

The
AUSTRALIAN
MUSEUM
MAGAZINE

Vol. VIII, No. 1.

JUNE-AUGUST, 1942.

Price—ONE SHILLING.



EATING

Koala or Native Bear.

THE AUSTRALIAN MUSEUM

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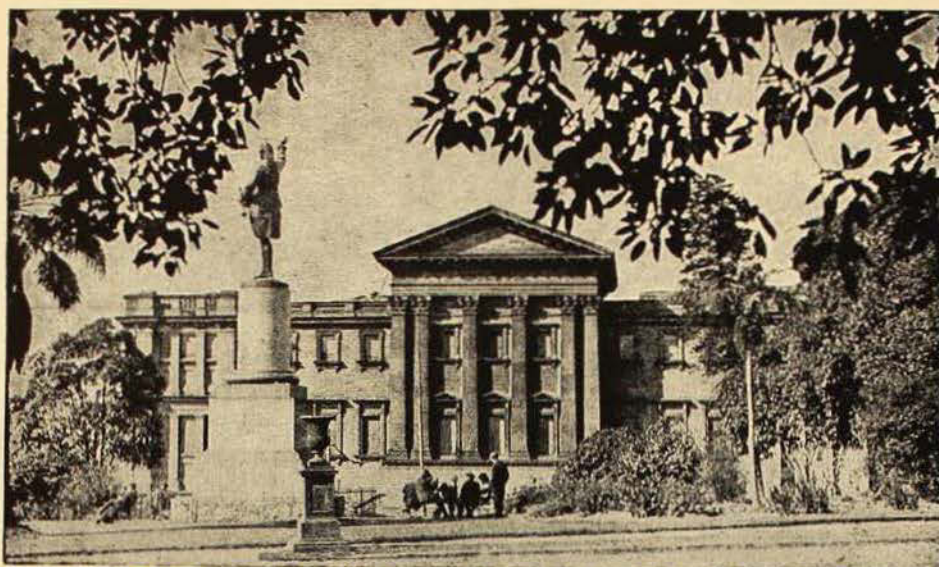
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THE AUSTRALIAN MUSEUM MAGAZINE

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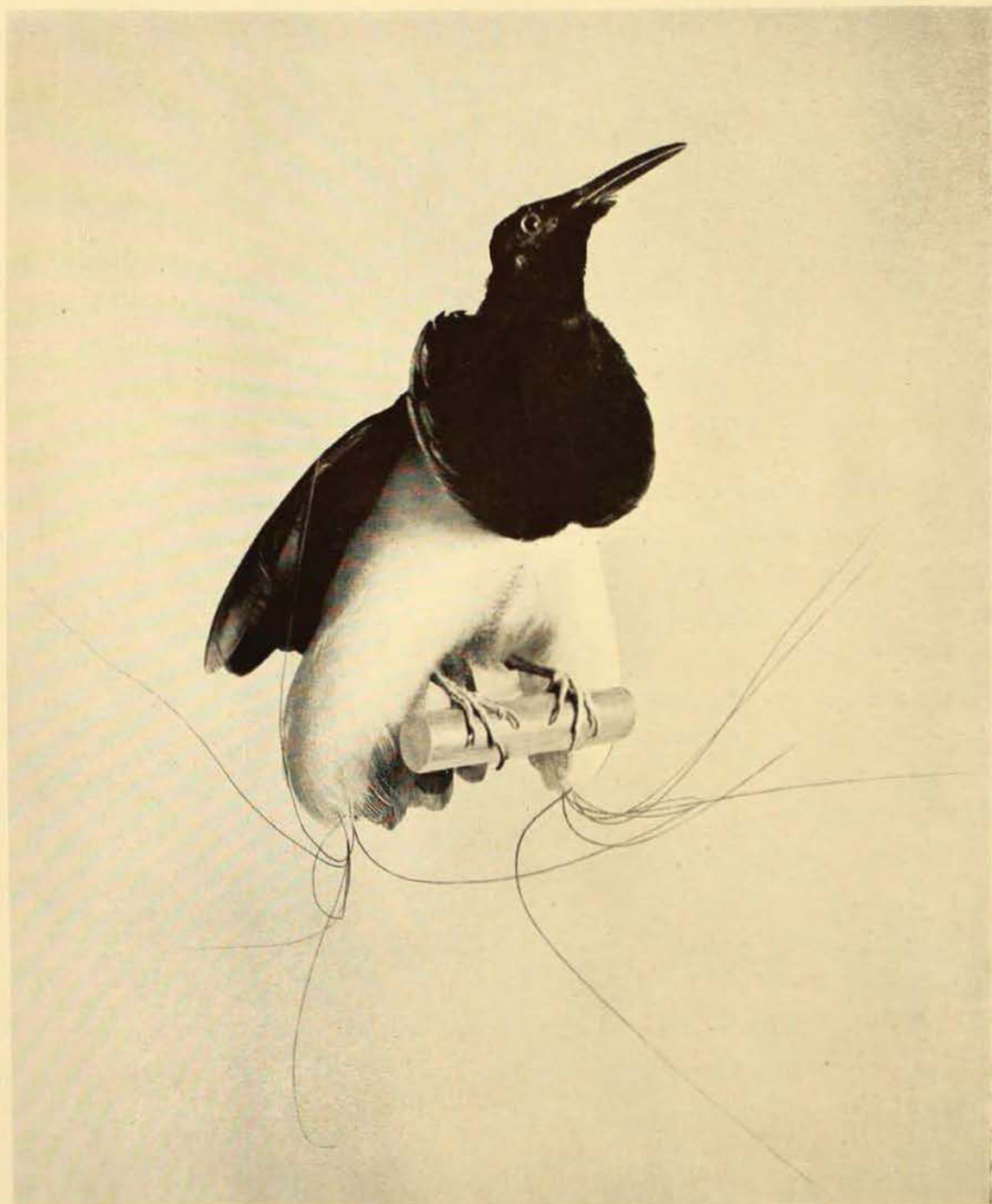
(Photography, unless otherwise stated, is by G. C. Clutton.)

● OUR FRONT COVER. The Koala, or Native Bear (*Phascolarctos cinereus* Goldfuss), is by Ethel A. King. It is one of a series of post cards issued by the Australian Museum.

This quaint, almost tailless marsupial, which superficially resembles a small bear, ranges from Queensland to Victoria. Though lacking a prehensile tail, it is well adapted for an arboreal life, its two first fingers being opposable to the other three, and its nailless big toe is of a grasping character.

During the day it mostly dozes in the fork of a tree, but at night it climbs the highest branches in search of food, which consists mainly of the tender shoots of various eucalypts. When alarmed or wounded it utters heart-rending cries. The single young (twins are rare) is born in June, and for some time after leaving the pouch it is carried on its mother's back.

Harmless to man, in the past they were slaughtered for their pelts, which were marketed abroad as "wombat"; hence the need for rigid protection now afforded them.



**The Twelve-wired Bird of Paradise (*Seleucidés nigricans* Shaw),
presented by Mrs. E. E. Patterson. (See page 12.)**
Photo.—E. A. Bradford.

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VOL. VIII, No. 1.

JUNE-AUGUST, 1942.

The Museum and Morale

EDUCATION, and advancement of knowledge, is a primary function of museums. The day when museums were more or less regarded as a haven to while away the tedium of a wet day, or as a collection of entertaining but intrinsically useless objects has long since passed. And for that change museums themselves are responsible. Improved methods of exhibition and lay-out, advanced taxidermy, and careful selection have all played their part. Whereas at one time exhibits were restricted to endless and somewhat boring displays of series of objects, of value to the highly experienced specialist alone, today the modern museum displays fewer specimens but has developed better methods of doing so, so that he who visits may learn. Study collections for research workers contain the other material. Exhibits with adequate labels tell their own story. The charm of an island scene, a vista of the African veldt, a glorious cave chamber, one may see in our own Museum. Antiquities from Egypt, and native handicrafts link us with different theatres in the titanic struggle between the Democracies and the Axis group; life histories of creatures sometimes more intimately associated with our own existence than is pleasant are also on view. These few, but very few, instances are mentioned to indicate the wide range and educational value of our gallery displays.

In these days the more adequate utilization of leisure, limited though that may be, has a national value in preserving that abstract quality, civil morale. Abroad, where total war has, unhappily, left its mark on the civil population, the part that museums, art galleries and kindred institutions are taking in providing stimulating and thoughtful recreation is well recognized. The view shared by all these institutions is that the present is no time for curtailment, or marking time—which, to put it more plainly, is stagnation. Rather is it contended that the present should be a time for the forging of new links with public interest. It is commonly said that the war is being fought on the home front. That can only be partly true, but the provision of informative and inspiring recreation is a factor of no mean dimension in maintaining civil morale. It is evident everywhere that that ubiquitous creature, the man in the street, looks to these institutions for some definite respite from the blight forced upon him.

Never was there a time when the public was in such close contact with its sources of information as the present, and never have museums had greater demands upon their resources. A restriction, or rather contraction, of activities in one field is merely a conservation of energy for its application in another. Though in the interests of knowledge we have taken steps

to safeguard many of our valuable specimens—a number of them unique—our galleries still present a display that is not only entertaining but definitely educational, a policy which we will maintain. True, our evening lectures have been suspended, but the series to schools and colleges continues. Apart from these activities the museum is continually dealing with requests for information, and in many cases such requests are plainly geared to present exigencies.

Of our kindred institutions abroad some word is due. Here in this Commonwealth we have not experienced a blitz, and we can only hope that should such be our lot, we may carry ourselves as do our kinsmen. To quote *Museum News*, Washington, 1st February, 1942: "the

public galleries, or at least part of them, are kept open whenever possible. Should accidents happen and the museum have to close for a while, every nerve is strained to reopen part of it as soon as possible. What this means cannot be told except by those who have had to do it, and they are the last to say anything about it, but the fact that 70 tons of broken glass were removed from the Bristol Museum in the course of cleaning up for the reopening in February, 1941—only two and a half months after the bombs fell—is an indication." This instance is not by any means isolated, it is quite typical.

Through education, and education alone, can we achieve intelligent citizenship. Museums are contributing their share.

Specimens and their History

THE Museum frequently has had offered valuable specimens which it would have been very pleased to accept for its collections. Objects concerning which there is no information are usually worthless and often essential particulars are missing. It cannot be too strongly urged that it is of the greatest importance that the locality should be recorded, and in many instances it is desirable that the date should be mentioned. This is important, as it indicates the season. Without such information a specimen may be regarded as possessing little value, if any at all. One may well remember the remark of Captain Cuttle, in Dickens's *Little Dorrit*, "When found, make a note of"—and, having remembered it, apply it.

Collectors should, therefore, take every care to note these details. As individuals they clearly recollect these particulars, and when displaying their treasures are able to recount all that is of interest concerning them. But the time comes when the collector is no more, and all this valuable history has departed with him. It is generally then that museum collections are thought of and what would have been a very acceptable acquisition is virtually of little account. Actually, the wisest course would be for the collector to realize that his specimens would be better in a national collection, where they would be for all time, and to transfer them there whilst he is able to give these very necessary particulars.

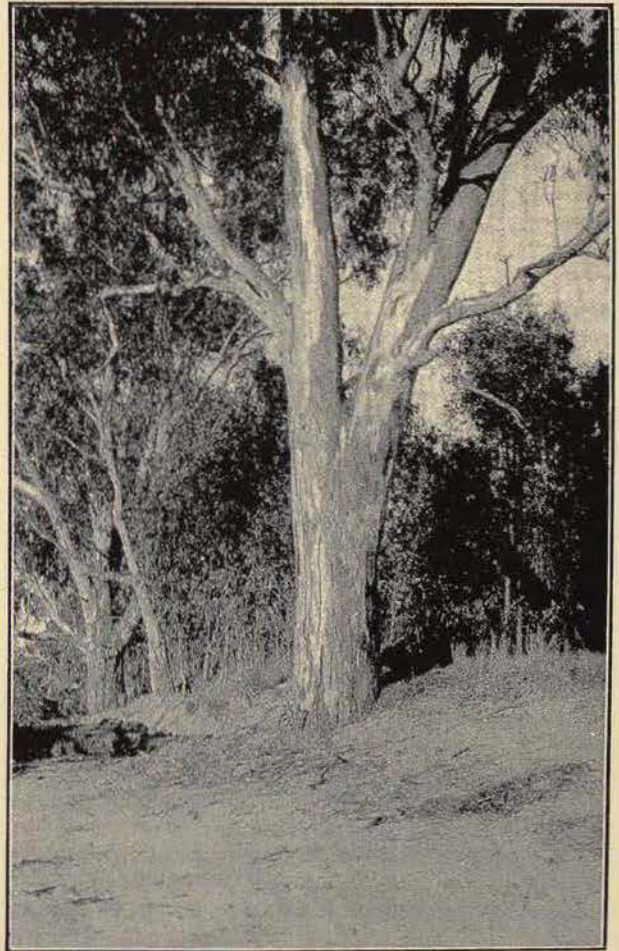
Sauntering Round the Marshes

By J. R. KINGHORN, C.M.Z.S.

IN *Frontiers*, a magazine of the Academy of Natural Sciences, Philadelphia, I recently had the pleasure of reading a delightful story entitled "I walk for fun". You will guess that such a walk is comparable to our "Bush Ramble", now a very hackneyed term; but whilst we decide beforehand on our route, and often go in company with others, the author of "I walk for fun" says he "heads out from town along a country road without the slightest idea as to where he is going or when he will get back, sets his legs moving, and allows them to carry him where they will, turning off the track as the mood takes him, following birds, rabbits, squirrels, tracking animals in the snow and so on; he stops, looks and listens, and his mood governs the direction of his observations". As I write I wonder how many of you week-end ramblers start out in this manner; possibly you go forth with good intentions to observe one particular species of animal. You go through the heath and bushlands blind and deaf to all around except for the one particular bird or animal you are looking for. Luck may go against you and you return in the evening, weary, perhaps a little disheartened at the result of your day's journeyings. Not so with the man who "walks for fun". The bushland is an open book to him, and he reads the pages as they unfold themselves in their own sequence; he is never disappointed, and his walk is a decided success.

Yes, we all must have walked in such a mood at times, perhaps not nearly often enough. When I glance through my old diaries relating to expeditions to various parts of New South Wales I now realize that on many occasions, when taking a look round in the very early morning, or at the end of the day, I have enjoyed every minute of my walk, I have seen things, and observed whatever offered

itself, perhaps letting my imagination play a small part, though not enough to upset the theme of the many dramas unfolded.



Stately river gums with the bark just peeling off tempted one to peep at the hidden creatures underneath.

Photo—K. C. McKeown.

Yes, I have walked "for fun" along the banks of the Namoi, Macquarie, Murrumbidgee and other rivers, or along the billabongs, across the plains and swamps, through the maze of eucalypts and mulga, and always in a round-about way back to camp. This is what my diary tells me. At six o'clock one morning I moved out from one camp along a billabong with great eucalypts lining its banks, some

with loose bark just asking to be peeled off, and I wondered what was under that bark? Carefully it was pulled away from the trunk, and behold, a large huntsman spider that gave me a bit of a shock before he quickly made for a crack in the timber higher up; I don't like spiders, so was glad to see it depart; but a few inches to the right was a grey coloured frog about as long as my thumb and almost the colour of the new growth of bark. The frog turned its head to see who had so rudely removed the wall of its shelter, drew its hind legs completely under its body and hi! with a leap was away and soon down into the stones and damp grass near the water. I knew that in a very little time that greyish frog would change colour to a rich mottled brown, so as to merge into the reddish soil and stones of its temporary hiding place.



A grey-coloured tree frog turned its head and slowly blinked at the intruder who had so rudely disturbed it.

Photo—K. C. McKeown.

On the hard baked and cracking soil, only a few yards distant, a black snake with head raised was watching me, but a lucky shot with a large piece of wood sent him hurtling into the water, and whilst I watched him swimming towards the opposite bank, I could not resist several parting shots with stones.



A large Huntsman spider scrambled for the shelter of a crack in the timber.

Photo—K. C. McKeown.

Leaving the billabong I turned and crossed a waterhole by way of a submerged fence, when a number of splashes told me that a company of deep voiced green swamp frogs had suddenly decided that the water was a safer place than a log from which to view this early morning prowler. I waited a few minutes for a glimpse of my frightened friends, and to my satisfaction saw at least a dozen heads each with two big brown eyes peeping at me from the water; they appeared to be somewhat inquisitive, perhaps resentful of my intrusion, so I passed quietly on my way.

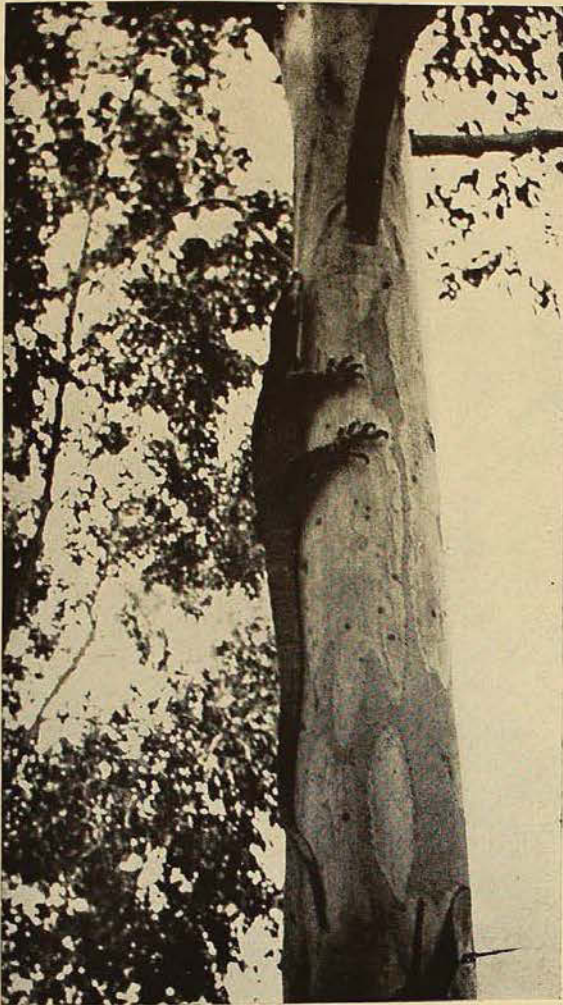
Climbing on to a fallen tree trunk, my attention was diverted by a small bird, a dotterel, and she was trying to lead me away with the old broken wing trick. I had been tricked before—who has not?—and I was not to be caught this time, knowing it would be of no avail to follow her, as she would lead me further and



In the deeper waters among the reeds were the nests of ibis, coot and other water birds; here a mother teal piloted her family to a place of greater safety.

further afield away from the chicks she was so faithfully protecting. I sat on the log and waited; the mother circling round, limping, falling over, gasping, first this, then that wing hanging as if badly injured, whilst she screamed at me, feigning untold pain and misery, but to no avail. It was an amusing, yet pathetic scene. One, three, four minutes passed when lo and behold, something moved at my feet; I had been sitting a few inches above the crouching and well camouflaged chicks without knowing it; they would not have been seen had they not taken fright and suddenly broken cover. The mother went nearly mad, scolding them for their impatience, while I drove them down to the pebbly foreshore where within a few seconds they had scattered and crouched between the friendly stones, thereby successfully performing the disappearing trick. A goanna moved out

from the shelter of my fallen tree and turned his head to cast a resentful look. I knew what the matter was, I had disturbed the dotterel chicks just as he was deciding on a poultry breakfast. Back I wandered through the trees, turning over logs and stones, possibly half an hour passing before a frightful din and screaming of small birds drew my attention—what was the matter so early in the morning? A battle royal only a few yards away in the scrub; the enemy proved to be a kookaburra that was being attacked by two wagtails in turn, urged on by a mixed audience of noisy birds. As the wagtails dived at the kookaburra in desperate endeavours to drive him away, he merely turned his head and snapped his beak in defiance. When I walked towards the combatants, the intruder flew heavily away, joined his mate in a nearby tree, where both broke into loud and raucous



After casting a resentful look a goanna hurriedly climbed a tree to safety.

Photo—A. E. J. Thackway.

laughter. Was the joke on me or on the wagtails? Fossicking round, I soon found the reason—two terrified young wagtails in a tiny open nest—where was the third or fourth? Surely there should have been four; probably the kookaburra knew; he laughed, yes, he knew, he had just had his breakfast, and the “joke” was on the wagtail family. It was with very mixed feelings that I reminded myself that Nature solves her own problems. By this time the sun was well up in the sky. It was much warmer, and the early morning bird chorus was dying down; the bush folk were now settling down to their daily routine. My footsteps led me along the marsh, and just emerging from the reeds a mother teal floated along, looking this way and that, wheeling completely round, and then proceeding in the original direction. She

was very agitated, why? what was she looking for? Ah! here they come, just what I expected; two, five, seven, nine, a dozen fluffy, tiny chicks; they appeared to be only a day old, a little late in the season too, but they struck out bravely after mother, their tiny legs working furiously: as they caught sight of me they scattered as if sensing an attack—they knew the art of confusing an enemy—but when no attack was forthcoming, and



There were many goshawks in the air; hunting was easy. Was it a hawk or a falcon that hovered over the teal family?

Photo—C. Barrett.

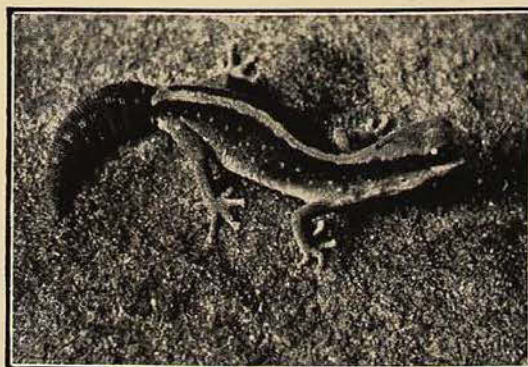
mere man was squatting on the bank, as still as a log, the chicks gathered into a compact mass, and with renewed energy and straining muscles struck out for the shelter of the reeds and fallen timber some yards distant. They were safe from me, but even whilst I pondered over the question I instinctively glanced upwards and there, hovering high over the water, was a small hawk, possibly the little falcon, though I could not be sure, but



A Jew lizard jumped to the ground and pushed out his chin in an attitude of defiance.
Photo—J. R. Kinghorn.

there is no doubt in my mind that his sharp eye had seen the mother duck and her family, and was only awaiting his breakfast on the first sign of unwatchfulness on the part of the ducklings. The sight of this family gathering diverted my attention from a dead tree, from which I intended to remove more bark, and carefully this time, remembering my momentary shock earlier on uncovering a large spider; but here to my surprise were two kinds of wood geckos, broad-headed, large eyed, fat tailed, clumsy looking, but quite harmless lizards. They, as were the frogs, were well camouflaged in their own way, and could not easily be detected from a dozen feet away, but they scurried quickly to the ground, and dived under some loose leaves and rubbish at the butt of the tree. They were not going to rely on their camouflage alone. Yes, all seemed very silent since the local wagtail-kookaburra fight, the bushland seemed deserted, and I sat down wondering where next to go and when to start. Why was everything suddenly still and hushed. Could all the birds have deserted the place? No, the forest folk are awake and watchful. One enemy had been driven out, but this early morning hiker—this man—what did he want? I sat down puffing a cigarette, and let my eyes wonder around—ah! Over to the right a jew lizard, so plentiful hereabouts, was sitting silently on a log, and when disturbed jumped to the ground, pushing out his chin, as if daring me to come nearer. Small birds flitted silently about, looking

me over from all sides, and after ten minutes or so, each of us observing the other, I moved off towards camp. I had wandered a long way round the dry country and found that the shortest route back was straight through the shallow water of the swamp lands, so in I waded, splashing through several hundred yards towards a mass of fallen timber on ground not completely submerged. Here a large black snake slid silently into the marshy ground and made for a hollow log. It was followed by several others; some appeared to be coming my direction—I was not sure—but suddenly decided I had an appointment away over to the right, and so my feet splashed along, avoiding that snake-ridden hide-out. All around me were large trees, old giants of the bush, the ringbarked ones appearing as white skeletons, reaching upwards from a sea of flooded country. The air was filled with water birds,



Wood geckos, large eyed, clumsy looking but harmless lizards were almost everywhere under loose bark and stones.

Photo—J. R. Kinghorn.

Wild duck rose from the swamps in enormous flocks.
Photo—J. R. Kinghorn.



cormorants craned their necks to watch me from high branches, ducks were rising from the swamp in enormous flocks, herons and ibis were peering at me as they stalked through the shallow water; others were standing on branches preening themselves, and drying their feathers in the morning breeze, whilst here and

there young birds stretched their necks and squeaked in despair, telling the fond parents it was high time breakfast was served; and so it was. I suddenly felt hungry and made straight for the cook-house. I had enjoyed my early morning walk, yet only recently have I realized that I also had "walked for fun".

During the past few months, the Museum has received by donation a large number of stone artifacts, including examples of rare types, from Australia and New Guinea. Mr. W. H. P. Kinsela has presented his collection of 1,169 specimens, which include 87 bone implements and two shell fish-hooks, gathered during the last ten years along the coast of New South Wales. The balance of the late Mr. A. E. Ivatt's collection, comprising 1,800 specimens, has been received; this collection is the result of a lifetime's hobby collecting in eastern New South Wales, especially in the Bathurst district. Mr. P. D. Riddell, Superintendent of Technical Education, has presented a large collection from western New South Wales, which forms a valuable addition to the Museum's limited series from this region. Mrs. Jamieson has

presented nine hafted stone axes collected by her late husband some forty years ago in the Barron River district of north-east Queensland, and Mr. G. Kimlin has presented two examples of the rare tanged artifacts from the Cairns district, Queensland. Dr. C. E. M. Gunther has presented a stone mortar and an anvil from the Bulolo Valley, New Guinea, both unusual examples of their types, and important additions to our series of prehistoric artifacts from New Guinea. Mr. Clifford Coles has presented a small collection of adzes from Melanesia, and a stone Buddha from the Great Wall of China, while Mr. M. W. F. Tweedie has presented several hundred flake implements from Tasmania. All of the specimens in the above collections are localized, and some of the series will yield important distributional and other data when studied.

A Strange Partnership

Strange Habits of a Crab from the Great Barrier Reef, Queensland

By F. A. McNEILL

IN introducing Mrs. *Haplocarcinus marsupialis*, we present a rare female whose domestic life is beyond reproach. Despite the length of her name she is herself barely half an inch long. Nevertheless, she is twenty times bigger than her husband, but this does not concern him.

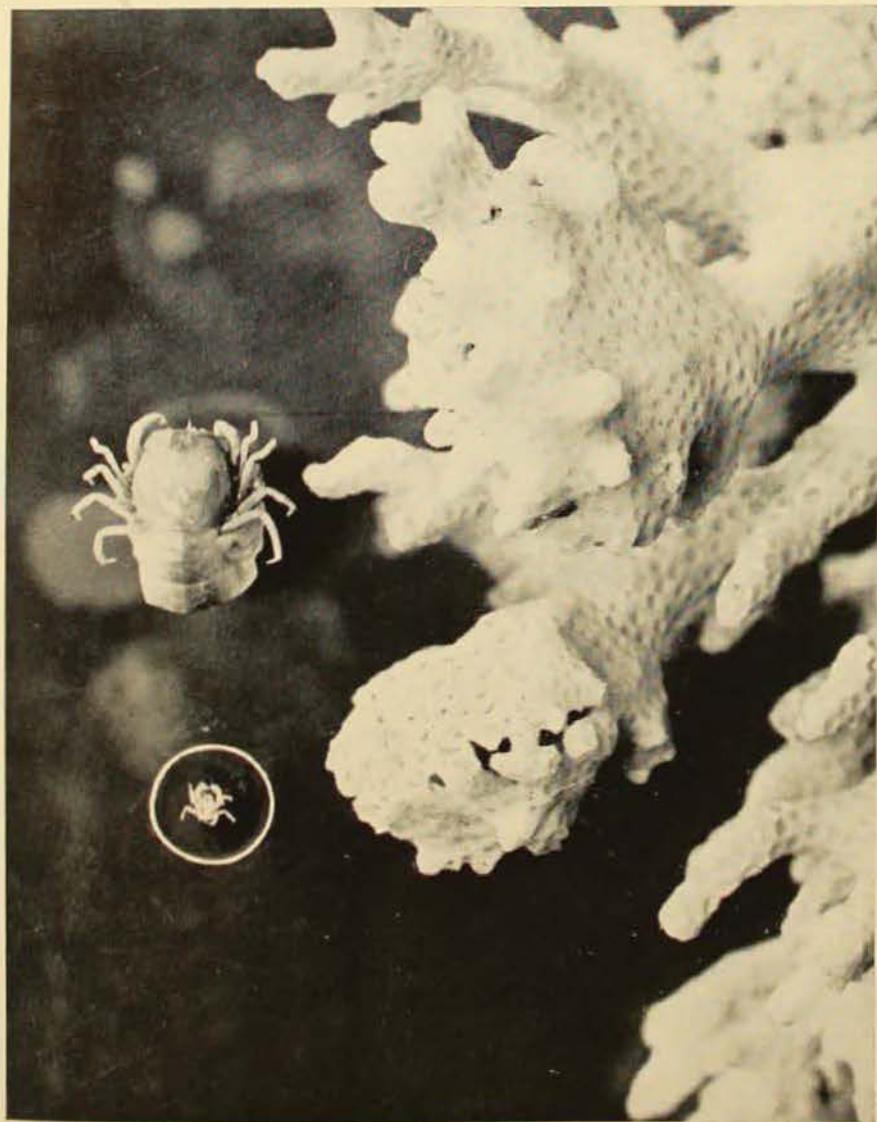
She takes up her abode in the larval state among the delicate branches of

certain kinds of living coral, and assumes full charge where she squats, controlling the coral growth so efficiently that it comes to form a prison cell about her. The hard walls which range around this strange female ultimately become loosely knit overhead, making her prisoner for life. Mr. *Hap.* must surely appreciate the position as well, for he has as free a life as any male could wish.

If he cares to, he may avail himself of a warm home welcome by entering his mate's abode through one of the several apertures left above her head. Should he wander and not conform to whatever is the dutiful crab routine, he cannot be pursued by a wrathful wife.

Hubby, despite his size, is an alert and agile male. He took much longer to discover than the female. Scientists finally isolated a male by taking pieces of coral quickly from the water and wrapping them in a cloth. Then after breaking up the coral fragments, they found the tiny males dodging around.

Thus runs the story of one of the world's strange associations. The only freedom enjoyed by the female is that short span of life following the release of the first larval stage from the egg. This is a free-swimming state and is normal among crabs, when the larvae



commonly undergo a number of changes in shape before they resemble the adult form and settle down to the habits of their parents.

In the present instance the sedentary mode of life has produced marked degeneracy. The limbs are short, thin and weak and the shell is soft. There is, however, a special development of the gills whereby a strong flow of water is drawn

into the prison chamber. This ensures a regular supply of oxygen and the minute animal food which comes with the water. Also, a protected existence provides the opportunity to produce abundant offspring. For this purpose the tail portion of the female has become modified into a comparatively huge egg receptacle (marsupium), taking up half the bulk of the body.

Twelve-wired Bird of Paradise*

By J. R. KINGHORN, C.M.Z.S.

THOUGH there are many kinds of birds of paradise, each with outstanding characteristics peculiar to itself, the Twelve-wired Bird, *Seleucidés nigricans* Shaw, is notable for the extraordinary wire-like shafts of certain plumes which extend far beyond the tail. These, as is the case with the ornate display feathers of other birds, are present only in the male; the female, like others of her sex, carries no conspicuous colours or plumes, apparently relying on her charms rather than on gaudy or extravagant display.

In addition to the wire-like plumes, the male is remarkable for the velvet-like texture of the mantle and breast feathers, which are purplish-black, reflecting metallic flashes of violet, green and bronze-red. The flank plumes, in life, are snowy white at the base, becoming golden-yellow towards the tips, but the yellow fades rapidly after death.

A study of the bird of paradise group in the Museum shows many beautiful species, most of them even more striking than the Twelve-wired Bird, a perfect specimen of which has recently been presented by Mrs. E. E. Patterson. Whilst some of the plumed birds are comparatively common in parts of New Guinea, and are easily procured, this cannot be said of the species figured here, as it inhabits only the dense tropical forests of far-away, almost

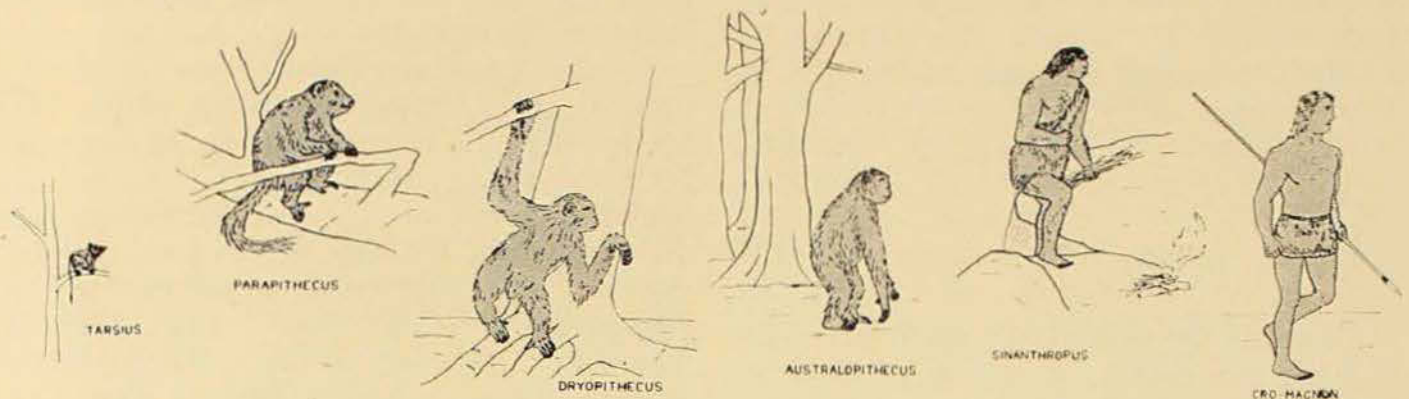
inaccessible mountains, at altitudes ranging from 2,000 to 5,000 feet, and it is only with the aid of trusty guides and a team of native carriers that such places can be reached.

In their native home, birds of paradise feed mainly on wild berries and soft fruits, and because of this, living specimens are more easily fed during transportation than are insectivorous or grain-eating birds.

The difficulty in securing the birds lies not in the actual trapping or snaring, but in the hazardous journey there and back, with rationed tinned foods that may impair the health, and leave the collector open to attacks by various tropical fevers. It is only by extreme courage and endurance in these inhospitable places that the collector is able to make the journey and secure these beautiful birds, so easily accessible to view in a museum or zoological park.

Trading in birds of paradise, particularly the red-plumed and golden-plumed kinds, became so extensive some years ago that when the International Plumage Bill was proclaimed, prohibiting the wearing of the feathers, the governments in different parts of New Guinea totally protected the birds, except for scientific or zoological study. This closed the doors on trafficking, with all its cruelty, and prevented the gradual extermination of a group of birds unrivalled for beauty.

* See Frontispiece.



The Story of Man*

By ELSIE BRAMELL, M.A., Dip.Ed.

NEANDERTHAL MAN.

The first important find of prehistoric man was made in 1848 when a skull was unearthed accidentally at Gibraltar, but, since the Genesis story of creation was then universally believed, the skull did not attract much attention.

In 1856 another skull was discovered in Germany, and this one roused more interest. In 1864 it was given the name Neanderthal Man, but its scientific value was disputed and denied. Not until the excavation of two skeletons near Spy in Belgium, together with stone implements and remains of extinct mammals, was it generally realized that a distinctive type of mankind had been discovered.

By now a great many finds of Neanderthal Man have been made throughout Europe and the Near East. They represent several varieties which may be the result of racial variance or evolutionary development. The face is heavy and massive, with huge jaws, sloping chin and forehead. The skull is depressed, but long, and bulges at the rear; it has not expanded up and sideways as in modern man. The size of the brain itself is that of an average European, but its convolutions are not nearly so well developed. We know from the shape of the limb bones, and attachments for

heavy neck muscles that Neanderthal Man had a somewhat stooping posture, and was stocky and robust in figure. He was associated with the Mousterian culture, which is characterized by hand-axes, scrapers, points and bone implements, and points to a knowledge of fire and a practice of burial of the dead in a conventional manner.



Skull of Rhodesian Man. This skull is remarkable for the enormous brow ridges and muzzle and the low cranial dome.

This species of man is considered to have lived over a long stretch of time, from the third interglacial stage until the appearance of *Homo sapiens* at the end of the Ice Ages, a period of some 100,000 years or more. The great cold of

* Continued from THE AUSTRALIAN MUSEUM MAGAZINE, Vol. vii, No. 12, March-May, 1942, p. 407.

Mousterian times drove man to caves and rock shelters for homes. The animals he hunted included the mammoth, woolly rhinoceros, reindeer, Arctic fox and hare, wild cattle, cave bear, giant deer and wolf.

THE TRANSITION FROM THE OLD TO THE NEW STONE AGE.

Towards the end of the great Ice Ages came a succession of minor glaciations, bringing in their train a more rapid series of cultural changes, and a new type of man—*Homo sapiens* or Modern Man. His original home is uncertain, though he came from southern Asia. We know that the Mousterian culture, practised by Neanderthal Man, was superseded by cultures of greater variety called Aurignacian, Solutrean and Magdalenian. Coarse implements gave way to smaller and more refined implements. There was an extensive use of bone; points of diversified form and flakes tended to replace core implements; microliths began to appear.

It was soon noticed that the people were very like ourselves. They were of the same anatomical proportions, and their high intellectual forehead betokened a race far superior in achievements to any hitherto discovered. Their remains show that they were hunters, and artists with brush and chisel. Their period was Upper Palaeolithic, and extended over the close of the long glacial epoch to about 40,000 B.C.

Of these early forms of modern man there are at least three distinct local varieties—Cro-Magnon, Grimaldi, and Combe Capelle. Cro-Magnon is the famous type skull, and was found in the Dordogne district of France. This skull has a capacious brain box which housed a brain larger than that of modern beings. In the central plateau of France to-day live a people very like Cro-Magnon (Combe Capelle also has modern representatives in out-of-the-way parts of Europe). Other skulls of late Palaeolithic age have come to light; all have well developed crania, some have pronounced brow ridges and jaws, others softer

features, and most have descendants living in Europe to-day.

In Aurignacian times came a timid decoration on bone and ivory which led up to the vigorous outburst of artistic fervour in the Magdalenian era, which found expression in cave drawings of animals and humans in scenes of the chase. The figures are admirable in expression, proportion and detail. Towards the end of the Magdalenian period came a revolution in art and industry. Vigorous painting degenerated into lifeless conventionalizations, delicately made bone points gave way to coarse harpoons made from antlers, to rougher blades and scrapers. The final stage of the Transition period produced axes and adzes.

The climate was very cold throughout the whole of Upper Palaeolithic times, tempered by the warmer Achen oscillation in Aurignacian times. The remains found are those of tundra life, of steppe and browsing animals, such as the horse, bison and stag, and of the cave lion and cave bear.

NEOLITHIC MAN OF THE NEW STONE AGE.

The origin of the culture of the New Stone Age is obscure. The men who practised it were of various types and belonging to existing races—the narrow-headed, slightly-built Mediterranean, the narrow-headed tall Nordics, and the broad-headed stocky Alpines. There was no single race, but rather a series of people held together by a common civilization which practised agriculture, domestication of animals, manufacture of pottery, weaving, polishing of stone implements, funerary rites, including the building of stone monuments, and, latterly, the smelting of metals.

Agriculture brought with it a sedentary existence spent in village communities, the people turned to food-producing instead of food-gathering, and the struggle for a livelihood became easier. The result was an increase in population and a specialization of activities. Though the early Neolithic people lost the artistic ability of their

Cro-Magnon predecessors, life for them was now much more colourful, diversified and interesting. Civilization now began.

THE METAL OR BRONZE AGE.

The time when Neolithic man knew nothing of metals was very short, and we can define no hard line between Neolithic and Bronze Age cultures in Europe, so swiftly was the former followed by the latter. Once brass was discovered, and the trick of hardening it with tin, it was not long before the possibilities in tool-making of this more durable material were recognized. Stone implements continued in use for a long time, especially in districts where metal was difficult to obtain; but they too finally were replaced, particularly when bronze was superseded by iron. The pick and hatchet appeared in large numbers, and the great stone monuments were still built. The art practised was devoted to the decoration of domestic objects and tombs.

Great trade routes came into being for commerce in metals and other commodities. In the Age of Bronze started our earliest known historical records, which were found in the valley of the River Nile. Then came the Age of Iron, which saw the growth of the classical civilizations of Egypt, Mesopotamia, Assyria, Persia, India, China and Europe.

THE EVOLUTION OF THE BRAIN.

And now let us briefly retrace our steps in one direction—for we have hastened rapidly over the passage of some sixty million years!—and give a little attention to the development of the organ that distinguishes man so markedly from all other animals.

A study of the brain shows that the elementary sensory areas, such as smell, touch, vision, hearing and taste, and the simpler forms of movement are well developed in the brains of Tarsius, monkeys, anthropoid apes, and fossil men. The main increase in the size of the brain is concerned with the enlargement of new areas dealing with higher forms of intelligence and more highly skilled movement. These more recently evolved parts are known as

“association areas”, an apt expression, for they permit of the *full* appreciation of things seen, heard and felt, in contradistinction merely to seeing, hearing and feeling as simple responses. The gradual increase of this control department is all important, for it is this enlargement that is responsible for the superior mental powers of man. It is his “swollen head” that sets him apart from other primates, and is doubtless the cause of his bold claim to be *Homo sapiens* (Man the Wise). It is, unfortunately, not possible to illustrate the speech areas, which, possessed by man alone, afford him a unique asset—the ability to communicate with his fellows and build on the experience of others.

A salve to those still sensitive about our humble origin may be derived from the closing words of the great French prehistorian Boule, who says that man’s “true superiority, of a purely intellectual character, gradually acquired in the course of a slow and laborious evolution, now enables him to raise a corner of the veil which conceals from him both the lowliness of his origin and the glory of his ascent”.

DEVELOPMENT OF ERECT POSTURE AND OTHER BODILY CHANGES.

Correlated with cranial development came other changes in the proto-human frame, such as the gradual assumption of the erect posture, together with a widening of the pelvis, straightening of the thigh bones, and strengthening of the back muscles. The line of the spinal column moved backwards, and the head became supported on its summit. This latter all-important but vulnerable member is protected from the results of concussion by a system of arches in the spinal column and pelvis. The pelvis has become wider on account of the size of the infant brain at birth and the weight of the body supported by it.

The raising of the body from the horizontal to the perpendicular has caused a lengthening of the hind limbs and a reduction of the fore limbs. The lower extremity in man is obviously

designed for walking and taking weight. An arch has formed in the foot. The great toe has given up its grasping power for a forward thrusting on the ground, and its size has increased, while the other toes have shrunk and serve only as subsidiary supports. This specialization of function in the hind limbs has freed the arms, given them vastly increased mobility, and enabled the fingers to acquire greater sensitivity for the performance of delicate tasks. This keener receptiveness is a factor of great importance in the development of the brain.

Physical adaptation to the environment has been the universal rule in evolution. Some animals, such as the gibbon, have adapted themselves with great success and then remained static. But the forerunners of modern man did not become specialized in this way; they learned to think and to control their environment to some extent, and the portion of their body which suffered most change was their brain. This development had to be, or they would have become extinct.

A series of sketches, the outlines of which, it is now generally held, approximate those assumed by the ancient ancestors of man, illustrate, through lower to more advanced forms, the gradual assumption of the erect posture. It is interesting to note that one of the first organs to fall into disuse and diminution was the tail, a remnant of which man still carries at the end of his spine.

WHAT DO WE MEAN BY THE WORD RACE?

All human beings existing in the world to-day belong to a single species of man, termed *Homo sapiens*. It is clear that within the species there is a great number of physical types found in different parts of the earth. The term "race" is applied to these local varieties of mankind. It has been suggested by Haddon and Huxley that "ethnic type" would be a less ambiguous term than "race", which has acquired an all-purpose usage and a confusing vagueness.

All strict classifications of man into racial divisions hitherto made have

proved unsatisfactory. One cannot say where one type ends and another begins. Immigration and intermixture account for the mixing of stocks, while changes in climate and food-supply alter the physique of a local type. The world is, in truth, a melting pot, inhabited by a highly mixed population of ancient and inter-crossed lineage.

We can, however, list certain criteria by which varieties of men are differentiated, *e.g.*, pigmentation or skin colour, hair texture, form of the eye and the nose, stature (not a very reliable factor), the general shape of the skull, the cephalic index or ratio of skull measurements, and the facial angle.

It should always be borne in mind that the word race denotes physical characters alone, and no other traits, referring to cultural standards or national peculiarities of dress or behaviour, should be implied; too frequently it is used when the speaker means "nationality". The superiority or inferiority of a race can be fairly judged only by the way in which it is adapted to its environment. In our exhibit are shown some of the varieties in cranial form assumed by modern man, differences which are accentuated when clothed in the living flesh.

* * * *

And now we come to the end of our story. The phrase "the march of civilization" is a familiar one, but we think that the development of man and his culture might more fitly be likened to a pilgrimage or a crusade. There are at first the lonely, halting steps of the venturesome few, growing in numbers and confidence as time goes on, but occasionally losing the way. The pace for an interminable period through primeval forest and plain is painstakingly slow; vast ages go by and little progress is made. But, with greater experience and knowledge, the rate improves and gathers impetus until finally, at the close of the long Stone Age, the procession assumes the bright pageantry of a triumphal host. Man is now sure-footed upon his own road. He is, we trust, still moving onward, and will continue to advance to the betterment of his kind.

The Kangaroo Family

Origin and Earliest Discoveries

By ELLIS TROUGHTON, F.R.Z.S., C.M.Z.S.

VARIOUS ancestral types of marsupials inhabit the American continent, but it is a well-known zoological fact that the pouched mammals have attained their "infinite variety" within Australia. Their amazing development in this great world-terminal of distribution was the result of prehistoric invasion, when primitive marsupials and rodents were probably dominant forms of mammalian life. The furry little migrants must have arrived either on rafts of debris by narrowed water-ways, or by ancient land-bridges which disappeared before any clawed or hooped competitor could follow.

The primitive marsupial army of occupation, by natural deployment or *adaptive radiation*, to use the zoological term, gradually expanded in peaceful isolation to fill every available economic niche. An incredible variety of adaptations was thus evolved, such as the pouched-mole and ant-eater, weasel-like "native-cats", and the marsupial-wolf of Tasmania. The monkey-like climbers of the possum family, sloth-like koala, and the grass-eating kangaroos, which developed from tiny insect-eaters and took the place of hooped mammals such as the deer and cattle of other lands.

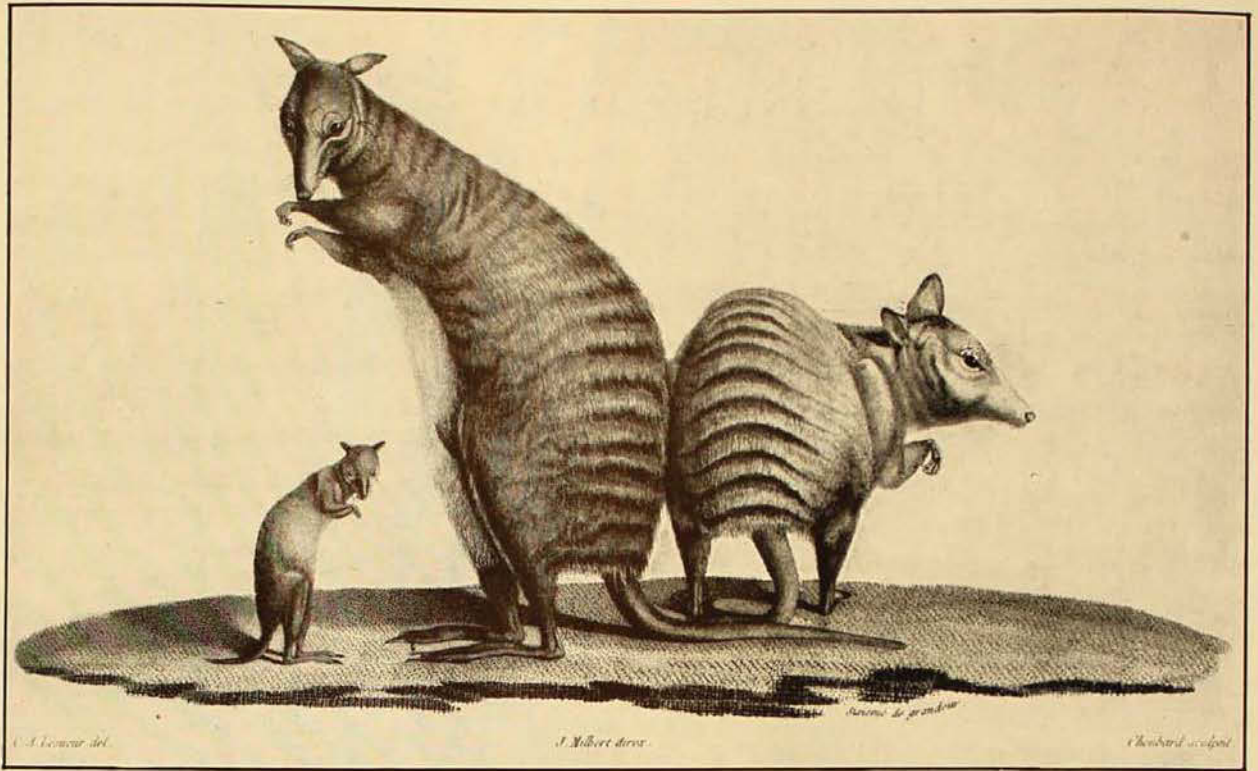
The use of such names as bear, cat, and wolf for our unique marsupials by early explorers emphasizes a general outward similarity of physical equipment. The parallel or convergent influences of evolution, in relation with environment and function, are strikingly illustrated by the development of a hopping means of progression by most birds, many rodents, and the kangaroo family. Picture for yourselves a little rat-like ancestor of the kangaroo stretched upright on slender hind-limbs, straining long ears for the

swoop of pouncing birds of prey. In this alert position, a brisk hopping was quickest for clearing tussocks and logs. Naturally, the little mammal soon realized that erratic leaps and bounds aided its escape from flesh-eating fellows, birds, and reptiles.

The fore-limbs gradually shortened, as they were used mainly for grasping food, while the hind-limbs and feet lengthened to form powerful springs. To counter-balance the weight of the body, the enlarged tail became a kind of pendulum in the see-sawing action of a speeding kangaroo. The tail does not thump the ground with every leap, except when hopping lazily, contrary to the belief of many Museum enquirers who supposed that the kangaroo on our latest penny was wrongly shown with the tail curved upwards. The powerful yet pliable tail also acts as the third leg of a tripod when the animal stretches upwards, and as a lever to thrust the hindquarters forward while grazing.

No wonder Australia became known as the land of the kangaroo soon after Captain Cook's exploration led to settlement of the east coast of Australia. Because of their spectacular hopping action, and grass-feeding in the open during the cooler times of day, even the smallest of the kangaroo family were amongst the first animals seen by early explorers. Any nature-lover can readily imagine how fascinating the various kinds of kangaroos must have been to great navigators such as Dampier and Cook, on reaching the great southern land of their hopes and dreams.

The earliest account compared a wallaby, or small kangaroo, with foreign animals such as a hare, squirrel, cat, and monkey. The discovery that the



Dampier's "Raccoons": The Banded Hare-Wallaby (*Lagostrophus fasciatus*) observed by Dampier in 1699 at Sharks Bay, Western Australia, seventy years after Pelsart's description of the Tamar Wallaby on Houtman's Abrolhos, off Geraldton.

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

young were not only carried in the mother's pouch, but suckled from teats within it, added to the general confusion regarding the strange hopping mammals. It was many years before even scientists of the day were convinced that kangaroos really were marsupials and therefore distantly related to the true American opossums.

FIRST DISCOVERY—WESTERN AUSTRALIA.

Contrary to popular belief, kangaroos were not first made known to the civilized world by Captain Cook's exploration of the eastern coast in 1770, but actually about 150 years earlier from south-western Australia, the northern region of which was then well known to sea-faring Dutchmen. Over three centuries ago the Dutch navigator Pelsart wrote the first known account of a wallaby, or small kangaroo, when wrecked in 1629 on Houtman's Abrolhos, off Geraldton. The shipwreck was associated with tragic incidents following Pelsart's departure to obtain assistance from Batavia, when mutineers killed about a hundred fellow castaways. They intended seizing the

relief ship and becoming pirates, but the rescue party fortunately outwitted and killed all but two of the mutineers who were abandoned on the mainland, possibly as its first white occupants.

In providing what is doubtless the first description of any Australian marsupial, and trying to reconcile the unique build of the kangaroo with various foreign mammals, the observant Dutchman wrote:

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

The species described in Pelsart's account, overlooked for nearly two centuries, was the well-known Tamar Wallaby of south Western Australia, which was not given its scientific name until 1817.

The next record of the kangaroo family is contained in a brief account by another Dutchman, Samuel Volckersen, published in 1658. At Rottnest (Rat-nest) Island, off Fremantle, he states that "two seals and a wild cat, resembling a civet-cat, but with browner hair" were seen. The "wild cat" was actually the Quokka or Short-tailed Wallaby of the south-west, which was not specifically named until 1830, from a dead one found by French naturalists on sandhills at King George's Sound.

In 1688 William Dampier, in his buccaneering ship *Cygnet*, "fell in with the land of New Holland" in what is now the Kimberley region of Western Australia. Gaining fame by accounts of his voyage, including the first published description of the aborigines, he persuaded the British Government to send an expedition to search for gold in the new southern land, and was placed in command of the ancient and almost rotten H.M.S. *Roebuck*. According to Dampier's journal, after reaching Sharks Bay on 6th August, 1699:

The Land-Animals that we saw here were only a Sort of Raccoons, 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).

Sometimes claimed as the first account of a kangaroo, the description refers to the Banded Hare-Wallaby, the striped coloration of which reminded Dampier of the stripe-tailed raccoons made familiar by his journeys about the Spanish Main.

CAPTAIN COOK'S KANGAROO.

It was almost a hundred and fifty years after Pelsart's discovery of the small western wallaby that Captain Cook's voyage made known the fertile eastern coast of Australia, and the "Kanguru" of the aborigines. It has been generally thought that Cook's party first observed kangaroos near Sydney, but only indications of them were noted when he wrote of the doings at Botany Bay on 1st May, 1770:

In the woods between the Trees Dr. Solander had a bare sight of a Small Animal something like a Rabbit and we found the

Dung of an Animal which must feed upon grass and which, we judge, could not be less than a Deer.

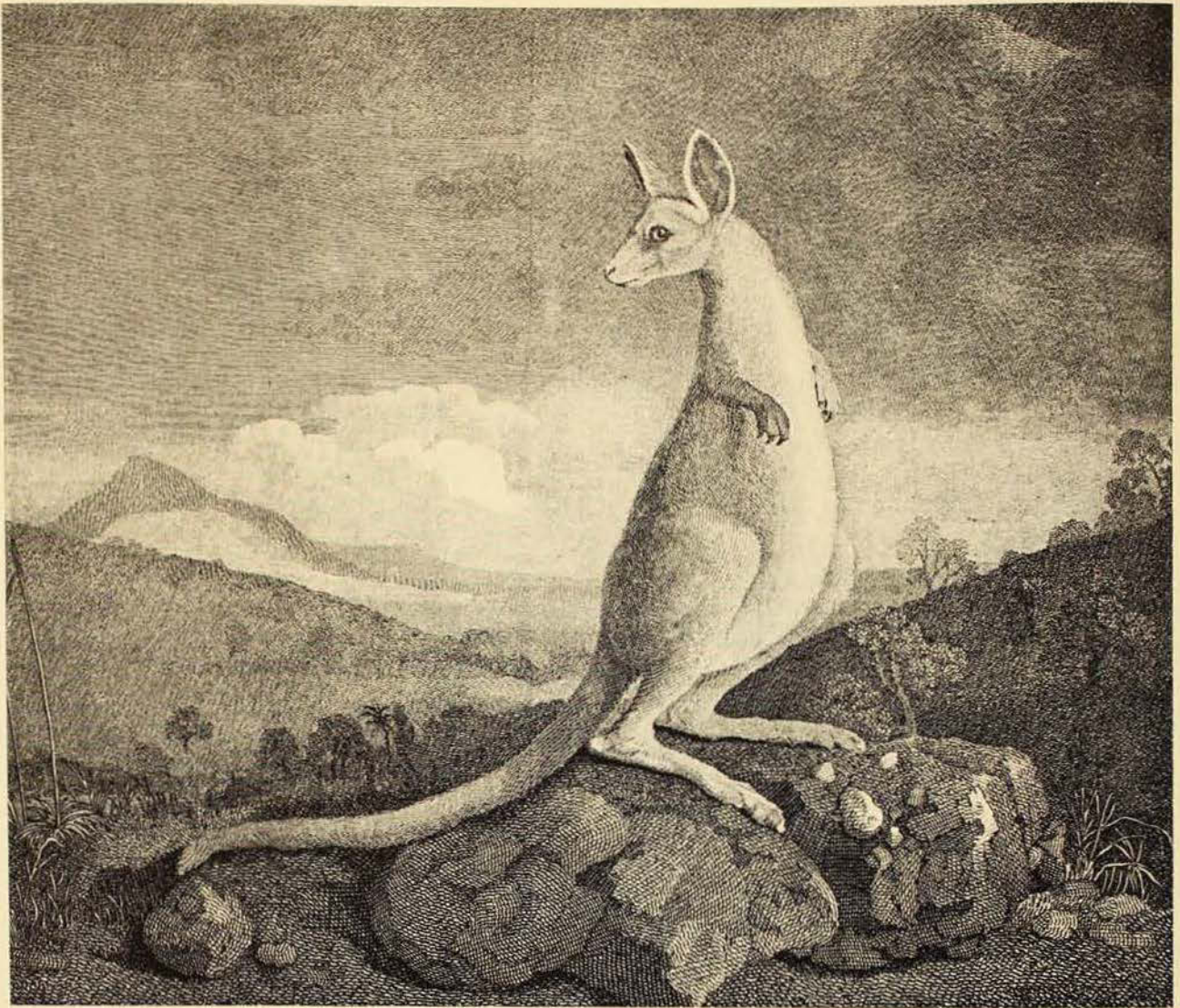
One must travel far north to Cooktown, at the mouth of the river where his ship *Endeavour* was beached for repair, to visit the spot where Cook's party saw and killed their first kangaroos. According to his narrative:

I saw myself this morning a little way off from the Ship, one of the Animals before spoke of: it was of a light mouse Colour and the full size of a Grey Hound; in short, I should have taken it for a wild dog, but for its walking or running, in which it jumped like a Hare or Deer. . . . Its progression is by Hopping or Jumping 7 or 8 feet at each hop upon its hind Legs only, for in this it makes no use of the Fore, which seems to be only design'd for Scratching in the ground. . . . It bears no sort of resemblance to any European animal I ever saw: it is said to bear much resemblance to the Jerboa, excepting in size, the Jerboa being no larger than a common rat.

Evidently, the comparison with foreign jerboa rodents was supplied by the naturalist Solander, who was most impressed by the outward similarity of form developed by the hopping action, failing close observation of the function of the pouch, herbivorous dentition, and anatomy. So remarkable a creature at once became the focus of interest for naturalists of the day, who were misled by the suggestion of rodent relationship and corresponding inference of abnormal size. As a result, the strange animal was soon provided with a variety of scientific names such as *Jerboa gigantea*, based merely upon the description and illustration given in Cook's *Voyages*.

Fortunately, the earliest specific name for Cook's Kangaroo was the appropriate one of *canguru*, founded on the aboriginal name by Muller in 1776. Unfortunately, this name was overlooked for about a hundred and sixty years, while the later one of *giganteus* was wrongly applied to the Forester or Great Grey Kangaroo, as known to settlers about Port Jackson. In the general confusion the actual identity of Cook's kangaroo, amongst several species about Cooktown, remained doubtful until 1937. Evidence was then assembled¹ clearly indicating that Cook's

¹Iredale and Troughton.—RECORDS OF THE AUSTRALIAN MUSEUM, XX, 1, 1937, pp. 67-71.



Captain Cook's Kangaroo: The Cape York Whip-tail Wallaby (*Wallabia canguru*). This drawing of the "very slender made" Cooktown Kanguru by Parkinson, a naturalist with Cook's party, indicates the unusually long neck, sloping shoulders, tapered muzzle, relatively large ears, and extremely long and pliable tail which distinguish this kind of wallaby from the Great Grey and other large kangaroos.

From "Cook's Voyages", Vol. iii, 1773.

original kangaroo was a medium-sized wallaby. The species, under the valid name of *Wallabia canguru*, was shown to be the Cape York representative of the Whip-tail or Pretty-face Wallaby of coastal Queensland and northern New South Wales.

The medium size of the *first* "Kanguru" examined and described in any detail by Cook's party is indicated by the original accounts. In the journal kept by Sir Joseph Banks, in consultation with the naturalist Solander, there are preliminary comparisons of its size and length of the tail with the proportions of his greyhound, which chased the kangaroos on several occasions. The journal records, 14th July, that:

Our second lieutenant had the good fortune to kill the animal that had so long been the subject of our speculations. . . . Its forelegs are extremely short, and of no use to it in walking; its hind again as disproportionately long: with these it hops seven or eight feet at a time, in the same manner as the jerboa, to which animal indeed it bears much resemblance, except in size, this being in weight 38 lbs., and the jerboa no larger than a common rat. 15th: The beast which was killed yesterday was to day dressed for our dinner, and proved excellent meat. . . . July 27th: This day was dedicated to hunting the wild animal. We saw several, and had the good fortune to kill a very large one weighing 84 lbs.

The limitation of size implied by the greyhound comparison, maximum leap, and weight was confirmed by Cook's own note of 27th July that:

Mr. Gore shot one of the Animals before spoke of, which weighed 80 lbs. and 54 lbs. exclusive of the entrails, Skin, and head; *this was as large as the most we have seen.*

Naturally, the question of size was not considered in the early days when the first fleters, believing Cook's party had seen kangaroos at Botany Bay, supposed that the Great Grey about Port Jackson represented his original species. Distinction in size was here indicated, however, even in Phillip's *Voyage* (p. 104) which says:

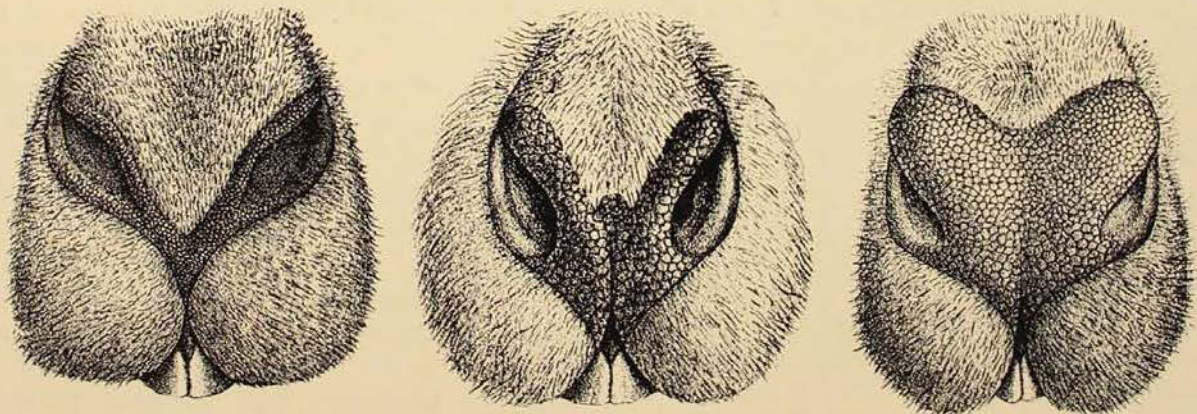
The largest kangaroo which has yet been shot weighed about one hundred and forty pounds. But it has been discovered that there are two kinds, one of which seldom exceeds sixty pounds in weight; these live chiefly on the high ground; their hair is of a reddish cast, and the head is shorter than in the larger sort.

The smaller species was the Red-necked Wallaby which, like the Cooktown Whip-tail, favoured hilly and therefore rougher country. The Great Grey Kangaroo, however, as indicated by the popular name "Forester", always favours the more open lowland forests. Although its range extends to the northern slopes of the Atherton Tableland, near Cairns, there is no authentic record of the Great Grey ever having inhabited the environs of Cooktown. Evidently, no adult males or old "boomers" of the Forester were seen by Cook's party, as is usual with even small mobs of that kangaroo. Furthermore, had their first small captive been merely the 38 lb. baby of a Great Grey

Kangaroo, the parental association would have been obvious to naturalists of the party.

In the absence of any distinctive colour-markings for Cook's "dark mouse or grey" kangaroo, there is fortunately one character in Solander's Latin description which positively distinguishes Captain Cook's Wallaby from the Great Grey Kangaroo. It was stated that the muzzle-tip was "naked between the nostrils and there [*ibique*] covered with very black rugose skin", like the muzzle of a dog. On the contrary, the Great Grey group differs from all other kangaroos in having the muzzle completely haired *between* the nostrils, which are only narrowly edged with bare skin.

It has been suggested that the first Cooktown captive was the shy Agile or Sandy Wallaby (*Wallabia agilis*), but the brighter yellowish coloration, and hairing of the nose half-way down between the nostrils, apparently eliminates this species. Anyway, it seems evident that Cook's 84 lb. "kangaroo" must have represented another and considerably larger species, although aged male wallabies grow to unusual size at times. The large specimen may have been a young male of the Cape York wallaroo, which would have the muzzle entirely naked between the nostrils. However, the original description is applicable only to the first small specimen which was



The Muzzle of the Great Grey Kangaroo (left) shows the hair of the nose extending below the level of the nostrils, a characteristic feature of the Forester group. In the centre, the muzzle of the Agile or Sandy Wallaby shows an intermediate partly-haired condition. On the right, the muzzle of a Wallaroo shows the entirely naked or dog-like appearance stressed in the Latin description of the first Cooktown captive, typical of the Whip-tail Wallaby.

From the British Museum Catalogue of Marsupialia and Monotremata.

definitely not identical with the Great Grey Kangaroo.

Actually, comparison of skins and skulls from the Cooktown district has confirmed the relationship of Cook's first kangaroo with the well-known Whip-tail Wallaby. Like its southern relative, the Cape York Whip-tail is gregarious and not very shy, as shown by the comparative ease with which Captain Cook's party observed and obtained the wallaby. An easy mark for thoughtless "sportsmen", or kangaroo-shooters, it would be a faunal tragedy if the survival of this beautiful and historic species should be endangered by neglect or careless exploitation. Already, the existence of the southern Whip-tail is threatened by inevitable clearing for settlement, and the undesirable use of its skin in making toy travesties of the even rarer koala, which could be more effectively and economically made from rabbit or lamb skins!

The urgent need for adequate national parks could not be more clearly indicated. One can imagine the peacetime attraction for travellers to visit the scene of Captain Cook's landing and see in a nearby

sanctuary the attractive wallaby just as the great navigator's party saw it so many years ago. The word kangaroo has since been popularly restricted to the largest of the family, such as the Great Grey Foresters, the Red Kangaroo of the inland plains, and the stocky wallaroos of the rocky ranges. There are, however, about fifty smaller members of the family, including the rat-kangaroos, rock-wallabies, and tree-kangaroos of the Queensland rain forests.

As the difference between a wallaby and kangaroo is a frequent subject of inquiry at the Museum, the scientific names of Captain Cook's wallaby (*Wallabia canguru*) are remarkably appropriate. This combination of generic and specific names emphasizes that there is actually no marked anatomical distinction, while associating the aboriginal inhabitants with the landing of the gallant ship *Endeavour* at Cooktown, and the first observation of kangaroos on the vast eastern coast of "New Holland".

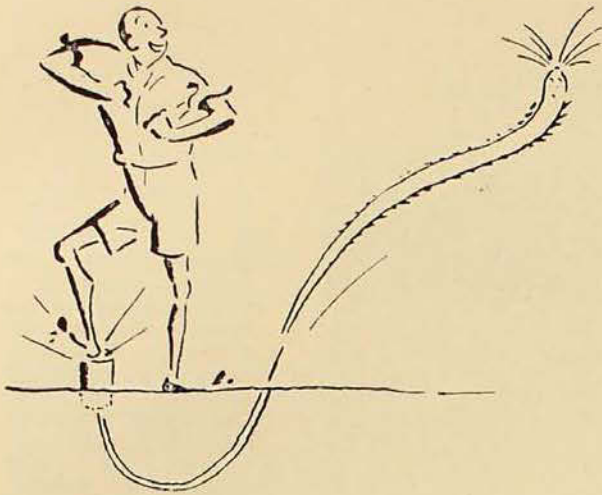
[Marsupial birth and transference to the pouch will be the subject of an article in our next issue. Subsequent articles will deal with various groups of the kangaroo family.]

The G. H. Blakemore Collection

The Trustees recently acquired the mineral collection of the late Mr. G. H. Blakemore, well known in the mining world of this State. He was first appointed at the Central Mine, Broken Hill, in October, 1888, as Chief Assayer. He occupied several positions at the Hill, until he left in August, 1895. Thus Mr. Blakemore had the opportunity of collecting there in the early days when the wealth of variety of minerals was being won from the oxide zone.

That he took full advantage of this is indicated by his collection, which consists

mainly of Broken Hill minerals. The outstanding specimen of the collection is one of marshite, the extremely rare copper iodide, consisting of a crystalline encrustation of the tawny coloured mineral on green malachite. This one specimen contains more marshite than was previously in the Museum collection. With other marshite specimens the Museum probably has the best collection of the mineral in existence. Another exceptional specimen is a large mass of fine arborescent silver and embolite (chloro-bromide of silver), intimately mixed together.



Fish are “Worm-conscious”

By ELIZABETH C. POPE, M.Sc.

THINGS are coming to a pretty pass when people accuse fish of being “worm-conscious”. While deploring the use of the word “conscious” in connection with fish, it must be granted that the idea which the writer was trying to convey was perfectly true. The statement was that at certain times of the year fish become “worm-conscious”. He was, of course, referring to freshwater fish which are fussy about the time of year and the type of food which will attract them at the various seasons. At one time they favour insects and insect larvae and at other times worms. This is a fact well known to anglers who vary their lures according to the seasons and the known habits of the fish.

Freshwater fish are not unique in this respect. Some marine fishes are just as “worm-conscious” and will not bite at a hook baited with a worm of what they consider the wrong type. Expert fishermen say, for instance, that when fishing off a surf beach, it is useless to use as bait a bristle-footed worm captured from the sand of an estuary. Equally unsuccessful is the converse experiment. Worms from the surf beach are no use in “inside” fishing. The fish seems to relish only the worm from its own particular habitat and is suspicious of one from any other type of environment. There are two common sand worms used as bait on the coast of New South Wales, and the statement above certainly applies to them.

The worms concerned are very different in size, but both live in similar surround-

ings—buried in the sand. The accepted methods of capturing the two kinds differ greatly despite the fact that they both inhabit the wet sand. The gigantic worm of the ocean beaches, *Onuphis teres*, has a number of popular names. Fishermen even discriminate between worms captured near high tide (calling them “Silver Worms”, “Silver Slimeys” or “High Tiders”) and worms taken at the low tide levels of the beach. The latter type they call “King Worms”, probably because they are, as a rule, distinctly larger and the skin shows a high degree of iridescence, making them the handsomer type. Careful examination and comparison of the two types, however, failed to disclose any true differences other than those of size and colour, and both the Silver and King worms are the same species. It has also been noticed that, as a rule, beach worms tend to be smaller and smaller as one goes inland from low water mark. As a consequence of this the worms taken higher up the beaches are never the record-breakers that the low-tiders are. Beach worms have been taken up to eight feet in length and the capturing of such giants is no mean feat.

The method of capture for *Onuphis* is interesting. The worm is shy and elusive and can burrow speedily through loose, wet sand so that it is useless to try and catch up with one by digging. A lure is used—preferably a piece of decaying meat or a dead sea bird—and this bait is tied to a string and trailed through the wash



Trailing the bait in the wash of a receding wave to locate the worm, *Onuphis*. When a head pops up it reveals itself to the keen watcher as a tiny V-shaped ripple in the retreating water.
Photo—K. Salter.

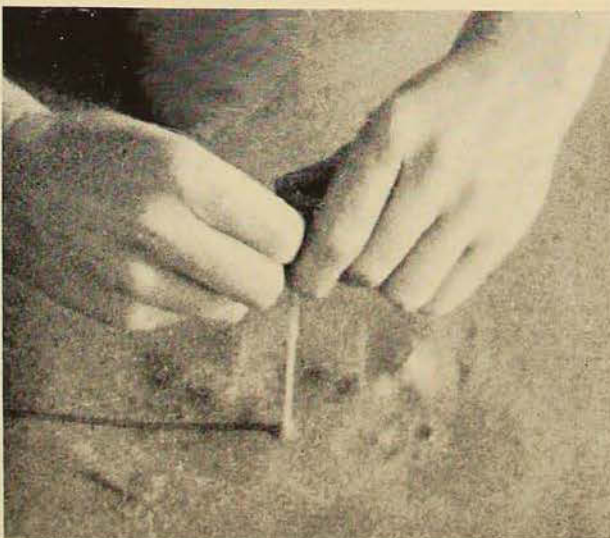
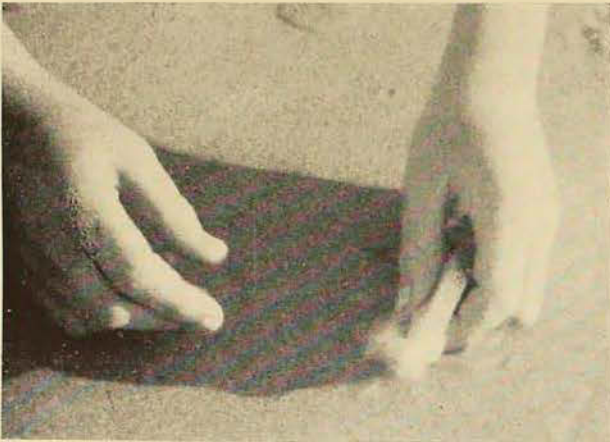
of a receding wave. The worms seem to receive a gustatory stimulus as a result, and, tasting the presence of food, they pop heads out above the sand to investigate more closely. The head of a worm betrays itself to the watchful bait-catcher owing to the fact that it causes a tiny V-shaped ripple, as the water washes around it—just as a snag does in a swiftly flowing river. Once the worm has been detected, the next step is to use a smaller bit of fish bait, right above the spot where the head was seen before. As the wave washes over the spot the worm comes out to seize the small bait in its strong jaws. The bait is held so that the thumbs and forefingers of both hands are free to grasp the worm. Gingerly the fingers are “ploughed” through the sand till the “neck” of the worm is grasped, then a sudden, straight, upward pull will catch the worm unawares and it is possible to draw it out of the sand. Should the unwary bait-catcher touch the worm, or otherwise warn it of his proximity, his chance of capturing it is gone, for the worm either clings by means of its oar-like bristle-feet to the walls of its burrow, or disappears into the sand like a flash. The strength of the worm when resisting capture is amazing and some fishermen

prefer to use a pair of long-nosed pliers, the nose of which has been padded with rag, for gripping the head. This method has the advantage of being operated with one hand, leaving the other hand free to dangle the bait.

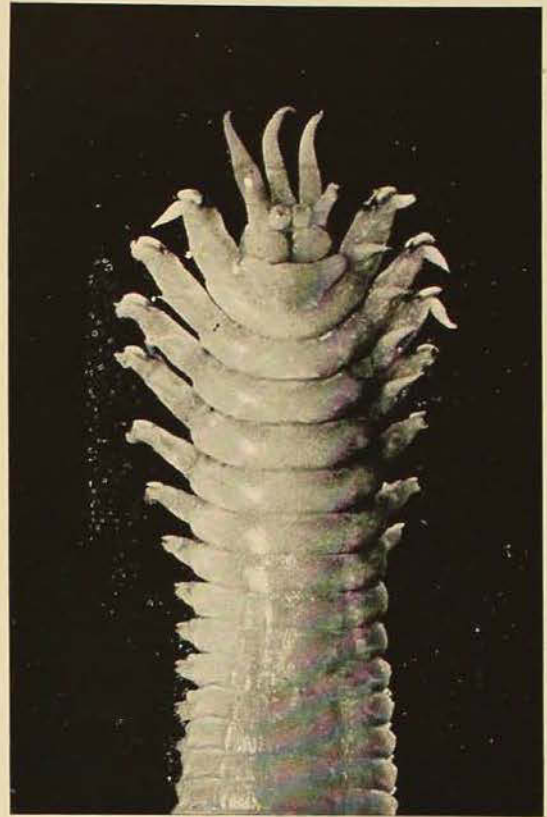
Onuphis is sporadic in its occurrence, being plentiful on some surf beaches and absent altogether on others. As a general rule, the worms are found in selected patches of sand where small local food-bearing currents meet and sweep the sand. The presence of the worms is hard to detect at first because there is no permanent hole to betray the position of the burrow—the worm just burrows as it goes.

Whichever method of capture is used, the operator must have quite a considerable degree of skill and technique if he is to succeed and the hunting of the worm is often as good sport as the subsequent fishing. Sometimes the fisherman has no time to hunt worms and fish on the same day, so a mention of methods for their preservation may not go amiss. There are two quite effective ways of preserving *Onuphis*. The first is to store the worms in a glass container in a very weak solution of formol seawater (1 part formaline to 100 parts of seawater). This will

preserve them for weeks and even months at a time, but the formaline must be soaked out for about a day before the worms can be used. The best method of soaking out is to put the worms through several changes of pure seawater. The second method of preservation is to dry the worms in the sun till they are hard like sticks. Again, before use, they must be soaked in water till the lost water



Method of capturing *Onuphis*. As the worm's head pops up the small bait is shifted towards the back of the hand, leaving the fingers free to grip the worm.



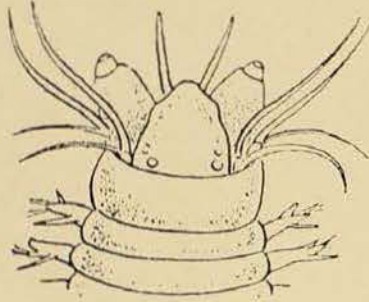
Underside of head of *Onuphis*. Note the three larger tentacles on the upper side of the head. The mouth, lips and palps are also shown clearly. The parapodia of the first seven body segments are much enlarged and bear hard pads which make them very effective as digging organs.

content is restored. Of course, preserved bait is never so attractive to the fish as the fresh material is and live worms are greatly to be preferred.

Quite different is the burrow of the estuarine Sand Worm, *Nereis*. The burrow in this case is U-shaped and has two entrances. At low tide, it is a simple matter to catch the worms, once their holes have been discovered. A fairly large cocoa tin is ideal because it has sharp edges. After placing the tin bottom upwards on the sand, over one burrow entrance, the bait-collector then stamps quickly on it. The air is forced from the tin down the burrow, and, out of the second entrance shoots a spurt of water and the worm. If not seized promptly the worm quickly disappears into the wet sand. Though *Nereis* constructs a definite burrow it frequently leaves its home to swim gracefully about in search of prey or to swarm at the surface of the sea in the breeding season. Very often a new

burrow is constructed at the end of such a fit of wandering.

Nereis is small and slender and rarely attains a length of more than a few inches. Its body is, on the whole, darker than that of *Onuphis* and the horny cuticle is extremely iridescent.



Upper side of the head of *Nereis*. Note the four pairs of long tentacles and the single pair of short ones. *Nereis* has four eyes. The two palps are short and conical in shape.

Onuphis and *Nereis* are alike in body-plan. In each the elongated body is made up of a series of rather similar rings, each of which bears on either side a projecting swimming organ, the parapodium. These organs are used like oars and are

provided with bunches of bristles, hence the name bristle-footed worms. The heads of the two worms differ markedly. In *Nereis*, the head bears two small and eight large sensory tentacles, as well as two short, stumpy palps. The head of *Onuphis* bears five tentacles, of which the three nearest the upper surface are the largest. Just below the tentacles are a pair of palps. On the upper surface of the second ring of the body in *Onuphis*, there may be seen a tiny pair of nuchal tentacles. In most other respects the two worms are similar.

Though scientifically the differences between these two worms are slight, yet they are great enough for the discerning fish, and a worm from a foreign habitat is at once suspect and is therefore rejected. So while we deplore the spread of the craze for coupling the word "conscious" to still another noun, we are forced to admit that in this case the slang phrase certainly is expressive, and is a short and handy way of conveying quickly an otherwise rather long-winded statement.

The birthplace of General Douglas MacArthur, Commander-in-Chief of the Allied Forces (South-west Pacific), at Little Rock, Arkansas, United States of America, has been opened as a Museum of Natural History and Antiquities. It was formerly the Federal arsenal, and there General Arthur MacArthur was stationed in 1880 at the time Douglas MacArthur was born. In 1940 the building, after serving as an armory, was remodelled by the city for museum use.

Amongst recent visitors to the Australian Museum were Dr. and Mrs. E. A.

Petersen, Mr. and Mrs. K. Sheard, Mr. L. Stach, M.Sc., and Lieutenant G. Rogers, U.S. Air Force. Dr. and Mrs. Petersen, it will be remembered, made their voyage to Australia under somewhat unusual circumstances. Messrs. Sheard and Stach have previously utilized the research facilities here.

An interesting study collection of coelenterates—alcyonarian soft corals, jelly-fish and hydroids—has been prepared for the use of senior zoology students of the University of Sydney visiting the Australian Museum.

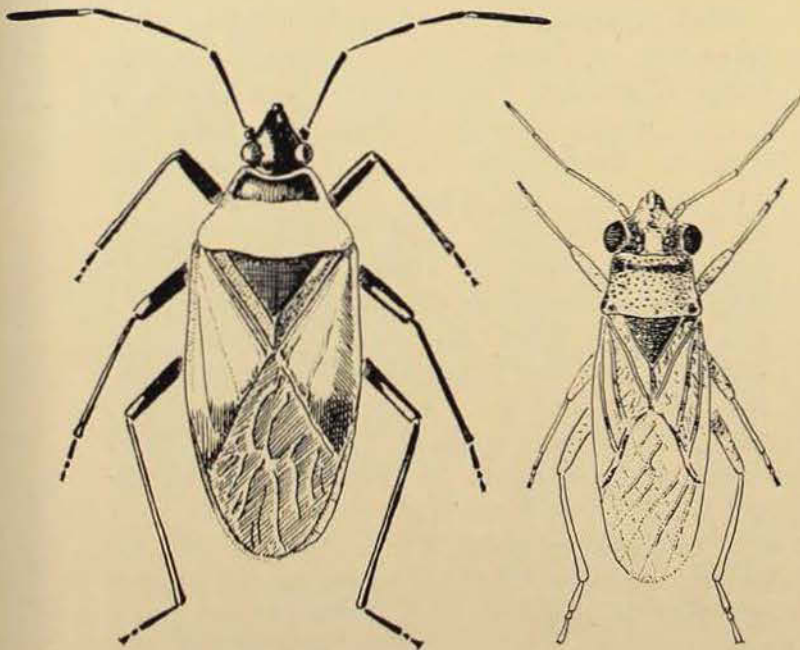
Australian Insects. XVII

The Bugs—Order Hemiptera-Heteroptera, I

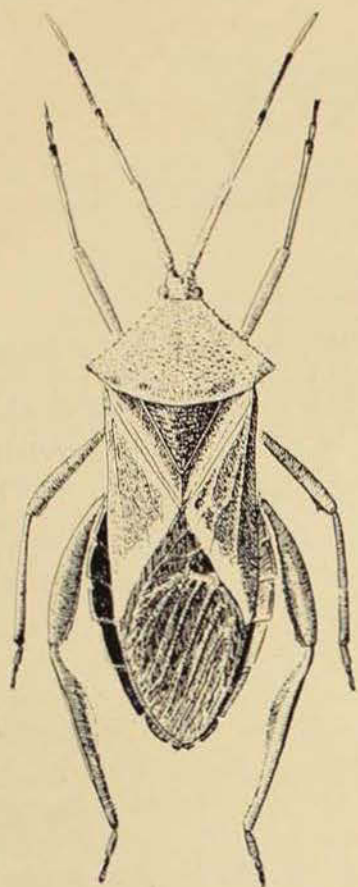
By KEITH C. McKEOWN, F.R.Z.S.

THE general characteristics of the bugs and their allies, the Cicadas, Tree- and Leaf-Hoppers, the Aphids, and other members of the Order Hemiptera, were described in the preceding article in this series; some attention must now be given to the various families. It is unfortunate that in the majority of instances little or nothing is known concerning the life-histories and habits of the Australian species, and the statement "Nothing is known of the lives of these insects" recurs with disheartening regularity. A wide field lies open to the student who will devote his time to the observation and recording of such details. He will be assured that the greater part of his work will be breaking new ground. Our attention will be confined here chiefly to those species of which we have some detailed knowledge; others must perforce receive only passing mention. Insects of the sub-order Heteroptera, the true bugs, come first.

The family Lygaeidae contains a number of small to medium sized insects of somewhat elongate form with the antennae inserted well below the level of the large compound eyes; small simple eyes are almost always present upon the vertex of the head. The best known representative of the family is the Rutherglen Bug (*Nysius vinitor*), a tiny silvery-grey insect which, during the summer months, swarms in such vast numbers upon vegetation that by depleting the sap by the constant sucking of their pointed beaks, the infested plants wilt, and may even die. The Rutherglen Bug is one of the most serious insect pests with which the fruitgrower has to contend, the fruit remaining blemished after the invading insects have disappeared. The control of the insect presents many intricate problems. In most localities the eggs are deposited on a number of weeds, Cudweed, Sow-thistle, Blady grass, and others, while in south-western New South Wales the immature bugs may be found crowded under native species of "pig-face", which suggests that the eggs may also be laid on these plants, although they have not yet been discovered. The eggs are deposited in masses among the hairs of the plant-stem or its seed. When newly laid they are creamy white in colour, elongate oval in shape, and about a millimetre in length. One female lays about 450 of these eggs! As the embryo bug develops within the egg, its colour darkens, and hatching takes place within six days. The little nymph is active, and feeds constantly throughout its life, casting its skin five times. In the later moults, tiny wing-pads appear until, with the discarding of its last nymphal skin, the insect is winged and mature. The bugs are sluggish in the cold of early



Lygaeid bugs, *Dindymus versicolor* and *Nysius vinitor*.



The Crusader Bug,
Mictis profana.
Nancy B. Adams,
del.

morning and evening, but during the heat of the day are very active, flying readily, and rising in a dense whirling cloud when disturbed.

Another small allied species is the Coon Bug (*Orycaenus luctuosus*), a tiny creature marked with black and white in a somewhat checkerboard pattern. These insects are usually found in more or less open country, where they feed upon the succulent herbage; Bathurst Burrs (*Xanthium spinosum*) are often completely defoliated as a result of its attacks, but the plants usually recover. Less hardy vegetation would probably succumb. In some seasons the bugs appear in immense numbers, and the young nymphs, in which the exposed abdomen is bright red, swarm thickly upon fence-posts or tree-trunks, giving them the appearance of having been daubed with red paint. Its life-history is essentially unknown.

Other genera included in the Lygaeidae are *Daerlac* and *Oncopeltus*. *Oncopeltus quadriguttatus* has been recorded as attacking cotton in Queensland, where it

causes discoloration of the lint, and, in consequence, is often referred to as a "Cotton-stainer" bug. *Astemma sidac* is a terra-cotta coloured insect with a small black spot about the centre of the horny portion of the fore-wing; the membranous wing tips are black. It is widely distributed throughout Australia, and is especially abundant in the western areas of New South Wales, where it sometimes swarms on the Pittosporum trees, crawling about over the trunks and upon the ground beneath. It usually appears about April, and all stages may often be found at the one time.

The family Pyrrhocoridae, popularly known as "Red Bugs" or "Fruit Bugs", is a small one, in which the best known species is *Dindymus versicolor*, the Harlequin Bug. It is a well known pest of fruit, and apples are especially attacked, the white pulp discolouring in patches where the tissues have been pierced by the feeding insects. In appearance these bugs closely resemble the larger forms of the preceding group; the essential difference being the absence of the simple eyes or ocelli.

The Coreidae are fine large bugs, and although common in the bush, the family lacks a generally accepted popular name; Froggatt suggested "Gumtree Bugs", but its scope is so wide that it cannot be considered distinctive enough.

The handsomest and most widely distributed of these bugs is, perhaps, the large Crusader Bug (*Mictis profana*), a large brown insect about an inch in length, decorated with a yellow or whitish St. Andrew's Cross upon the back—a marking which gives it its popular names of "Crusader Bug", "Holy Bug", and "Catholic Bug". Under natural conditions these insects live upon the wattles (*Acacia*) sucking the sap from the young shoots. They have, however, found the young growth of the introduced citrus trees equally to their taste, swarming upon it to feed and causing it to wilt and blacken as though frost-bitten. Whole family parties of these bugs, in all stages of growth, may be found assembled upon one young shoot. When disturbed the insects seem to prefer to avoid flight if

possible, and circle cautiously around the stem, keeping it between them and the intruder. In the heat of the day they can, and often do, take wing readily and fly strongly. The Crusader Bug, when disturbed, has the extremely disconcerting habit of discharging a jet of foetid, buggy-smelling fluid from glands situated at the extremity of the body. This fluid can be squirted for a distance of several inches, and causes great pain and irritation should it come in contact with the eyes. Although this bug is very common, and as already indicated, can be found in all stages of development, its egg does not seem to have been recorded. Despite their possession of an objectionable odour, and, presumably, equally nauseating taste, the Crusader Bug is not as free from enemies as one might be inclined to imagine; a number of species of birds attack them, and I have frequently seen sparrows chasing and capturing them, and then battering the unfortunate insects against a branch in an effort to reduce their strongly armoured bodies to a more manageable mouthful—or rather beakful.

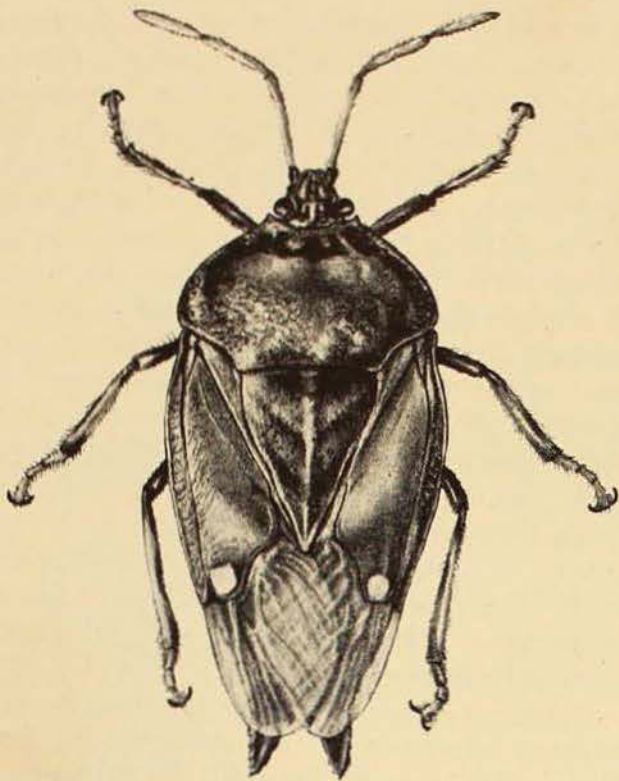
Members of the genus *Leptocorisa* are elongate, narrow bugs, generally of a dull brownish colour.

The family Neididae (also known as the Berytidae) is represented by a single Australian species—*Capyella lobulata*. This is an extremely slender insect with elbowed antennae, and its body perched high on thin stilt-like legs. Its life-history appears to have entirely escaped observation.

The Cydnidae, or Burrowing Bugs, are shining black creatures which live under stones and logs. They are broad, flattened, and superficially resemble beetles. Nothing appears to be known regarding food, habits, or any of the intimate details of their lives. When disturbed by the overturning of the stone under which they are sheltering, they make hasty efforts to bury themselves in the soil. It seems probable that they emerge from hiding at night, and carry on their activities under cover of darkness.

The Shield Bugs (Pentatomidae) form a large and distinctive family; nearly four hundred species have been described from Australia. They are readily distinguished by the large size of the scutellum, the more or less triangular plate fitting between the bases of the wings, and this may even cover the whole of the abdomen. Almost all these insects possess an offensive buggy odour which has its origin in a fluid secreted by special glands on the upper surface of the abdomen. Most of these Shield Bugs suck the sap from plants, but a few of them have left the vegetarian path and attack insects and suck up their blood with their sharp, needle-like beak or rostrum. These latter are of some economic importance.

Lyramorpha rosea may be taken as a typical example of a Pentatomid bug. The adult insect measures almost an inch in length, and is of a somewhat yellowish-green colour, but this fades into a dull tint after death. A pair of pointed, horny appendages project from the extremity of its abdomen, rendering its identification easy. A circular yellow spot ornaments the tip of the horny part of the forewing. The soft bodied nymphs are flattened, yellowish creatures, with the stink glands prominent upon the upper surface of the abdomen. Like the adult, the body terminates in a pair of horny appendages. The life-history of the Green Vegetable Bug (*Nezara viridula*), a common pest in gardens, may be given here as illustrating the cycle of this group of insects. It is doubtful whether this bug is a native of Australia; it is extremely probable that it has been introduced from overseas. The eggs are deposited in masses upon the leaves of infested plants, and are placed in regular rows, securely glued to their support and to each other. The number of eggs in each cluster may be about sixty, but a single female is capable of producing a family of some two hundred. Each egg is shaped like a miniature barrel, and of a pale green colour, but, as the young bug develops within, its colour darkens and becomes reddish-brown. The young emerge by pushing off the lid-like cap



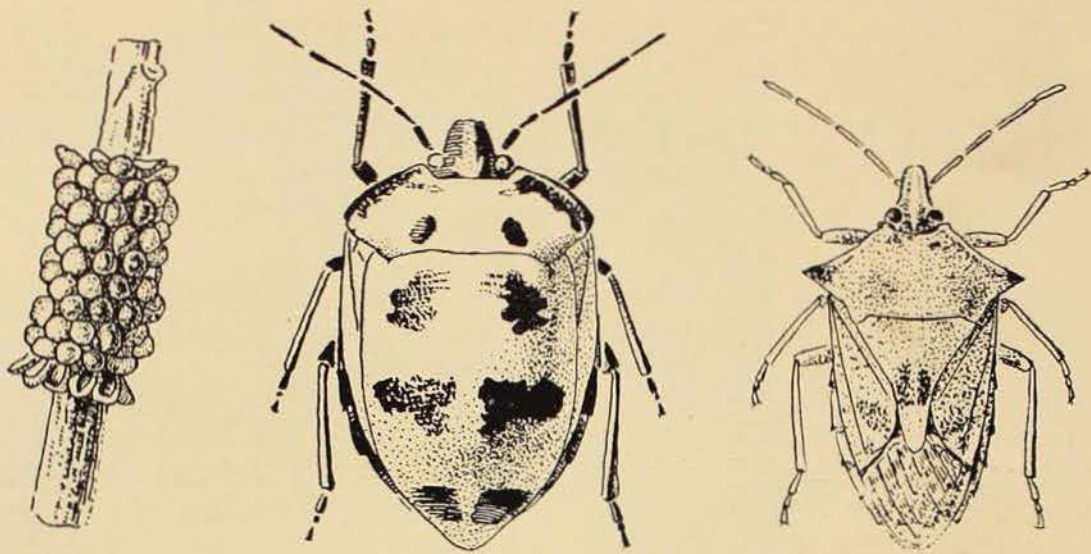
A typical Pentatomid bug, *Lynamorpha rosea*, and its larva.

of the egg by means of a special egg-burster, situated upon the head. As the little bugs hatch from the eggs, they cluster together for mutual protection in small family parties, and remain together for several days before scattering over the food-plant to fend for themselves. The nymphs moult five times before attaining maturity, and the nymphal wing-pads appear with the casting of the fourth skin. When newly hatched the bug is bright orange with darker mark-

ings, but the colour changes as the insect develops, darkening to a bronzy blue marked with red. The adult bug is a uniform pale green and measures about five-eighths of an inch long. The complete life-cycle occupies about two months, but the adult bug may live for a further nine or ten months.

The large and striking Cotton Bug (*Tectocoris diophthalmus*) is remarkable for its maternal care of its eggs and young—a habit rare among the insects—the parent watching over them for a considerable period, not only until the eggs hatch, but till the youngsters disperse. Mr. F. P. Dodd has studied these strange bugs closely. He writes: "Apparently the mothers never leave their eggs temporarily; any that I have met with unprotected were quite abandoned. . . . It is absolutely certain that the 'broody' bugs remain foodless for the whole of the period of three weeks or more of 'sitting', they occupy the same position always, and various investigations have failed to reveal any punctures in the twigs in front of them. . . . As already stated, the position of the insect never alters as she stands above the eggs—the forelegs are clasped about the twig in front of them, the third pair holds it just behind, and the middle pair clasps them about the centre, so that they are effectively shielded above; they are placed in rows all round the twig.

"In approaching a 'sitting' bug, or pushing any object near her from the side, she inclines her body towards the threatening quarter, or exhibits much concern if the hands, say, are held near and moved about her; it is most absurd to watch her determined efforts to shield the precious eggs; she sidles to the right or left, as the case may be, to meet the supposed danger, but no menacing in front or behind will induce her to move." As the eggs hatch the parent bug backs an inch or so away from the egg mass, and stays there long after the last egg has hatched—then, after a few days, the young bugs are abandoned to take care of themselves, and make their way off among the foliage.



Eggs and adult of *Tectocoris diophthalmus*, and the Vine Moth Bug (*Oechalia consocialis*).

Nancy B. Adams, del.

Representative of the Shield Bugs that have carnivorous habits are the Long-nosed Bug (*Cermatulus nasalis*) and the Vine Moth Bug (*Oechalia consocialis*); the former preys upon the larvae of the sawfly known as the Pear and Cherry Slug; the latter on the caterpillars of the Vine Moth, and other lepidopterous larvae. Moth eggs, too, are destroyed, and their juices sucked up. The Vine Moth Bug is narrowly triangular in shape, with the prothorax produced into prominent lateral spines. These insects attack the helpless, feeding caterpillars like wolves among a flock of sheep, and plunging their sharp beaks into their sides, proceed to extract the juices from their bodies despite the frenzied lashing from side to side of the forepart of their

victims in an effort to dislodge their attackers, but it is rarely that these tactics are successful, for the bugs are persistent, and usually succeed in attaining their object.

Another common Pentatomid bug is the little black and orange Horehound Bug (*Agonoscelis rutila*) which feeds upon the plant from which its own name is derived.

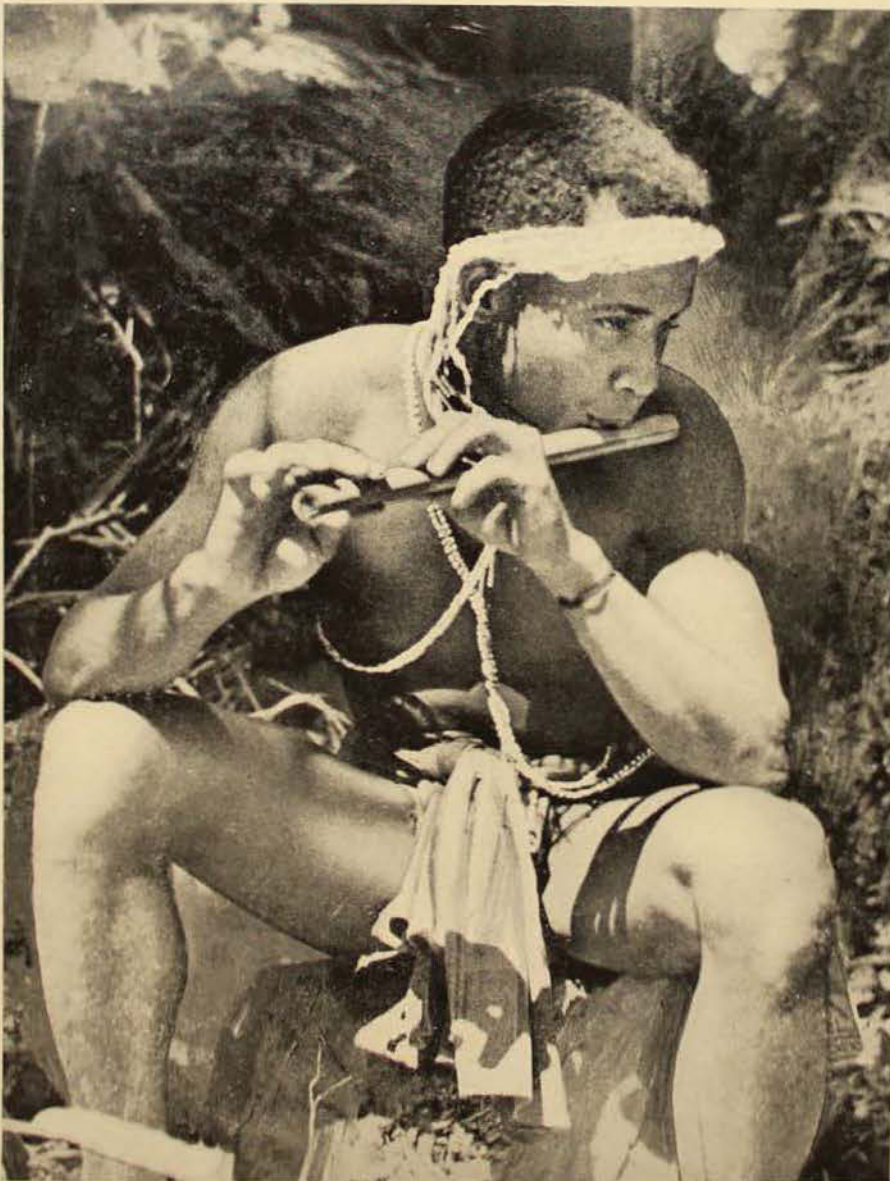
Many extremely interesting species are to be found in the Pentatomidae, but limitations of space preclude even the mention of more of them. It is hoped, however, that sufficient has been written here to show their great beauty and fascination, and to induce others to study their ways and try to elucidate the problems of their lives.

The Pygmy Peoples of Oceania

By FREDERICK D. McCARTHY

IN the dense rain-sodden and gloomy jungles covering the mountain ranges on some of the numerous islands which Nature has bounteously scattered over the ocean from south-east Asia to Australia, there live groups of cheerful little people, the pygmy Negritos. They attract our attention not only because of their tiny stature and simple but tough mode of life, but also for their remarkable

adaptability, and their ready absorption of customs and ideas from neighbouring peoples of higher cultural standards. They live in small hordes of a few families, and each band has a recognized hunting territory. Each tribe has a chief, but complete equality exists among the people generally. Each man has only one wife, and adultery is punishable with death.



**Semang Negrito of Perak
playing a bamboo flute.**
Photo—F. D. McCarthy.



Semang woman of Perak winnowing rice. Note the coiffure and the comb worn as a charm to ward off sickness.

Photo—F. D. McCarthy.

Generally speaking, the average height of the Negritos is four feet nine inches for the men, and about three inches less for the women. They have crisp brownish-black frizzy hair, and a beard is often seen among the men. The face is rounded, forehead low but swollen, nostrils exceptionally wide, lips thick and sometimes everted, and the jaws prominent. The eyes are large and dark. The colour of the skin ranges from yellowish-brown in New Guinea to dark brown and black in Malaya and the Philippine Islands. The body is well proportioned, and is carried leaning slightly backward, with an easy swinging gait. A noticeable feature of their physique is the strong development of the thigh and leg muscles due to the mountainous nature of their environment.

The covering of the body is not a serious problem for the pygmy. A bark-cloth loin covering, or a girdle to which is attached an apron of leaves, is the principal garment. A head covering is rarely worn, although a pandanus or palm-leaf mat is used for protection against rain. The Semang of Malaya shave off all the hair apart from a circular patch at the back of the head, and a forehead fringe left by the women, who wear ornate bamboo combs bearing magical designs to ward off disease. Ornaments

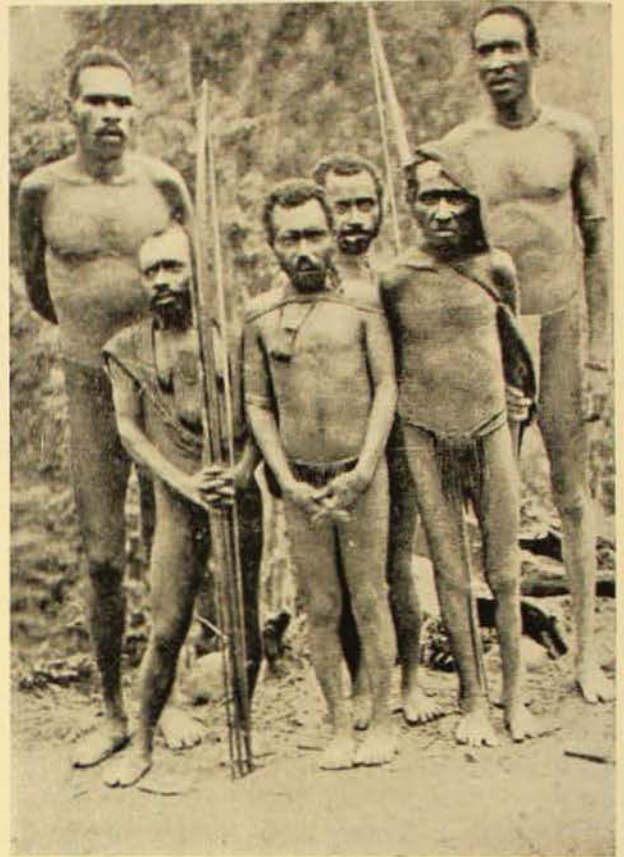
are limited to arm and leg bands, ear pendants, nose-styles, and necklets of seeds, shell, animals' teeth and bones. Cicatrization of the body and limbs is practised by the pygmies in Malaya and the Philippine Islands.

In the Malay Peninsula, where they are called Semang, the pygmies live as hunters, fishermen and traders in the mountainous States north of the Pahang River. Their abodes consist of caves, shelters of palm-fronds on a bough frame, and tree buttresses. Each person has a sleeping platform, and each family a fire-place. They gather roots, nuts, fruits and edible leaves, set ingenious traps and snares for animals and fish, and kill tigers, pigs and deer with the spear, bow and arrow, or the blowpipe and dart, the points of the projectiles being tipped with deadly Ipoh and other poisons. The sharp-edged bamboo provides knives, cooking vessels and containers, and the only stone implements used are pounders and flake knives. The Semang believe in a sky-world presided over by Kari, a spiritual being associated with thunder, who gave the people their souls, and Ple, who created the earth and man, while the wind acts as a messenger between the people and these beings. The dead are usually buried, but the corpse may be

placed on a platform in the bush, the soul journeying to the spirit-world; the Semang do not fear the ghosts of the dead.

The Negritos in the Philippine Islands lead a similar life to those in Malaya. In both places they file the upper front teeth (up to as many as six) to points, cultivate rice and other crops, build houses on piles, use drums, stringed musical instruments, and the blowpipe, among customs which they have learnt from the Malays or Filipinos. There exist the shy untamed nomads in remote and inaccessible areas, and marginal groups which have adopted the above customs and whose whole culture is but a superficial imitation of that of the more highly advanced Malays and Filipinos.

The Tapiros of south-east Dutch New Guinea form an excellent example of the light-skinned pygmies who frequent the southern and northern slopes of the main



Four Tapiro pygmies and two Papuans from the neighbouring coastal district. The pygmies are armed with bow and arrows, and are wearing netted bags of two sizes, girdles with grass apron, and one has a netted head cover.

After Rawlings.



Semang Negrito of Perak using the blow-pipe. The darts tipped with poison are projected through the bamboo tube with great accuracy up to 35 yards.

Photo—F. D. McCarthy.

central range of this island. They live on the Mount Tapiro Range at the headwaters of the Mimika River. Their villages consist of a small number of houses on piles on neatly cleared and terraced ground near the top of steep ridges, and their gardens are situated within a short distance. They grow tobacco, sweet potatoes, taro and bananas, hunt the pig, wallaby, cuscus and cassowary in the forest, and catch fish and crustacea in the rivers. Their weapons comprise the bow and arrow and a bone dagger. Many of their customs, such as the methods of constructing their houses and of making netted bags, gardening, and the use of a rattan body armour, have been learnt from the taller Papuans who are their neighbours. The Tapiros are fond of brightly coloured seeds, shells, feathers and bones as ornaments. Their hair is allowed to grow into a big hump at the



A group of Tasmanoid people of the Idindji tribe, north-east Queensland. Note the size of the shields and clubs in comparison with height of the people.
By courtesy of the South Australian Museum.

back over which is worn either a grass helmet, ornamented with paradise bird feathers, or a bark cloth covering. All of their personal possessions are carried in two netted bags, a small one hung round the neck for ornaments and tobacco, and a large one hung from the shoulder for fire-sticks, fishing-tackle, and tools of bamboo, stone and bone. They are rarely seen without their weapons ready for instant use.

The Negritos are inveterate traders. In Malaya and the Philippine Islands they gather rattan, beeswax, resin, and elephant's teeth, and prepare medicines. These they exchange for cloths, rice, tobacco, and metal for knives and arrow-heads; not a word is spoken between the traders, for the goods are left in the bush for the pygmies to choose from, leave their equivalent, and retire. In New Guinea the Tapiros make up bundles of

dried tobacco leaves from their gardens, and these form the principal item of barter with the lowland Papuans who fear the little jungle dwellers.

The various progressive changes that have taken place in the culture of the Negrito groups described above contrast sharply with the stagnation of the extinct Tasmanians, who were also Negritos. Their average height was higher than that of living Negritos, due probably to admixture with Australian aborigines. They were forest hunters and food gatherers, while those living near rivers and along the coasts subsisted mainly upon fish and molluscs. As weapons they used clubs, spears, stones and shields, their tool-kit was made up of stone flakes with chipped edges, bone awls, and shell knives, their dress was a marsupial skin, and their home a cave or bough hut. Canoes were made out of strips of bark

bound into three long bundles and then tied into canoe form. Art was of the simplest kind, and consisted of realistic paintings of animals on bark, scratchings on spear-shafts, and engravings of circles on rocks. Little is known about their social organization and religion.

A discovery by the Yale-Adelaide Universities' Expedition during 1938-39 established beyond doubt that the Negritos once lived on the mainland of Australia. This expedition revealed that a yellowish-brown people of small stature, with crisp curly hair, inhabits the dense forests on the mountains between Cape Grafton and Cardwell in north-eastern Queensland. They are a mixed physical type, that of Negrito and Australian aborigine (southern type), but have retained recognizable Tasmanoid (or Negrito) characters. Most of them are now living on Government Aboriginal Stations, but a few remain in their jungle retreat. Their weapons are extraordinary for a small people, as they consist of shields up to four feet six inches long, cut from the buttress roots of the *Ficus* tree, and decorated with striking totemic designs, and large flat-bladed sword clubs made of heavy wood, up to five feet long and five pounds weight, spears and spear-throwers. Well-shaped cane and bark

baskets, and coiled bags, are fashioned by the women, and beaten bark blankets are worn. Implements comprise hafted stone edge-ground axes and flakes. Trees are climbed with the aid of a cane loop. Poisonous secretions are extracted from some seeds and nuts by washing, leaching, roasting and fermentation. Flesh food is obtained by hunting the wallaby, tree-kangaroo, flying-fox, and cassowary, but in the old days they ate human flesh, especially that of enemies they succeeded in killing or capturing. In their social organization and religion these Tasmanoid people have adopted many ideas and practices from the neighbouring aboriginal tribes.

The existence of Negritos in such widely scattered localities as Africa, Andaman Islands, Malaya, Philippine Islands, New Guinea, Australia and Tasmania, proves to be untenable the theory that pygmies are merely dwarf negroids who have degenerated because of insufficient food. The Negritos are simply a race of little negroids, well proportioned, without any signs of degeneracy, and taller races of man live in the same environment. In both Africa and Oceania they are considered to have preceded the taller negroids, with whose origin, physically, they are linked.

Recent changes in the mammal and osteological galleries were taken as a measure of safety and air-raid precaution. The dismantling of large island cases afforded a long-awaited opportunity for the placing of the splendid Lion and Antarctic Groups in different positions, changes which not only enhanced them but also improved the entrance hall.

A subject of perennial interest, the birth of marsupials, has caused rather more inquiries than usual; this will be the topic of an article in the next issue of the MAGAZINE. In the December, 1941, issue there appeared an article on the Water-Rat; the question of farming it for its fur is attracting much attention and enquiry.

An unusual inquiry came from a Queensland coastal farmer, who sought plans

and specifications for building bat "roosts" in the hope that the bats would eradicate insect pests, while supplying payable quantities of bat-guano. It was pointed out that the only successfully colonized roost in Texas had not eradicated malarial mosquitoes. Merely encouraging a transference of residence would not increase the natural influence of bats in controlling the balance of nature, where bats are already plentiful because of a rich insect fauna and suitable haunts.

Selected exhibits of birds and mammals to assist in the Army's training in camouflage were prepared. These were specially chosen and, provided with suitable backgrounds, will form an instructional display.

E. LE G.T.