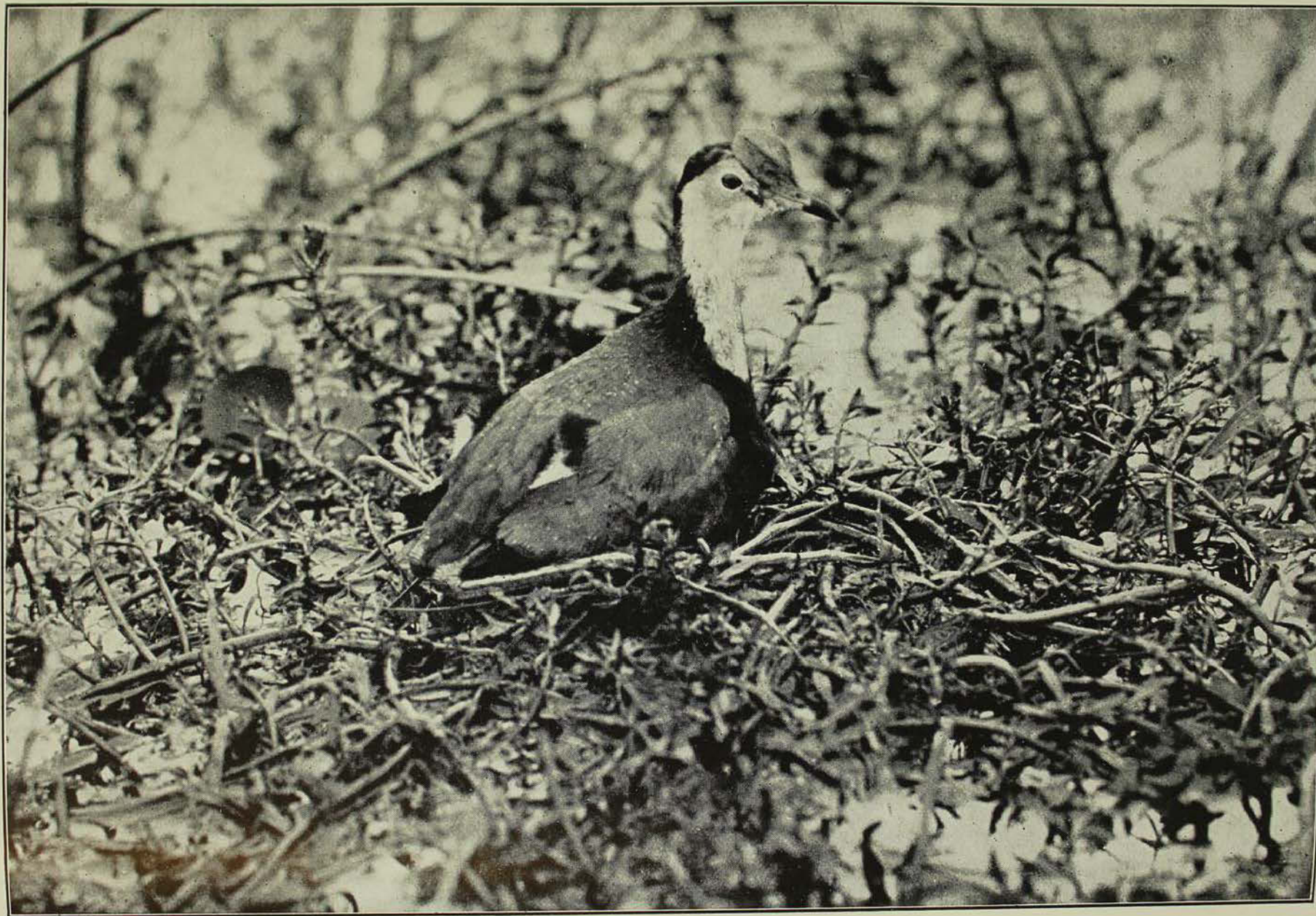
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■ OUR FRONT COVER. Gouldian Finches (*Poëphila gouldia* Gould) is by Lilian Medland. It is one of the series of postcards issued by the Australian Museum.

The beautiful Gouldian Finch was named by John Gould, the father of Australian ornithology, in honour of his wife, who was an accomplished artist and painted many of the plates of Australian birds which adorn his great work. It is one of a group of gorgeous Grass Finches which are related to the Weaver Finches of Africa, and not to the hard-billed true finches of the Old World.

The Gouldian Finch is a bird of the grassy plains in the interior of northern Australia, where it occurs in enormous flocks, feeding upon the seeds of grasses and other plants. It is captured in great numbers and exported to grace the aviaries of the world, its wonderful beauty causing a great demand for it.

Like all its tribe, the bird constructs a somewhat rough and clumsy grass nest, with a long spout-like entrance, and lays half a dozen white eggs.



The Lotus Bird, or Jacana, upon its nest, a flimsy, floating platform. Observe the long claws, particularly the needle-like hind claw immediately beneath the leg.
[Photo.—K. A. Hindwood.]



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APRIL-JUNE, 1934.

Crane-flies or "Daddy Longlegs"

By NANCY B. ADAMS.

THE fragile, long-legged flies that are commonly called "Daddy Longlegs" or Crane-flies, are a fascinating but little known group of insects well represented in Australia.

They belong to the family Tipulidæ, and may be found practically all over the world wherever insect life can exist, from Greenland, near the North Pole, through the equatorial regions, to the furthest lands of the Southern Hemisphere, excepting the Antarctic continent, which is not known to contain any winged insects.

The great antiquity of the family is responsible for this wide distribution, for, although it was not one of the first groups of insects to appear, nevertheless it is known to have been in existence in very early times. Its members were contemporaries of the dinosaurs and other gigantic reptiles which have long since disappeared. They have adapted themselves to changing conditions, witnessing during the long period of their descent the evolution of the entire class of mammals.

Crane-flies are moisture-loving creatures and occur wherever water is found, from the marshy, brackish areas at sea level to the valleys and streams of the highest mountains.

LIFE HISTORY AND HABITS.

Comparatively little is known of the life history of Australian Crane-flies.

The eggs are usually hard and seed-like, and are scattered about on the ground. From these eggs hatch slender cylindrical larvæ, legless, with small heads which are not completely developed posteriorly and can be withdrawn into the body. These larvæ breathe by means of pores or spiracles, which are situated in pairs at the fore and hind ends of the body, or at the hind end only.

The larvæ of most species apparently live in damp mosses, decaying wood, or leaf mould, while a few are aquatic. The latter feed on vegetable matter found in the water, although there is a European species found in the beds of streams and ponds which preys on an aquatic worm.

To allow for its increasing bulk the larva casts its outer skin, usually three times, and when fully grown changes into a pupa. The pupæ are peculiar mummy-like forms, each enclosed in a membranous jacket through which the outline of the wings, antennæ, and legs, all closely folded against the body, can be seen. They are provided with breathing horns which are attached just behind the head. They do not feed, and remain practically inert and motionless until the adult Crane-fly is ready to emerge. The pupa then splits open to allow the delicately winged, long-legged creature to escape.

Crane-flies are slender, graceful insects, with small heads and narrow wings. Only the fore wings are present, the hind wings being reduced to a pair of tiny balancers known as halteres. There is a fairly common species found in Victoria, *Macromastix fergusonii*, that has completely wingless females, while the males are quite normal. It is difficult to find a reason for this degeneration, for, although wingless forms are not rare, they usually occur only on wind-swept mountain tops or in the icy northern regions.

Many species seem to be short-lived, for they disappear completely from localities where for a brief period they were present in large numbers. Some forms are apparently extremely local, occurring in very restricted areas, while others, particularly the more robust types, fly for considerable distances.

One of the best represented groups of the family is the genus *Gynoplistia*, the members of which are for the most part medium sized, brightly coloured Tipulids with feathery antennæ. The commonest form is *Gynoplistia bella*, a short-legged, distinctly marked, black and orange fly, its wings heavily mottled with black. It is a widely distributed insect, popularly called the Painted Crane-fly, and may often be found resting on flowers or low scrub in the early summer.

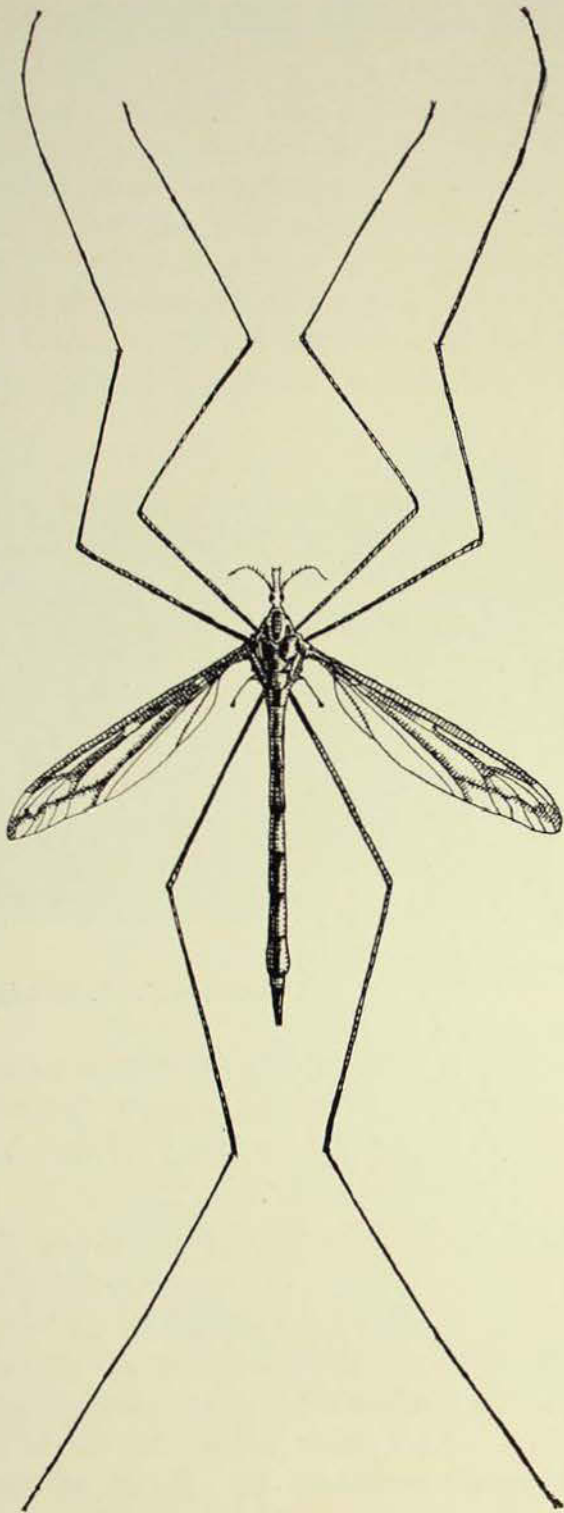
In shady valleys, particularly where tree-ferns grow, and in the shelter of



Semnotes imperatoris.

[Nancy B. Adams, del.]

mossy cliff faces, large numbers of small species belonging to the genus *Limnophila* occur. They are frail, dull-coloured flies and are easily overlooked when at rest, but sometimes they collect in small swarms of about fifty, and commence an airy spirited dance. A little cloud of these ethereal species, some of them rising, some falling, will hover in the same position for quite a long time. Occasionally one will pause to rest on a leaf nearby, and then fly back to join the dancing throng.

**Plusiomyia gracilis.**

[Nancy B. Adams, del.]

THE GIANTS OF THE FAMILY.

The largest Australian Crane-fly is *Semnotes imperatoria*, a striking and rather rare insect which is found in Victoria and New South Wales and may be seen on the wing round Sydney, generally in the very early summer about September and October. It is dusky-

winged, with a heavy body marked with bright yellow and black, and very long black and yellow legs. This gorgeous giant forms a remarkable contrast to the tiny members of the genus *Limnophila*.

Another large and handsome fly is *Plusiomyia gracilis*, a common species with a fairly wide range. It is gracefully built, and has extraordinarily long spindly legs. It is brownish with transparent wings mottled with dark brown.

The rare species belonging to the genus *Clytocosmus* are considered by many authorities to be the finest Crane-flies in the world. *Clytocosmus helmsi*, which is found on the Monaro plateau, is a large and beautiful creature with a velvety black body marked with white and tipped with orange at the hind end. Its head and thorax are orange and its wings are cloudy yellow.

Ischnotoma serricornis is a common and widely spread Crane-fly, apparently a hardy species, for it may sometimes be found in quite cold weather towards the end of the winter. It is large and graceful, with prettily marked brown and white wings and body.

One of the most striking Tipulids is the Long-Horned Crane-fly, *Macromastix costalis*, which has a range extending from Tasmania to Queensland. It may often be seen resting on low scrub in the districts near Sydney. It is light brown, its transparent wings marked along the front margin with a brown band. The most remarkable feature about this species is the extraordinary length of the antennæ, which can easily be mistaken for an extra pair of legs. When disturbed it darts away in swift, uneven flight.

Crane-flies are unpopular with collectors, chiefly because their long, fragile legs so easily become detached, making them unsightly specimens. A wide field of research is open, particularly with regard to the life history and habits of this fascinating and much neglected group.

The Lotus Bird
by
K.A. HINDWOOD.



Where the Lotus Bird, or Jacana, dwells.

[Photo.—K. A. Hindwood.]

MORE than three hundred of the seven hundred species of birds occurring in Australia have been recorded from the County of Cumberland, that is, within a radius of some forty miles of Sydney. Many of these records refer to single specimens which, through abnormal weather conditions, or other causes, have been forced to extend their usual range. It can well be imagined that the appearance of a species hitherto unrecorded as inhabiting the County is a matter of considerable interest to naturalists. When, after investigation, it is found that the birds in question have apparently been breeding and increasing in numbers for several years, the "discovery" is somewhat surprising.

This was the case with the Lotus Bird, or Jacana (*Irediparra gallinacea*), a species which normally does not occur further south than north-eastern New South Wales. The nearest locality to Sydney where the Jacana had previously

been recorded was Mudgee, where several specimens were secured about forty-five years ago; they have not since been noticed in this locality.

Late in 1933 persistent rumours that Jacanas were then breeding near Windsor induced several ornithologists to carry out a thorough examination of suitable areas in that district. The results were surprising. Not only were the birds discovered and studied in their swampy environment, but nests containing eggs were found, and an extensive series of photographs, including a cinematographic record, were secured of this unusual and extremely interesting species.

APPEARANCE AND AFFINITIES.

The Lotus Bird is the only Australian representative of a group of birds which inhabit, for the most part, the tropical and sub-tropical regions of the world. The majority of the eleven species known to science are not dissimilar in appear-

ance. One form, however, occurring in India, Ceylon, and China has an exceptionally long tail, and on this account has been called the Pheasant-tailed Jacana (*Hydrophasianus chirurgus*). In structure and markings the Jacanas appear to be most closely related to the dotterels and plover-like birds (Charadriiformes), a surmise supported by many of their habits, by the coloration of the eggs, and the plumage pattern of the young

are so large in comparison with the weight and bulk of the bird that it is able to move about the surface-growing vegetation with the utmost ease. With an element of truth it can be said that they walk on water, and this habit has caused them to be called "Lily-trotters", "Lily-walkers", and "Christ-birds". Another common name is the Comb-crested Parra, *Parra* being the original generic name for the species, while "comb-



The Lotus Bird, *Irediparra gallinacea*.

[After Mathew's "Birds of Australia".]

birds. The relationship, though fairly definite, is now somewhat distant; their environment has so moulded certain external characters that systematists have placed them in a separate family, the Jacanidæ or water-pheasants.

The outstanding features of the Lotus Bird are the long legs, the extreme development of the toes, and the elongated, almost straight, spur-like claws, that on the hind-toe being two and a half inches in length. The toes and claws

crested" refers to the red fleshy wattle on the head.

Apart from the very large feet, the most prominent part of the bird in its natural haunts is the brilliant red three-lobed wattle which extends over the head. The wattle of the female bird does not appear to be so brightly coloured as that of the male. In certain lights, especially when the sunlight is shining through this frontal plate, it assumes an orange tint. The body is not quite as large as that of



The nest and eggs of the Lotus Bird.

[Photo.—K. A. Hindwood.]

a domestic pigeon; the throat, sides of neck and breast are white, bordered with pale yellow. A thin black streak extends from the head down the back of the long neck; this widens out on the shoulders and extends across the chest and abdomen, the lower portion of which is whitish. The tail feathers and coverts are black, whilst the back and wings are brownish in colour. A narrow black stripe extends from the eye to the base of the lower mandible. In life the male bird appears to be a little more pronounced in coloration than the female, and when nesting less courageous than his mate.

OCCURRENCE IN THE HAWKESBURY DISTRICT.

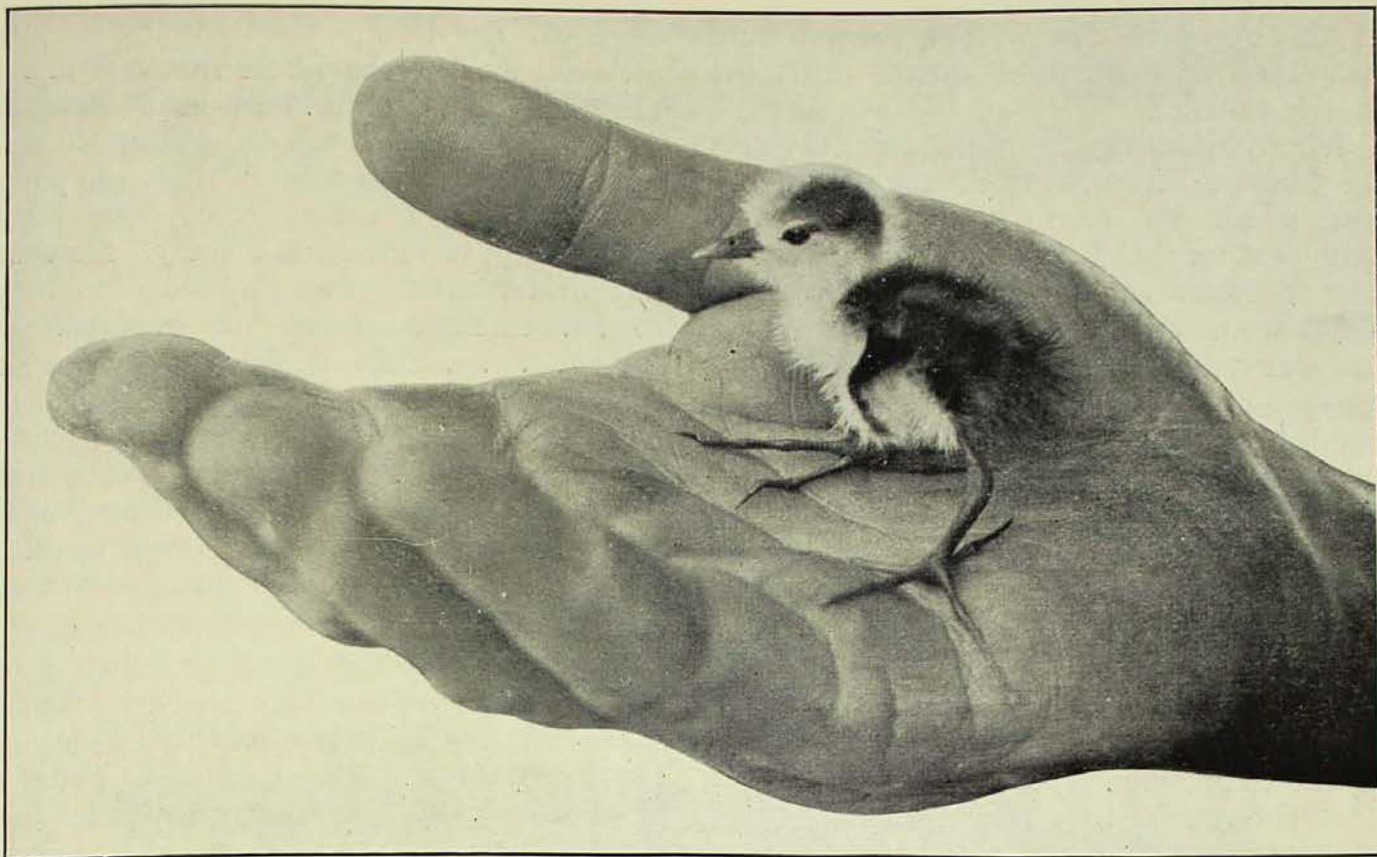
Usually Jacanas inhabit lagoons and swamps where water-lilies grow in pro-

fusion, and they move over the large flat leaves of these plants with ease. However, there were no water-lilies on the swamps frequented by the birds in the Hawkesbury district. The vegetation comprised two species of *Myriophyllum*, much of which grows in thick masses below the surface, mixed with a green weed-like growth, *Ceratophyllum demersum*. Other common plants were coastal *Nardoo* (*Marsilea Brownei*), the four-lobed leaf of which rests on, or protrudes above the surface, and *Ottelia ovalifolia*, the leaf of which is oval. A reed, *Triglochin procera*, which has flattened ends to the leaves, was very numerous. So profuse were all these plants that the Jacanas had no difficulty at all in walking about the swamps. It was noticed that when they

came to a patch of clear water they either jumped or flew across the space devoid of vegetation.

BREEDING HABITS.

The nest at first sight appears to be a flimsy floating platform about eight inches in diameter and about half an inch in depth. On investigation it is found that, as in an iceberg, the greatest bulk is below the surface. A nest taken for reference purposes was roughly circular in shape, some twelve inches in diameter and from two to three inches thick. It was composed chiefly of the soft porous stems of *Myriophyllum* nipped off nearby plants by the bird, and closely interwoven until a compact raft was formed. A number of reed leaves were bent over and built into the nest. Much of the vegetation forming the nest was



Young Lotus Bird a few days old.

[Photo.—K. A. Hindwood.]

alive, so that the small portion actually showing above the surface merged into its surroundings so well that, had it not been for the eggs, the existence of a nest would never have been suspected. The visible portion of the nest was packed with a small and beautiful aquatic fern (*Azolla pinnata*). Nests are more or less waterlogged, and at times the weight of the sitting bird is sufficient to submerge the eggs partly.

Few eggs are more attractive than those of the Lotus Bird. The ground colour is a rich yellowish-brown, over which is a network of irregular black lines. The surface is highly lustrous, and has the appearance of having been varnished. This, combined with the intricate markings, makes them objects of great beauty and much sought after by egg collectors. As beautiful as they are in a specimen cabinet, how much more attractive they become when surrounded by water-lilies or similar plants in the quietude and isolation of a swamp! The eggs are extremely pointed at one end, which prevents excessive rolling. Four eggs

form the usual clutch, but sometimes three eggs are laid, and occasionally five, though this is rare. It is generally possible to tell when the birds are breeding by their alarm at any intrusion, but, despite their apparent concern, they are loath to return to the eggs if they suspect they are being watched. The presence of a camera does not disturb them unduly. To discover nests it is often necessary to sit or lie on the ground and watch the birds in the swamp fifty or sixty yards away. Field-glasses are essential, for at this distance the birds are difficult to see among the vegetation without their aid.

They gradually make their way towards the nest, feeding as they move. By exercising a little patience one will be rewarded by seeing the bird settle on the eggs. Then comes what is often the most perplexing part of the proceedings. In the swamp wading is laborious, and the distance easily misjudged. There are seldom any landmarks to act as guides, and the sameness of the vegetation is confusing. The one sure method is to "take a line" on some prominent object

at the opposite side of the swamp and then keep on a straight course until the nest is reached.

When brooding the bird squats with the feet on either side of the body and resting on the nesting platform. The long slender hind-claw of the back toe then reaches almost to the tail. The position of the foot, together with the hind-claw, is clearly shown in the accompanying photograph. A peculiar dotterel-like bobbing motion of the head is noticeable, especially when the bird first comes back to the nest.

Young birds apparently remain at the nest for a day or two after hatching. Then they take to the water, where they are quite at home. One or two observers have handled young birds without collecting them. Until recently no museum contained a specimen less than a few months old. The reason that they are practically unknown in collections can be attributed to an extraordinary, perhaps a unique, habit. At the approach of danger the young birds dive, remain under the water for some time, and then slowly rise. Still keeping the body below the surface, they poke the bill sufficiently above the water to enable them to breathe. This has to be seen to be believed. Is it any wonder that searching for about a quarter of an inch of a bird's bill among a mass of vegetation becomes a discouraging and seldom successful task?

It was the good fortune of several friends and myself to observe this practice. We had been watching an adult Jacana which always returned to a particular spot after being disturbed. On searching the area again a young bird was noticed paddling about, fortunately just before it dived. Gradually it poked its bill above the surface, although the body remained hidden from view. The size of this bird can be gauged from the fact that when weighed it turned the scales at a quarter of an ounce. After examining the chick we allowed it to dive again, when it was timed actually to stay under the water for eighty seconds before putting its bill out to breathe. The eyes of the bird remained

open all the time. Carl Lumholtz¹ gives an even more remarkable instance of this singular habit. He had been watching Jacanas with young on a lagoon near Rockhampton, Queensland, but the young birds always vanished from sight whenever he approached too closely. He could not understand what happened to them, ". . . until one day the problem was solved. . . . The small ones dived under the water and held themselves fast to the bottom, while I watched them for a quarter of an hour, before taking them up." The young bird observed by us must have had a considerable amount of oil on its downy feathers, for whenever it came to the surface it was quite dry.

The adult birds have a quick direct fluttering flight, and when travelling any distance they keep two or three feet above the vegetation. The long legs and toes trail out behind the body conspicuously. Just before landing they commence to glide, bring the feet forward and alight gracefully. The usual call-notes uttered by the Jacana are high-pitched twitterings; young birds have a similar call, but of course very much softer.

Small fresh-water fish, water beetles, and other aquatic life provide an almost inexhaustible supply of food. Such insects as dragon-flies are also eaten.

In the swamp there is much to interest one apart from Lotus Birds. Coots, moorhens, crakes, herons, cormorants, grebes, black swans, ducks, ibis, and even pelicans, provide ever-changing scenes in an ever-beautiful setting. Such birds as black-fronted dotterels, magpie larks, chats, strong-voiced reed-warblers, plaintive grass birds, and fantail warblers haunt the muddy foreshores or live among the rank growth of grass and reeds. The feeling of loneliness and solitude that seems to pervade a swamp changes to that of fascination and pleasure when one comes to understand the wonderful bird life it harbours, notwithstanding biting water beetles, marauding mosquitoes, and submerged logs.

¹ Carl Lumholtz: *Among Cannibals*, 1890, p. 23.

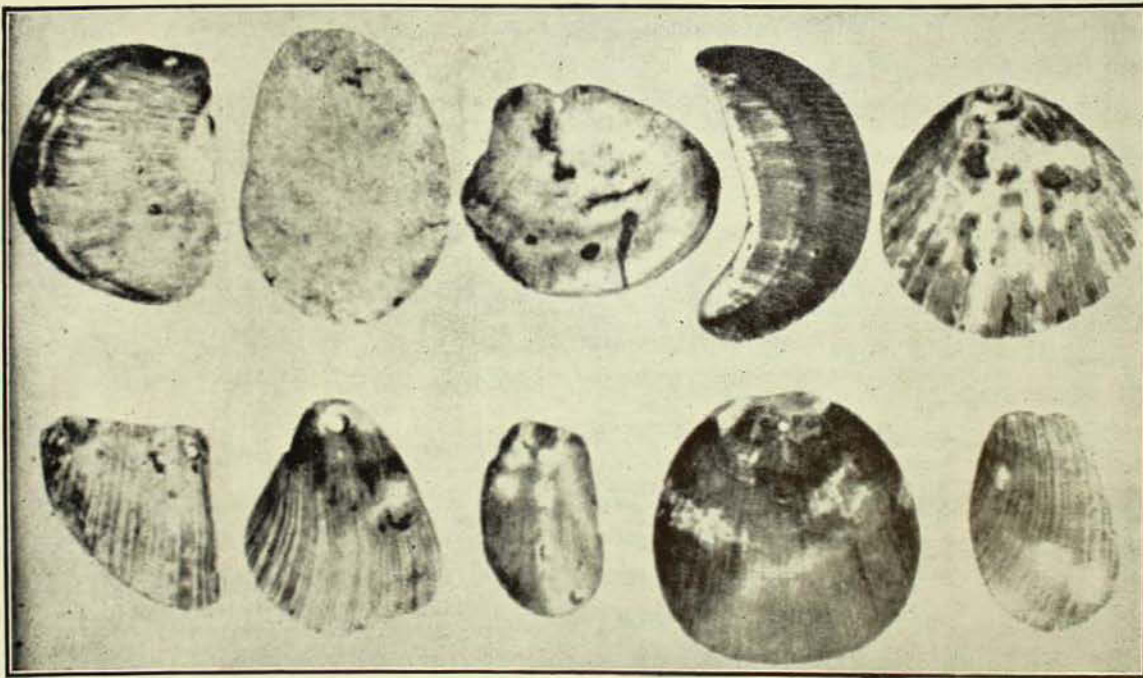
Rossel Island Money: A Unique System

By GERALD DILLON.

AWAY at the most easterly end of the Louisiade Group, in the territory of Papua, lies the island of Rossel, which, owing to its isolation, has preserved much of the original culture of its people. This culture is, in many respects, vastly different from that of the rest of the Louisiade Archipelago, and Rossel also boasts of a unique monetary system of considerable complexity.

few millimetres. They are roughly triangular in shape, of varied colour (by which difference their values are identifiable), and with a polished surface. The Nker money consists of varieties of ten discs, of various size according to value—though any ten discs comprising a unit are of uniform size.

These two kinds of currency form quite independent but parallel systems. There



Rossel Island currency, some of the lower value units of the Ndarb series.

[Photo.—Gerald Dillon.]

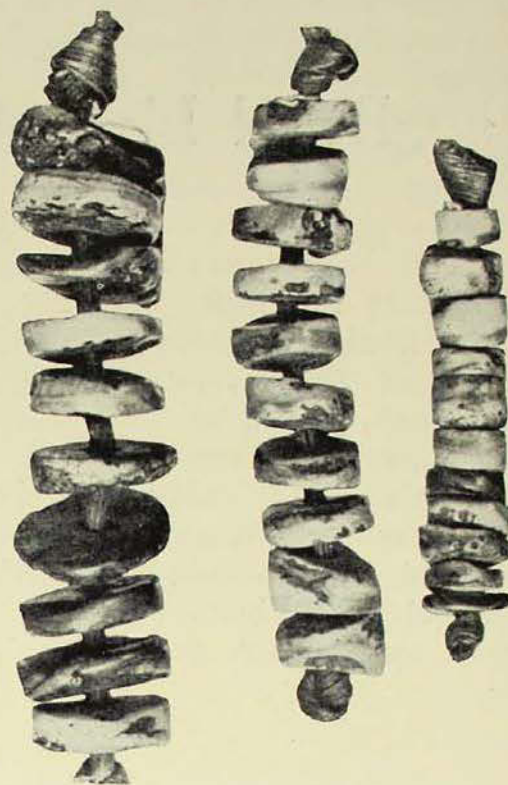
The Rossel money is, of course, made of shell, and is of two varieties. The one is known as *Ndarb*, minted from some sea shell I could not identify. The other is known as *Nker*, and is probably made from one of the spiny oysters, the shells of which are broken and ground into discs. The *Ndarb* vary in size, but never cover an area greater than twenty square centimetres, with a thickness of but a

are sixteen values of the *Nker* system as against twenty-two of the *Ndarb*. Each unit of the *Ndarb* has an individual name, and that name is the same also for the *Nker* values with the addition of the suffix *Kagner*. So that, in full nomenclature, the two varieties may be set forth as follows (the numeration is added merely for the sake of easier identification):

| NDARB. | NKER. |
|----------------------------|--|
| 1. Dwondwo. | |
| 2. Gamer. | |
| 3. Kerjim. | |
| 4. Bwomondarb. | |
| 5. Quia. | |
| 6. Ouabe. | |
| 7. Tebuda. | Tebuda Kagner. (This is the lowest value of the Nker series.) |
| 8. Tebudongwo. | Tebudongwo Kagner |
| 9. Diamer. | Diamer " |
| 10. Yealangwindo. | Yealangwindo " |
| 11. Yealangwin- jinido. | Yealangwin- jinido " |
| 12. Tangwolondo. | Tangwolondo " |
| 13. Kwarunundo. | Kwarunundo " |
| 14. Pimba. | Pimba " |
| 15. Yananindo. | Yananindo " |
| 16. Gumindo. | Gumindo " |
| 17. Bwelejung- wanagu. | Bwelejung- wanagu " |
| 18. Diamundi. | Diamundi " |
| 19. Tejuma. | Tejuma " |
| 20. Jemida. | Jemida " |
| 21. Bwojuma. | Bwojuma " |
| 22. Kwojuma. | Kwojuma " |

Thus the lowest value in the Nker series is the Tebuda Kagner, and the highest the Kwojuma Kagner, while the lowest value in the Ndarb series is the Dwondo, and the highest the Kwojuma.

The higher values of the Ndarb series are exceedingly rare, and their possession is guarded most jealously. In fact all the Ndarb series above No. 18 is today in the hands of the older men, and a certain sacredness is attached to their possession. The highest value Ndarb (No. 22) has actually ceased to circulate, the few remaining ones being in the hands of a few individuals, by whom they are transmitted hereditarily. The lower values of the Ndarb are, of course, more common, but all told, the total amount of this currency scarcely works out at three per head of the adult male population. There is no restriction in movement in the higher values of the Nker series, though they are also of limited quantity. I have succeeded in persuad-



Rossel Island currency, some values of the Nker series.

[Photo.—Gerald Dillon.]

ing a Rossel native to sell me some of the higher Nker values (at about ten shillings each), but it was done only on the understanding that they should not be taken away from the island, a promise I kept. I did not succeed, however, in seeing any of the Ndarb series above No. 17, nor would any promise, or offer of money, tempt any native to show me one.

In practice the Nker currency functions mostly in the hands of women, and is a sort of auxiliary currency for transactions in which a particular Ndarb functions as the main payment. For instance, in marriage, a Rossel native purchases a wife by means of this island currency. The business is initiated by the man on giving a No. 18 Ndarb to the father of the girl. Further payments follow, the bridegroom's male relatives contributing Ndarb payments to the bride's male relatives, while the bridegroom's female relatives contribute Nker payments to the female relatives of the bride. In the same way, at a mortuary feast following on the death of a chief, at which cannibalism was practised, the



A juvenile Rossel Islander, with trochus shell. This shell is plentiful in these waters; its market value is occasionally as much as £60 per ton. Natives dive for the trochus, their average "catch" being about thirty per man per day. The shell is used principally in the manufacture of buttons.

[Photo.—Gerald Dillon.]

dead chief's son made payment with a No. 20 Ndarb to the victim's uncle, and lesser Ndarb and Nker payments followed from the chief's male and female relatives to a group within certain degrees of kindred to the victim.

The entire currency is, of course, of limited extent. Exactly at what period it was made, or ceased to be made, is unknowable. I have been gravely informed that the entire supply was made by the gods before man appeared on Rossel. However, judging by the appearance of the higher Nker values, they would seem to have been in circulation an almost incalculably long time. Because the currency is limited, and owing to the fact that a particular Ndarb is the exactly right payment in a certain transaction—and that in such a monetary system it is obviously impossible either to give, or receive change—there are natives who specialize in money operations to effect the necessary transfer of the pieces required. These men, known as Ndeb, are really brokers in a primitive form.

They borrow from one who has no immediate need of a particular piece and lend it to another who has, making a profit for themselves by borrowing at a lower rate than that at which they discount. Thus *A*, who is in need of a No. 5 Ndarb (though he may have a No. 4 or No. 6), goes to *B* (a Ndeb), who borrows the necessary unit from *C* and lends it to *A*. The loan of this No. 5 Ndarb will be cancelled at the end of a specified period by the payment of a No. 6 Ndarb or some higher value, for a longer period. So that every unit in the series is expressible in terms of the amount of time it would take on loan to be repaid by the next higher unit. And the broker actually makes his profit by employing a form of magic, so as to influence his debtor to repay within the specified time, while operating on the mind of his creditor in the exactly opposite way.

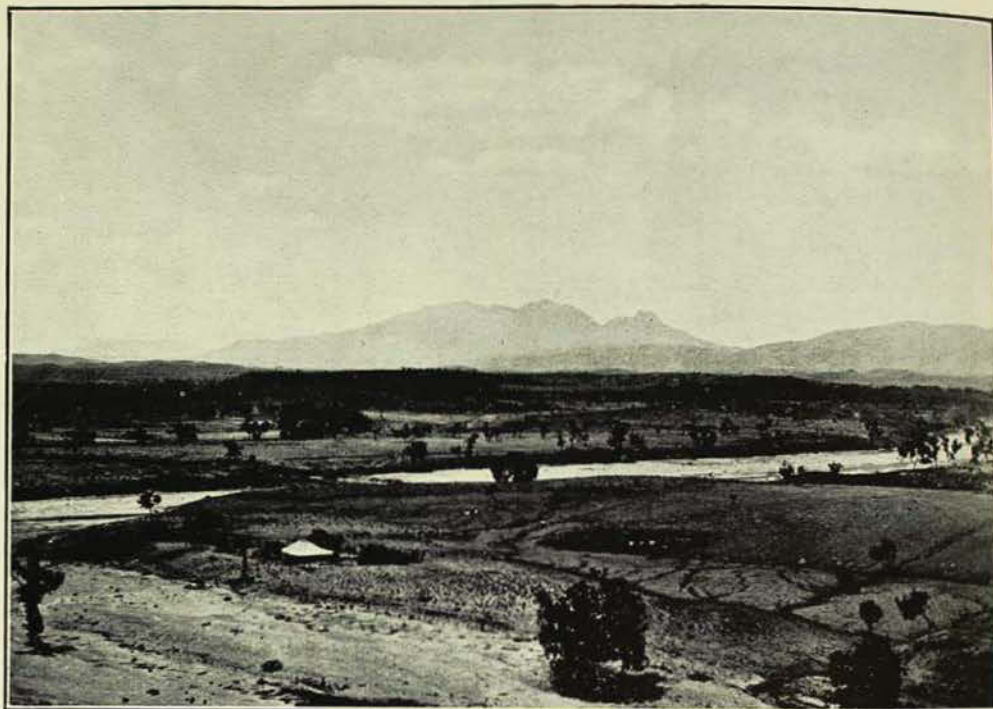
[Mr. Gerald Dillon has very kindly lent some examples of this interesting currency. These have been placed on exhibit in the Ethnological Halls.—Ed.]

Some Central Australian Mammals

By H. C. BARRY.

LAST summer I was fortunate enough to be a member of a scientific party from Sydney University visiting Central Australia. Our headquarters were at Hermannsburg, a Lutheran mission station west from Alice Springs. The mission houses lie on a sandy plain beside the dry bed of the Finke River and surrounded by the rugged red sandstone hills of the McDonnell and neighbouring ranges. Amongst other interests I was anxious to see what mammals were still to be found there, particularly as they play such a large part in the aborigines' life. Not only do they form their daily food, but also are intimately woven into the stories of their totemic ancestors.

Soon after arriving I gathered about a dozen old blacks around me and showed them some photographs of the animals I expected to find. The little marsupial mole (*Notoryctes*) is particularly interesting, so I showed them a picture of it first. Their eyes shone with excitement as they put their hands in the sand and imitated the mole's action of coming to the surface and then dipping down again. "Toturriturri, plenty along this country", one exclaimed, and I felt I would see one any minute. Pictures of the bilbey (*Macrotis lagotis*), kangaroos, wallabies and rat kangaroos were accompanied by cries of "Big mob", and the little kangaroo mice (*Notomys* and *Ascopharynx*) by "Properly big mob", which appears to be



The dry bed of the Finke River at Glen Helen. Mount Sonder is seen in the distance.

[Photo.—H. C. Barry.]

the mission comparative. Some even seemed to recognize the Banded Ant Eater (*Myrmecobius fasciatus*), a very rare and interesting mammal.

I was delighted, never expecting to find the furred creatures in such numbers and so close at hand. But I never saw a bilbey or a kangaroo hopping round the mission during the next few days, and the collections of lizards that were brought in to be exchanged for tea and sugar never contained anything more interesting from a mammalogist's point of view than a few crumpled bats. I was soon to learn that a black's interpretation of "big mob" was often as few as three or four, possibly scattered over a hundred miles.

Generally speaking, one has to go looking to find much evidence of mammal life in Central Australia, though in good seasons some species will swarm in amazing numbers. I saw an example of



A female bilbey (*Macrotis lagotis*) and her young one. Their white tipped tails are favourite ornaments among the natives in the "Centre".

[Photo.—H. C. Barry.]

this at a siding on the Alice Springs line, where hundreds of the little kangaroo mice (*Notomys* and *Ascopharynx*) were buried in the sand. At night they came hopping round the camp lights looking for food, and the men on the line used to knock them over in dozens with sticks. During the day they were never seen, and were apparently only an isolated swarm, for eighty miles away it was difficult to find any.

Owing to a long drought which broke only two years ago the Red Kangaroos (*Macropus rufus*) have been wiped out from large areas. Heaps of their bones were found under the dead mulga trees after the drought. Now they are slowly regaining ground and odd pairs are to be seen in the open country.

THE EURO.

The Euro (*Macropus erubescens*) has for centuries been the staple diet of the blacks. Now that the rabbit has reached the centre it does not play quite such an important part, but it shares with the emu the honour of providing the best meal for a hungry camp. The red sandstone hills, usually covered only by clumps of porcupine grass, are its strong-

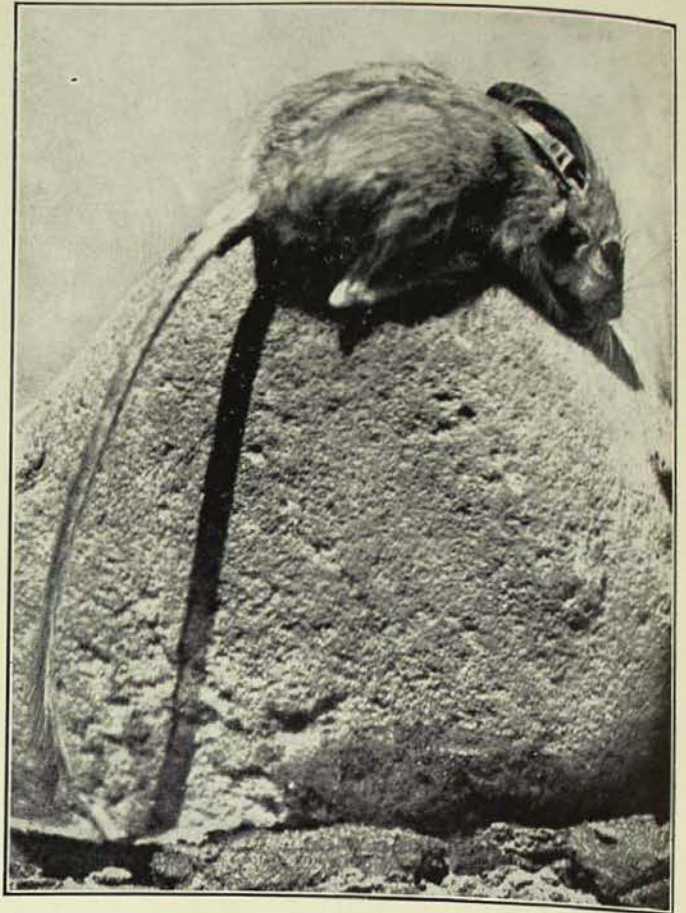
hold, and the animals are still plentiful in spite of a toll for food and skins. When one goes further west than the shot gun has penetrated they become much less wary and are usually about in the late afternoon. Each pair seems to keep very strictly to its own domain and visits the same waterhole every night. It was at one of these waterholes that I obtained my first glimpse of a euro. We rode to a valley near Hermannsburg where a small rock pool contained the only water left since the last rains. My companion and I arrived just as the moon was getting up and settled down about ten yards from the pool. It was nearly dry but it was still the Mecca of dozens of frogs, many of which came hopping down the hill over us on their way to and fro. Rabbits were soon about, too, many coming for miles, as the next waterhole was a long way down the Finke. The moon was full and we could see clearly right up the valley. Apart from a few croaks from the frogs there was not a sound. About midnight some stones rumbled on the opposite hill and soon the unmistakable thumps of two euros coming cautiously down could be heard. One was a fine big animal, and the other considerably

smaller—probably a buck and doe. They came slowly down to within fifteen yards of us and stood there shining in the moonlight, but afraid to come the extra few yards. It was nevertheless a striking proof of their need for water that they were ready to face all dangers in order to drink from such a foul hole. A slight movement sent them bounding away, and they never reappeared. Soon after an animal caught my eye as it ambled over the rock near the pool. I ran down and found that it was an old Echidna, or Spiny Anteater, evidently thirsty also. I was told they were very good to eat and was persuaded to try one once. So we killed it, and when the dawn broke fried its hams for breakfast. We found them very tasty, though perhaps a little tough.

That was my first acquaintance with the euros, but subsequently I saw many, both by waterholes at night and around the hills in the early morning. It was very interesting to accompany a couple of blacks and sit with them by a waterhole all night in an endeavour to provide a meal for their hungry families. There were always hundreds of rabbits, and a few rock wallabies (*Petrogale lateralis*) sometimes came early, but the latter were usually spared in the hope of getting a euro. We would take it in turns to watch and sleep, and it was usually well after midnight before one was heard. One of my companions, though now a good shot with a gun, had been brought up to spear them in his boyhood. Two blacks would go to a hole at night. One would stand behind a heap of porcupine grass with a firestick, the other with his spear held prepared in his womerah only a few yards from the hole. When the euro came to drink, the porcupine grass was lit and the blaze both dazzled the euro and allowed the spear thrower to see his mark.

ROCK WALLABIES.

The Banded Rock Wallaby (*Petrogale lateralis*) is found associated with the euros on the hills. Unlike the latter, they live in little groups and seem to have isolated strongholds scattered over the ranges. We found such a locality on a



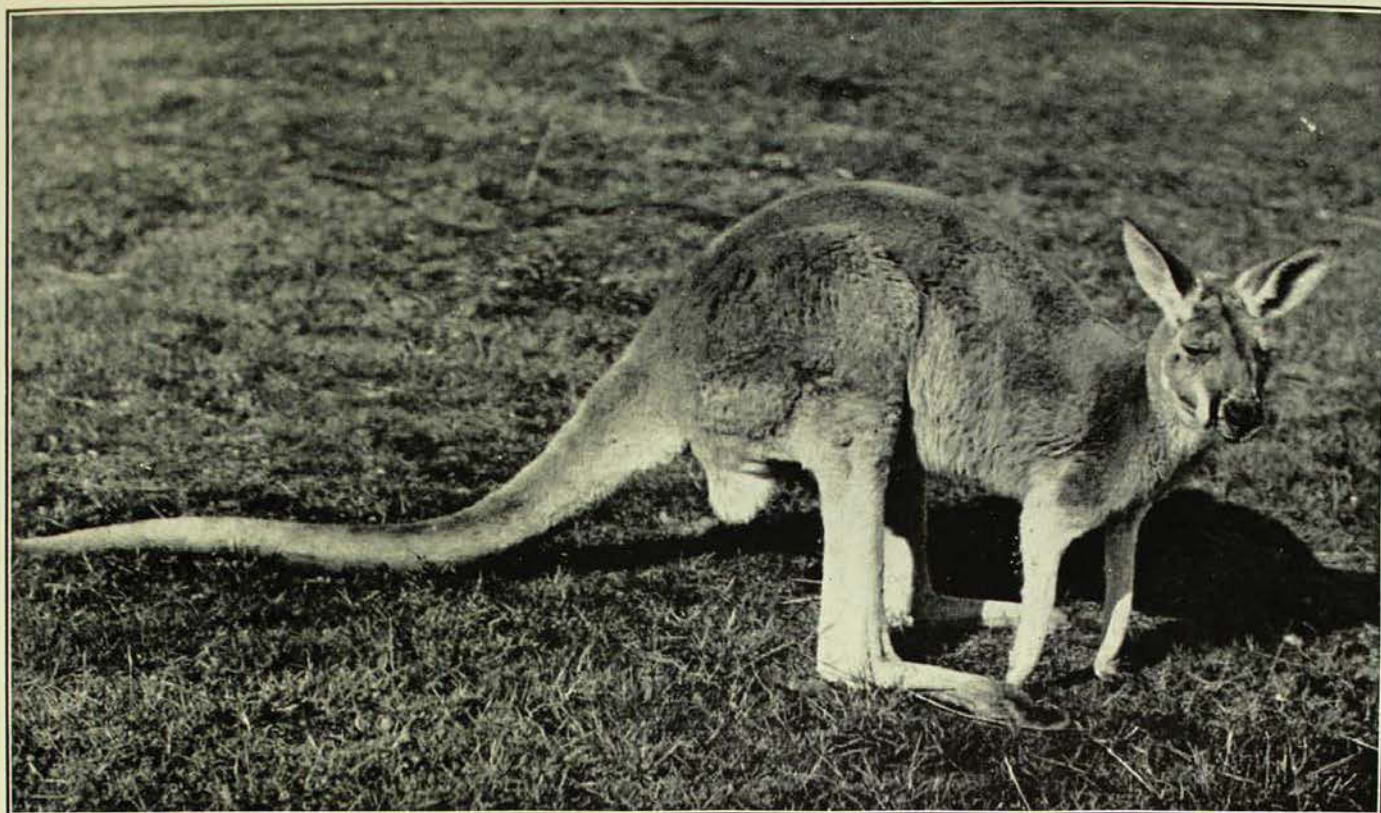
“Ratjah”, the Kangaroo Mouse. Observe his long tufted tail, and strong hind limbs.

[Photo.—H. C. Barry.]

trip to Glen Helen Gorge. Here the McDonnell Ranges are cut clean through by the Finke River and a large permanent waterhole fills the cutting. The cliffs along the Finke Bed there are very steep and ragged and have many remarkable dyke-like shelves of rock running from top to bottom. Signs of the wallabies were soon seen, and at sunset we disturbed several on the top of one of the hills, when it was marvellous to watch them leaping at full speed over the rocks. Next morning we saw over a dozen sitting on the rocks on the other side of the valley sunning themselves. Many caves and crevices, some very narrow, were found where they had been lying up, but we could not find one at home.

THE RABBIT BANDICOOT.

One of the blacks came to me very excited one day with a sugar bag full exclaiming, “Nkaija! Nkaija!” I looked in and saw a whole family of bilbeys; a



The Red Kangaroo of the West (*Macropus rufus*). They are found in flat open country, whereas the sturdier Euros (*Macropus robustus*) confine themselves to the hills and ranges.

[Photo.—H. C. Barry.]

large male, a female, and two fully furred young ones. The Rabbit Bandicoot (*Macrotis*) is probably the most characteristic inland animal, though its numbers have been decreasing rather alarmingly in recent years. They have a pretty silky fur of a bluish grey colour and look rather delicate for the hard burrowing life they lead. The most striking features are the long hare-like ears, and a long white-tipped tail. The latter is one of the most prized aboriginal adornments; about twelve tails are tied together and used as a head-dress or a loin cloth. The bilbeys are also hunted for food, being tracked to their burrows and dug out. These burrows are very deep and long and the bilbey inside is also burrowing hard when disturbed, so perhaps my black boy was right when he thought he should be well rewarded for his "nkaijas".

I was told that rat kangaroos were fairly common. They are known as "Qualpa" to the mission Arunta blacks, and as "Oqualbe" to the Loritchas, who had just come in from the country to the

west. I went out with a party of Loritchas hoping to find them. We spread out and walked through patches of spinifex scanning the sand for tracks, but we found nothing. Unfortunately a strong wind blew every day for about a month, and, as was explained to me, the Loritchas could not catch them when the tracks in the sand were blown over.

KANGAROO MICE.

Tracks of the little kangaroo mice (*Ascopharynx* and *Notomys*) were common on the sandhills, though I could never see them until they were pointed out by the blacks. The piccaninnies are artists at reading the tracks on the sand and would often find where the animals had been the night before. I persuaded some of the black boys to go out hunting for "ratjah", as the animal is known to them, and they dug several out. Most of the specimens had their tail tips off when I saw them, and the tail is the most interesting feature. It is surprising how easily the end of the tail with the terminal

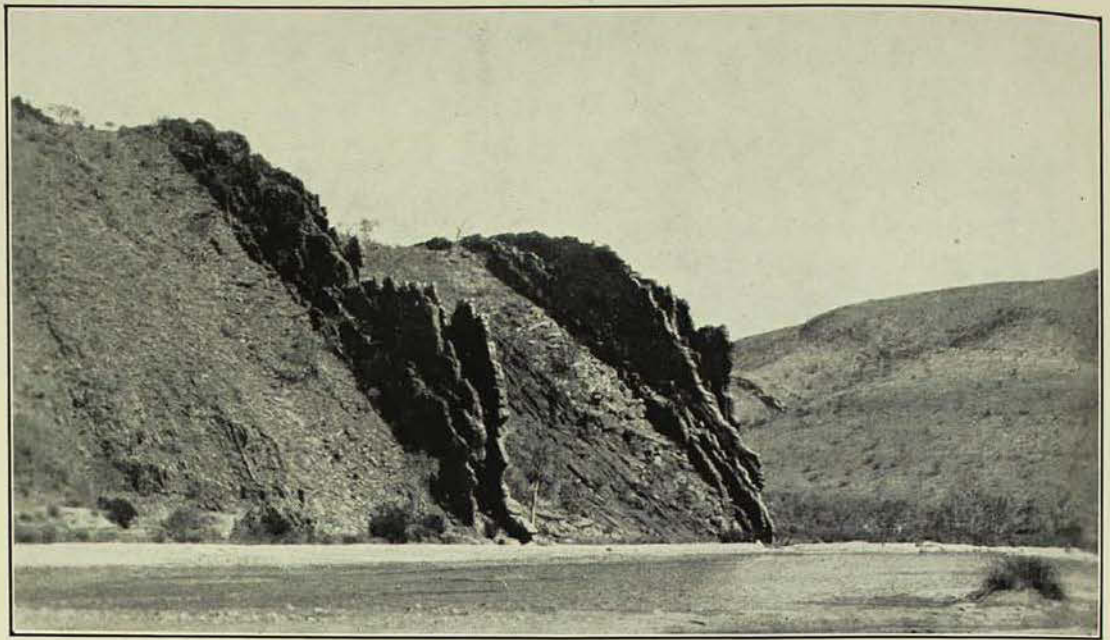
tuft slips off when handled; it was only after some weeks that I got an unspoiled ratjah to photograph. They are very frightened and excited in the day time, and soon exhaust themselves; one I was photographing leapt around without stopping for a couple of minutes and then dropped dead. Two kinds of ratjah are common in the Centre, one a little larger than the other.

The larger variety (*Ascopharynx*) is also distinguished by the presence of a small pouch on its throat. Their habits are similar and they appear to live together.

Another little inhabitant of the sandhills is the Crested Tailed Phascogale (*Dasycercus cristicauda*), known to the blacks as "umbota". It is one of the little carnivorous marsupials and is distinguished from the others by a thick fat tail covered by a black crest. Only one was seen at Hermannsburg while I was there, but it appears to be very common further west, where it was frequently brought in to other members of our party.

THE MARSUPIAL MOLE.

Finally there is the little mole; its presence in the centre is well known to both blacks and whites. The Aruntas know it as "Toturriturri", while the Loritchas call it "Pitelbatelba". It was common knowledge among the blacks



Red sandstone cliffs, showing remarkable dyke-like vertical formations, along the bank of the Finke River. These cliffs were the homes of many Banded Rock Wallabies (*Petrogale lateralis*).

[Photo.—H. C. Barry.]

that it favoured the little pockets of red sandhills and was very rarely seen except just after rain. As we only had a few points during our stay we did not see it; it is unlikely that it comes to the surface in dry weather except perhaps at night. Tracks were sometimes found around the mission, on one occasion just behind the main buildings. All the black inhabitants set to work to dig the little creature out, but it was probably moving faster than the others combined. Since our return one was caught near the mission and sent down to Sydney. The blacks say they catch many as soon as they come to the surface after rain, but hunting alone is unlikely to reduce their numbers. The mole was discovered only in 1888, and it must be one of the most interesting animals in the world. Its mode of life should protect it, and, in fact, it would not be surprising if it outlived most of our larger native marsupials.

On 24th February ninety-four members of the Royal Australian Historical Society paid a visit to the Museum to examine the Cook relics and other historical objects in the collection. Dr. Anderson

delivered a short address on the foundation and early history of the Museum, and the visitors were afterwards entertained to afternoon tea.

The Australian Aboriginal from Infancy to Parenthood

BY FREDERICK D. MCCARTHY.

TO the average person the Australian aborigine is a savage of lowly state, comparatively unintelligent, leading an idle, pleasant existence wandering about the country. But the life of the natives is in reality in sharp contrast to this Utopian picture; indeed, so strenuous is it that only the fittest can and are allowed to survive, especially in the arid regions of the continent.

We will take the Arunta as an example. They live in the vicinity of the Macdonnell Ranges of Central Australia, where the environment is not an attractive or a fertile one. It is hot and dry, lightly timbered with scattered gums, mulga, and hakeas amongst the clumps of porcupine-grass, and much of it is desert. In the summer, water is present in few pools, so that roots of trees and even the dew on the grass and bushes are used to quench the thirst of the inhabitants. For

food they depend wholly upon nature's bounty, as they are a nomad race, and do not practise agriculture of any kind. They kill whatever game they meet with on their daily journeys from waterhole to waterhole, the men hunting the larger animals, such as the kangaroo, wallaby, and emu, with spear and throwing-stick,

while the women gather fruits, berries, and seeds, and dig for roots, grubs, and lizards with pointed sticks.

In this article we will trace the life of an individual in this primitive society, and see how it is moulded and guided, how it is absorbed into that of the group,

and the effect this has on the personality in its relation to the social structure. This in the Arunta is a very complex one, in which age and experience are of great value. There are no class divisions, such as nobles and commoners, nor any real distinctions based upon crafts, which are so prominent in Polynesia and Africa. The sphere of the sexes, however, is so distinct that it may be called a male society.

The life of the Arunta might be said to begin when the spirit of an Alchera or mythical ancestor impregnates the mother at a totem-centre, and is thus reincarnated in the child. But the

fate of the latter is dependent upon other factors. There may be a baby not yet weaned, the family already big enough, or the food supply affected by drought; hence it may be killed at birth, and in this respect it is interesting to note that no special rites are carried out at this crisis. If the baby is allowed to live it





Feather of Eagle Hawk Totem, Arunta Tribe. Each individual has a churinga, the symbol of his totemic beliefs, which is a link between him and his ancestors. It is his most sacred possession and is never shown to the women or uninitiated men. (Australian Museum Specimen.)

[Nancy B. Adams, del.]

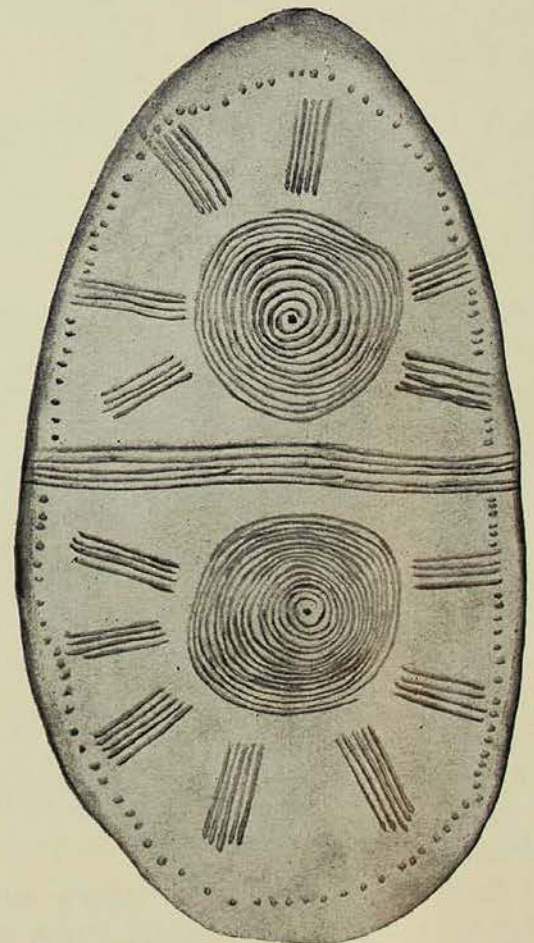
is well cared for during infancy, a duty devolving wholly upon the affectionate and attendant mother. When strong enough it assists her in securing edible roots, seeds, and small animals. The girls continue this uneventful life until puberty, when they are married, but the boys are taken from the women at an early age, about ten years, for initiation, and we will now follow the initiate to parenthood.

During this early period of life the child acquires a great deal of invaluable knowledge of its environment. The boys form a playmate companionship, in some cases the beginning of lifelong friendships. They use miniature weapons with which they compete against one another in tournament and duel. The men watch them, even participate, being careful to encourage and aid them in the skilful use of these essential media for the securing of food. Their games are aimed at making them skilful trackers, and giving them an intimate knowledge of the habits of the animals they hunt, of the plants they need, and of the water supply. By constant practice they learn to throw spear and throwing-stick quickly and with unerring aim, to judge distances accurately; they become courageous and resourceful, while their stamina is developed on the march. Generally speaking, their boyhood is a long and efficient training to adapt them to their physical environment.

Socially the child has been solely under the influence of its father's family. Its relations have been with its parents and their close blood relatives, so that its existence has been in a narrow sphere. No serious attempt has been made, nor is

it required, to mould its personality and character. But now a new and very potent factor comes into the boy's life.

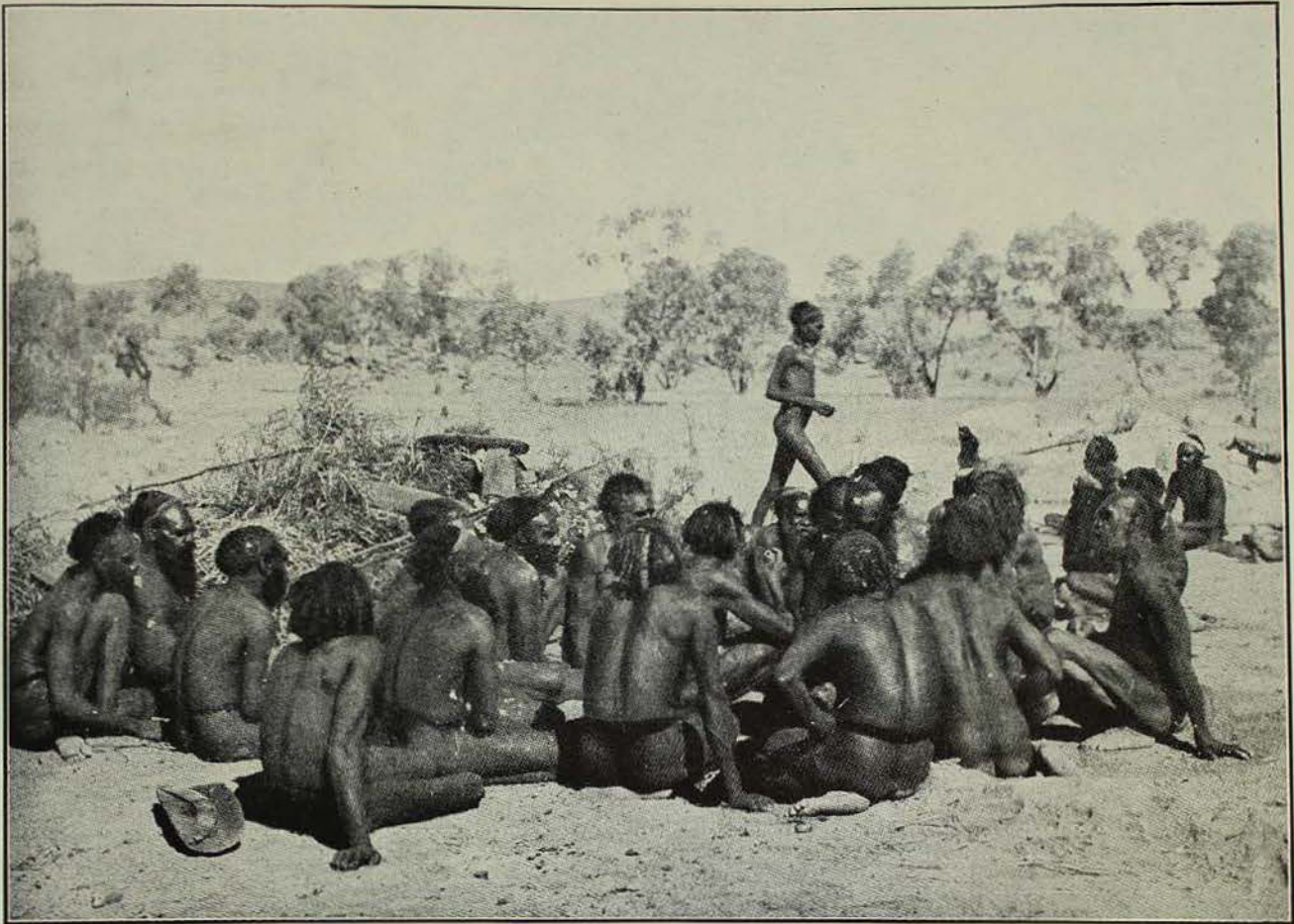
This is initiation, which for the boys is the period of their life when their relationship with the group and its institutions really commences. The initiate is subjected to rigorous and exacting tests of pain and hardship; indeed, his claims to manhood and his



Marsupial Rat Totem, Arunta Tribe. Each clan has its own design on the churinga, but all consist of the same elements—concentric circles, semi-circles, lines and dots—arranged in varying patterns but with a different meaning in each design.

(Australian Museum Specimen.)

[Nancy B. Adams, del.]



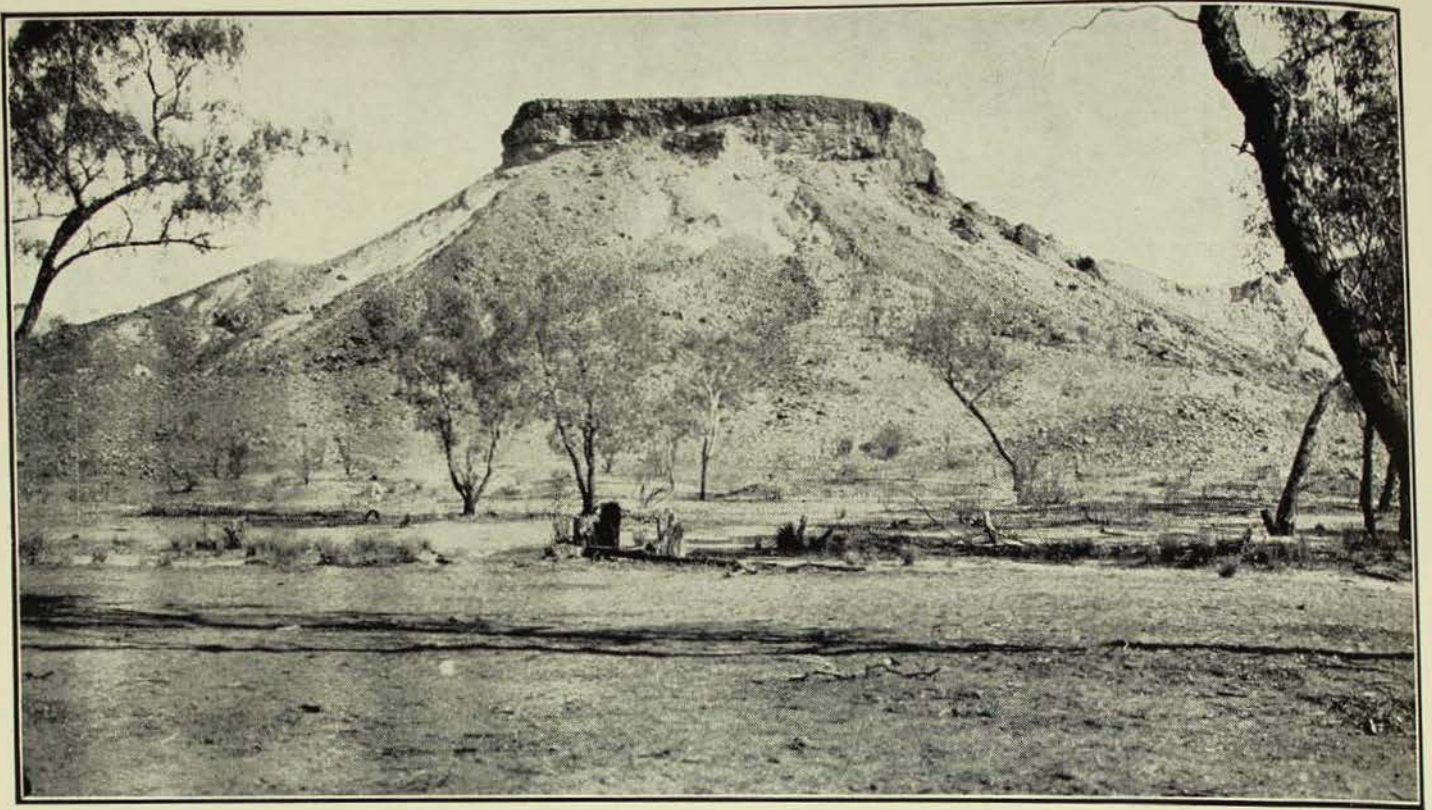
The elders of the horde form a council, and all matters of importance are discussed until a unanimous decision is reached.

[After Spencer and Gillen.]

very right to live and be a member of the tribe, are dependent upon his successfully negotiating the initiation rites. There is nothing in our society comparable with it. The sacred and secret lore is unfolded to him. He learns the significance of the totem of his clan; he is given a churinga, is told its meaning, and his connection with the spirit world. There are five distinct ceremonies in the Arunta type of initiation, probably the most extreme form in Australia. It takes from ten to fifteen years to complete, so that the initiate is about twenty-five years of age and in some cases even older before becoming a fully initiated man. During this time the education of the youth in the traditional ways of the tribe is carefully and strictly taught to him by the elders. He has to undergo fire ceremonies, observe food taboos, and supply his guardians, usually the father or brother of his future wife, with food. In addition,

he is allowed to wear insignia of his status as he advances, until he is able to assume a man's girdle, and join the men's camp.

The knowledge and status acquired during these critical years of his life give to the individual a position of superiority so far as the women and uninitiated are concerned. Throughout the rites his separation from them has been stressed and he behaves accordingly. But initiation imposes upon him also the duties of preserving this knowledge, of not disclosing it to those ineligible to know it, and of handing it on to the initiates who will be in his care in the future. He is taught the meaning of his kinship relationships, particularly to those whom he must respect, and his behaviour towards the rest of the community and theirs to him is made known to him. Above all, there is impressed upon him by this change of status the part of the



Crown Point, an arid, sparsely vegetated region.

[Photo.—C. Barrett.]

individual, that is his part, in the life and solidarity of the community.

Initiation thus brings with it a new set of conditions to which the young man must adjust himself, and fits him for full participation in privileges, rights and duties of adult members of the tribe. He can now marry. His education, physically, morally, and spiritually, is complete so far as the society requires it to be. The inescapable duties of a tribesman are forced upon him, and he must fulfil them. Whereas hitherto his father's family, with its limited sphere, has been the dominant influence in his life, the local group, his clan and his own family now take its place.

Let us consider, then, these ever-widening extensions of relationships and institutions which now enter his life.

The local group of which he is a member by reason of descent traced through his father assumes primary importance. In the Arunta system it is composed mainly of members of one clan, and consists of his male relatives, with their wives and children, with whom he lives his whole

life. This group has its own hunting territory, and strictly preserves its rights to it. It is the country of his ancestors, and he is the living incarnation of one of them through the spirit for which his body is the earthly abode. The totem-centre where his ancestor entered the ground, and where, too, the spirit is reincarnated at the death of each individual of its line, is a very sacred place to him. If this is a tree, then its fruits, or animals of any kind upon it, are taboo to him. Should it be destroyed, then he would die, because this would sever the link between him and his ancestors; therefore, he must die in this territory, and so enable his spirit to return to the sacred site and so perpetuate his line. But it is also of great importance to the tribe as a whole that this happens, because each group or horde has portion of the body of myth, legend and lore to preserve, and the totemic spiritual bond of the people with their territory is the basis of their emotional life. The individual now takes an active part in the sacred and secret totem rites of his clan, he can participate in the corroborees, and

can even invent songs and dances for the entertainment of his colleagues.

The acute food problem is greatly alleviated by the co-operation of the group members. They appeal to their ancestors in their totemic rites to ensure the continuity of the food supply, they perform magic to bring rain, and share whatever game is secured. Thus they feel at home with the community and secure in its environment and territory.

The horde is the fighting, ceremonial, and legal unit of which the individual has become an integral part. Other groups are separate entities to him, merely members of his own tribe, with whom he has little in common. He fights against them, and uses sorcery to kill them, as they do in return. His own horde has become his whole life, social, economic, spiritual, and political, and in time he may become a member of its council, should he be considered sufficiently capable. When he marries, his wife joins it. The horde even transcends the tribe in this respect, and its comparative isolation so tempers its unity as to bind the individual inexorably to it.

The tribe, however, still retains a certain interest for him. It is the widest extension of his real friends, and he is bound to it by the intricate kinship system. The terms which are used to denote and regulate his behaviour towards others extend outside his local group to the whole tribe. They even cover strangers, and simplify his journeys to other districts of the tribal territory. He is a member of a sub-section of a moiety (or division of the tribe into two halves), and he is expected to seek a wife from a similarly defined sub-section of the other moiety. He mingles with the tribe at ceremonies, in some cases to feast upon a seasonable fruit or grub, and he trades with them. It is apparent, however, that his connection with the tribe is mainly a social one.

So, too, marriage necessitates another readjustment to new elements, and brings with it enormously increased responsibility for him. He has obligations to his

wife's relatives, to whom he gives weapons and choice morsels of food as gifts. As the head of a new family he is brought to realize to the full the sharp distinction between the sexes in everyday life and in ceremony, and the position of his family in the community.

For the woman the case is different. At marriage she joins her husband's group, where she is, comparatively speaking, a stranger. She is not allowed to participate to any real extent in the political or religious life of the community, and has no really important ceremonies to mark her crises of life. Her husband's family and horde are the dominant influence in her life, which is an inconspicuous one of hard work, lacking the responsibilities of the man. Many of the old women do, however, attain to a position of great respect in the community.

Thus the relation of the individual to the social structure in Arunta society, technically termed the social personality, is determined by membership of the kinship groupings, with its attendant obligations. Tribal morality governs his conduct, and if he commits a crime against traditional law and order, or infringes the conventions, he is punished even to death. Very often he has to fight a duel against a man whom he has offended. Psychologically his stimuli and responses are guided profoundly by the very nature of his life—fellow feeling, communal force, attachment to territory, and the terrific and exhausting struggle for existence in a poor and more or less barren environment.

The individual in our own society is given a much wider scope, without so rigid an adjustment to the social structure, than is the aborigine. But despite this, the native has the opportunity to develop his singular talents of oratory, of magic and medicine, rain-making, and fighting to enable him to become a renowned and respected individual. His skill in making weapons adds greatly to his prestige, and his ability, if an elder, to find sufficient sustenance for the group in times of scarcity is of inestimable value and importance.

It is apparent, then, how easy it is for the white man to shatter such a flexible though delicate mechanism of social regulations. The stockman, settler, and trader, unable or unwilling in many cases to try to understand or even respect the function of the institutions of the aborigines, and arrange their activities so that no real harm will be done, subordinate them to their own needs with disastrous results. The missionary and administrator are not entirely free from blame in this respect, and good intention has been frustrated by ignorance of these, it must be admitted, complex matters. The discontinuance of an institution such

as initiation by a semi-civilized community of natives, the breaking up of the clan, or the abandoning of totemic rites is a serious matter, but these are the phases of their life that suffer most from contact with our own people, and give to them an outlook of utter despair for the future. The isolation of the natives on government cattle stations, growing their own fodder and vegetables, seems to offer the best solution for their future. They leave reserves in dry areas on account of drought and cluster round the townships; their association with whites is not, unfortunately, always to their advantage, even though it be well meant.

The Sea Serpent and its Kind

By C. ANDERSON, M.A., D.Sc., C.M.Z.S.

MAN is incurably romantic, exceedingly prone to exaggeration, and credulous in the extreme. In the domain of natural history we find some astonishing manifestations of these engaging human qualities, and the mere enumeration of the various mythological creatures which have been described, pictured and firmly believed in at one time or another, would fill several pages. The kraken, wyvern, cockatrice, hydra, basilisk, unicorn, dragon, griffin, gorgon and a host of others, strange in appearance and generally deadly in their qualities, have played so important a rôle in tradition, folklore, and fairy tale that they are almost as real to us as Santa Claus himself.

It may be accepted that these "monsters" were not evolved out of man's inner consciousness, but that there has always been some basis, however flimsy, upon which fancy could build. Thus many myths originated in the tales of strange beasts which early European travellers related on their return from journeys into previously unknown lands.

They were naturally inclined to magnify the perils they had escaped, and to astonish the stay-at-homes by "improving" on the strange creatures they had seen in distant countries. And they were materially aided by the imaginative powers of these same stay-at-homes. Thus the unicorn myth is apparently based on an off-hand description of a rhinoceros as a creature resembling a horse with a horn on its face. Later, when the long spirally twisted tusk of the narwhal was brought back from the Arctic seas, it was hailed as the veritable horn of the unicorn, and, when an artist depicted a horse with a horn on its forehead, the unicorn was firmly established, and is now familiar to us all as a heraldic device and one of the supporters of the royal arms.

So the dragon, which in one form or another is one of the oldest and most widely spread of mythical creatures, probably originated in stories of the pythons of tropical Asia and Africa, great snakes which may attain a length of

twenty-five feet or more, and which on account of their great strength, sinister appearance and dangerous character, were regarded with superstitious awe by the primitive peoples who inhabited these regions. Add wings and clawed limbs to a python in order to make it more fearsome and we have the makings of a first-class dragon, a worthy antagonist of the heroes of old, from Hercules and Perseus to St. Michael and St. George.

Now that we are more fully acquainted with the lands of the globe and their animal denizens, we are more critical regarding travellers' tales, consequently most of the mythical monsters of the Middle Ages have been relegated to the limbo of things that are not. Although there are many kinds of land animals yet to be discovered and described, they are mostly of small size, and it is safe to say that there is no mammal, bird, or reptile of large dimensions and unusual structure which is entirely unknown, and which would not fall naturally into some well recognized group. Yet superstition and belief in the bizarre and the marvellous die hard, and popular fancy can still be tickled by rumours of the existence of some gigantic unknown animal, usually supposed to be a survival from prehistoric times, when, as we know, strange creatures, quite unlike any present-day animal, did exist. But we must not forget that to one of the long-extinct reptiles of the Mesozoic period, which lived and died millions of years ago, the existing fauna, including man, would also be passing strange.

The residual fabulous creatures are usually inhabitants of the ocean, or of lakes and rivers, for these may be supposed to show themselves but seldom, and in a furtive manner, so that the little knowledge we do obtain in brief glimpses does not fetter our imagination in the slightest. Such aquatic "monsters" are the great sea serpent of every sea, the water kelpie of Scotland, and the bunyip of Australia—and the greatest of these is the sea serpent.

THE SEA SERPENT.

Erik Pontoppidan, the learned Bishop of Bergen, who wrote a "Natural History of Norway" in 1755, gave pontifical authority to the sea serpent, and also described the kraken, which is now known to have been a large squid. Since Pontoppidan's day alleged sea serpents of large size and fearsome appearance have been reported from time to time in many different places, but the descriptions by eye-witnesses vary so much that one would be led to suspect that there are several very different kinds of sea serpent.

One of the best authenticated is that which was seen from the deck of H.M.S. *Daedalus*, off the coast of Africa, in 1848. A report by Captain Peter McQuhæ described it as at least sixty-feet in length, with a head which was "without any doubt that of a snake". It had no fins but "something like the mane of a horse or rather a bunch of seaweed, washed about its back". A sketch of this "serpent", made immediately after it was seen, has been several times reproduced, and depicts a creature resembling a large snake or eel.

In May, 1917, Captain F. W. Dean and several of the officers and men of H.M.S. *Hilary* saw a "sea serpent" about seventy miles south-east of Iceland. The creature passed at a distance of about thirty yards, and lifted its head once or twice as if looking at the ship. "Its head was black and glossy, with no protrusions such as ears, etc., in shape about that of a cow . . . the top edge of the neck was just awash, and it curved to almost a semicircle, as the creature moved its head as if to follow us with its eyes. The dorsal fin was a black equilateral triangle which rose at times till the peak was estimated to be four feet above the water."¹

The poor thing was used as a target for anti-submarine practice at about 1,200 yards range, and, a direct hit

¹ *Nature*, March 22, 1930, p. 469.

having apparently been scored, it disappeared, leaving no trace. A few days later the ship was torpedoed and sunk, and all records regarding the "sea serpent" were lost.

Australia, too, has records of sea serpents, and its latest appearance on the South Coast of New South Wales in 1930 will be fresh in the memory of our readers. The Bellambi Reef specimen was seen at fairly close quarters by some courageous fishermen who rowed near it, and from their description Mr. D. G. Stead concludes that it was probably a Pike Whale.¹ A day or so later another monster was reported from Scarborough, a few miles north of Bellambi Reef. In this case the creature was seen by various reliable observers and was described as resembling a huge snake eighty or ninety feet long.

AN ORCADIAN SEA SERPENT.

But the most convincing of all sea serpents is that which in the autumn of 1808 was, during a gale, thrown ashore in Rothiesholm Bay on the island of Stronsay, Orkney, for in this case it was not a question of merely viewing the creature from the deck of a ship or from the shore, its body was actually available for *post mortem* examination, and a pretty controversy arose over its mortal remains. Its subsequent history, too, is not without interest, showing as it does that evidence given in good faith by reliable but inexpert witnesses may be utterly misleading, and that conclusions based thereon are quite false. The whole story conveys a useful lesson and warning.

Statements by various people who saw the animal after its stranding were made on affidavit before Dr. Robert Groat, physician in Kirkwall, and Malcolm Laing, M.P., well known from his historical writings. According to the depositions the animal had a snake-like body fifty-five feet in length, a sort of crest or mane along its back, and three

pairs of legs. Patrick Neill, a naturalist of some repute, described it before the Wernerian Society of Edinburgh as a sea serpent similar to that of Bishop Pontoppidan. The depositions were forwarded to Sir Joseph Banks, and by him submitted to Everard Home, a distinguished anatomist and ichthyologist, who was also able to obtain from Malcolm Laing some portions of its body. From a study of the depositions and such fragments as he was able to examine, Home concluded that the supposed sea serpent was a Basking Shark (then called *Squalus maximus*), one of the largest of the shark family and one which frequents the Orkney Islands. Dr. Barclay of Edinburgh disputed this opinion, and concluded with the caustic remark, "if the characters of genus and species be to rest on such vague and conjectural evidence as that which proves this animal to be a *Squalus*, we may as soon get acquainted with nature through the dreams of cosmogony, or the tales of a tub, as through the observations of natural history."¹

Dr. Barclay himself is non-committal as to the exact nature of the animal, but refers to it as a cetaceous fish!

The argument assumed almost international importance, and varying views as to the nature of the monster were expressed. Oken, the learned German scientist, thought it might be a "rabbit-fish" or *Chimæra*, Dr. Hibbert regarded it as a sea serpent, and Professor John Fleming of Edinburgh was inclined to agree with him. The German zoologist Rathke thought it might be a relative of the extinct plesiosaur.

Part of the Orcadian monster was given to Lady Byron (of all people), and part to the Natural History Museum of Edinburgh University. This is still preserved in the Royal Scottish Museum, and Professor J. Ritchie, University of Aberdeen, formerly Keeper of Natural History in the Edinburgh Museum, has

¹ Stead: *Giants and Pigmyes of the Deep*, Shakespeare Head Press, 1933, p. 83.

¹ *Memoirs of the Wernerian Natural History Society*, I, 1808-1810, p. 429.

re-examined these, and in the *Times* of December 16, 1933, he publishes his conclusions, which support Home's identification of the animal as a Basking Shark, the "mane" being the frayed-out fin rays, the legs consisting of the remains of two pairs of fins and the claspers. In justice to the honest islanders it must be remembered that the fish had been dead for several days before its body was critically examined, that it was largely decomposed, and sea birds had been feeding upon it in great numbers.

THE LOCH NESS MONSTER.

This creature, whatever it may be, has for months past created almost as much interest and speculation as disarmament or test cricket. Some animal which is not in its usual environment has certainly been seen in this Scottish loch, and we have the usual crop of conflicting accounts of its size and appearance. Its length has been variously given as ten, thirty, and sixty feet, it has presented itself as a series of humps recalling the sea serpent, as a huge amphibian or salamander-like creature, and as a cross between a seal and a plesiosaur. It has been photographed and is now being pursued with a Marconiphone hydrophone apparatus (whatever that may be), and £20,000 has been offered for it, alive, and in a condition to be shown in a circus. No doubt its real nature will be discovered ere long, perhaps before this appears in print, but it may be hazarded that there is nothing "mysterious" about it; most probably, as a writer in *Nature*¹ suggests, it is a large gray seal (or a number of these) which has made its way into Loch Ness and has not yet been able to escape to the open sea.

THE BUNYIP.

The Australian bunyip, like all fabulous creatures, probably has some excuse for its persistence; for it is not alone a creature of aboriginal legend; white

settlers, too, have at various times seen or heard evidence of the occurrence in billabongs or rivers of animals which they could not identify. There may be aboriginal legends of the former existence of the *Diprotodon*, which is commonly believed to have haunted rivers, swamps and inland lakes.¹

The bunyip is generally represented as a large furred animal, dog-like in form and with shining eyes, which progresses by means of fins or flippers and haunts lagoons or billabongs.

The awe-inspiring sounds sometimes heard in swamps are doubtless made by the Brown Bittern (*Botaurus poiciloptilus*), which on account of its booming cry has been called the Murray Bull; many inquiries are received at the Museum regarding this loud-voiced bird. A wandering seal may easily be the origin of some bunyip stories, for these animals occasionally find their way into inland waters. Dr. Charles Fenner quotes an instance of a seal's being shot at Conargo, New South Wales.² It must have ascended the Murray River for nine hundred miles, which shows that seals can travel far in fresh water, perhaps making their way overland for short distances.

PREHISTORIC SURVIVALS.

It has often been suggested that some of the strange reptiles of the Mesozoic period have left living descendants which now appear as sea serpents, and the prevalence of the dragon myth has also been explained as a legendary memory of these long extinct creatures. But these hypotheses are far-fetched. The dinosaurs, plesiosaurs, pterosaurs, mosasaurs, and their kind became extinct in the Cretaceous period, about one hundred million years ago, and no sign of their remains has been found in more recent rocks. No legend, however old, can bridge a span of a hundred million years. It is certain that man was *contem-*

¹ Anderson: AUSTR. MUS. MAG., II, 1926, p. 374.

² Fenner: *Bunyips and Billabongs*, Angus and Robertson, 1933, p. 6.

¹ *Nature*, January 13, 1934, p. 56.

poraneous with the mammoth and the woolly rhinoceros, animals which were comparatively recent, but the evidence is not traditional; it is based on drawings of these creatures by prehistoric artists and the finding of their bones.

That living relatives of the plesiosaurs and tylosaurs of old may still exist in the vast ocean is extremely unlikely, so much so that it is scarcely worthy of serious discussion. It is true that sea snakes do exist in all warm seas, and it is suggested that there may be much larger forms of which we have no certain knowledge. This is improbable. All reptiles are air-breathers and must spend much of their time on the surface or along the shore. Sea snakes six or seven feet in length are commonly observed, and one might expect that if forms of fifty or more feet in length existed they would be seen now and then, or even be captured or washed ashore and find their way into some museum. But no part, not a bone or a tooth of a large reptile that could figure as the great sea serpent has ever been found on the coast of any continent, in off-shore deposits or in ocean dredgings, although skulls of extinct rhinoceroses have been recovered from the North Sea, teeth of very large extinct sharks, and ear-bones of whales have been found on the ocean floor, or in marine deposits of recent age.

It is a favourite device of novelists and writers of film scenarios to tickle our spines with tales of primeval monsters, which have survived into the human period and supplied the background for thrilling adventures and blood-curdling

incidents. In "The Lost World" the late Conan Doyle imagined a huge steep-walled plateau in South America which had persisted since Mesozoic times and formed a sanctuary for the fearsome reptiles of that period. But this is contrary to all geological knowledge, for denudation is no respecter of plateaux, which would be reduced to the common level in a much shorter period than a hundred million years.

Yet we must not forget that there are some striking examples of archaic survivals in the animal world. Our own platypus and native porcupine (egg-laying mammals) are exceedingly primitive, and the tuatara of New Zealand is the sole survivor of an order of reptiles that elsewhere became extinct in the early Tertiary (about sixty million years ago) and had its greatest development in the Triassic, about two hundred million years ago.

CONCLUSION.

Summing up, one may say that, while there is a bare possibility that unknown sea snakes of large dimensions *may* exist, it is more likely that other creatures, whales, porpoises, ribbon fish, large squids, or seals, have been mistaken for snakes. Even such objects as a flock of birds, floating logs, or seaweed might conceivably present some resemblance to a sea serpent, and one skipper confesses that he was once deceived by a line of soot floating on the water. An observer once saw what he took for a sea serpent in Scapa Flow, Orkney, but a pair of binoculars resolved it into an optical illusion.

In March a party consisting of Mr. T. Hodge-Smith, J. Kingsley and H. Jackson paid a short visit to the Belubula Caves to obtain additional material for the Caves Exhibit, now in course of construction.

Mr. A. Musgrave, F.E.S., Entomologist, left Sydney on March 7 on long service leave of twelve months. Mr. Musgrave will visit America, Britain and the continent of Europe, and will inspect various museums and libraries and study entomological collections.

The First Naturalists in Australia

BY GILBERT P. WHITLEY.

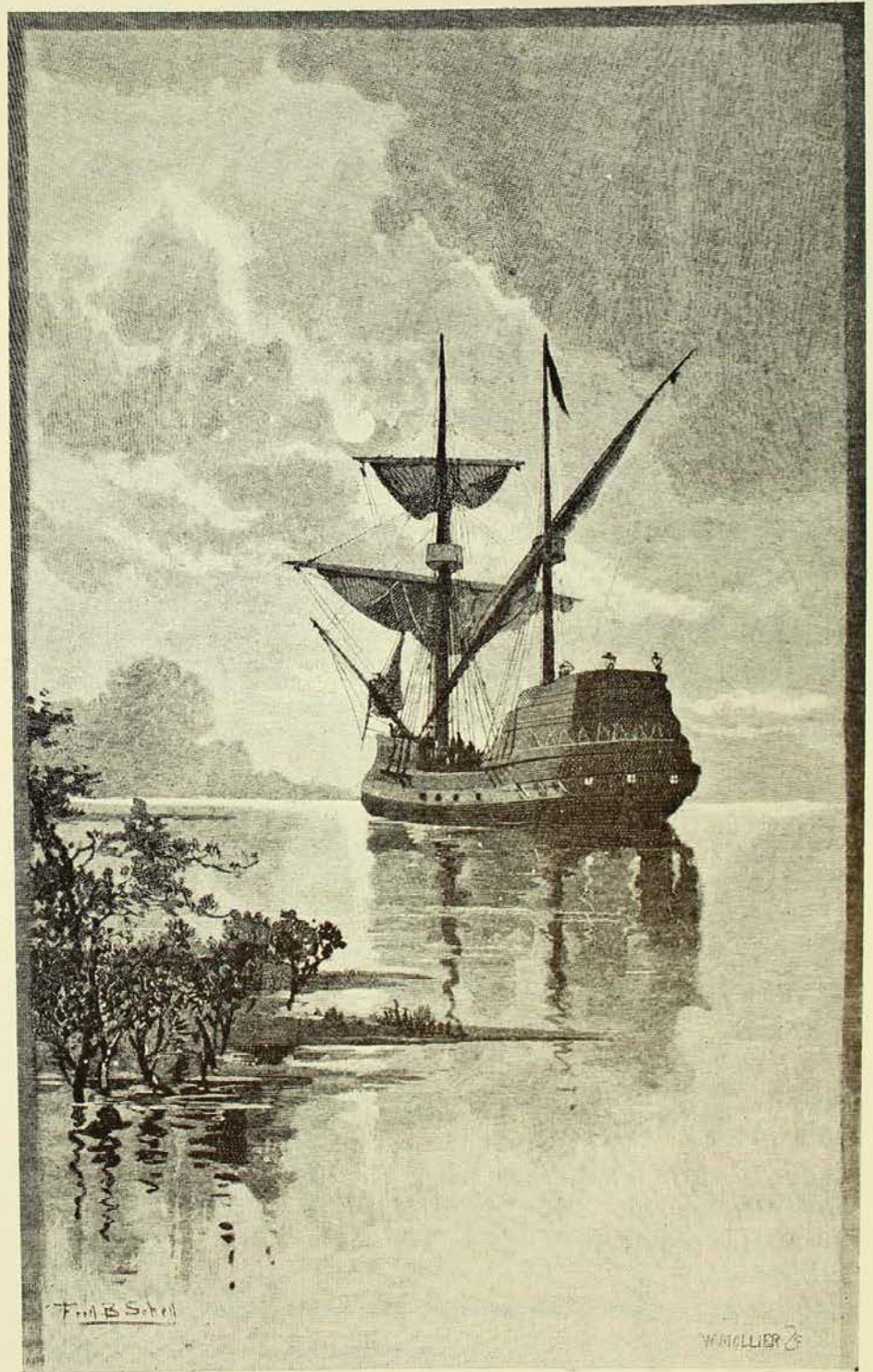
WHO can tell if the Flying Dutchman, condemned to ride the storm-tossed southern seas, ever sighted the coasts of Australia, discovering them only to flee again towards his ghostly destiny? Whether or no, we owe the discovery of Australia to the Dutch, the first authentically recorded contact with our shores being made by William Janszoon in the ship *Duifken* ("Little Dove") on the east coast of the Gulf of Carpentaria early in 1606, and many of our early nature notes were made by Dutchmen.

DON DIEGO DE PRADO.

Though it is now recognized that Torres never sighted the Australian mainland, the fact that he sailed through Torres Strait in September - October, 1606, indicates that he entered what are now politically Australian territorial waters. In Prado's *Relacion*, published in H. N. Stevens' *New Light on the Discovery of Australia*, 1930 (p. 159), we read of animals and fish [albacore and dugong (?)] seen at the Island of Malandanca and the Isla de los Perros (Isle of Dogs).

The Torres Strait Pigeon was noticed on the Isla de Vulcanquemado (extinct volcano), whilst the Isles of Cantharides were named because "so great was the number of flies they call cantharides that it seemed as if they wanted to eat the men up".

After leaving our waters for the north-west, observations were made of the eggs of fishes which covered seven leagues of sea, oysters, and other animals.



The "Duifken" in the Gulf of Carpentaria, 1606.
[From *The Picturesque Atlas of Australasia*.

Ten years later, Eendracht's Land, now part of Western Australia, was discovered by Dirk Hartogszoon and named after his ship, whilst Dirk Hartog's Island is still marked on our maps. A circular plate, suitably inscribed, was left behind by Hartogszoon, and was not found until 1697 by another Dutchman, Vlamingh, who took it away, replacing it with a copy, further inscribed. This plate was observed by Hamelin in 1801, and later still the crew of the French corvette *Uranie* removed it to France. If either the original or Vlamingh's second plate is still in existence in Amsterdam or Paris, it would probably be the oldest Australian relic known. The posts to which they were nailed are in the Public Library, Perth.

The early Dutch pioneers made landfall in their search for gold, precious stones and other treasure trove which might add to the riches of the Indies. But Australia was unproductive of these requirements, and the natives were sometimes treacherous, so that except for replenishing the larder and getting fresh wood and water, they gained little from their visits, whilst the hardships they underwent were very severe, and murder and mutiny occasionally resulted.

To naturalists any notes on the animal life encountered in those early days are of interest, and such as have been brought to light, though brief, are historically priceless. The student of the early Dutch voyages to Australia has his task lightened by a valuable compilation, in which are reproduced copies of original documents in the State Archives at the Hague; I refer to *The Part Borne by the Dutch in the Discovery of Australia, 1606-1765*, by J. E. Heeres, with an English translation by C. Stoffel, published 1899.

From this book we can see how the outlines of the map of Australia were gradually inked in on the old charts, years before Cook surveyed the east coast so thoroughly. Many of the old Dutch ships cruised along the Great Southland, as Western Australia was then called, and now and then a wreck or other misfortune caused a temporary setback to these

indomitable navigators. In 1622, an English ship, the *Trial*, was wrecked on some rocks off our western coast. Probably those hardened old sailors would have excused themselves as being no naturalists, thereby practically confirming the fact that many of them were, as who knew more of the habits of the albatross and other seabirds, the presence of whales and sharks, and how tasty fishes could be hauled aboard, than those old salts? So, in 1618, we have Skipper Claeszoon van Hillegom observing the birds of sea and land, making some of the first known nature notes from Australia, and Carstenszoon, in 1623, having "encountered sharks, sword fishes and the like unnatural monsters" near New Guinea or what is now Cape York [game fishermen, please note], is delighted to find "plenty of delicious fish" from the Waterplaets, now believed to be the Mitchell River district, Gulf of Carpentaria, Queensland.

Tiny shells, brought up on the sounding lead, and the floating population of our north-western tropical seas also came in for comment, cuttle-fish bones being mentioned by J. van Roosenbergh, who also observed birds, in 1627. However, it was not until François Pelsaert's ship, the *Batavia*, was wrecked at Houtman's Abrolhos that we gain more than a glimpse of the land fauna. Here ant-hills or termites' mounds were remarked, and the first entomologists in Australia were tortured by persistent flies. But most important of all, it is to Pelsaert that we are indebted for the first description of an Australian marsupial, the wallaby, of which he wrote in his *Journal*, November, 1629:

Besides, we found in these islands large numbers of a species of cats, which are very strange creatures; they are about the size of a hare, their head resembling the head of a civet-cat; the fore-paws are very short, about the length of a finger, on which the animal has five small nails or fingers, resembling those of a monkey's forepaw. Its two hind-legs, on the contrary, are upwards of half an ell in length, and it walks on these only, on the flat of the heavy part of the leg, so that it does not run fast. Its tail is very long, like that of a long-tailed monkey; if it eats, it sits on

its hindlegs, and clutches its food with its forepaws, just like a squirrel or monkey.

Their manner of generation or procreation is exceedingly strange and highly worth observing. Below the belly the female carries a pouch, into which you may put your hand; inside this pouch are her nipples, and we have found that the young ones grow up in this pouch with the nipples in their mouths. We have seen some young ones lying there, which were only the size of a bean, though at the same time perfectly proportioned, so that it seems certain that they grow there out of the nipples of the mammæ, from which they draw their food, until they are grown up and are able to walk. Still, they keep creeping into the pouch, even when they have become very large, and the dam runs off with them, when they are hunted.

Mr. W. B. Alexander,¹ in his excellent "History of Zoology in Western Australia", says: "This account refers to the Dama Wallaby, *Macropus eugenii*, which is still plentiful in the islands."

It will be noted that Pelsaert inaugurated the fallacy that the young wallaby was born on the mammæ of its mother. Even after three centuries some people still maintain that this is the case in kangaroos, wallabies and the like; I would refer them to the explanation of the problem in the pages of this MAGAZINE by my colleague, Mr. E. Le G. Troughton.²

TASMAN'S VOYAGES.

By 1640 quite a large extent of Australia's outline had been joined up on the old maps, the Gulf of Carpentaria, Arnhem Land, the north-west and western coasts and the breadth of the Great Australian Bight having been traversed by the brave Dutch sailors. It was not until 1642 that Tasmania was discovered by the man whose name it now bears, Abel Janszoon Tasman (1603-1659), who actually circumnavigated Australia, though he gave it a wide berth, touching only at Tasmania, and then proceeding to discover New Zealand, Tonga, Fiji, and other islands.

Tasman sighted and named Maria Island, Tasmania, in November, 1642, but did not go ashore. His pilot-major,

Francoy Jacobszoon, landed with a party, however, and was surprised to see huge trees with notches cut at some distances apart in their trunks; these he thought were giants' footholds, but actually they were toeholds cut by the natives they did not see. Jacobszoon also observed birds' nests, footprints not ill-resembling the claws of a tiger, some dung of four-footed beasts, gulls, wild ducks, geese, and "divers mussels sticking in sundry places on bushes".

On the second day of Tasman's visit, the Chief Carpenter, Pieter Jacobszoon, swam ashore and erected a flag as a memorial.

In 1644 Tasman explored the shores of the Gulf of Carpentaria and northern Australia, whilst in following years various voyages to Western Australia were continued by the Dutch. The next natural history notes were recorded by Volckertszoon in 1658, who noted the mammals of a large island off the coast of Western Australia, including "two seals and a wild cat, resembling a civet-cat, but with browner hair", the latter being the wallaby which still abounds on Rottneest Island, which derives its name from its "rats' nests" or wallaby runs.

WILLIAM DAMPIER.

After Tasman, sailors of other nationalities appeared in Australian seas, but the English Captain Daniel and the Frenchmen de Voutron and Duquesne, 1687, seem to have left no natural history records of their visit.

The versatile William Dampier, a pirate more of necessity than by choice, who is said to be the first man to describe the boomerang,¹ next appeared on the scene.

Dampier was quite a good naturalist, and aboard the zoologically named ships, the *Cygnets* (Captain Read, 1688) and the *Roebuck* (Captain Dampier, 1699), noted many different animals, some of which were illustrated for the first time in one of his books.

Dampier first encountered north-western Australia on 4th January, 1688.

¹ Alexander: *Journ. Nat. Hist. Soc. W. Aust.*, v, 1914, p. 52.

² Troughton: *AUSTR. MUS. MAG.*, Vol. ii, 1926, p. 387; and Vol. iii, 1927, p. 53.

¹ Thorpe: *AUSTR. MUS. MAG.*, ii, 1924, p. 55.



Vlamingh's men catching black swans during their visit to the Swan River in January, 1697; nowadays there are none to be seen there.

[From Valentyn's *Oud en nieuw Oost-Indiën*.

He was certain that, large as it was, New Holland "joyns neither to *Asia*, *Africa*, nor *America*", and proceeded to note¹ the vegetable and animal productions of the place, though he gave far more particulars concerning the natives. Turtles and manatee (*i.e.*, dugong) were used as constant food by the *Cygnets*' crew.

Between Dampier's first and second visits to New Holland, another Dutch expedition, under Willem de Vlamingh, visited Western Australia.

WILLEM DE VLAMINGH.

Reference has already been made to the discovery of the plate left by Dirk Hartogszoon in 1616, by Vlamingh's men

of the *Geelvink* and other vessels. It is interesting to note here, however, that, at the time of their visit in 1696-7, the first collections of natural history objects were made in Australia and taken to the East Indies. Thus, that extraordinary bird, the Black Swan, which had been regarded as an impossibility from classical times, appeared in life before the amazed princes of commerce in Batavia, where the birds unfortunately died before they could be shipped to Amsterdam. A picture of Vlamingh's boats amongst the swans was published in 1726 in Valentyn's *Oud en nieuw Oost-Indiën*. A "box containing shells collected" was doubtless also regarded as almost equally curious.

According to Labillardière, the first specimens of any kind to reach Holland from New Holland, were two shells which had been given

¹ Dampier: *New Voyage Round the World*, Ed. 3, 1698, p. 463.

to Burgomaster Witsen of Amsterdam in 1698 by a sea captain in the service of the Dutch East India Company. This was William Vlamingh, who had visited Western Australia in the previous year; and, in a letter to Dr. Lister of the Royal Society, Witsen says: "He found them on the seaside, and I make bold to send you the draught of them, the shells themselves being twice as long and as broad as the draught." He adds the courteous message: "I could not bestow them better than on one who hath the best knowledge of these and all other sea products."

A description of the shells, with illustrations, was afterwards published in Lister's "Synopsis Conchyliorum" — one being the first nautilus (*Nautilus pompilius*), the other then named the *Concha persica clavícula radiata*.¹

Some of these shells, sent to Holland, may have been ceded to France from the Stadtholder collections at the time of the French Revolution. Whilst the specimens have doubtless perished, it seems likely that some old description or engraving may refer to this first Australian shell collection.

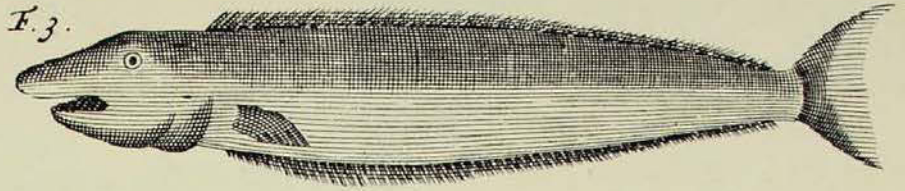
A large angler fish is perhaps the creature described as follows by one of Vlamingh's expedition: "Our people observed a remarkable fish here, about two feet long, with a round head and sort of arms and legs and even something like hands."

Various mammals and birds, turtles, and fish are also mentioned in an anonymous journal, printed at Amsterdam, 1701, and extracted in Major's *Terra Australis*, 1859, pp. 120-133. In this one also reads: "On the 2nd [February, 1697] we took three great sharks, one of which had nearly thirteen

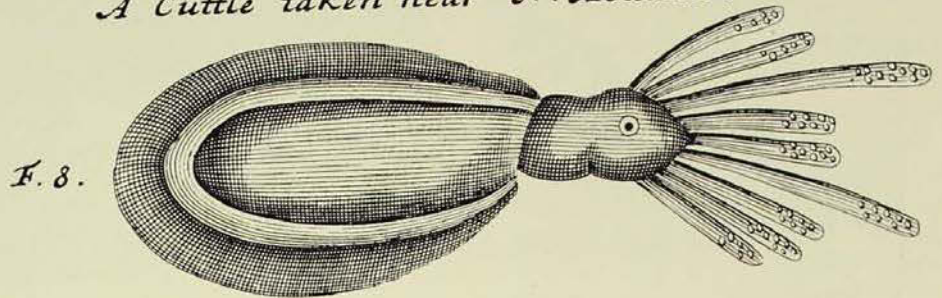
¹Ida Lee: *Early Explorers in Australia*, 1925, p. 1.

Plate 1

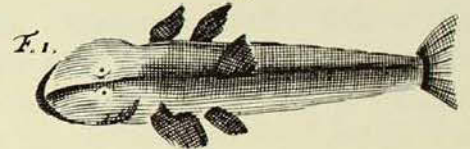
A Fish taken on the Coast of New Holland.



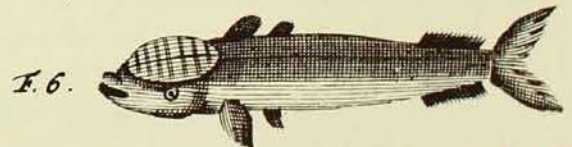
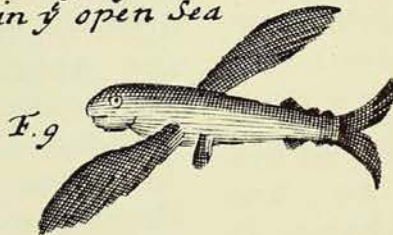
A Cuttle taken near N. Holland.



The Monk Fish. Page 141.



A Flying Fish taken in y open Sea

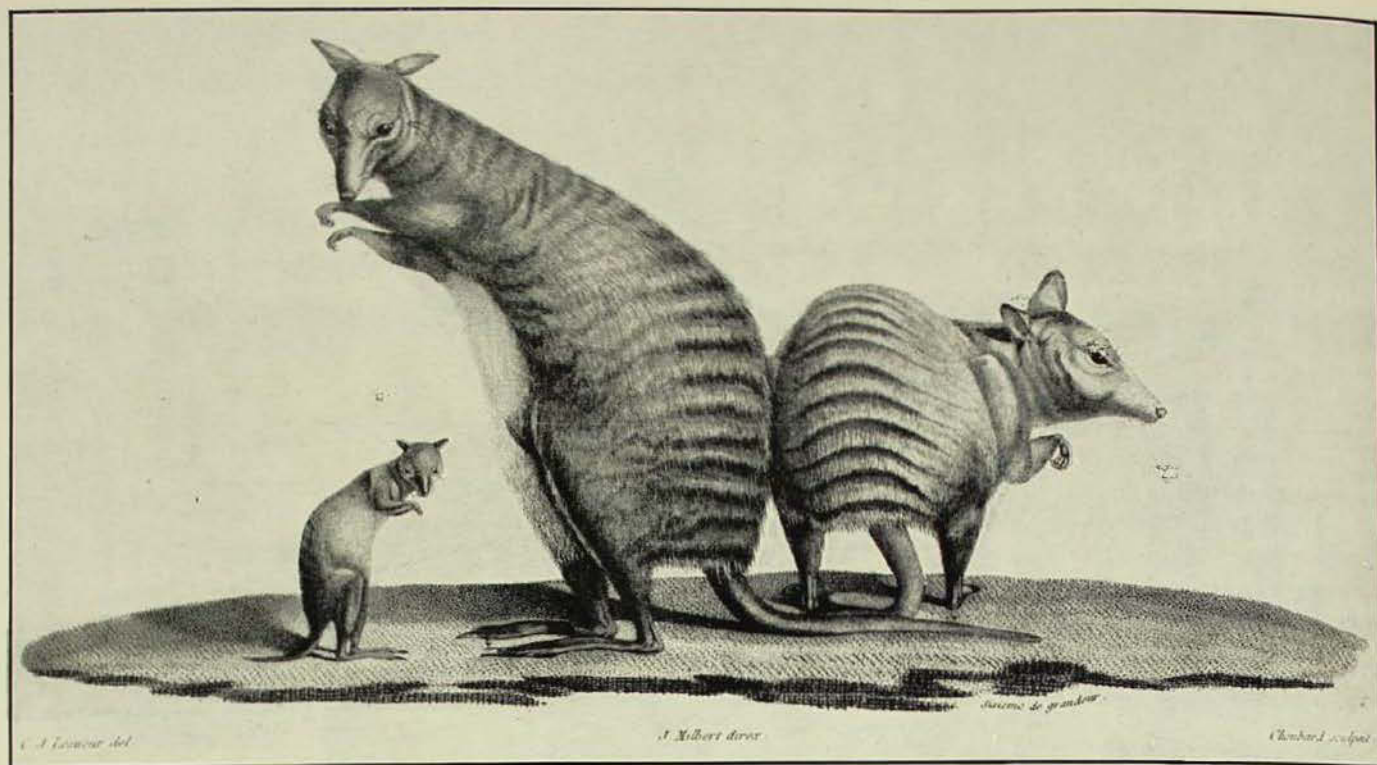


A Remora taken sticking to Sharks backs.

[From Dampier's *Voyage to New Holland*.

little ones, of the size of a large pike. The two captains (for De Vlaming had also gone on shore) returned on board late in the evening, having been a good six or seven leagues up the country. Our captain brought with him a large bird's head, and related that he had seen two nests, made of boughs, which were full three fathoms in circumference."

Whoever wrote this account was not sorry to leave our shores, as we are told that on 21st February, 1697, "half-an-hour after sun-rise, our captain came from on board De Vlaming's vessel,



Dampier's "Raccoons", the Banded Hare-Wallaby.

[From Péron et Freycinet, *Voyage de découvertes aux Terres Australes*.

from which five cannon shot were fired and three from our vessel, as a signal of farewell to the miserable South Land."

DAMPIER AGAIN.

On his second Australian visit, in the *Roebuck*, Dampier realized he was approaching Australia by the change in the floating weeds, the occurrence of certain birds, fishes, whales, and "abundance of Scuttle-bones".

On this voyage, to quote his own words, Dampier, "having now had in the Ship with me a Person skill'd in Drawing, I have by this means been enabled, for the greater Satisfaction of the Curious Reader, to present him with exact Cuts and Figures of several of the . . . Birds, Beasts, Fishes and Plants. . . ."

In Dampier's *Voyage to New Holland*, published 1703, are the first printed pictures of Australian birds, observed on, or off the western coastline in 1699; he also shows some fishes of New Holland, which are here reproduced.

At Dirk Hartog Island, Dampier saw "a sort of Raccoons" recalling those he had seen on the Spanish Main, but

"different from those of the *West Indies*, chiefly as to their Legs; for these have very short fore-Legs; but go Jumping upon them as the others do (and like them are very good Meat)". Mr. W. B. Alexander identifies this animal as the Banded Hare-Wallaby, *Lagostrophus fasciatus* Péron. Dampier also gave a description of the New Holland Guano which appeared to have a head at both ends and forelegs both fore and aft, evidently a Shingle-back Lizard. Dampier named Shark's Bay in Western Australia, and took from the maw of an eleven foot shark "the Head and Boans of a *Hippopotomus*", perhaps the remains of a Dugong. He also observed many marine creatures, and wrote: "I gathered a few strange Shells; chiefly a sort not large, and thick-set all about with Rays or Spikes growing in Rows." Though he lost most of his shell collection, perhaps he took some of these to England, so they may still be hidden, unlocalized, in some museum.

In 1719, Captain Nash in the *House of Austria* discovered "Cloates Island", Western Australia, where he saw "small birds like lapwings both in size and flight". Nash's journal was found on

board the *Haeslingfield*, which visited the same waters in 1743 under Captain Robert Haldane, who noted "2 or 3 birds of a whitish colour and of the size of a pigeon".

Holland's rule of the waves had not quite ended, however, as in the early eighteenth century, many more of her captains arrived, though these again have apparently not recorded any observations that they may have made on our animals. Doubtless, however, they relished the flesh of the seals and saw the whales and sea snakes so frequently observed by travellers off our western coasts, and the councillors at Batavia would read their journals and write reports from them. Snipe, a "tiger" and an immense number of black birds [swans] are thus noted in a 1705 despatch reproduced in Major's *Terra Australis*.

Gonzal visited north-western Australia and the Gulf of Carpentaria in the ships *Ryder* and *Buis* in 1756, and noted dogs like Bengal Jackals, birds, shells, and animal footprints, but gave no details about them. Probably the dogs referred to were dingoes.

So, sketchy and fragmentary as the records unavoidably must be, the labours of the first naturalists in Australia (since

the aboriginal inhabitants and stray Asiatic fisher-visitors) are handed down to us. Though Australia is regarded as a young country, the times with which we have been dealing might well have been many centuries earlier for all the resemblance they bear to the times of today.

The novelty of New Holland was scarcely wearing out before the complaint of an old sea dog, Sir John Narborough,¹ began to be no longer applicable:

'Tis to be lamented, that the English Nation have not sent along with their Navigators some skilful Painters, Naturalists, and Mechanists, under publick Stipends and Encouragement, as the Dutch and French have done, and still practise daily, much to their Honour as well as Advantage. The English have Capacity, Industry, and Judgment in these Matters, equal to, if not beyond their Neighbours. Sint Maecenates

A flood of light was soon to be flashed on the little-known animals of the then unexplored east of Australia by the naturalists of Cook's expedition in 1770, but an account of these and other early zoologists in Australia may be held over for a later article.

¹Narborough: *An Account of Several Late Voyages*, etc., 1694, introduction, p. xxix.



Cape Vlamingh, the westernmost point of Rottneest Island, Western Australia. This island was frequented by many of the old Dutch and French explorers of the early days.

[Photo.—G. P. Whitley.]

Reviews

TRAVELING WITH THE BIRDS. By Rudyerd Boulton. Illustrated by Walter Alois Weber. (M. A. Donohue & Company, Chicago. New York, 1933.) Price 10s.

This book on bird migration is obviously prepared for the use of children, but the beautiful illustrations make it a desirable acquisition to every bird lover's library. The letterpress is written in plain language by an ornithologist who stands in the front rank in America, and who is well versed in the subject, so that the book can be referred to with profit by everyone, young and old. It, of course, deals with American forms, but the

wading birds also travel from the frozen North, where they breed, to Australia, where they live during our summer. The puzzle of the migrating instinct is dealt with in easy terms, and a plain acknowledgment of "not understood" is openly made. A great field for observation on this subject in Australia has not yet been touched, and it is one of the most fascinating subjects in nature. The artist has apparently taken the place of the famous L. A. Fuertes, but the beautiful plates in this work appeal more than most of the latter's work, and compare very favourably with that of the best English bird-artists.

TOM IREDALE.

Notes and News

Recent visitors to the Museum include Dr. Aubert de la Rüe, of the University of Paris, on his way to New Caledonia to search for jade; Miss E. A. Bowley, B.Sc., of Western Australia, to study terrestrial isopods; Mr. Chauncey J. Hamlin, President of the Buffalo Society of Natural Sciences, Buffalo, New York, and a Trustee of the American Museum of Natural History, who is on a world tour; Miss L. Evelyn Cheesman, who has been collecting in Papua for the British Museum; Dr. A. L. Rand and Mr. R. Archbold, who have been in New Guinea collecting mammals and birds for the American Museum of Natural History.

* * * *

An interesting testimonial to the value of THE AUSTRALIAN MUSEUM MAGAZINE has been received from a subscriber in Queensland, who writes: "Thanks to the article on the Red Back Spider in the October-December number, my life and that of a small boy in this district were

saved. We knew the Red Back was poisonous, but did not think it was dangerous, ranking its bite with the sting of a wasp. I was bitten in February, saw the spider, and had the bite lanced and sucked and a ligature tied round my arm. Even then I was sick for over a week and suffered much pain, nausea, and headaches for over six weeks, but am well again now. The little boy was bitten in his sleep, and the spider was not seen for about ten minutes. Then the wound was lanced and sucked, but no ligature could be used, as the bite was on his neck. He lost the power of his legs about an hour afterwards, and was taken to hospital. It was touch and go with him for three days, but he is getting better now.

The lancing and sucking saved us both, and the knowledge that this was necessary was obtained from reading the MUSEUM MAGAZINE. We (both families) are grateful to your MAGAZINE."