

MARCH

Grierson and I sailed from New York aboard the American Pioneer Line freighter S/S Pioneer Star on 5 March 1964. Ports of call en route to Brisbane, Australia were: Newport News, March 6-7; Savannah, March 8-9; Colon, March 14; transit of Panama Canal, March 15; departed Balboa for Brisbane March 15.

During the voyage the recording of bird sightings took almost our entire attention. Grierson photographed birds whenever conditions permitted. At Savannah, Georgia, Grierson and I tape-recorded the songs of several species of frogs. In the Panama Canal Zone Grierson photographed the large lizard (Iguana iguana).

Throughout the entire voyage every courtesy and much valuable assistance was extended to us by Captain Nelson P. Garland, and by Chief Officer Arthur Scott, himself a knowledgeable bird watcher. Second Mate William W. Rowland, who acted as ship's doctor, gave me much valuable advice on the treatment of minor illnesses under emergency conditions, and was most generous in adding to our stock of medical supplies for field use. Burn ointments, especially, turned out to be of particular use in our remote expedition camps. Serious burns are often incurred by babies and young children who roll into the ever present center-of-the-house or shelter fires in their sleep. Since our camp was often the only source of medical aid in emergencies, there was rarely a day that passed without an appeal for help.

Two birds, found injured on board ship, were made into study skins by Grierson (); their ectoparasites were also collected. The only flying fish taken during the crossing was found on deck by Mr. Scott (26°-58' S. Lat., 160°-36' E. Long.). Specimens: B,2; F,1.

The first and most important factor in the selection of a material is its availability. It is essential that the material be readily obtainable in the quantities required for the work. The second factor is the cost of the material. It is essential that the material be obtained at a reasonable cost. The third factor is the quality of the material. It is essential that the material be of a high quality and free from defects. The fourth factor is the ease of working the material. It is essential that the material be easy to work and that it can be worked in a simple and straightforward manner. The fifth factor is the safety of the material. It is essential that the material be safe to work with and that it does not pose any danger to the worker. The sixth factor is the durability of the material. It is essential that the material be durable and that it can withstand the wear and tear of the work. The seventh factor is the appearance of the material. It is essential that the material have a pleasing appearance and that it is suitable for the intended use. The eighth factor is the compatibility of the material. It is essential that the material be compatible with the other materials used in the work. The ninth factor is the environmental impact of the material. It is essential that the material be environmentally friendly and that it does not cause any harm to the environment. The tenth factor is the health and safety of the worker. It is essential that the material be safe to work with and that it does not pose any danger to the worker.

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APRIL

The S/S Pioneer Star entered the fringes of cyclone Henrietta, one of the largest cyclones in Australian meteorological history, on April 3. April 4 and 5 were spent making for the Queensland coast in very rough seas with winds up to force 10 on the Beaufort scale. The ship passed to the south of the slow-moving double eye of the cyclone; at one time the ship was only 160 miles from the center of the southern eye. The Moreton Island lighthouse was a welcome sight at dawn on April 6. Moreton Island is the base for one of Australia's well known shore stations for the catching of humpback whales (Megaptera novaeangliae), one of whose populations migrates along the east coast of Australia. Marlow (1961) describes the marking of humpback whales which begins in September at the end of the catching season from shore stations. As the ship turned south into Moreton Bay the fantastic shapes of the Glasshouse Mountains were clearly visible to starboard on the mainland to the west. Low-lying Bribie Island hugs the coast to starboard. ~~It is~~ ^{Here} ~~that~~ a remnant population of the great grey kangaroo ^{WAS INTENSIVELY STUDIED, AND (THE LIFE OF THE KANGAROO, 1966)} (Macropus giganteus) has been the subject of a book with superb photographs [^] AND KAY BREEDEN WAS by Stanley [^] Breeden, ~~and Kay~~ [^] formerly Chief Photographer of the Queensland Museum. We docked at noon at the port of Brisbane which lies ~~several~~ ^{several} ~~hundred~~ ^{hundred} winding miles up the Brisbane River. April 7 to 11 were spent in Brisbane. The Queensland Museum, under the directorship of Jack Woods (George Mack, ^{EARLY} the former Director, died in 1964), was visited on several occasions. [^] Grierson and I visited the Lone Pine Koala Sanctuary, and Grierson was kindly allowed to photograph the koalas by the owner, Mr. Reid. On April 10 Mr. and Mrs. James R.P. Fearnley drove us to the Mt. Glorious area just west of

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Brisbane. A brush-tailed phascogale (Phascogale tapoatafa), found dead on the road within the Brisbane city limits, was preserved by Van Deusen.

MacGowan arrived in Lae from Brisbane April 5, Hoogland from Canberra on April 7, and together they began to uncrate the expedition cargo sent from Canberra and New York. As was the case in 1959 John S. Womersley, Chief, Division of Botany, and Curator of the Lae Herbarium, very generously extended the use of the botany work-shed to the Expedition for the storing of specimens and working of cargo. Grierson and I flew to Port Moresby April 12; Grierson continued on to Lae while I remained in Port Moresby to consult with various Administration officials on Expedition business. Approval for the conduct of the Seventh Archbold Expedition to New Guinea (1964) appears ^{ED} in the Territory of Papua and New Guinea Government Gazette No. 14, page 310, 19 March 1964, published in Port Moresby.

I flew to Lae on April 14. At a conference of the expedition personnel that evening it was decided to make the Pindiu Patrol Post the base of operations for the Rawlinson Range-Cromwell Mountains phase of the trip. The original plan to begin work in the Finschhafen-Sattelberg area was abandoned on the strength of an unfavorable report on the vegetation of the Finsch Coast based on aerial reconnaissance by Hoogland. Lack of suitable transportation was an additional factor in the decision. April 15-19 was spent in Lae organizing food and collecting supplies, obtaining firearm permits, and meeting Administration officials. Tobram, one of the two mammal boys on the 1959 expedition, arrived in Lae from Mt. Wilhelm via plane from Goroka on April 17.

On April 16 I chartered a light plane from Crowley Airways to fly ~~the~~ District Officer, D.N. Ashton, Hoogland, and 800 pounds of cargo to the Pindiu Patrol Post about 40 miles E.N.E. of Lae. The flight was made

April-3

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in good weather; the steep-sided valleys and the densely forested ridges of the Rawlinson Range gave promise of excellent collecting and much hard walking. The Rawlinson Range rises abruptly from the northern coast of the Huon Gulf, and roughly parallels the east-west coastline. The southern aspect of the Range shows no sign of native population. The upper elevations of this range (Mt. Rawlinson, 2,270 meters, is the highest peak) are usually in cloud, so that aircraft headed for Pindiu fly east along the coast until the lower course of the Mongi River is sighted. The turbulent, boulder-filled Mongi, which has its source in the high eastern peaks of the Saruwaged Mountains, is the longest river on the Huon Peninsula. The Mongi is then followed upstream (north) until the Pindiu airstrip on the west side of the river comes into view. Two major tributaries, the Bulum and the Kua Rivers, which join the Mongi from the west, are passed during the flight.

We were met at Pindiu by Patrol Officer Ron Willard and Mrs. Willard (sister of James Sinclair, then Assistant District Officer at Wau, whom L. J. Brass and I met on the 1959 expedition). The grass house on the ridge overlooking the airstrip, formerly the home of the Patrol Officer, was offered to the Expedition for the duration of its stay in Pindiu. Most New Guinea villages have what is called a "House Kiap" ^{VISITING ADMINISTRATION PERSONNEL ON TOUR AND OTHER} for visitors. ~~house~~. l.c.

The house at Pindiu had a thatched roof and plaited bamboo walls and partitions. A good timber house near the airstrip, for bulk supplies and for sleeping quarters for our native staff, was also made available. We returned to Lae before noon on April 16, covering in thirty minutes flying time a distance which a carrier line would have taken nearly a week to negotiate.

MacGowan flew to Pindiu in Laurence Crowley's twin-engined Piper Aztec with the second lot of cargo on the morning of April 20. Grierson and Tobram followed with additional supplies on an afternoon flight in poor weather. Hoogland and I flew to Pindiu on April 21 with the remaining cargo.

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Pindiu, at an elevation of 915 meters, served as a shake-down camp for the remaining days of April. Mammal and herpetological collecting began immediately. Mist nets, set in a sago palm swamp below the village, caught Syconycteris and Paranyctimene. Traps took mostly Rattus exulans, and jacking produced only Dobsonia, ~~certainly the most abundant~~ ^{THE ONLY} large fruit bat at Pindiu at the time of our visit. The vicinity of Pindiu is in garden plots for the most part, and little primary forest remains in this sector of the valley. However, the active felling of forest and the making of gardens resulted in a fine collection of snakes. Silver shillings were incentive enough to ensure such specimens being brought in alive from a radius of several miles for our photographer, Grierson. Low clouds misted in our camp one night in two, and a good frog chorus was common on our ridge. Tape recordings were made of the songs of several species.

Small airstrips in the interior of the Australian administered Territory of Papua and New Guinea have played a most important role in the post-war administration and economy of the eastern half of New Guinea. The strip at the Pindiu Patrol Post is a case in point. D. N. Ashton, District Officer of the Morobe District in 1964 (and now District Commissioner of the same important District, with headquarters at Lae), has kindly sent me the following notes on the history of the establishment of the Patrol Post at Pindiu and the building of the present airstrip.

"When I arrived in the Morobe District on 28 May 1958 there was a Patrol Post serving the Pindiu area situated at Yunzain (Yungzain) in the Dedua Census Division [Finschhafen Subdistrict]. Access to Yunzain was by Land Rover over an atrocious road from Heldsbach on the [Finsch] coast through Sattelberg to Nanduo [Kotte Census Division]; thence a two and one half hour

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April-5

walk from Nanduo to Yunzain. This place was extremely poorly located, and, because of this, was closed by me on my first visit to the area in January 1959.

"I immediately set about finding a more suitable site and chose Pindiu [Hube Census Division] for the purpose. There was in existence at that time a small grass strip at Pindiu. This was some 1,100 feet long, but could only be used by the Piper Cub aircraft of the Lutheran Mission.

"I personally made several trips into the area, and, as a result, arranged for the Department of Civil Aviation to inspect and draw up plans for a more adequate airstrip. The survey was completed by 31 July 1959, and construction commenced immediately thereafter.

"The first officer posted to Pindiu was Mr. P. J. K. Broadhurst. He was followed some short time later by Mr. P. G. Whitehead. The strip was opened in May 1960, and the first aircraft to go in was piloted by Laurie Crowley [now owner of Crowley Airways of Lae] with a District Airport Inspector and me as passengers. The airstrip has been extended slightly and the general condition considerably improved since it was originally opened. It is now classified as Category "C" and can take aircraft of the following types: most Cessnas, single or twin Otters, Piper Aztecs, Beech Barons and a number of others."

One final commentary on this grassed airstrip is in order. During the first week of my stay at Pindiu we regularly heard an unidentifiable mechanical droning in the distance. The mystery was solved one day when we walked down to the strip to meet a scheduled flight. There was a gasoline lawn mower in full operation! We learned that mowing the airstrip was a cooperative venture on the part of several of the Pindiu men. Thus comes civilization to stone-age New Guinea!

April-6

On the advice of Patrol Officer Willard we decided to set up our first bush camp several miles down (south) the Mongi River in an area of unbroken rain forest. During the final days of April, MacGowan, with the help of Willard, sent out a call for carriers to all the villages near Pindiu.

On the 15th of March 1914, the following was received from the
Hon. Secy of the Interior, U.S. Dept. of the Interior, Wash. D.C.
The enclosed report of the Surveyor General of the Territory of
Idaho, dated at Boise, Idaho, 12th March 1914, is hereby approved
and the same is hereby ordered to be published in the official
Gazette of the Territory of Idaho.

52,000,000 LBS

HYDROGEN

W. J. BOYD

1914

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MAY

Carriers assembled at Pindiu on May 2, and in the early hours of May 3. The carriers were "lined" in front of our rest house and were assigned their loads by MacGowan. A load of 35-40 pounds is the agreed limit for both men and women. Expedition black boxes weighing up to 75-80 pounds were lashed on poles and secured by bush vine; these were two-man or woman loads. Smaller articles such as kitchen gear, shotguns, and large live traps that would not fit into our standard boxes or swag bags were eagerly sought by the younger boys and girls. In all my experience in New Guinea no item of expedition gear has ever "gone bush". It is a joy to live with such honesty, and a credit to the native men and women who became our friends. To the uninitiated the "lining" of carriers is a scene of confusion, but, with an experienced man in charge like MacGowan, the good-natured grabbing for the lightest loads soon resolves itself and the carriers break for the trail often chanting and shouting as they go.

Since it is very difficult to appraise the quality of camp sites when talking to people who are not naturalists, we decided to make our way towards the lower reaches of the Mongi River following trails connecting the established villages. The vicinity of each village is much too disturbed to be of any value to a collecting expedition, but we hoped to find a suitable site between villages. Our route from the rest house on the Pindiu ridge led south "across the grain" of the drainage system.

The carrier line left at 9:00 A.M. We still required about 20 additional men for two-man loads. The natives at Pindiu ^{HAD}~~have~~ reached the degree of sophistication where they were no longer interested in trade tobacco and newsprint as payment for services. Hard money, in this case, the silver shilling,

May-2

was now the accepted medium of exchange. Grierson and I left at 10:00 A.M. The trail immediately drops into a small stream bed at 840 meters. At 11:00 we neared the top of the ridge opposite 1,065 meters. The weather, which had threatened heavy rain early in the carry, now cleared, but the trails were still treacherous. A few minutes later we entered the small village of Pependangu with its well-swept red-earth foundation. From its ridge-top location one could see to the southwest the heavily-forested Rawlinson Range which fronts on the Huon Gulf. This range was later to be one of the prime objectives of the expedition and the virgin aspect of the terrain augered well for future collecting. After leaving the village and its garden plots the trail followed the contour to the west and then south to the crest of the second ridge south of Pindiu, and then led down the long ridge running south-east to the Mongi River. While still some distance from the Mongi the trail turned south again and dropped sharply into the bed of a beautiful rushing stream called the Masba at 580 meters. We arrived here at 12:30 P.M. About an hour after crossing the Masba we came to one of the main tributaries of the Mongi, the Kua^{AT} 440 meters, which drains a large mountain-encircled valley in the heart of the Huon Peninsula. Having passed through what appeared to be largely undisturbed forest between the Masba and the Kua, I recalled the carriers, who were waiting at the Kua crossing, and we retraced our steps to a small but level stretch of forest just south of the Masba Creek crossing and high above the Mongi to the east. Here we made camp at an elevation of 610 meters.

The Masba Creek camp was in operation from May 3 until May 23. At the Masba we were introduced to a practical way of supplying the camp with water. Seven to eight foot sections of bamboo four to six inches in diameter were

May-3

cut, and the septum at each joint pierced. Carrying water is usually woman's work but here both sexes joined in.

Clearing the camp area, digging latrines, cutting trails in the dense forest for jacking, and building tables and benches (with thin saplings and bush string) usually occupies the first full day in camp. Personnel were continually on the lookout, however, for frogs, lizards, insects, and mammals disturbed during the clearing operations. In fact, one short-legged lizard, found under the wet leaves, may turn out to be a new genus allied to Sphenomorphus. This and later finds point up the importance of close observation when any fresh ground is broken in New Guinea forests.

The rigorous routine of a collecting camp quickly took over. We were at the upper limit of rain forest at an elevation of about 2,000 feet (610 meters). On the first night of jacklighting Grierson shot a tube-nosed bat (Nyctimene). This female, which appeared to be nursing, was only stunned and remained very much alive. Returning to the same area the next night Grierson heard a low squeaking, and after a careful search found a two-thirds grown Nyctimene on a low branch. The female had without doubt become separated from the baby the night before as a result of the shooting. When presented to the female in camp the young was readily accepted and began suckling immediately.

The return carry to Pindiu was carried out successfully on May 23. The period from May 24th to 29th was spent reorganizing our gear for the trip to Rawlinson Range. MacGowan flew to Lae to replenish our food supplies. Hoogland took this opportunity to collect a Pandanus and a number of palms. On May 25th, Grierson and I investigated a local limestone cave located about three miles north of Pindiu and one-quarter of a

May-4

mile north of the junction of the west-flowing Foria River with the Mongi River at an elevation of about 1,900 feet (meters). Masses of flowstone a few feet inside the entrance, out of which flowed a small stream, prevented any exploration of Buma Cave, but we mist-netted the entrance and at dusk we captured 18 Hipposideros. A call for carriers to assemble on May 30 went out during this period. The carry from Pindiu to the village of Zengaren on the northern slopes of Mt. Rawlinson, was a difficult one. May 30 saw us "break" (cross) the Kua River at an elevation of about 1,550 feet. We then passed through the ^{LUTHERAN} Mission Station ^{WITH ITS AIRSTRIP (ONE OF FOUR ON THE} ~~at~~ Mindik [^] and spent the night at the village of Tumnam where we collected frogs. At Mindik we were cordially received by Mr. and Mrs. Werner Jacobsen, German Lutheran missionaries, who told us about a small natural history museum with New Guinea specimens at the Lutheran Training Center in Neuendettelsau, Germany. May 31, a Sunday, turned into a day of rest and a night of frog collecting at ^M Tunang [^] because the carriers preferred not to work.

HUON PENINSULA)

JUNE

On June 1 we traversed the uplands between the Kua and Bulum Rivers. This was an easier carry than the first day because it involved only modest dips and climbs out of creek beds of less than 1,000 feet. We encountered our first beech tree (Nothofagus sp.) at an elevation of 4,650 feet as we approached the divide between the rivers at 4,900 feet. Noon found us in Ogeramnang. Near here in 1929 Ernst Mayr, who was to become one of the world's leading ornithologists, collected a peculiar long-footed rodent that became the type of Leptomys ernstmayri. Later in the month we were to collect a fine series of topotypes of this hydromyine. We spent the night at Selimbing ~~at~~ (4,850 ft) after passing through the villages of Kemai and Semketa. June 2 saw us "break" the Bulum ~~at~~ (2,500 feet), a roaring mountain torrent with its headwaters in the distant Saruwaged Range. We passed near the village of Maran (3,200 ft.) on the way to the log bridge crossing. The rough slippery trail now led up the forest covered slopes of the Rawlinson Range. Here and there we found natives clearing the primary forests for gardens. At 3,100 ft. we saw our first Rhododendron sp. We passed through the old village of Zengaren at 3,800 ft., and the six hour carry ended at Zengaren #2, ~~perched high~~ on the north slope of Mt. Rawlinson at 4,500 feet. Gaytson, the village counselor, whom I had met at a gathering of counselors chaired by the District Officer, Des Ashton, in Pindiu, promised to show us a good camp site near water the next morning. The village was perched high above the Bulum River with a dramatic view northwest to the Saruwaged Range and northeast towards the Cromwell Mountains, our two next objectives of the trip. We spent the evening trading for trophy

SAM = PANDANUS FRUIT

June-2

skulls and sing-sing artifacts made with cassowary feathers. We began to realize how important the cassowary (^{quela}) was in the lives of these people on the Rawlinson Range. Two useful tools are made from cassowary long bones: sut from the femur, and dubat from the lower leg bone. We also bought arrows that were pointed with ^{THE} long sharp ^{CASSOWARY} toe-nail. ~~from the cassowary~~

On June 3 a morning's carry brought us to a lovely rushing stream ^{called GANG} on the east flank of Mt. Rawlinson. ~~called Gang~~. The Zengaren people helped us clear a camp-site about 100 feet above and east of the Gang which flowed and tumbled north to the Bulum River. Even as camp was being set up we found two Paranyctimene roosting in undergrowth six feet above the ground. We also noticed the men bringing in huge banana leaves from the forest for temporary shelters. Hoogland later traced these to their source and found a "tree" measuring 47 feet in height, and more than seven feet in basal circumference. Musa ^{FRUIT} ~~ingens~~ ^{bananas}, described only two years before this expedition, had small ^{FRUIT} ~~bananas~~ with large black seeds. We obtained our drinking water from a tiny stream called Mut on the ^{SOUTH} ~~perimeter~~ [^] of camp. We later trapped a young Hydromys here.

The Gang Creek Camp was the center of mammal collecting until July 5. On June 29, ^{LYN CRAVEN,} [^] Hoogland and a young assistant visiting from Canberra, transferred their botanical collecting from the Gang to a "Top Camp" on Mt. Rawlinson at 6,000 feet. Dr. Richard G. Zweifel and his assistant, Kip Sluder, arrived in camp on June 21 as guests of the Expedition; they collected herpetological specimens and made recordings of frog calls until June 30 when they left for Pindiu and eventually Lae. On June 18 MacGowan climbed to the summit area of Mt. Rawlinson (not the true summit as we learned later); his altimeter read

There are also some other things that are not mentioned in the report.

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June-3

7,390 feet (m.). On June 19 we were visited by people from the various small villages on the north slopes of Mt. Rawlinson. The "sing sing" lasted far into the night; Grierson and I were still recording the drum music at one in the morning. On June 30 a hunter brought us the first Zaglossus of the trip. Hoogland came down on July 1 from "Top Camp" to join Grierson and myself in a long picture-taking session.

1. The first of these is the fact that the
value of the dollar has fallen to a level
which is well below the level of 1913.
This has caused a general depression in
the value of all property, and has led to
the fact that the value of the dollar is
now only about one-half of what it was
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of what it was in 1913.

Winston

Kent Bond

JULY

HOOG-LAND'S

On July 2^x Van Deusen and Tobrum visited ~~the botanical~~ "Top Camp" and then climbed to the true summit of Mt. Rawlinson. Adzing, our guide from Zengaren, absolutely refused to continue beyond a certain point (possibly MacGowan's "tree summit"). Tobram and I pushed on through the "mossy forest", which had a sprinkling of small but colorful rhododendrons, until we reached a point when our altimeter read 7,450 feet (m.). The peak was tree covered and even though the day was fair and without clouds (a rare event) we could not see any distance through the trees.

On the walk to the summit we entered a large glade in the forest (elevation 6,950 feet) which Adzing called "place bilong muruk". Many cassowary droppings containing large fruit pits were concentrated ^{AT} ~~in~~ this spot. We left the summit at 2:30 P.M. (altimeter still reading 7,450 feet) and arrived back at the Gang at 5:30 P.M.

On July 5 this highly successful camp was broken and carriers from Zengaren and other villages carried our gear back to Zengaren #2, this time by a different route than the original carry. We passed through a number of new garden areas at an elevation of about 5,000 feet. On our July 2 climb we passed a small water hole at 6,500 feet; we were told that this was the last water (highest) on this limestone mountain. After settling in at the "house kiap" (~~every village has a house for visitor~~) one of our hunter friends brought me a large male tree-climber. July 6 was spent at Zengaren repacking our specimens and gear for the four day carry back to Pindiu. That evening the village counselor, Gaytson, was our host in his compound for a muruk feast set out on home-made tables. Vegetables from

July-2

the mountain gardens were far easier to chew and more palatable than the tough, greasy cassowary meat, but we did our best to show our appreciation by much smacking of lips. Then followed speeches in pidgin English and local dialect by the counselor, various luluais and tultuls, and finally a speech in pidgin by myself to thank these helpful people for their hospitality while we were on their mountain ~~called~~ Zebunung. And again, the hour-glass drums were alive until the early morning hours.

July 8 saw us break the Bulum River for the last time on our way to Maran, Selimbing, and finally Ogeramnang, where we spent July 9 as the guest of the native pastor in his home. MacGowan stayed behind at Zengaren No. 2 to await more carriers. Craven departed for Pindiu by way of Tobo with a guide. This was a day of great excitement. Two more Zaglossus were brought to us from the mountains further north near the upper Bulum River. While at Ogeramnang I wrote to Ernst Mayr to remind him of his collecting days ~~of~~ 35 years before. I decided to return to Pindiu by a different route, not only to get some idea of the broken country between the Bulum and the Kua Rivers but also to advise some of the villages to the north that we would need their help in carrying to the Cromwell Mountains. We passed through the village of Tobo, broke the Kua River, and climbed ~~up~~ to Yapang where we spent the night. Kim, our cook, stayed behind at Tobo to enlist more carriers, and arrived in Yapang after midnight. It rained in the morning and a number of humus frogs that were calling were collected for Zweifel.

July 11 and a five hour carry saw us back ~~at~~ our base camp at Pindiu. July 12, one of a number of fair days, saw us drying skins and packing collections to be flown back to Lae. Cadet Patrol Officer and ~~I~~ ^{STEPHEN GIBSON} celebrated our return by inviting us to dinner. On July 13 Hoogland flew to Lae with botanical and mammal specimens for storage. Our live Zaglossus were photographed

July-3

at length by Grierson. We supplied them with portions of a broken-open ant hill, but they paid no attention to these adults. July 14 saw MacGowan fly to Lae to renew our supplies; Hoogland returned to Pindiu. I spent part of the day skinning out a Zaglossus, a demanding task. On July 16 we saw Hoogland off for the Cromwell Mountains. More knock-down boxes were filled with dried mammal specimens, and I flew to Lae at 4:30 P.M. MacGowan showed us his motion picture films of the early part of the expedition that night at the Hotel Cecil. Zweifel was still in town taping frog calls in the Botanical Gardens. On July 17 I reported the expedition's ~~FUTURE~~ plans to the District Commissioner, Alan Timperley, and to the District Officer, Des Ashton, mailed film, pickled a Zaglossus, picked up an ammunition box of silver shillings (to pay carriers), photographed in the Gardens, and at night collected frogs and geckos. On July 18 I was offered a cuscus from the Finschhafen area of the Huon Peninsula by Dr. Brass' transport officer on the 1956 Archbold Expedition, Lionel Evenett. This was a stroke of good luck because the expedition had had no opportunity to collect in rain forest near sea level. I photographed Phalanger maculatus and Dendrolagus goodfellowi at the Evenett home. However, he would not allow me to make a specimen of his pet tree-climber! After working in the botany shed I had tea at the home of John and Mary Womersley, where I met my friend Harold Brookfield from the Australian National University in Canberra. Zweifel and Sluder left by air for Wau in the Eastern Highlands District to continue collecting. The new herbarium was taking shape in the Botanical Gardens; the structural steel for the roof was now in place. Laurie Crowley flew MacGowan, Grierson and myself to Pindiu on July 20. Packing for the long carry to the Cromwell Mountains occupied July 21. I finished

July-4

making up the Zaglossus study skin. R.D.M. Cleland, the son of the Administrator, Sir Donald Cleland, was at the Patrol Officer's home for a visit, and showed great interest in the work of the Expedition.

In spite of a shortage of carriers at Pindiu, Grierson and I left on July 22 for the village of Berakwaiyu at 9:30 A.M. ~~where we arrived~~ ^{AND} in the rain at 2:30 P.M. (elevation 4,900 feet). A second day of

carrying took us to Yapang (elevation 3,050 feet) where we stayed on July 23 waiting for MacGowan and his carriers to ~~arrive~~ ^{CATCH UP}; MacGowan came in with the cargo at 3:00 P.M. Bat shooting was good at dusk. On

July 25 we had a surplus of carriers and we passed through the village of Nengi and arrived at Lalang (elevation 4,500 feet) before noon.

July 26, Sunday and heavy rain, ^{WERE} a combination ^{THAT} ~~which~~ discouraged carriers from leaving their villages. July 27 saw us with enough carriers to

reach Podzerong, and finally Avenggu (elevation 5,300 feet) at 1:30 P.M.

For several days we had been following the height of ground far above

the Kua River making for its steep northern head wall. Avenggu was the

jumping off point for the broad divide between the Kua River and the

upper reaches of the Mongi River. Heavy rain kept us in Avenggu July 28,

but on July 29, even though there was light rain, the carriers left at

8:00 A.M. for the longest and most difficult carry of the expedition. The

track was often root-covered and slippery as it climbed to the height of

land at 8,300 feet. However, there was much of interest to distract us

from our footing. We passed our first Rhododendron mac at

5,200 feet. All the way from 5,400 feet in kunai grass to 7,000 feet the

rain encouraged the humus frogs () to call almost

continuously. We collected as many as we could during our rest stops, never

July-5

suspecting that these would be almost the last of this species that we would encounter during the expedition. In fact, after reaching Mongi River drainage we never heard another of these curious little frogs with their ventriloqual piping calls. Hoogland's camp, which came to be known in my notes as the "Plains of Ulur Camp" came into sight at 4:00 P.M. The carriers set up camp just within the fringe of the tall forest and bedded down in bark shelters for the night. Hoogland had set up camp on a high rise of ground in the grassland just outside the edge of the forest, and about 100 yards above and to the west of where the Mongi River emerged from the forest. The view to the north to the beautiful forest covered ridge of the Cromwell Mountains was a striking and never to be forgotten sight. The elevation at our camp site was 7,800 feet (m.).

AUGUST

The Plains of Ulur Camp, or Mannasat, the native name for the locality, was to be one of the most pleasant and interesting "homes" I had ever had in New Guinea. We remained here until August 31. Mist nets, museum specials, Victor rat traps, 4 Hav-a-Heart live traps, steel traps of two sizes, snares, and ground pits were soon in action. We were again fortunate to have several hunters with their dogs to assist us from time to time. We also set up a bowl-shaped reflector lined with aluminum ^{Foil}~~paper~~ on a tripod, and put a Coleman kerosene pressure lamp in the center of the reflector. This threw up a beam of light that attracted moths which in turn attracted bats. As they flickered through the narrow cone ^{OF LIGHT}~~we~~ attempted to shoot them on the wing. MacGowan, who had been a champion rifleman in Port Moresby, became our most successful wing-shot at this camp.

There is a mystery about the name Ulur. One of the high peaks on the Cromwell Ridge is plainly marked "Mt. Ulur" ^{ON}~~^~~ But ~~the~~ natives from Indagen who own the Ridge, and our carriers from Avenggu had never heard of the name "Ulur". They had their own names for the several peaks: from east to west, Samiang, Kwarakambuk, and Upusenga (the highest). On August 11 MacGowan and Tobram set up a climbing camp at the southern edge of the Cromwell Ridge, and early on August 12 they climbed Kwarakambuk and then Samiang (Mt. Ulur?). The altimeter on top of the latter ^{PEAK}~~^~~ read 9,370 feet (2,857 m.). The summit of the ridge was almost a razor-edge in places, and they were forced to cut trail through the dense "mossy forest". From the peak they could see out through the moss-covered branches, and looked across the ^{COVERED "PLAINS OF ULUR"}~~Kunai-plain~~ to our camp five miles to the south. On August 19 Grierson, Tobram, Edewawa (one of Hoogland's "flower-flower boys"), and I climbed Kwarakambuk and "Mt. Ulur" (altimeter 9,400 feet). On the way to the Ridge we flushed two beautiful

ADD
MAP
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+ No.

August-2

grass owls (Tyto longimembris papuensis). We also passed a fair-sized stream that suddenly dropped with a roar into a sink hole in the limestone based plain and thundered away under our feet. The crest of the Ridge

GRACEFUL AND

was crowded with the stems of a ~~lovely~~ delicate species of tree fern.

ADDED A SPLASH OF COLOR TO

The red petals of a climbing Rhododendron sp. ~~littered~~ the trail to Mt.

Samiang. MacGowan set up a base camp on August 19 preparatory to climbing

Mt. Upusenga on the 20th.

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SEPTEMBER

The carry from Indagen (6,000 feet) to Iloko (5,500 feet) was made in six hours on September 1, a fair hot day that was relieved only by a swim in the cold waters of the Kwama River which takes its source in the high Saruwaged Mountains. We crossed the grain of the country, passing through a number of small villages. Nearly all the land was under cultivation or had been cut over in recent years. At Iloko we traded for artifacts **AND TROPHY SKULLS** and lined up carriers for the final carry to Kabwum on September 2. During **(THE FIRST WE HAD SEEN SINCE LEAVING THE KUA)** this six hour journey we had the good fortune to collect a humus frog on a mountainside (5,800 feet) just south of the village of Indum. Kabwum (5,000 feet) was reached at 1:30 P.M. and we were promptly invited for drinks by Patrol Officer Tony Heriot and Mrs. Heriot. We wirelessly contacted Crowley Airways to pick us up the following day, but we were to be held in Kabwum for six days by bad weather either in Lae or Kabwum. Each morning would see us packed and waiting on the airstrip, which slants ~~down~~ from south to north at an angle of 15°. A cliff partially blocks airspace a few hundred feet beyond the north end of the strip. Every mountain landing field has its own personality in New Guinea! However, prangs are few and far between. The Department of Civil Aviation has strict rules, and New Guinea boasts some of the finest bush pilots in the world. The long delay was not without profit. What is probably the largest one-locality collection of spiders in New Guinea was the result. **WE WERE** ~~was~~ enthusiastically aided in the collecting by Lionel Tilley, the young Agricultural Officer stationed at Kabwum. Finally on September 8 the single engine Otter arrived, and, after all the expedition gear and personnel were carefully weighed (load limits were strict) we left for Finschhafen. We followed the course of the Kwama River to the north coast at Vincke Point, passing over large areas of forested hills, and then

1. The first (and most important) question is: what is the purpose of the study?

2. The second question is: what are the research objectives?

3. The third question is: what are the research questions?

4. The fourth question is: what are the hypotheses?

5. The fifth question is: what are the methods?

6. The sixth question is: what are the results?

7. The seventh question is: what are the conclusions?

8. The eighth question is: what are the implications?

9. The ninth question is: what are the limitations?

10. The tenth question is: what are the future directions?

11. The eleventh question is: what are the ethical considerations?

12. The twelfth question is: what are the practical considerations?

13. The thirteenth question is: what are the theoretical considerations?

14. The fourteenth question is: what are the methodological considerations?

15. The fifteenth question is: what are the statistical considerations?

16. The sixteenth question is: what are the interpretive considerations?

17. The seventeenth question is: what are the reporting considerations?

18. The eighteenth question is: what are the dissemination considerations?

19. The nineteenth question is: what are the evaluation considerations?

20. The twentieth question is: what are the funding considerations?

21. The twenty-first question is: what are the management considerations?

22. The twenty-second question is: what are the communication considerations?

23. The twenty-third question is: what are the policy considerations?

24. The twenty-fourth question is: what are the legal considerations?

25. The twenty-fifth question is: what are the social considerations?

26. The twenty-sixth question is: what are the cultural considerations?

27. The twenty-seventh question is: what are the environmental considerations?

28. The twenty-eighth question is: what are the technological considerations?

29. The twenty-ninth question is: what are the economic considerations?

September-2

turned east following the coastline to the grassy 10,000 foot airstrip at Finschhafen. In the 1920's, somewhere on this northeast coast of the Huon, Rollo Beck, the famous bird collector for the Whitney South Seas Expedition, landed and visited Sevia in the Cromwell Mountains. He collected birds and a few mammals. ^{At FINSCHHAFFEN} ~~Here~~ we met Brian Lee, who invited us to use a Civil Aviation house when we returned from Lae. We arrived in Lae at 2:00 P.M. after a 40 minute flight and saw our precious collections safely stored in the Botany shed.

We arranged to sail on September 11 on the small ship "Beringa" with Capt. Edward Foad, who was on his way to the Siassi Islands. Leaving at 10:15 P.M. we had a calm all-night trip through the Huon Gulf to Malasiga, arriving at 6:00 A.M. on the east coast of the Huon Peninsula, and then on to Dregerhafen at 8:00 A.M. We hired a battered Jeep and moved into our new "home" on the Civil Aviation grounds, a beautiful palm-studded spot on the shore of the Solomon Sea touched by the southeast trade winds. Bats were to be our constant companions for the next two weeks.

Bat collecting may be pursued anywhere up to 10,000 feet in New Guinea, but if one wants a variety of species he stays below 3,000 feet. This was our first opportunity during the expedition to collect near sea level. This was our prime reason for leaving the high Saruwageds to our botanist and ecologist friends (Hoogland and Costin) and taking the low road instead.

→ ^{DURING} it was an excellent decision as ~~the~~ events ~~of~~ the next two weeks proved. ^{ED} Much as I love the high alpine country on top of New Guinea ~~we~~ Grierson and I immediately asked everyone within reach if they knew of any bat caves. The Agricultural Officer had a native assistant who said he knew of a cave in the ridge that overlook^{ED} the airstrip. The cave was no myth. At five

September-3

hundred feet above sea level in ancient upraised coral we entered a stream-eroded winding tunnel with bats galore in various chambers. In the first high-ceilinged "room" we found Hipposideros diadema; it was too dark for Dobsonia, which like twilight chambers with plenty of flying room.

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THE FIRST FIGURE IN PARENTHESES INDICATES THE PERCENTAGE OF THE TOTAL AMOUNT OF THE BOND WHICH IS PAID IN ADVANCE.

THE SECOND FIGURE IN PARENTHESES INDICATES THE PERCENTAGE OF THE TOTAL AMOUNT OF THE BOND WHICH IS PAID IN ADVANCE.

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