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Best Travel Story
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Best Travel Story



No. 82 Sep-Oct 1990

Paradise is published bi-monthly
by Air Niugini, PO Box 7186,
Boroko, Papua New Guinea
(telephone 273415;
telex NE22225).

Welcome aboard,

Jean-Michael Cousteau witnessed during his recent visit to PNG the shark calling by fishermen in the waters off Tabar Island and observed the amazing orcas (killer whales) in the Wuvulu Island waters. These great mammals shake their prey of manta rays and sharks to pieces as they display their strength and power to the divers watching.

We join two National Art School students leading the new wave of contemporary PNG art, following the success of the first generation which achieved international acclaim.

Enjoy your flight.

Dieter Seefeld
General Manager & Chief Executive



Dieter Seefeld
General Manager &
Chief Executive

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Papua New Guinea — c/- The Editor,
Paradise Magazine, P.O. Box 7186,
Boroko.
Australia — Samuelson Talbot &
Partners Pty. Ltd.
236 Dorcas Street,
South Melbourne 3205.
Telephone Melbourne (03) 699 8677

Subscriptions

Annual subscription rates for six issues are : USA, Europe, UK and Africa Kina 23 (US\$28)
Australia, New Zealand, Asia and South Pacific K19 (US\$24, A\$25)
Papua New Guinea K13 payment by international bank draft.

Printed in Hong Kong by
Progressive Printing Agency.

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Cover: First photo taken of a the sensational new orchid hybrid, Dendrobium Aussie pink, a cross of Papua New Guinea's Dendrobium crutwellii and the Australian Dendrobium phalaenopsis.

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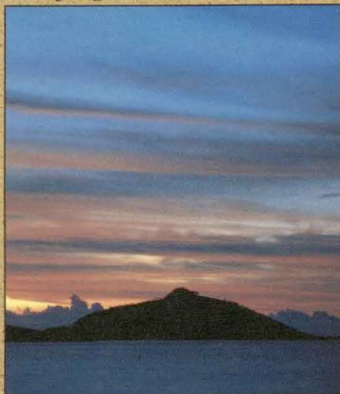
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VILLAGE AID POST

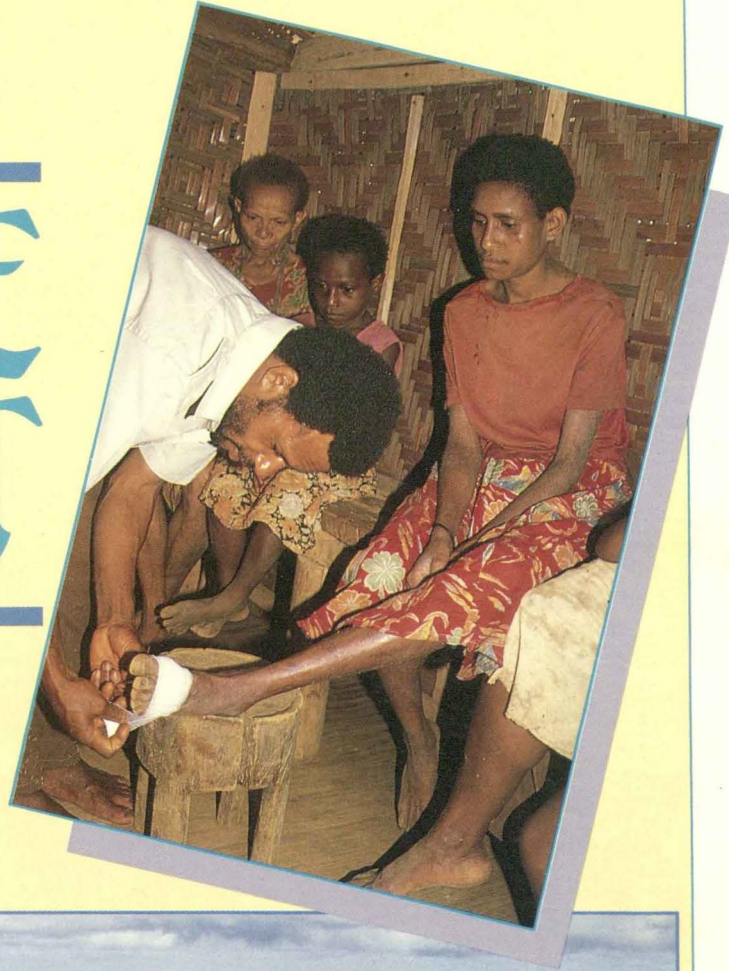
Story and photographs by Keith Briggs

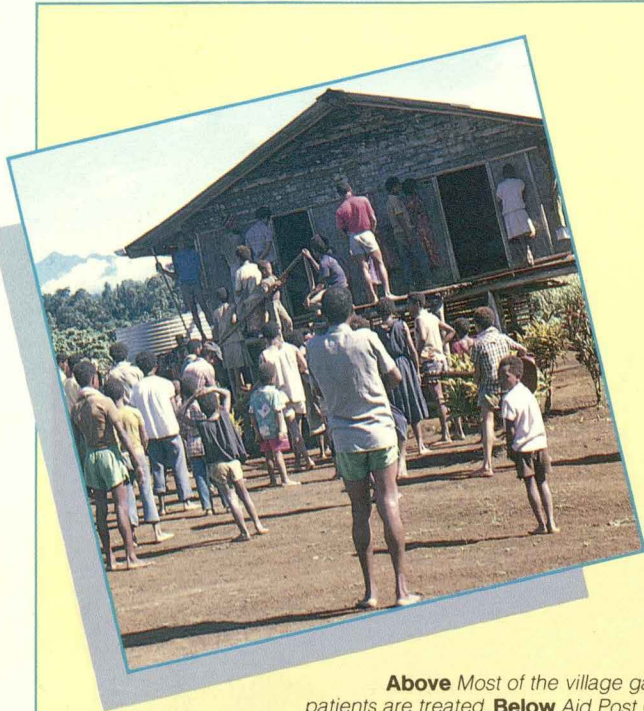
Can you imagine living in a village where there is not even one aspirin or sticking plaster, let alone treatment for malaria? How would you like to carry your sick child almost two days' walk (for a fit person) to the nearest medical centre, or stagger the distance yourself with a raging fever? In many remote places in Papua New Guinea that was once the norm. Musula on the flat, steamy lowlands where the borders of the Southern Highlands, Gulf and Western Provinces meet, used to be one such spot.

Top right Aid Post Orderly Libe Baribago and patient.

Right Musula village and its handmade airstrip.

Below Villagers built the house which doubles as an aid post.





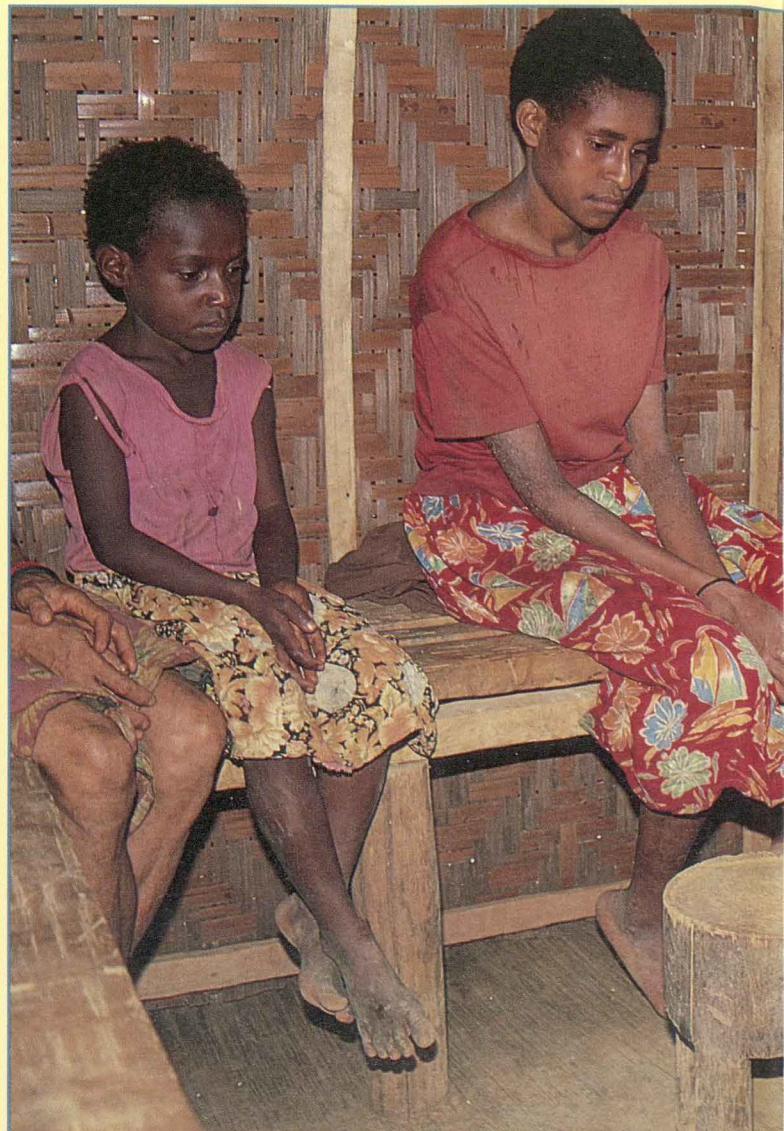
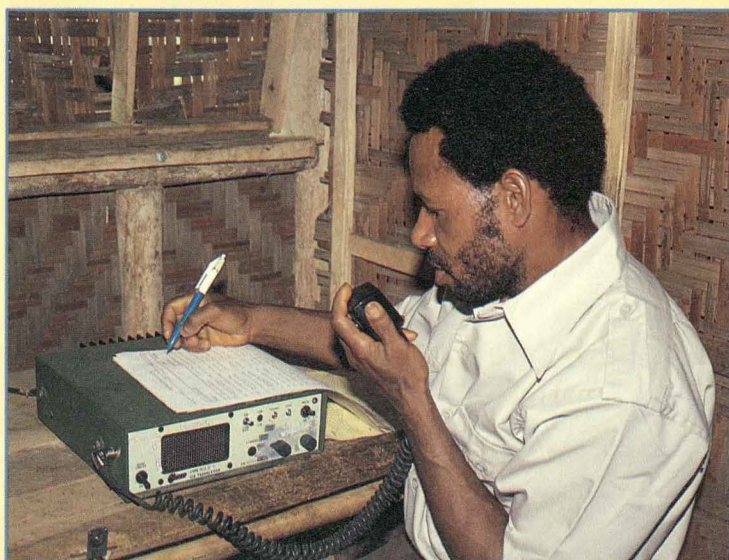
Above Most of the village gathers when patients are treated. **Below** Aid Post Orderly Libe Baribago mixes medicine and consults by radio with a doctor. **Centre and bottom right** Treatment is always a family affair. **Top right** Libe's wife Goma Baribago takes care of cooking and washing.

In 1981 a Gogodala pastor named Kela, his wife Nakela and children, trekked in to settle and minister at Musula. They had a few basic medicines but nothing to combat the venom of the death adder that one day bit Nakela. Her grave stands as a reminder of the price paid by her and many others, black and white, who have given their lives in the task of opening up isolated parts of PNG.

Soon after Nakela's death, the Musula people built an impressive airstrip using hand tools. Aided by missionaries and pastors of the Evangelical Church of Papua (ECP) and some Provincial Government funds, they purchased cone markers, a wind-sock and a radio transceiver to link them into the communication network of ECP. Gone was

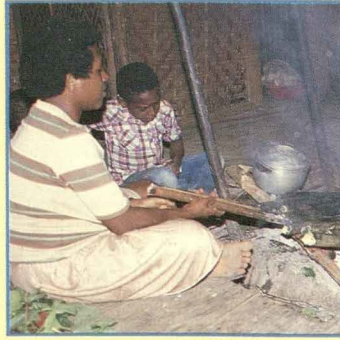
that sense of helplessness and isolation. Instead, a wonderful feeling reinforced by the coming and going of the yellow planes of Missionary Aviation Fellowship (MAF) bringing store goods for the budding entrepreneurs and taking sick people to the health centre at Wawoi Falls.

The next progressive step was to build a bush materials aid post and house for the Aid Post Orderly (APO). An APO was assigned to Musula by the ECP health agency. His medical supplies and pay are sent through the Balimo health centre 35 minutes flying away. As an encouragement to the Musula community, Government funds were provided to put an iron roof on the aid post and a tank alongside to catch the rainwater from it.

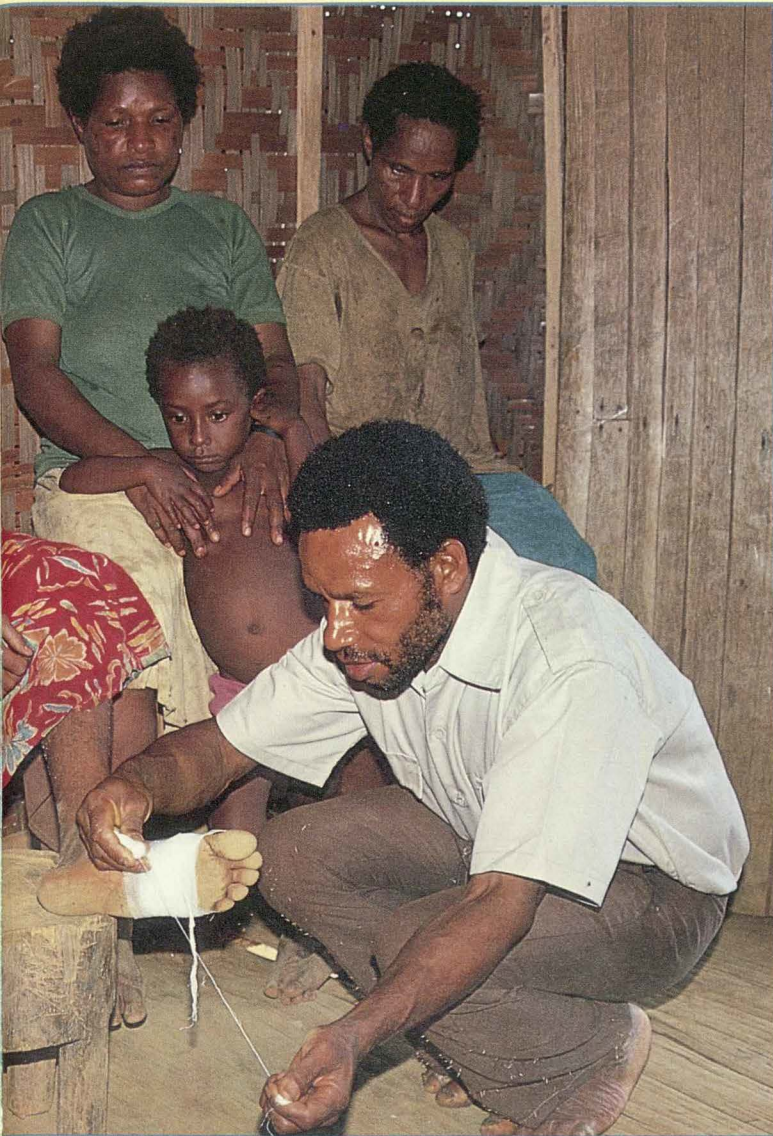
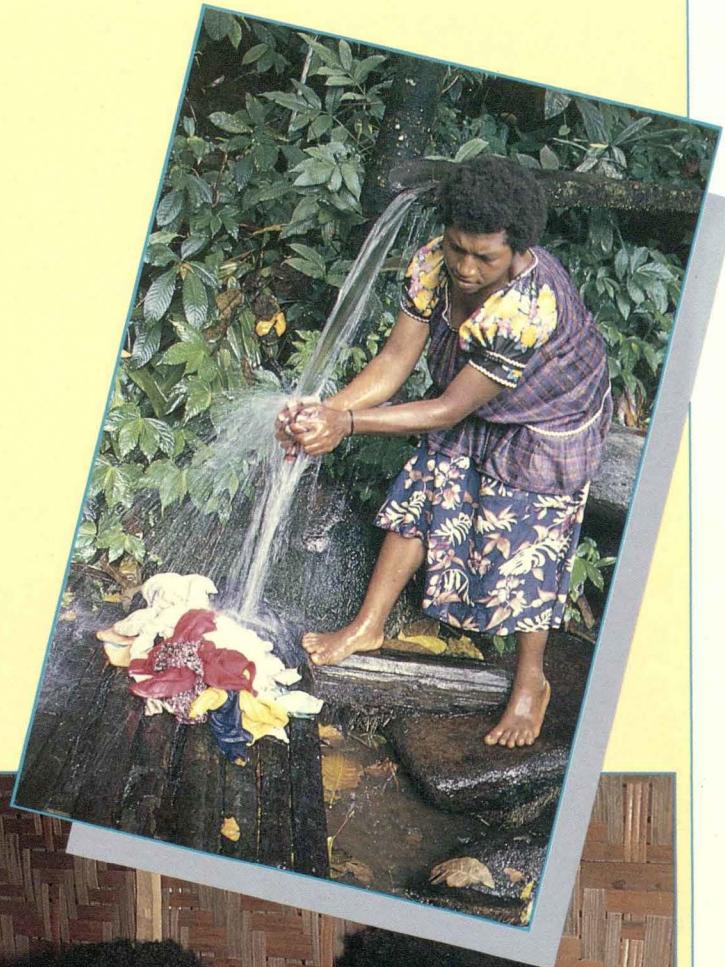


Mr Libe Baribago, a Huli man, is the APO currently looking after the medical needs of the Musula population, with his wife Goma. He was trained at the ECP Hospital at Rumginae, Western Province. Although Highlanders from near Komo, they are very much at home in the steamy climate of Musula, 230 metres above sea level. It is the community's responsibility to maintain Libe's house and the aid post. Libe and Goma have a Highlands garden behind their house and the local people are generous in giving them produce, bush fruit, coconuts, animals, birds or fish that they catch. It is a highland-lowland relationship that is working admirably.

Libe's bathroom is about 200 metres from the house down a



pleasant, shaded path along which half a dozen leeches will attach themselves to you as you come and go. Water is piped from a small rivulet along a black palm spout to serve as both shower and washing machine. In their home, food is cooked on an open fire in the centre of the living room. There are no mosquitoes in the house (and very few people) when that



sort of cooking appliance is turned up!

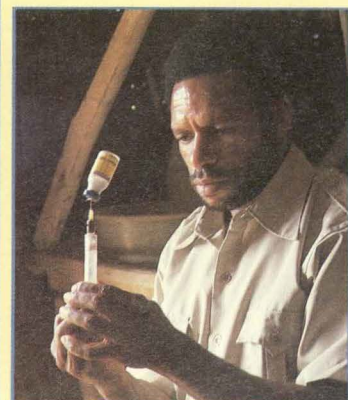
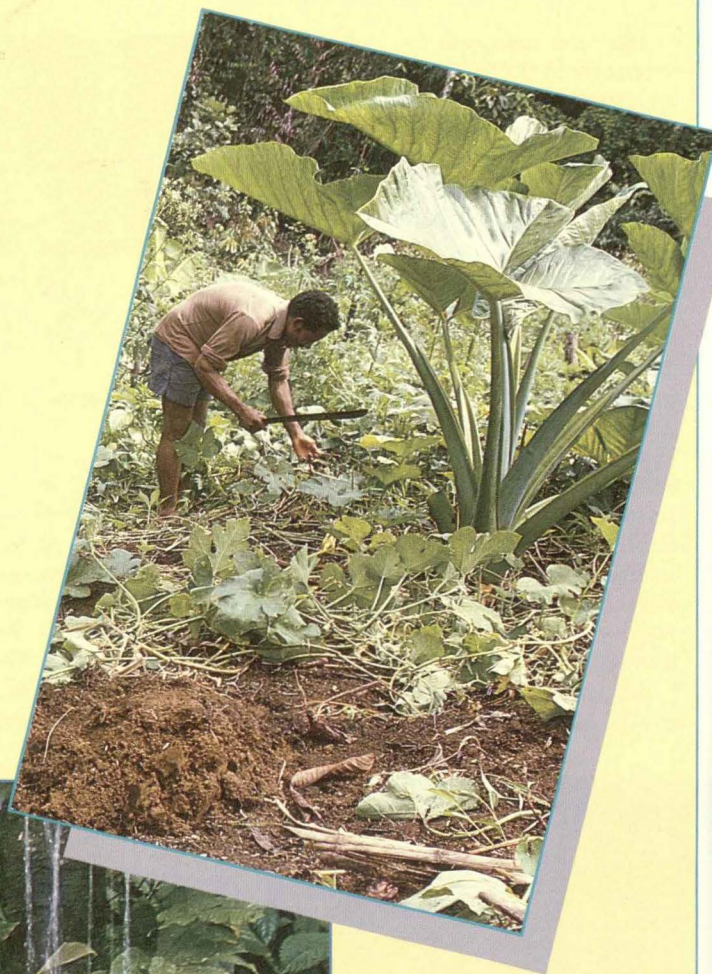
Although there are set hours for attending the aid post, Libe is on call seven days a week for emergencies or the sudden onset of malaria. If he has a patient whose condition warrants more expert help he can call the ECP doctor at Balimo on the regular midday medical schedule. Should the patient need treatment at a larger medical centre, the doctor will contact the Provincial Health Officer for permission to evacuate. The flight will be paid for by the Health Department. The MAF pilot can also be called on the same frequency on the transceiver and it is not long before the little yellow plane is bearing the patient to Balimo for expert and dedicated care.

People like Libe are the

foundation of the nation's health services. Without them, many folk would suffer and die in painful, hopeless isolation. Because of Libe and others like him most sicknesses are caught in the early stages and treated. There are countless Papua New Guineans today who owe their lives to the services of the village Aid Post Orderlies.

Top right Aid Post Orderly Libe Baribago gardening.

Below Scrubbing up. **Bottom right** Preparing an injection.



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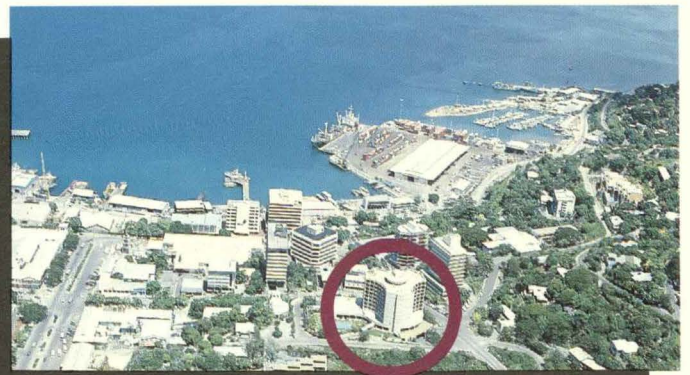
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THE ■ LATOURIA ■ ORCHIDS

Story By Andree Millar. Photographs by Andree Millar and Phillip Spence



Papua New Guinea is one of the richest orchid countries in the world, certainly with the greatest number of species and with some of the most beautiful.

Scientifically minded explorers who arrived in this area in the late 1870s and the 1880s discovered and described some of them, a very few of them. The greatest work was done by a German, Dr Rudolph Schlechter who, in the days when New Guinea was a German colony, worked as a botanist and travelled far and wide over the country. He made herbarium specimens of every plant he found but it is for the orchids that he won his undying fame. He collected thousands of specimens, wrote them up in his field book and carefully described them in German and botanical Latin. He drew them, catalogued them and placed them in their correct sections and so gave us the foundation of today's science of orchidology.

He made many wearying patrols and from his work he wrote a book 'Orchidaceae von Deutsche Neu Guinea' (Orchids of German New Guinea) which

Right *Dendrobium Andree Millar*, a hybrid bred from lowland and highland parents and named in honor of the author.

was published in Berlin in 1914. It was, and still is, the only complete and authentic record of the orchids of his day and the foundation of all that we have been able to do since. Other botanists were working in British Papua and Dutch New Guinea, but none did the momentous work of Rudolph Schlechter. Even before his book was translated by the Australian Orchid Foundation, it was the only reference we had to the validity and identification of what we had found. Schlechter's book is still the world's greatest orchid book.

In it, many of more than 10,000 plants he described were followed by the magic notation 'spp.nov' which means new species and I can imagine his joy at being the first botanist to see them. In recent years when we were working in the Highlands, where he did not penetrate, we found many more new species.



Title page The spectacular flower resulting from crossing the white *Dendrobium rigitifolium* with the rare white form of *Dendrobium bigibbum*. **This page, below** *Dendrobium Aussie green*, bred from a high-country *convolutum* and a hybrid, *Sandcay*.

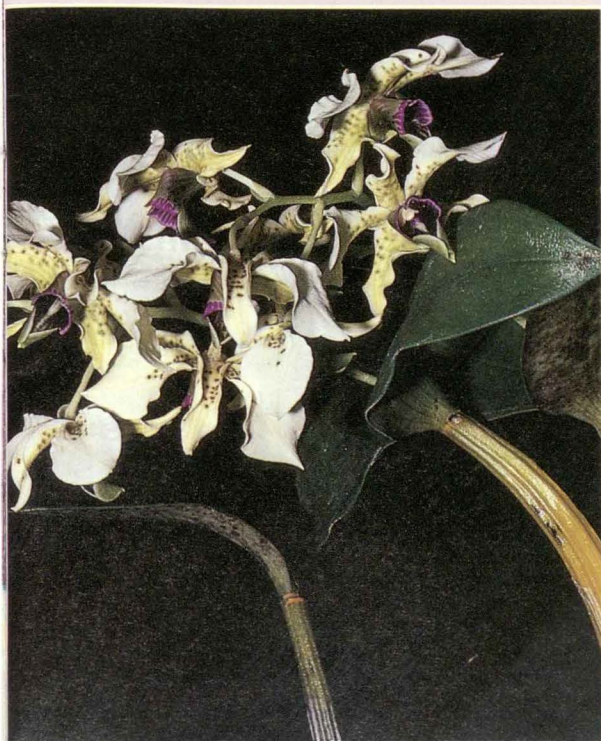
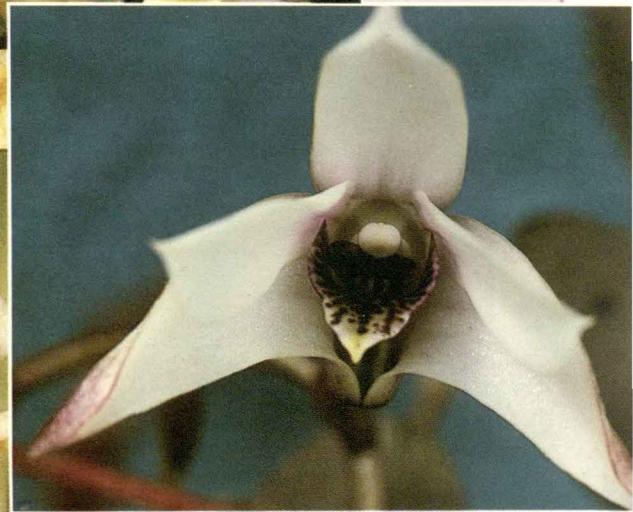
Others are still to be found as today's young botanists get into the remote mountains.

I think PNG's most beautiful orchids are those of the *Dendrobium*s which Schlechter divided into 41 different sections, according to their varying botanical and physical characteristics. One section now making a very great impact in the world of orchid breeding is the *Latourias*.

Schlechter described only 10 species in this section but more have been discovered, mostly in the misty Highlands. We now recognise more than 35 species, of which only a few have received the attention of the world growers and hybridisers. Research has shown us that they have a great future, as they are interfertile with other *Dendrobium* sections, such as *Phalaenanthe*, *Spatulata*, and *Nigro-hirsute*. One of our most spectacular *Dendrobium*s belongs to the *Spatulata* section, the famous Sepik Blue (*Dendrobium lasianthera*).

The first grower to really bring the *Latourias* into the horticultural world of beautiful hybrids and recognise their potential was a young man in a hurry called Phillip Spence. He is an Australian with engineering skills whose work brought him to PNG several times a year. A collector of Australian





orchids, he fell completely in love with the orchids of PNG, in particularly the Latouria Dendrobiums.

The Latourias are sturdy plants, some up to 60cm tall. One of the most beautiful is *Dendrobium atrovioleaceum*, discovered by the botanist Rolfe in his Papuan days. Hundreds of plants were collected and taken back to England in 1900 but they all died due to climatic problems and ignorance in dealing with a completely new form of plant. They are fragrant, heavy-textured and long-lasting, white with purple on the labellum and they hang their heads just a little.

Top Grotesque or beautiful, depending on one's viewpoint, the *Dendrobium spectabile* is certainly an eye catcher.

Top right One of the whitest orchids, *Dendrobium rigidifolium* is one of the few orchids Highlanders use for ceremonial decoration.

Left Discovered last century by the English botanist Rolfe on Samarai Island, *Dendrobium atrovioleaceum* is regarded as one of PNG's most beautiful orchids.



Above Mountain dweller, *Dendrobium convolutum*, with its magnificent purple labellum. Nectar feeding insects are smeared with pollen by the labellum.

Right Brightly spotted *Dendrobium tapinensis* is a striking and sturdy orchid.



quite beautiful, easy to grow and not temperamental.

Perhaps the most exciting development in the *Latouria* section came about with the use again of *Dendrobium convolutum*. Spence crossed this one with a completely different section of the *Dendrobiums*, the *Phalaenanthe*, of which we have only one in PNG, *Dendrobium williamsianum*. The plant he used was a hybrid *Dendrobium sandcay*, which is the result of years of breeding experiments using mostly *Phalaenanthe* crosses which included *Dendrobium bigibbum*.

This hybrid, and others being made today, are great achievements. They are the result of patient experiments with crossing cold growing orchids with tropical species and so adding the color and glamor of the orchids from tropical regions to the collections in the colder areas.

Another great PNG orchid in the *Latouria* section, making great steps forward in the world of horticultural research, is *Dendrobium macrophyllum*, which grows in the rainforests of this country from 600 to as high as 2000 metres. It has the endearing quality of adapting itself to growing in much warmer areas and lower altitudes.

This plant grows to 30cm tall, with three large leaves purple on the undersides, dark green above and very handsome. The inflorescence has up to 15 flowers, 5cm across, creamy-white with hairs on the undersides of the petals and the magnificent lip is greenish white with purple veins on the sides.

It was left to Spence to cross *Dendrobium macrophyllum* with *Dendrobium bigibbum* and the photo here (top, p. 15) shows the result. It is a beauty, glistening cerise, long-lasting and holds its head up. The cross has not yet been registered as it is among his newest results.

Spence acquired this orchid on his first visit to Lae, when he came over from Port Moresby to see the Botanic Gardens collection. He immediately recognised its horticultural possibilities. Later he acquired another *Latouria* *Dendrobium* from the mid-mountains above Finschaffien, *Dendrobium convolutum*, a widely opened species with beautifully creamy-white petals and a magnificent purple labellum. This he crossed with *Dendrobium atrovioleaceum*. It produced a lovely little hybrid which he called for me, *Dendrobium Andree Millar*. It has produced a happy sensation at orchid meetings, quite new,

Dendrobium crutwellii is a lovely little orchid in the Latouria section and was first found in one of the delightful incidents that happen on a patrol. We had been on a long and tiring trip up Mt Albert Edward and on the way down, tired and hot, the carriers said: 'we know a short cut'. We had been following the usual hunting tracks that seemed to go for miles, so I jumped at the idea of a short cut. We slithered down this impossible mountain-side and as I went I grabbed a little orchid growing low down on a branch and carried on.

Eventually it was given to Spence and later, when more plants were discovered, it was named *Dendrobium crutwellii* Reeve. It honors Tom Reeve,

long-time missionary and botanist who has now retired and is running the National Park in the Eastern Highlands. Spence made another historic cross, *Dendrobium crutwellii* with *Dendrobium bigibbum*, another step forward between the two *Dendrobium* sections and a step ahead in the marriage of the cold and the hot growing species.

The Latouria species of the *Dendrobium*s are one of PNG's greatest assets in the orchid world and the passport to fame among the hybridisers and producers of beautiful new plants.



Above Glistening cerise petals of an orchid yet to be registered, a cross of *Dendrobium macrophyllum* and *Dendrobium bigibbum*.

Left *Macrophyllum*, although found usually in rainforests between 600 and 2000 metres, adapts to warmer, lower altitudes.

Below *Crutwellii* Tom Reeve, discovered by the author and named for a missionary-botanist of PNG.



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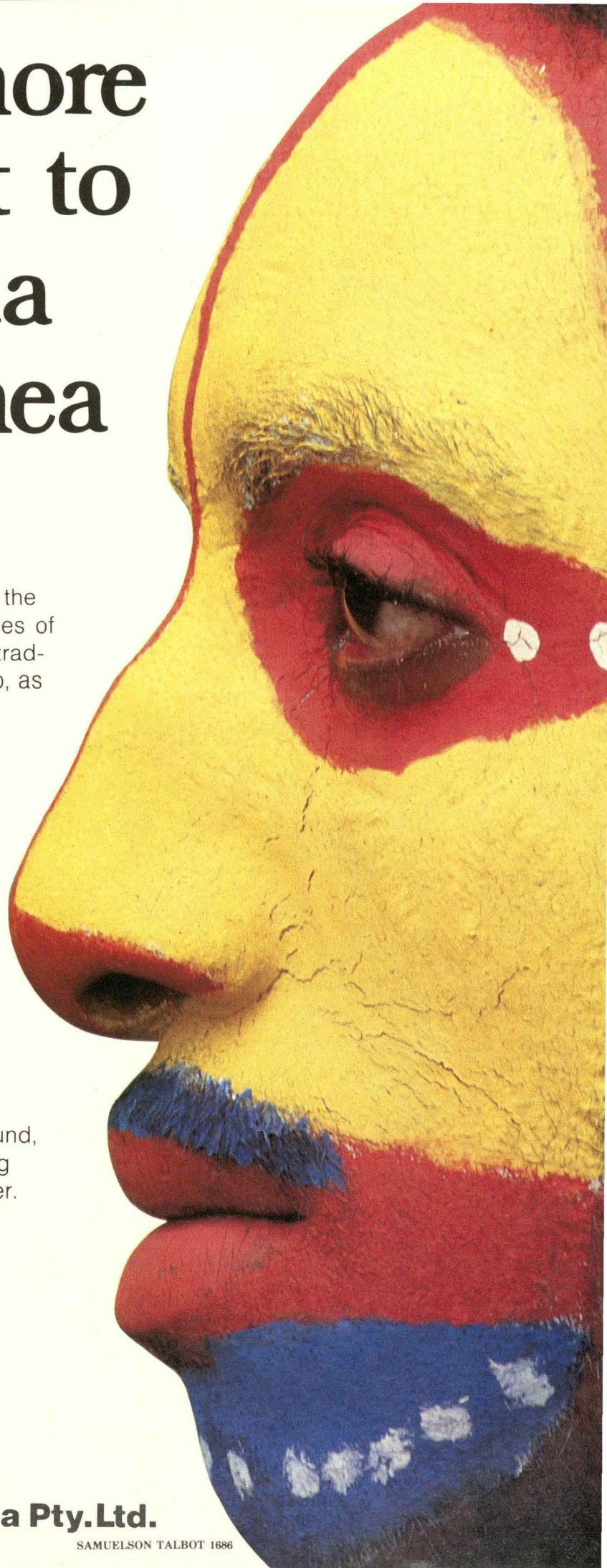
We sell explosives to break new ground, and adhesives, sealants and concreting products needed to hold things together.

All in all, there's a lot more holding ICI DULUX together than just paint. Rather like Papua New Guinea.

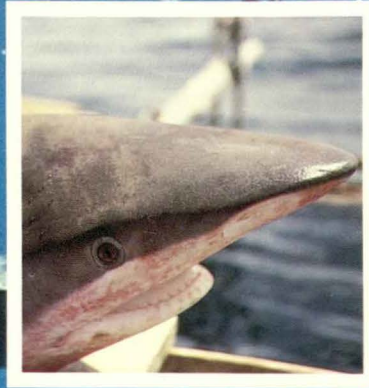


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Inset This shark answered 'the call' from a fisherman and became the day's catch.



As explorers who have travelled the planet during the last few decades, my father Jacques Cousteau and I, along with our teams, have come to appreciate the value of cultural practices which connect people to their environment. It has become clear to us that people whose traditions teach them to respect nature are more likely to protect and sustain natural resources than those who have lost their traditional customs. With this in mind, we set out to document on film people who traditionally 'call sharks'.

HARI calling

Story and photographs by
Jean-Michael Cousteau and
R.C. Murphy

Our first trip was to the Tabar Islands north of New Ireland, Papua New Guinea. A boat was hired and a search from coastal village to village began. After two days, we met an elderly man who assured us that he could call sharks. Further probing revealed that he had not performed the ritual in 20 years and it would take him at least a month for spiritual and physical preparations. During this conversation, we were surrounded by a crowd of curious young people and we asked the

old shark caller if he had a protege. He said that none of the young men were interested in learning the shark-calling ritual. We left saddened by what was probably the death of this tradition in the Tabar Islands.

Our quest next focused on the village of Kontu on the south side of New Ireland. With guidance from the Provincial Government, we had an audience

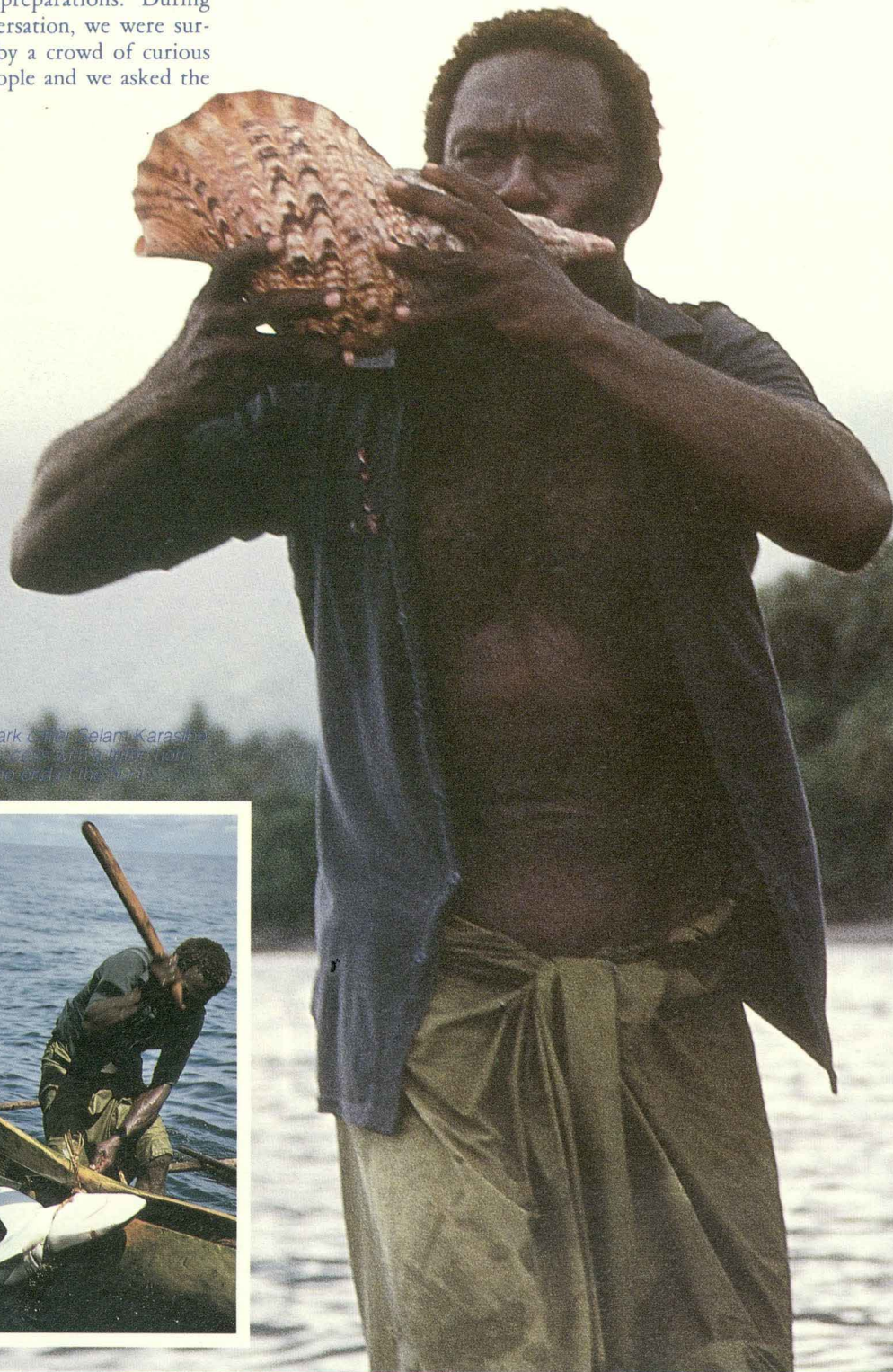
with the Council of Kontu and received permission to film shark caller Selam Karasibe at work, assisted by his protege, Randal.

The process began when Selam dragged his boat to the water's edge and equipped it with traditional rattles made from coconut shells, a spear, a triton shell horn, cigarettes and some coral stones. Out on the

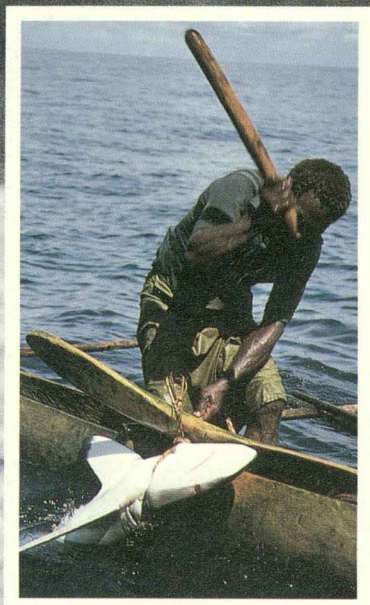
water, during a hot day, Selam observed various rituals by dropping the stones, shaking the rattles and chanting. No shark responded. For five frustrating days the process was repeated without result.

Our filming permit was about to expire and I decided that at the end of the seventh day, our ship Alcyone would have to leave Kontu so as to depart PNG on time. Just one hour before the scheduled departure, a shark appeared.

Depending on one's perspective, either the shark spirits responded to the calling or the acoustic sense of the shark directed it to the sounds of the rattles. Either way, the shark approached Selam's boat and began to circle. As it swam



Right Shark caller Selam Karasibe signals his call with the triton horn.
Below The end of the ritual.



closer, a small fish at the end of a stick was offered. The shark took the bait and made a second pass. Selam lowered a vine noose attached to a piece of wood carved in the shape of a propeller. The shark entered the 'lasso' and Selam gave a mighty pull.

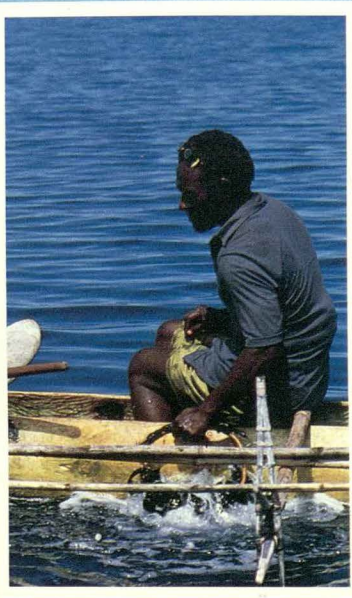
Then battle erupted! The shark struggled with all its might in its own medium of water while above, Selam struggled in the boat. The fight was neither short nor easy.

Above and below-water

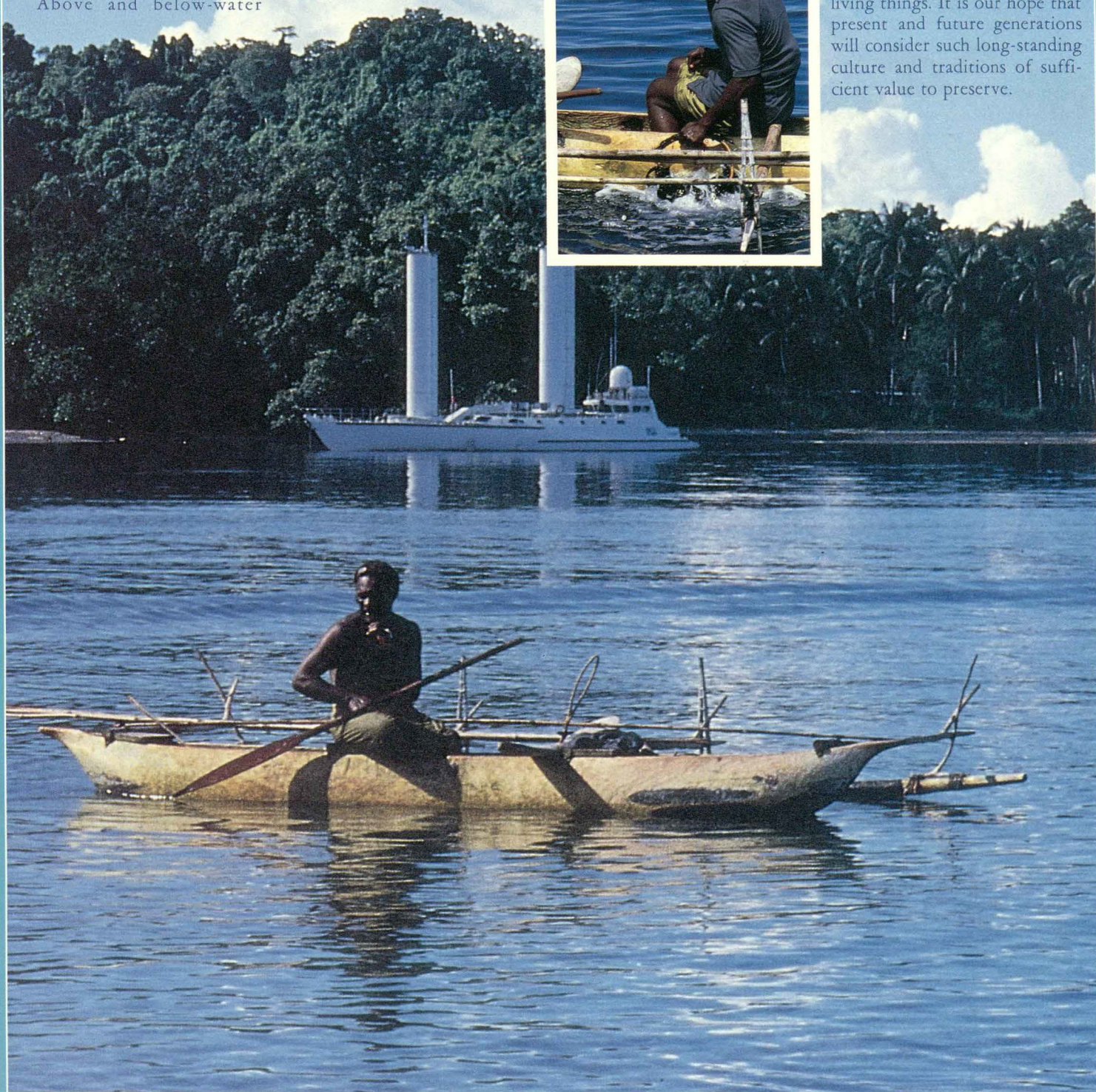
cinematographers, a still photographer and a sound man, after seven days of waiting, scrambled to capture the drama of the moment. Selam wrestled the shark, lifted it slightly above the water and began to club it into submission. Moments later the shark was hauled aboard. After a cigarette Selam used the triton to signal the village a few miles away that a shark had been called and captured.

This act affirmed the relation-

Below Shark caller Selam Karasibe and the Cousteau windship, *Alcyon*. **Inset** Coconut rattles are used in shark calling.



ship between shark spirit and shark caller since it is believed that the shark voluntarily submits to the caller according to his power. Through the shark caller, who is of a traditional lineage of callers, the entire community is reconnected to the shark spirits and to the natural world. From our perspective, this bonding between man and nature has significant long-term, ecological benefits by fostering respect for other living things. It is our hope that present and future generations will consider such long-standing culture and traditions of sufficient value to preserve.



I recently returned to Wuvulu Island after an absence of more than a decade. This time around, my aim was to film killer whales in clear water. Although we had filmed orcas elsewhere, conditions had always been difficult because the water visibility was limited or the whales were shy. Excerpts below from my personal journal tell what followed.

It is raining. We decide to explore a cave. In the vicinity of the cave three orcas appear, one a male.

As he approaches, I notice something strange about the shape of his mouth. I wonder if it is damaged or has been injured. We attempt to approach but the orca is not interested.

encounter with ORCAS

Story and Photographs by Jean-Michael Cousteau

Soon though, it passes by us and we are shocked! We are witnessing something probably never before seen by humans. We are in the middle of a hunt. The orca has a two-metre manta ray in its mouth!

We hang suspended in the blue, transfixed as the orca shakes its victim. Flesh is torn, pieces drift toward the depths,

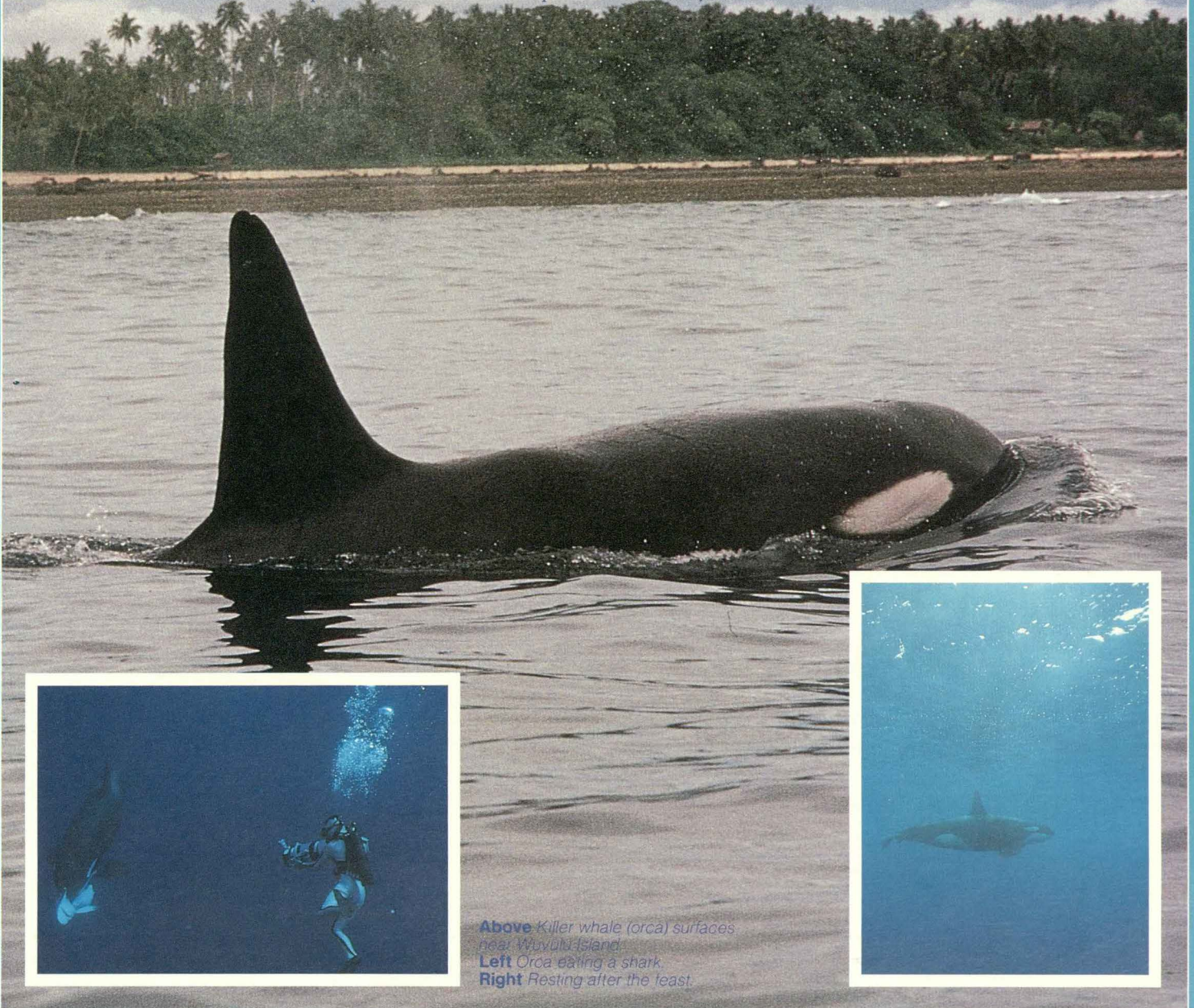
blood expands in a murky cloud. The carcass has great chunks missing and begins to sink. Suddenly the orca swoops down and retrieves its prey. The shaking begins again and eventually most of the manta is consumed. Bits and pieces drift off in the current to nourish others in the food web.

Next day, we follow the orcas

one-and-one half times around Wuvulu Island as we witness more remarkable events.

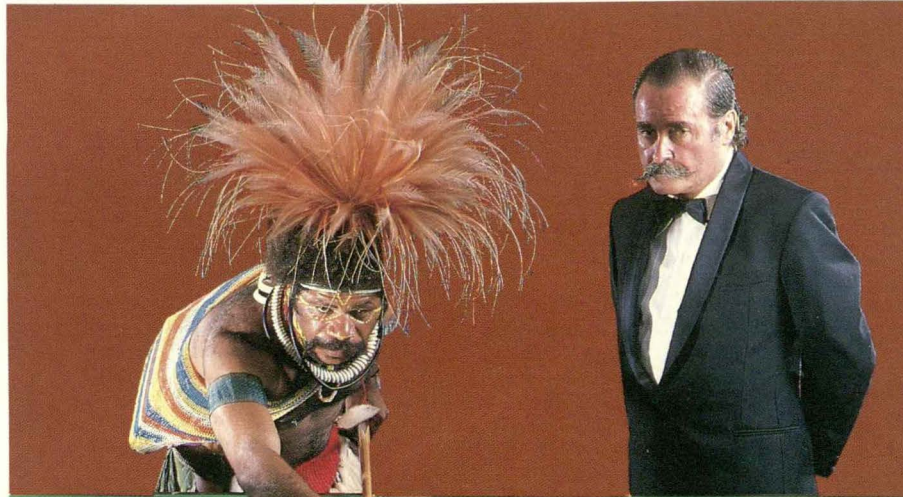
Around midday the orcas cease all swimming and hang, head down, suspended at about 45 degrees angle. They rise to the surface to breathe every few minutes. To us the impression is that of a siesta.

About an hour later the male descends out of sight, returns, and swims directly in front of us as if to show off what it is holding. A two-metre shark limply struggles in its grip. Moments later a female emerges from the depths also with a shark in her mouth. The orcas parade past, giving us the impression that they are showing off their catch.



Above Killer whale (orca) surfaces near Wuvulu Island.
Left Orca eating a shark.
Right Resting after the feast.

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art photographs by Liz Thompson



New Wave

ARTISTS

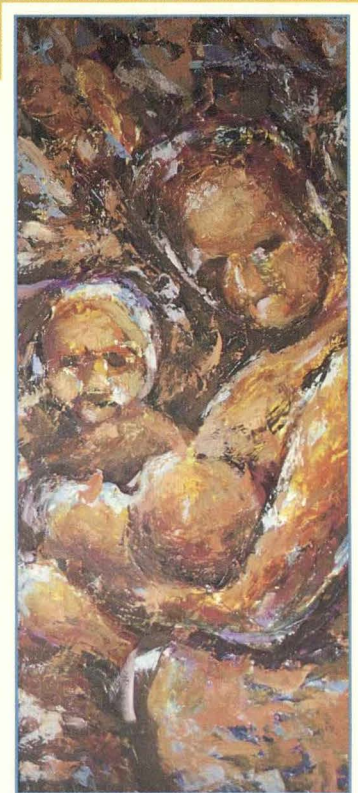


Above Untitled multi-media collage by Naup Waup.



In the painting studios of the National Art School, there is a huge, speckled snail, its round body made from a metal wheel rim. Long wire antennae protrude from its head, nuts and bolts from its neck, a mud guard forms its body. Close by, a smaller baby snail sits, splattered with Pollock-like blue and green streaks, absorbing the sunlight. This studio is shared by three third year art students, Naup Waup, Apa Tengere and Venantius Gadd. When I visited, Naup and Venantius were painting and took time to show me their work.

Naup, from Morobe, comes from a tradition of little carving but of great practice in body painting which he says initially interested him in painting. His work is often abstracted, executed in acrylics, and using paper collage as a form of preliminary drawing. His small studio is crowded with canvases and at first glance it is obvious his subject matter is predominantly traditional. Large masks peer from a haze of paint; women, heads bowed, carrying babies and bundles of wood, are almost lost in a sea of color.



"Most of my painting is usually about the mask, something to do with the spirits and so on," said Naup. "But sometimes I think about something which really saddens or worries me, usually women, the mothers who look after and carry babies, bear the burden of their husbands. These are the things I paint. I paint the figures of women and the things they do. In the years that I grew up I learnt about that, about women being given the workload all the time. I feel sort of sorry for them. When I go home I don't ask my mother to wash my clothes, I do it, I do the cooking too."

As he brings one painting after another into the sunlight many of them portray women, their grass skirts flecked with thick streaks of acrylic. One woman — depicted in thick orange pants with flecks of blue and white, impressionistic in spirit, as color forms light

Waup





Above Almost complete abstraction dominates paintings by Venantius Gadd.

Above Women's burdens feature in many paintings by Naup Waup.

Left Woman and her children, acrylic on canvas by Naup Waup.

and shadow — is hemmed into the frame by three small children. One she carries, one clings to her neck as it slides down her back, the other is in the background. Another collage made of scraps of newspaper and colored paper depicts a mother and child; another, women hunting with their children; another, a woman carrying a large bundle on her head.

While forms are obvious at a distance, the images are lost in the painting technique. On close viewing, the canvas becomes a mass of lines, equally attractive in close detail, widely abstracted. There is a contradiction between the frequently weighty feeling of the subject, women carrying their burdens, plodding through the day's routines and the wild, energetic, almost frenzied technique with paint seemingly splashed and squirted with an abandon that is fresh and invigorating. It is

this technique which, while depicting the women's activities also gives them a sense of spirit, a vitality. It somehow contradicts the subject matter and so suggests there is more to women than the arduous toil so often associated with them. There is an element of mystery in his paintings.

Naup won the 1988 painters award at the Papua New Guinea Arts and Crafts exhibition. He also took part in an exchange programme in 1988 which involved going to Australia for two weeks and working at a Queensland art college. He spent most of his time working with lithography which was, he said, "a new and challenging medium". Australian students' responses towards his work were very positive, he said. The National Art School encourages this kind of exchange. In 1989, two art students from Australia came to PNG while two more Papua

New Guinean students travelled to Australia. Outside of New Zealand, Australia and Hawaii it is the only art school in the Pacific region, which means that students from other Pacific Island countries quite frequently attend. As well as the inspiration derived from other Papua New Guineans from other provinces, there exists a cross-regional influence which Naup said was a great advantage.

Both Naup and Venantius attended the Art School's foundation course and then went on to cover the three-year fine art course. There are three major areas of study in the first year: painting, sculpting and print making. Subsidiary courses run through these, such as occasionally photography, depending upon who is available to teach. Each year the students drop one of the subjects so that in the third year they end up specialising in their chosen field. What ever they choose, all students work through an hour's drawing class early in the morning, something Carole Barnatt, the painting tutor, feels helps to develop a self discipline.



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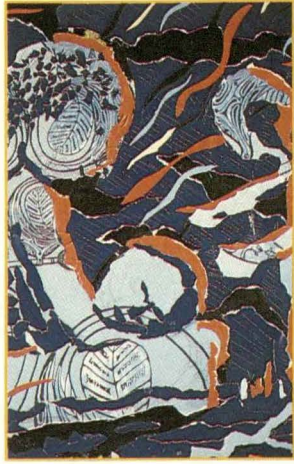


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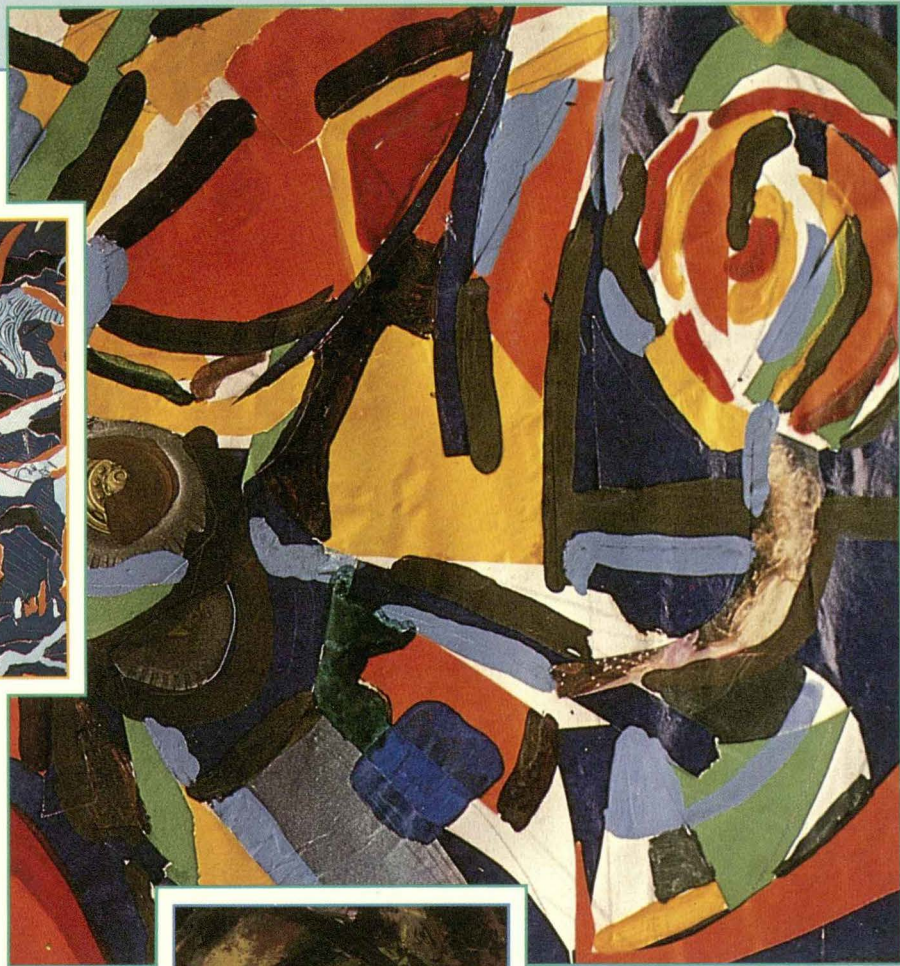
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Below Human forms surround the abstract unknown in this work by Venantius Gadd.

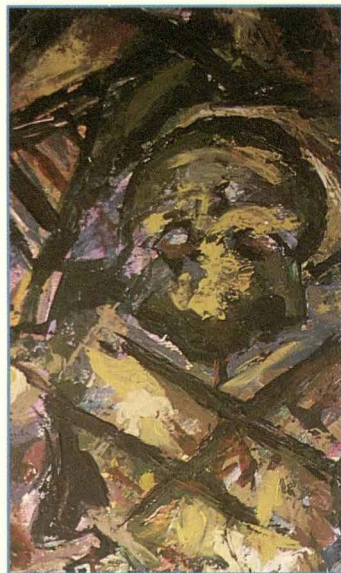




Above *Mother and children, a recurring theme by Naup Waup.*



Above *Untitled collage by Venantius Gadd. Left* *Detail from a work by Naup Waup.*



Venantius, is creator of the snail family and his work, he said, had changed quite dramatically in the three-year course. From depicting very realistic images he has moved into almost complete abstraction. Something he cites as a problem when trying to make a living from art. "Everyone wants realistic images," he said. "The more like a photograph the better. People look at my work and think a kid has done it. I feel people don't understand it." Working mostly with acrylics and mixed media he paints on large canvases. His paintings often have titles like 'Fear' and 'Escaping From A Monster' and depict strange faces and highly abstracted and patterned scenes. He often uses collage for preliminary drawing and sculpts with found objects. He said there was not a living to be made with painting in Papua New Guinea. Most artists have to supplement their income by

teaching, doing graphics, textile design or producing items seen to be more commercially viable.

Both artists seem to think this is the direction they will take. No doubt there would be a far larger market overseas for this kind of work but limited Art School funds make this a difficult project to pursue. Naup and Venantius are part of the contemporary art movement in PNG, an art

movement which depicts and reflects their society and the changes it is undergoing. The first generation of artists who became widely acclaimed, Jakupa, Akis, Ruke Fame and Kuage, received great support and enthusiasm, representing the beginning of a new art movement.

New, young artists who continue that tradition need continued support and enthusiasm. As the novelty element of contemporary PNG art wears off, this has to be maintained. There is a great deal more artistic talent yet to show itself, a great number of experiences yet to be described through the visual image. Naup and Venantius continue with the new tradition and their work suggests that contemporary art, as it appeared in the 1970s amid great fanfare, is a practice that will involve and develop in step with the evolution and development of the country.

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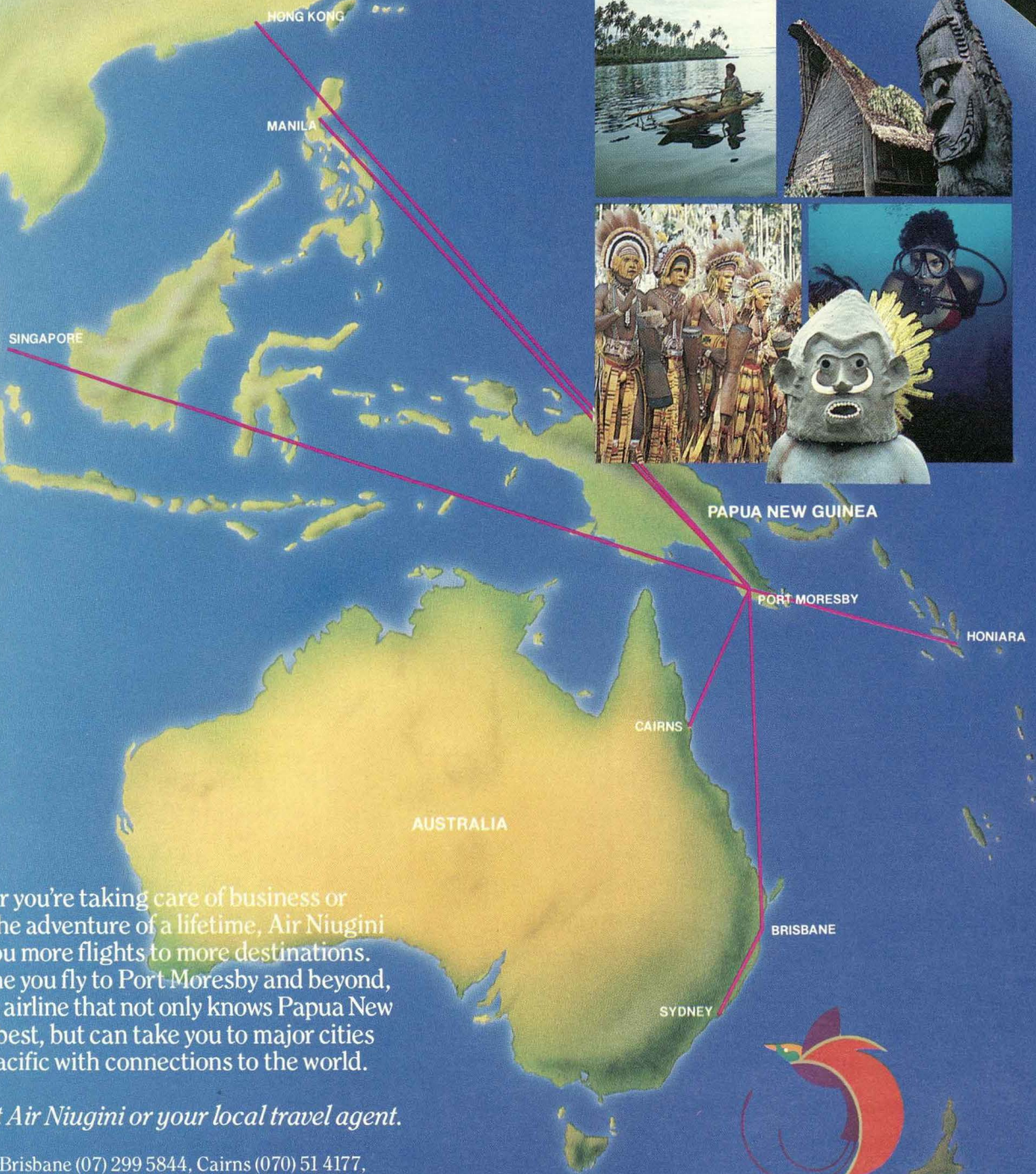
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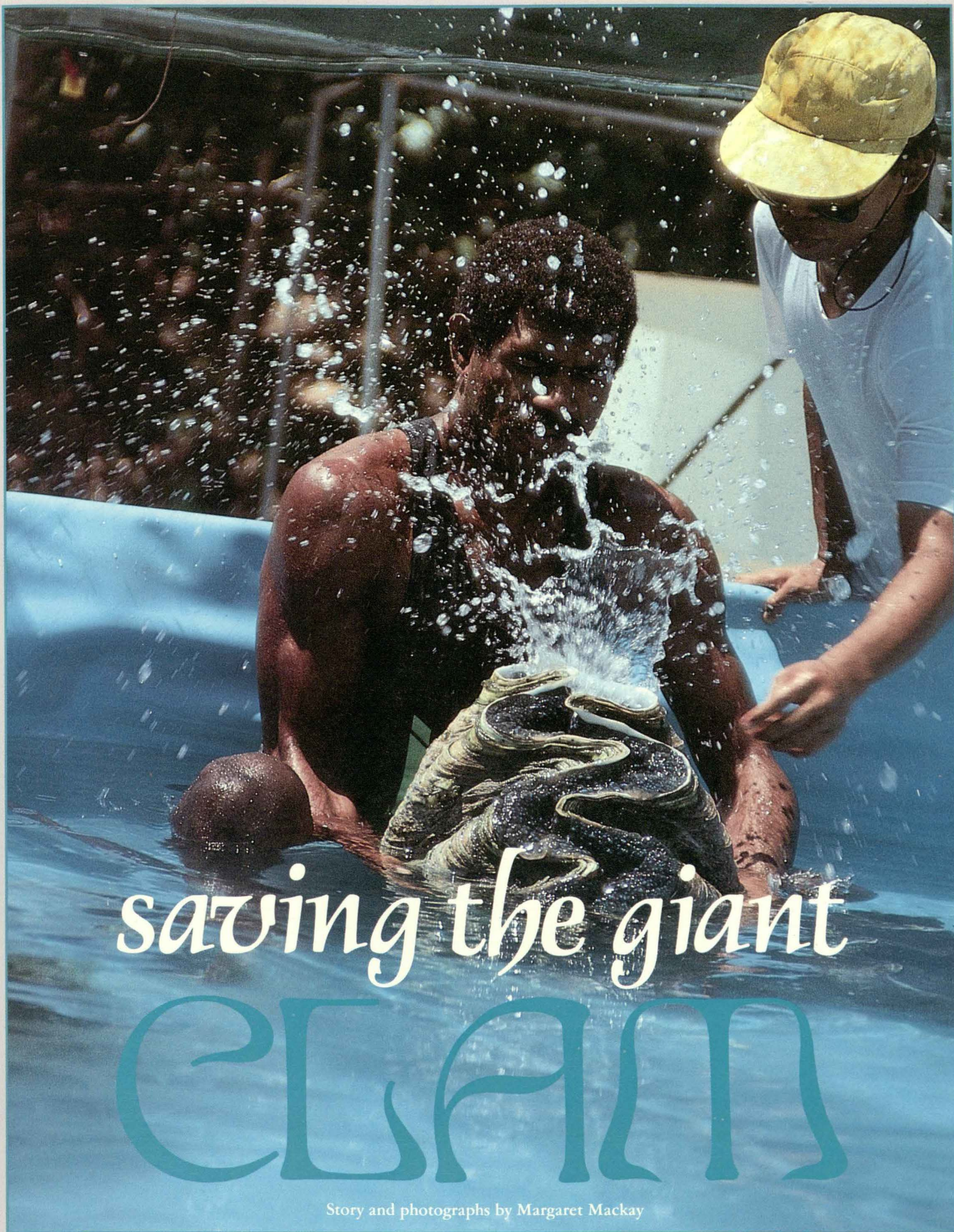
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saving the giant
CLAM

Story and photographs by Margaret Mackay

When we went to live in Papua New Guinea in 1964, some of the first places we went to see were Port Moresby's markets. Koki market is still a favorite spot to see the fishing canoes come in with their catches. In the sixties, as well as fresh fish, one could buy dangling white clam flesh on a loop of cane. Its flavor, delicate but delicious, made it a favorite and we little thought that we were helping to wipe out the clams.

Now the clams are scarce, not only in Port Moresby but in many Pacific countries. In some areas, they have been exterminated by over-collecting for markets. Many Indo-Pacific

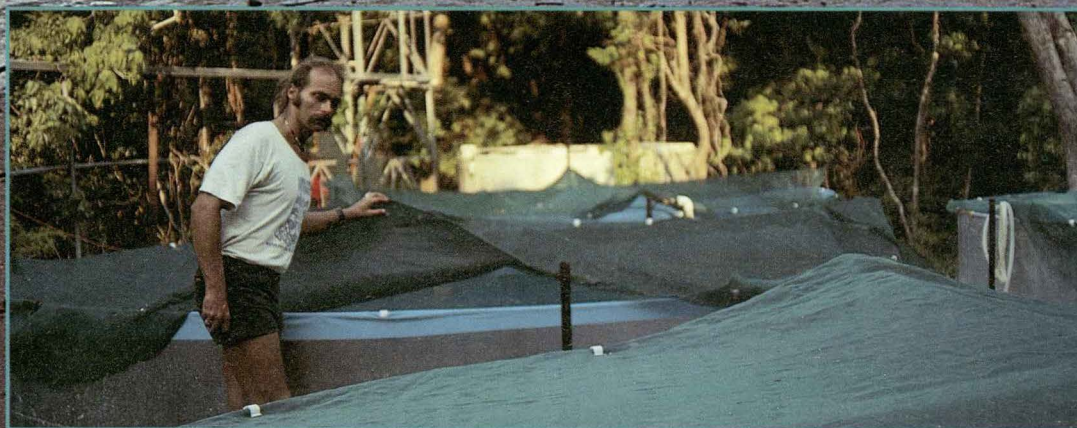
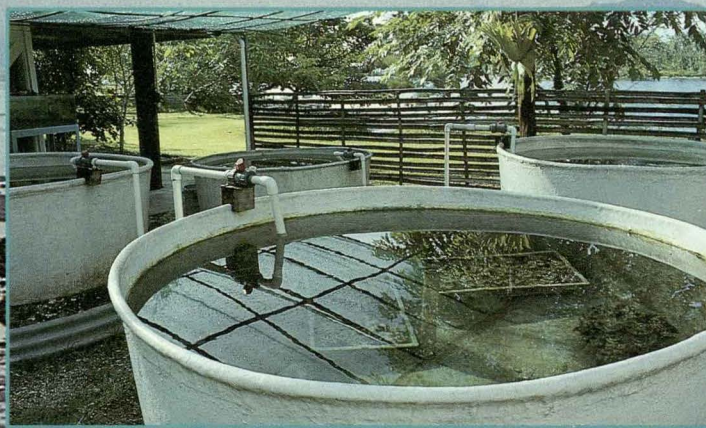
nations have started programs to breed and farm clams to restock their reefs and also to develop profitable export markets. A research centre in the Solomon Islands rears the giant clam; clams have been successfully husbanded at Motupore near Port Moresby and at the Christensen Research Institute at Madang and projects like these deserve every encouragement.

In 1984 Dr John Lucas of James Cook University in Queensland, Australia, headed an international giant clam project funded by the Australian Centre for International Agricultural Research (ACIAR). At that time, giant clam projects in the Philippines, Fiji and PNG

were included in the scheme. Work on rearing clams has been done also on Guadalcanal Island, Belau Island and on Lizard and Fitzroy Islands in Australia.

Five species of clam have been spawned at the James Cook University's Orpheus Island Research Station, north of Townsville.

I went to Orpheus Island recently to see the clam breeding project. Dr Richard Braley, who was in charge there, has been involved in working with clams since 1979. He had travelled round the Pacific Islands getting people involved in the project and helping to design or modify constructions for hatcheries. He was also talking about a course he was going to



Title page Students Sonny (Philippines) and Aisake (Fiji) are sprayed by giant clam protesting their touch.

This page, above right Clam research tanks, Madang.
Right Dr Richard Bradley, in charge of Orpheus Island clam breeding, and quarantine tanks.

run on Orpheus Island and in January a group of Pacific Islanders went there for the course on clam farming.

I arrived on their last day there. They came from Tonga, Fiji, Cook Islands, Tuvalu, Tokelau, Kiribati, Philippines and Palm Island, Australia. In a busy month they had listened to lectures, attended to the practical everyday chores of clam culture and had seen five spawnings, some induced and some spontaneous. They had carefully collected the minute larvae when, at two days old, they had grown shells. At this stage the larvae could be seen only under a microscope and were collected on 88-micron screens for transfer to special rearing tanks with

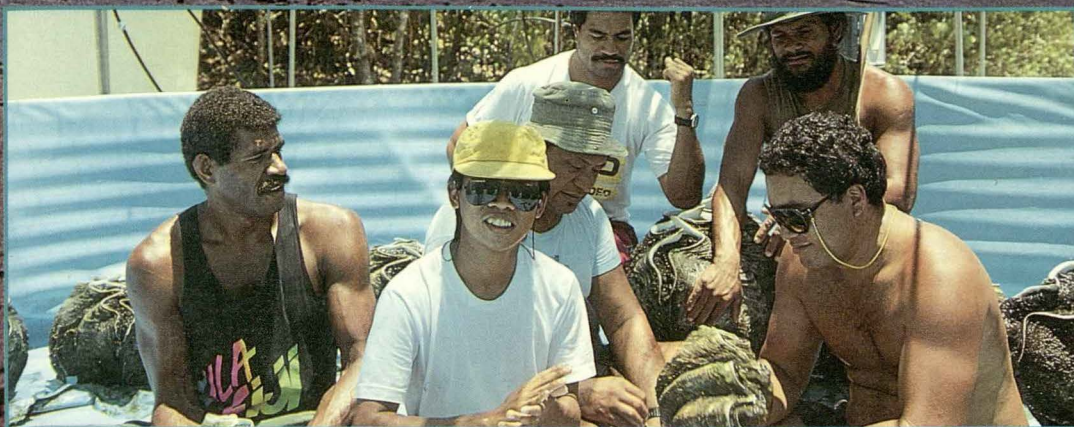
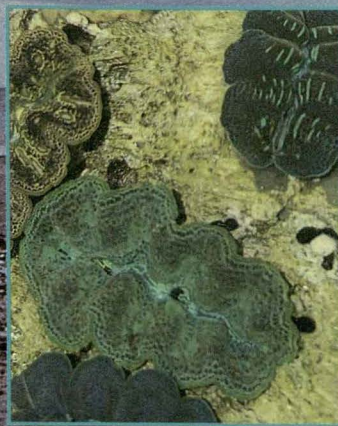
filtered, aerated water.

In the laboratory I peered down a microscope at two-day-old larvae while, nearby in bubbling tanks, single-celled algae were cultured for food. Clams have a unique adaptation for feeding. Instead of straining their food from the water, they shelter round, unicellular algae in their flesh and the algae in their turn produce nutrients for the clams.

The symbiotic algae are acquired from the water by the larval clams within a few days of hatching while they are still in the free swimming stage. This is necessary as the algae are not passed on through the egg. On the station, the algae are collected from the flesh of older

clams, cultured and then introduced into the water with the larval clams.

Another alga is a problem in the tanks, growing in long threads which smother the young clams. It is kept in check by grazing trochus shells and by herbivorous fish. Clam farming demands painstaking care, scrupulous cleanliness and well tested procedures. Over the years of experimentation, cyclones, invasions by unwanted bivalves and invertebrates, hungry human thieves and diseases have all taken their toll but, at this stage, it seems sure that industries can be set up successfully to exploit this fine animal without decimating its wild populations. Some of the students were look-



Above left Some of the smaller clams bred at Orpheus Island. **Above right** Small boring clams. **Left** Students cleaning a holding tank at Orpheus.

ing forward to establishing 'seed' clams, miniature giant clams 10 months old and 15mm long, in nurseries in their own countries on their return. These would be young clams they had watched growing on Orpheus Island.

The first adult clams I saw were the breeding clams, impressive big mama clams which can produce from 40 to 1,000 million eggs each from a spawning. I should say mama/papa clams as they are hermaphrodites, ejecting sperm first and then, a quarter to one hour later, ejecting millions of eggs, turning their tank into a miraculous soup of life. These were giant clams, *Tridacna gigas*.

The students cleaned the tank while I watched and laugh-

ingly disproved the legend of giant clams holding a drowning diver's leg. Though some of the smaller species of clams can close their shells tightly, the big clams have so much muscle and other tissue that their shells will not meet when closed. Etuale and Onio put their hands gently into one of the clams, hamming it up for a photo to debunk the fable. One of the clams was a bit of a showman too, squirting a torrent of seawater over Aisake to protest against him lifting it.

Next to the breeders' tank was the species tank with several different clams including the beautiful little boring clam, *Tridacna crocea*, which grows to only 10-13 centimetres. It is the smallest and most abundant of

the half-dozen or so species of clams and one of the most colorful. It burrows down into a coral boulder, making itself a permanent niche by rocking its shell on its muscular foot, grinding away the coral until its opening is level with the surface of the rock.

On my last day there, I had time for a walk before my boat was ready to leave. I wandered up the beach to the far point of the bay. There a ring of white floats marked an area where older clams, reared in the tanks, had been placed out on the reef. On shore was a huge mound of sand and shells where aborigines had feasted for hundreds of years and the commonest shells were — you've guessed it — clams.



Left Students Etuale (Tokelau Islands) and Onio (Cook Islands) testing the power of a giant clam. **Bottom left** Orpheus Island Research Station. **Below** Algae grown to feed the clams.



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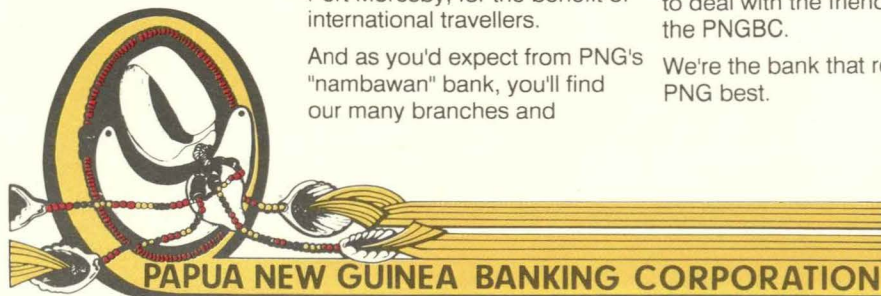
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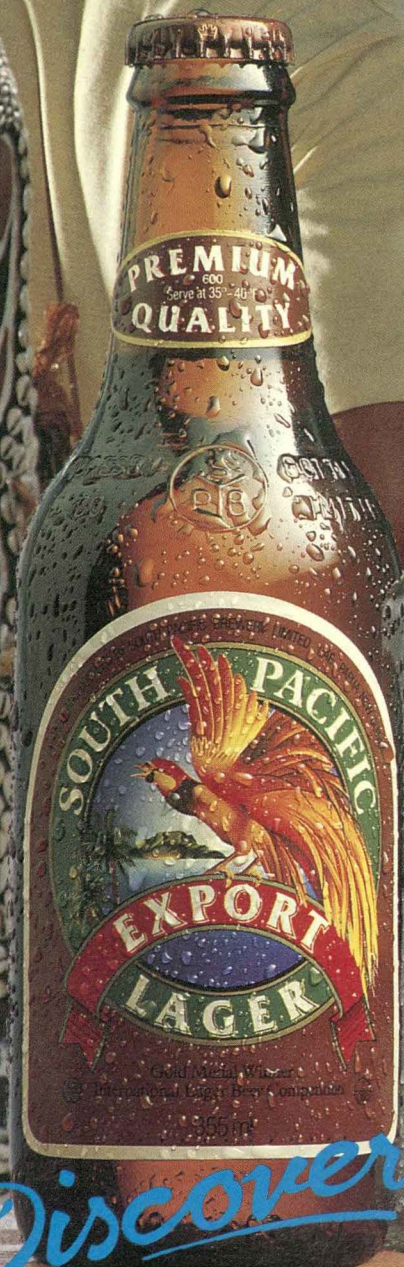
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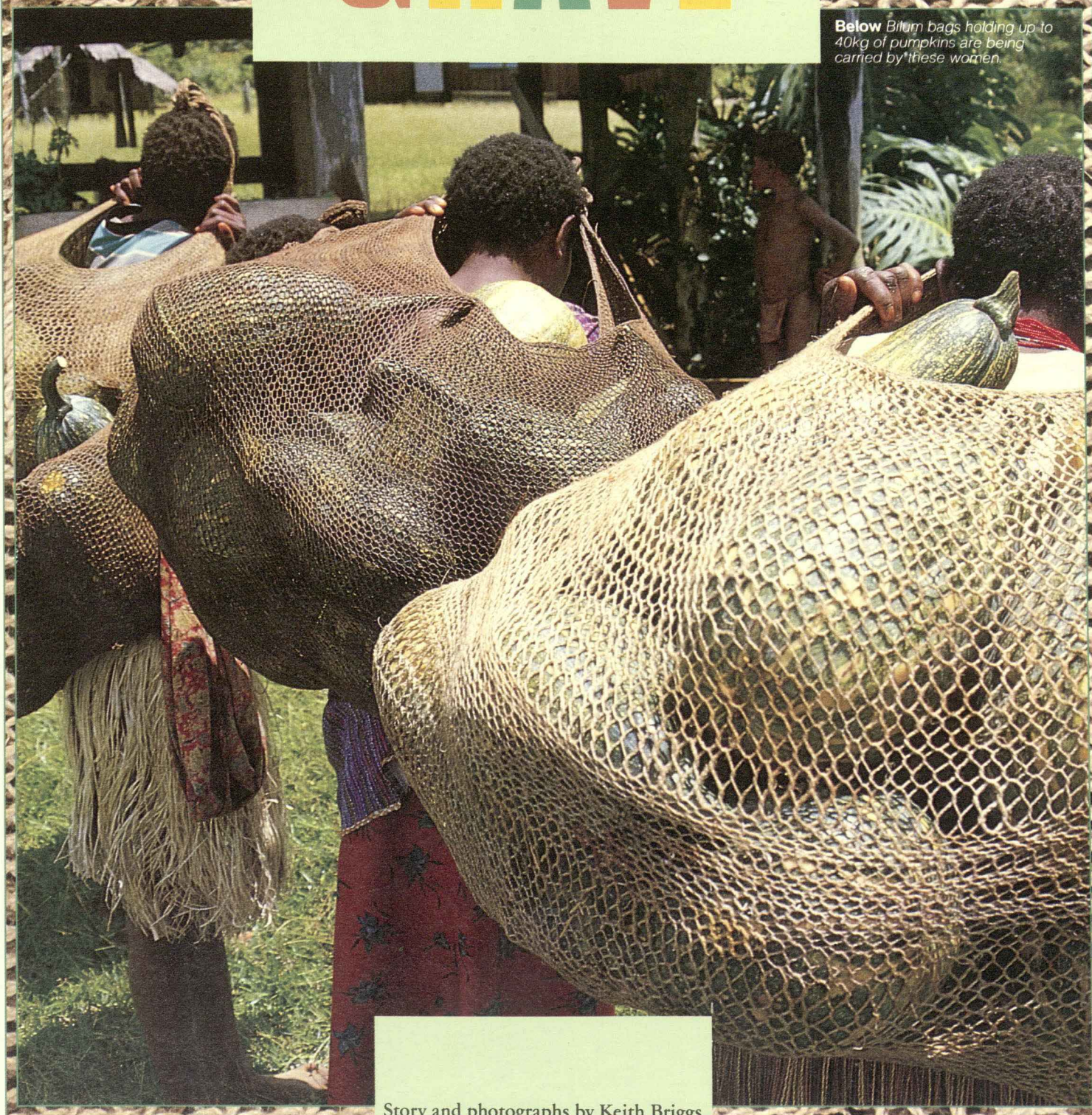


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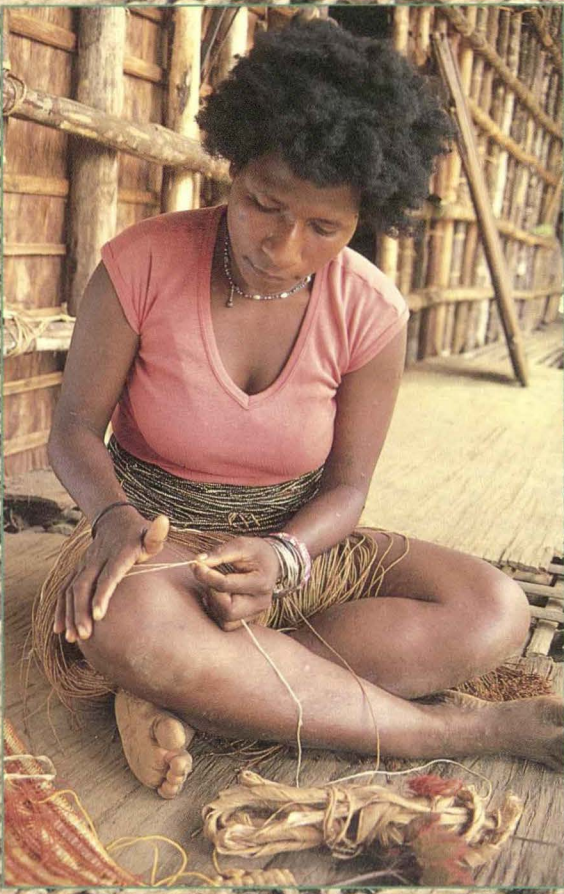
Below Bitum bags holding up to 40kg of pumpkins are being carried by these women.



Story and photographs by Keith Briggs

Traditionally, Papua New Guineans have not used saddle or pack animals, or constructed wheeled vehicles to transport cargo. Apart from those who used canoes on the coast, rivers or inland waterways, people themselves have carried everything that had to be moved from one place to another. Heavy pots and large items for house building were carried on men's shoulders. Except for such big and awkward items, virtually everything was carried in bilums (string bags) by men, women and children.

About the only preparation made for an expected baby was the weaving of a new bilum. If it was completed in time, the baby would be made snug in a nest of soft leaves inside the bag, spending most of its first year or so in there, hanging down mother's back while she walked and worked. At the garden, baby's bilum was hung from the lower limb of a shady tree where it swung gently while mother was at work. On the homeward journey, mother would employ another bilum for the vegetables, fire wood, bamboo water



tubes filled at the creek and a piglet or two just to top up the load.

We have seen the bodies of people who have died at the medical centre, carefully folded before rigor mortis has set in, fitted into large bilums to be carried back to the village by grieving relatives. The bilum truly serves from the cradle to the grave, where often it is carefully laid with the deceased, holding personal possessions.

The picture has not changed much today except in urban areas.

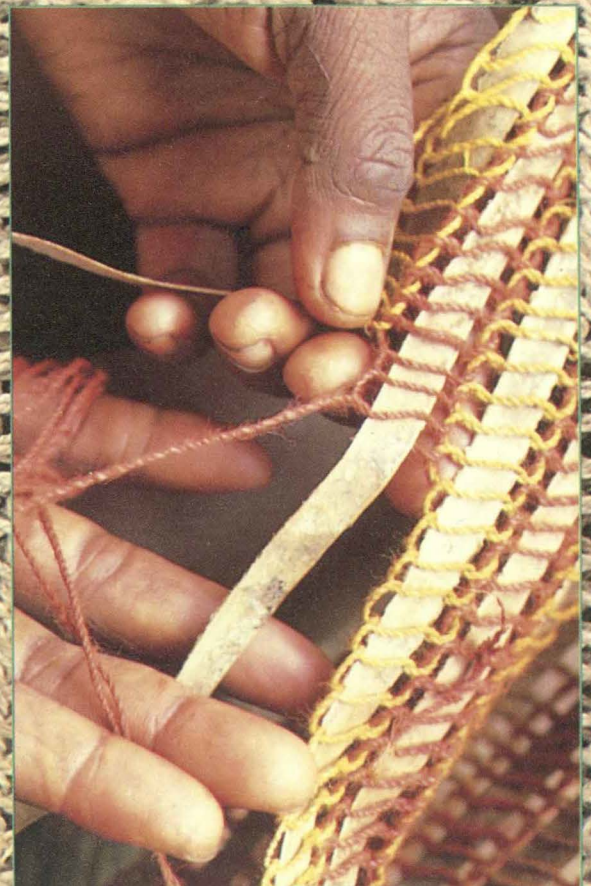
Generally, women carry the heavier loads, and their bilums are suspended down the back from the wide net band around the forehead. Men generally wear theirs at the side, suspended from the opposite shoulder. The title page picture (p. 37) shows a lady with 40kg

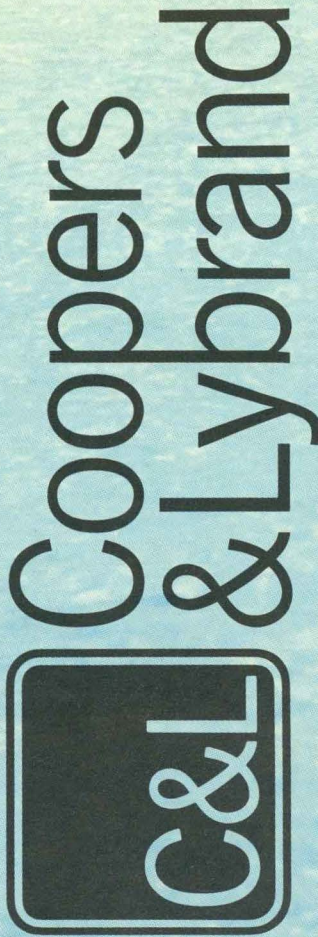
of pumpkins in her bilum, and her daughters carrying 30kg, 20kg, and 10kg respectively. They had walked on a rough jungle trail for one and a half hours bringing them in for sale.

Many roads that were pushed through PNG in the early days were built with hand labor, using spades and perhaps some wheelbarrows. Huge loads of stones for building up embankments or bridge buttresses were carried in these most versatile cargo movers. Today, as open truck-loads of people travel along established roads, virtually all of them carry bilums which hold their valuables and the results of trips to the trade store.

Colorful, expensive examples have become a part of women's attire, topping off their bright skirts, meri blouses and head cloths. These special bags are made by unravelling knitting wool and reworking it into a strong,

Far left Rolling fibres into string. **Centre** 'Tulip' tree bark provides the fibre. **Below** The bilum weaver dyes cords as she goes, using turmeric for yellow and bixa for red. **Below right** Deft fingers and keen eyes create the patterns.





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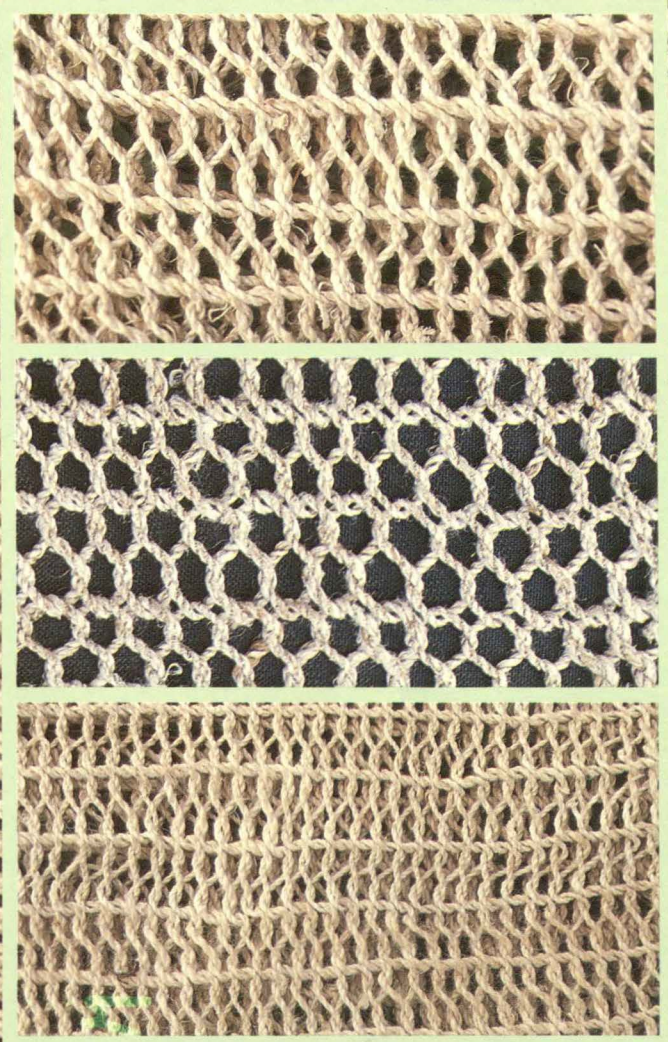
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high tensile cord. Sometimes wool is blended with the traditional fibre to give the color of the former to the strength of the latter. There are some beautiful designs to be seen, including ornate patterns where the makers have worked their names, a greeting or a verse of scripture into the face of the bag.

Colored nylon 'bilum twine' is sold in stores, and although it saves hours of tiresome string making and is extremely strong, it does not have the suppleness of wool and traditional string and tends to fray good clothes as it rubs back and forth.

The tree, *Gnetum gnemon* L. or 'tulip' in pidgin, which has edible leaves and fruit, is the one that yields the raw material for traditional bilum making. The bark is stripped from the young saplings, the inner fibrous layer is peeled from it and hung to dry. Once dry, it is teased to give fine fibres that are rolled on the thigh to form two light threads. With a quick, deft motion of the heel of the hand, these two are twisted together to become one uniform cord. The loose ends of the two threads are left frayed to enable the

Right Similar stitches from different weavers.
Below *Bixa* pod and turmeric root for dyeing.



next lengths to be blended into them. Some women put a fine talc-like powdered clay on their skin to smooth the rolling operation.

Strips of pandanus leaves about 10mm wide are prepared, on which to form the stitches and regulate their size. A metre or two of cord is made at one time. For coloring the string, ripe pods from the *Bixa Orellana* L. bush are on hand. The pods are split revealing rows of large seeds which are coated with a red liquid dye that soaks into the cord as it is drawn through the half pod being squeezed on to the cord. It dries fairly quickly and can soon be worked into the bilum.

For the yellow row, the cord is drawn through a cut in the yellow ginger-like root of *Curcuma Longa* L. or turmeric, which imparts its rich ochre color. This too dries quickly enough to be worked into stitches along the pandanus leaves without delay.

The end of the prepared cord is threaded through the loop of the stitch to be formed and pulled through by winding the slack thread onto the thumb and little finger in a very quick back and forth flicking of the hand. Once through, the stitch is held from slipping by pressure from thumb and forefinger of the left hand. The bulk of the string is dropped from the 'loom', the end threaded through the next loop and the slack swiftly pulled through again as the thread is whipped around the fingers of the flicking hand. Apart from the time-consuming task of making the string and dyeing it, each stitch takes about 15 seconds to form. A medium sized bilum with open weave has around 4,000 stitches!

Introduced materials are fast replacing the traditional string, but modern technology has not yet replaced the traditional bilum makers still seen in many places in PNG today.

Left A bilum takes shape, a common village scene. **Below** Pandanus leaves are used as guides to ensure uniformity.



The New Islander Hotel

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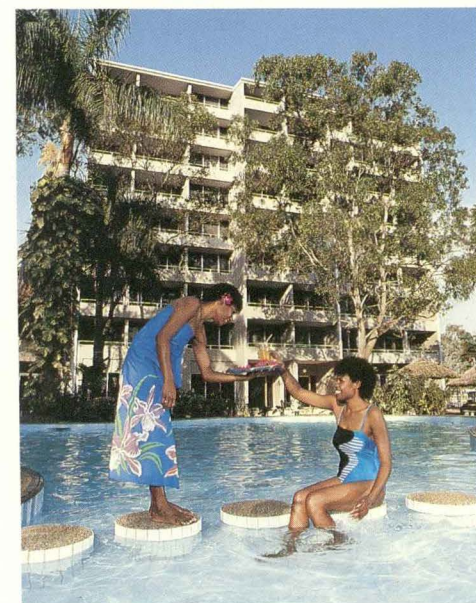
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