

TE VEGA EXPEDITION

GENERAL NARRATIVE--INSTALLMENT - 6

Singapore is a big city, a cosmopolitan city, a jumbled mixture of East and West. Modern business buildings, apartment houses and hotels occur cheek by jowl with cluttered, untidy, odoriferous streets teeming with Chinese, Hindus, and Malays. A Church of England cathedral stands almost within a stone's throw of a Moslem mosque; good universities with modern facilities and equipment contrast with the slowly moldering Raffles Museum; the fine Botanical Garden features bands of monkeys running loose and begging or stealing peanuts from delighted tourists; the Van Cleef Aquarium, with its exotic local fishes, is well worth a visit; the squalid muddy river is choked with sampans, each with a pair of eyes painted on the prow so that they can see where they are going. The people are just as varied and interesting: Indian money changers in white khurtas every ten feet along Collyer Quay; Eleanor Gann and Beau Fisher from home, the Moirs, whom we met in Honolulu, and the McKillops, whom we met in Kieta on the Pacific crossing, Hermon Slade from Sydney, all old friends here for the World Orchid Conference and proving the world is a small place after all; the bearded and turbaned Sikhs, who seem to have a monopoly on doorman's and guard's jobs; Roland Sharma, Lecturer at Singapore University, and Prof. Li Ming-Liang, of Nanyang University, who each brought groups of students on board; the Chinese trishaw men with bulge-muscled calves who have replaced the rickshaw pullers; Johnson, the artist who was passing through Singapore some twenty years ago and forgot to leave, is an ardent skin diver and knows all the best places to collect shells; Mr. Espey, local manager for the American President Lines, who was a most charming host as he entertained some of us at dinner in his beautiful home. These and many more helped to make our stay memorable.

But our stay in Singapore was not a vacation and a sight-seeing session. The end of one cruise and the start of the next involves work and attention to endless detail. We were all busy getting the ship in order for the next three months. The engine room, in particular, needed work, and the motors were disassembled, inspected and put together again; the proud symbol IIOE (International Indian Ocean Expedition) was painted on the sides of the wet lab; supplies and equipment were purchased and installed. Numerous trips to the American Consulate General, and letters and cables to Thailand, India and Indonesia were necessary before we could learn exactly where we could and could not work (unfortunately the Nicobar and Andaman Islands finally turned out to be off limits). Conferences with the Master Attendant (the man in charge of all marine activities) kept us informed of the latest news on the piracy situation in the Strait of Malacca and allowed us to plot a course through reasonably safe waters. The

The new scientists were welcomed, assigned to quarters, their gear stowed, they were briefed on the ship's rules and problems, and were started on collecting while we were still at anchor. A police permit had to be secured to get Frank Gill's shotguns and ammunition through customs, and a police escort arranged to get them on board ship. There was plenty to do, and only occasionally did we have time for a cool drink at the Raffles Hotel in salute to the city, while waiting for the launch to take us back to the ship anchored in the outer roads.

Fifteen days in port is a long time, and in spite of collecting at Kampong Layang, Sekudu Island in Johore Strait, East St. John's Island, Keppel Harbor, Pulo Hantu and Pulo Tekukor, we were all anxious to get moving. Finally, on Friday, October 25th we hauled in the hook and headed through Singapore Strait for the Strait of Malacca. By daylight of the 26th we were off the town of Malacca and soon anchored between two small islands, Pulo Anyut and Pulo Besar. The scientists split into two groups, one going to each of the islands to investigate the shallow waters. Collecting was not very good; surf on the outer Pulo Anyut and silt in both localities which coated the reefs and cut down the visibility hampered the work and reduced the catch. However, it was our impression that the area was not very rich. As a non-marine side-light, we found an intriguing plant on Pulo Besar. This was a vine of the milkweed family, Dischidia rafflesiana, which was rather common on the trees along the beach. The leaves were in the form of hollow pouches, each about three inches long, two inches wide and one inch thick, with a quarter-inch hole at the base. Each leaf was the home of hundreds of ants, and a poke with the finger brought these out in a boiling, infuriated mob. A few quick jabs at the leaves and the normal green plant was transformed into a swirling black mass of insects.

During the night of the 26th we headed north and were at anchor in the shelter of Cape Rachado next morning. Here we collected on the beach reef and in the adjacent mangrove area, but we found that the silt was a hampering factor here too. Our stay was not long since we wanted to get through the narrow southern portion of Klang Strait that is the entrance to Port Swettenham before dark. We left the Cape a little before noon and dropped anchor in Port Swettenham shortly before sunset, to find ourselves in the midst of a surprisingly large number of big ships from all over the world. Port Swettenham seems small and insignificant, but it is the port of Kuala Lumpur, the capital of Malaysia, and a lot of traffic crowds its narrow waters to support booming K.L., as the capital city is commonly called.

On Monday morning, October 28th, most of us went to K.L., some twenty miles away. I checked in at the American Embassy for a briefing and then went to the University

of Malaya to meet the people in the zoology department. Dr. Dwight Davis, of the Chicago Natural History Museum, is Professor on a temporary appointment, and he has a group of seven lecturers working in various research fields as well as teaching. Since the University is only about three years old, the buildings are all new, well designed, and the equipment is modern. With only about two thousand students at present, the University is growing rapidly and is feeling some pain in the process, but I was very favorably impressed by the aggressive manner in which the challenge is being met.

Dr. Davis and Dr. A. J. Berry, a malacologist, took three of us (myself and two students, Bronson and Kelts) to lunch and showed us the town and National Museum. Everything was much more modern than in any other southeast Asian city that I know, with new modern buildings everywhere, well paved wide streets, excellent parks and a feeling of uncrowded space. I think Kuala Lumpur would be a nice place to live.

Next morning, in response to my invitation on the previous day, more than twenty people from the University came down to visit and inspect the ship, and if vacation had not just started I am sure that there would have been many more. In the afternoon arrangements had been made for me to return to the University in order to explain our program to other departments and other interested people. The latter included Dr. J. B. Alexander, Director of the Geological Survey and Captain R. E. Gee, (both members of the Malaysian IIOE Committee), as well as some naval officers. I was gratified at the interest they displayed and at the number of penetrating questions that my exposition generated. After the meeting, Dr. Alexander and his assistant, Mr. C. R. Jones, drove me back to Port Swettenham. They came on board to inspect the vessel and stayed for dinner. As soon as they left, we got under way once more.

Dawn of October 30th saw us anchored off Pulo Jarak, a small densely wooded island far out in the Strait of Malacca. It looked very inviting, but I gave strict orders that no one was to land, since it was teeming with rats infected with scrub typhus. However, this did not stop our working in the adjacent waters, and we split into three parties; one collected birds at sea, one concentrated on algae and invertebrates, and one ran a poison station for fishes. All groups were moderately successful. In the afternoon, we pulled offshore a bit and occupied the first hydrographic station of this cruise. It was ragged, I fear. Then we took a trawl haul in thirty-five fathoms and brought up masses of sponges (to the great delight of Dr. Rutzler), as well as a rich assortment of alcyonarians, crustaceans, echinoderms, and numerous other invertebrates.

A night run brought us to Pulo Perak, well north of the entrance to the Strait of Malacca and far off shore, and also well out of pirate-infested waters. This island rises as a steep mound from depths of about fifty fathoms. It forms a strong contrast to heavily wooded Pulo Jarak since there is not a green leaf on it. The island is a rookery for sea birds, primarily gannets, and provides a perfect example of how animals can modify their environment. Since Pulo Perak is a bird sanctuary, Gill had to confine his shooting to offshore waters again. The rest of us tried to collect on the precipitous submarine slopes, but the algal and invertebrate collecting was not very profitable, and a poison station yielded only thirty-five species of fishes. In order to supplement the meager collections we took a bottom trawl close to the island in fifty-five fathoms and picked up such a mass of sticky gray-green mud that we had to wash most of it out with the fire hose before we could get the net on board. This catch was not rich either, but it contained a number of interesting organisms that we had not taken elsewhere. The mollusc people were pleased with several species of scaphopods (tusk shells) and I was delighted to get some blind gobioid fishes of the genus Trypauchen.

On Friday, November 1st, we dropped anchor off Phuket, Thailand, and waited for the port officials to come out. They did not arrive, and Capt. Olsen and I finally went in with the ship's papers in a small boat. Our first contact on shore was with Mr. Roy Greenwood, manager of the Tongkah Harbour Tin Dredging Co., who was kind enough to place a car and driver at our disposal. Off we went in search of the Chief Customs Officer, and as soon as we located him, we learned that the Thai Government had waived all formalities in our case, and we entered Thailand with the greatest of ease and dispatch. It was a very pleasant experience. Then came the hunt for the Thai scientist who was supposed to meet us. We asked the Customs Officer, the Governor, the Chief Fisheries Officer, our ship's agent and even inquired at the hotel where he would probably stay. No one had heard of him. Finally I telephoned the American Embassy in Bangkok only to learn that he was supposed to be in Phuket. On Saturday we got a telegram saying that he had come to Phuket on the 24th, waited for several days and then returned to Bangkok. Unfortunately there had been some confusion in communications regarding our changing schedule, and we had to sail without him, but we sent a radio to Bangkok inviting him to join us at Ranong if possible.

On the evening of our arrival at Phuket, most of the ship's company went in to the beach for an annual festival. It was the night of the full moon when everybody set small circular rafts, decorated with gaily colored paper and each bearing a lighted candle, afloat on the shore just at high tide. As the water ebbed, the colorful rafts drifted out to sea like tiny lightships, each bearing with it the launcher's accumulated troubles of

the entire year. All sorts of merchants had set up decorated stalls to sell every imaginable thing, and there was native Thai music and dancing. Those who attended said that it was a very delightful affair. I was chagrined because I had spent so much time trying to locate our Thai guest that I had to stay on board and catch up with my work. The only things I saw on my way back to the ship were the stalls being set up, the gathering multitude, and some of the rafts on sale.

Sunday morning, bright and early, we were at the Similan Islands, and on Goh Huyong we found the kind of place that we had been looking for. Diving in good clear water showed vast quantities of several different species of the alga Halimeda. They were so abundant that the beach sand was largely composed of their calcareous remains. Since Dr. Colinvaux is here specifically to study that genus, she was ecstatic and ready to stay here indefinitely. Dr. Kohn found many more cone shells of many more species than he had encountered elsewhere, so his specialty was equally well served and he was also pleased. Mr. Gill banged away and did very well on birds, bagging, among other things, the strange Nicobar pigeon (Caloenas nicobarica) and the rare tiger bittern (Gorsachius melanolophus, "the best bird yet!"). A poison station yielded about a hundred species of colorful reef fishes, by far the greatest number that we have taken at any one place so far. Everyone liked the place and was satisfied with the collections, so we worked it for two days, and we may hit it again on the way back.

Soon after leaving Goh Huyong in the late afternoon of November 4th, we took still another trawl haul in forty-five fathoms and got another catch differing markedly from those taken before. Each trawl haul and each station along shore brings new things into the laboratory that we have not seen before. The aquaria are crowded with all sorts of things under observation, and the laboratory is a madhouse, with people falling over each other and every available shelf space and most of the deck covered with plastic pans in which animals are being anesthetized, or hardened in formalin, or simply awaiting treatment.

November 5th, 6th, and 7th we worked Koh Sandarar Nua, the northernmost of the offshore Thai Islands, from which the southern islands of the Burmese Mergui Archipelago (forbidden to us) were clearly visible. The fact that we stayed three days indicates that it was also rich and interesting. Specimens poured in from attacks on beautiful coral reefs, offshore rocks, sand beaches, mud flats; even the dry land yielded birds and a viper, while collecting from the ship at anchor produced fishes and a lovely four foot black and white banded sea snake. We are quite swamped.

This cruise is much different from the Pacific crossing. We have had no long open-water passages on which we can set the pace of work at a reasonable tempo. We do our traveling at night, and each morning finds us at anchor in a locality that demands intensive field work. That is what we are out here for, so that is what we do, but the material piles up at an alarming rate and the lab is a beehive of activity. I try to sandwich in lectures in the evening when we are under way, but there is often material that has to be taken care of so that the results of the day's collecting will not be lost, and I am behind on the lecture schedule already. I am trying to double in brass by impersonating a physical oceanographer, but I find that it takes an astonishing amount of time to oversee the taking of a hydrographic station, to check out the students on making a bathythermograph cast or taking meteorological observations, or to supervise the reduction of the data taken. Oh how I wish Warren Thompson were back with us to do all that and to give the appropriate lectures! Since the senior scientists are concerned with different problems, they frequently scatter to different field areas, and the students scatter with them. I cannot be in several different places at once, but I have faith that they are picking up knowledge and techniques by direct experience. Somehow there seems to be very little time left for routine paper work, and I give fair warning that this narrative is going to get a bit thin. I can see that I will be unable to give as detailed an account as I have done so far; time is too short.

November 8th brought us back to the Similan Islands where we worked two stations. The first was Goh Similan, the largest of the group, and in the afternoon we hit Goh Huyong, which had so intrigued Dr. Colinvaux on the way north, once more. Both stations yielded rich collections.

Now we are on the way back to Phuket where, tomorrow morning, we expect to clear for Penang, Malaysia. It is necessary to go back there to refuel and pick up supplies before we start for Indonesian waters.

TE VEGA EXPEDITIONS

GENERAL NARRATIVE--INSTALLMENT VII

Our stay in Phuket was brief indeed. As soon as we had anchored, we went ashore and borrowed a car and driver from Mr. R. Kanjana-Vanit, an engineer for the Tongkah Harbour Tin Co., and a Stanford alumnus. With this, we were able to make a few necessary purchases, telephone the Embassy in Bangkok, and clear through Customs in short order, so that exactly four hours after dropping the hook we pulled it up again and were off for the Butang Islands, or so we thought. However, the dispatch with which we had discharged our business in Phuket, and our consequent early departure, gave us more time than we had anticipated. There was no point in arriving at the Butang Islands before morning; nights are for traveling. How should we use the few hours that had practically been presented to us as a gift? On the eastern horizon was an island of fantastic profile and intriguing name, Koh Phi Phi on one chart and Goh Pipidon on another. Not stopping to worry about variations in transliteration of Thai place names, we changed course and headed for it.

Ko Phi Phi (or Goh Pipidon, if you prefer) stole our hearts. Vertical or even overhanging limestone cliffs rose sheer from the sea for hundreds of feet and were capped with a dense green growth. Here and there on their faces were flimsy bamboo scaffolds, used by the natives to invade the shallow caverns for the collection of the indispensable ingredient of that oriental delicacy, bird's nest soup. In a deep bay between two spectacular headlands we found good anchorage facing a long crescent of white sand in front of a long crew-cut line of coconut palms. Boats were over the side in an instant and we headed for the beach. Some of us collected molluscs in the shallows just off shore; others explored the land briefly and tried to contact the natives, but without much luck. They were interested in us, and a few collected to watch us from a distance but none would approach closely. Even the children were too shy, which is most unusual. Darkness began to settle far too soon, and we returned to the ship and were off to keep our schedule, sorry to have to leave one of the loveliest places we have yet seen.

Next morning we anchored off Pulo Tenga in the Butang Group and worked a reef that yielded many goodies. I used a very little fish poison in a pool about three feet wide, six feet long, and not more than six inches deep high up on the exposed reef. It yielded about twenty-five species. Halimeda for Dr. Colinvaux was plentiful in the area; colorful sponges gave Dr. Rutzler all of the material he could handle; Drs. Rosewater and Kohn found a very rich and varied molluscan fauna; while Mr. Gill was pleased with the birds that he collected on shore. Leaving at dusk we were at Penang the next morning.

Penang, "The Pearl of the Orient," is an island a couple of miles off the mainland, with the strait between offering excellent shelter for shipping. Established centuries ago as a bunkering and supply station on the route between India and the Far East, and as a stronghold against pirates, the city of Georgetown (practically always spoken of as Penang) waxed fat on trade, and its beautiful streets lined with pretentious mansions reflects its wealth. Here we took on fuel and water, purchased supplies, had some work done on the machinery, and took a break to see the sights. Mr. H. T. Pagden, retired Chief Entomologist of Malay, appointed himself my personal host and guide during our stay and did much to make my visit interesting and pleasant. Providing a car, he took me around the town and entirely around the island. A keen general naturalist, he was able to point out all sorts of fascinating things. He knew the birds and the plants; he showed me some marvelously camouflaged nests of spiders on tree trunks, and of trap-door spiders in the ground; through field glasses we watched, from a distance of about fifty yards, a sea otter eating a fish, swimming, running around over the rocks, and generally being himself; best of all, when I mentioned that one of my ambitions was to see a live caecilian (burrowing worm-like amphibians that few American zoologists have seen), he took me to a spot where I was able to collect several of them. One afternoon he arranged for me to meet Dr. H. A. Reid, of the Penang General Hospital. Dr. Reid is the Director of the Snake and Venom Research Institute, and is the world's leading authority on snake bite and its treatment. I was particularly interested in the sea-snake antivenene that he has recently developed, because we shall be working for at least a year or more in the areas where sea snakes are common. He gave most generously of his time, discussed snakes and snake bites in fascinating detail, showed us through his laboratories where we saw many kinds of sea snakes, cobras, kraits, etc., had a technician milk a viper for its venom, allowed us to watch a python eating, and finally gave me three valuable reprints for the ship's library. It was a most stimulating and instructive meeting.

In the evening of ^{November} ~~September~~ 13th, we left Penang, stopped briefly at Langkawi next morning, but found that conditions there were not very good for collecting. We cut short our stay and ran for Pulo Tenga, which we knew from experience was good, and arrived in time for a couple of hours work on the reef in the late afternoon. Temptation to revisit beautiful Ko Phi Phi was too much for us, and at 0630 next day we arrived in time to spend the entire morning working there. At noon we left for Phuket, hoping to clear for Indonesia that afternoon. This would have been possible except for the fact that there was a telegram waiting for me with the request that I call the American Embassy in Bangkok. When I reached them, I learned that there was a mixup in our arrangements for the Indonesian

cruise, and a number of messages had to be sent back and forth between Phuket, Bangkok and Djakarta before the matter was straightened out. It took the entire weekend to solve the trouble and instead of leaving Friday night, we did not get away until Monday afternoon.

Since we had a commitment to pick up an Indonesian scientist in Kotaradja, on the northwestern tip of Sumatra, on Tuesday, November 19th, the delay in Phuket necessitated cancelation of our plans to work in deep water in the Andaman Sea. Although we made the run without interruption for any investigations, we did not arrive at Olehleh, the harbor of Kotaradja, until after sunset on Tuesday, and were late for our meeting.

Next morning, entrance formalities were completed very quickly and smoothly, and we found the local authorities to be most courteous and helpful. Our Indonesian guest came on board, and I was delighted to discover that he was Kesijan Romimohtarto, who had been with us on the Indonesian segment of our Pacific crossing. He had been a very pleasant and helpful colleague before, and it was good to see him again. He and some of the local naval personnel and the Harbor Master escorted me on a courtesy call on Governor Aly Hasjmi. I found him to be a very impressive figure of a man, who received me cordially. Over tea we exchanged pleasantries and I invited him to inspect the ship. Unfortunately, his duties did not permit it that afternoon but he will try to visit us when we return in December.

The countryside around Kotardja was beautiful, with coconut plantations interspersed with the lush green of young rice paddies, and the whole backed by impressive volcanic cones. One gained the impression that it was a land of plenty, However, our primary interest was the sea and we were impatient to be off. Fortunately, our first target lay close by, and we were able to do an afternoon's work on Pulo Boenta. It was interesting enough to have engaged our attention for a longer period, but we decided that it was best to utilize the night for the rather long run to Pulo Simueloe, or Pulau Simuelur (another transliterative discrepancy). There followed a riotous phantasmagoria of beautiful islands that tend to melt into one another in my memory: Pulo Bunan, Pulo Penju; Pulo Milila; Pulau Nias; Pulo Bai; Pulo Masa, Pulo Bali-bo. Each one yielded at least something to the ship's growing treasure trove, most of them tribute in good measure. In between islands or from the ship at anchor come such oddments as squids from around the night light, or sea snakes, or tunas from trolling, or treasures from trawling, including pogonophorans, or our gigantic pycnogonid (a sea spider with a spread of about two feet), while plankton hauls bring us pteropods and other curious creatures too numerous to mention. I feel somewhat as Cortez must have felt when confronted with Montezuma's hoard of gold--overwhelmed. I believe everyone on board feels much the same way. On the Pacific crossing, we

occupied sixty-one biological stations; on this cruise we have passed the forty mark already, and most of the stations are compound, including different types of collecting in the same area. And still the material rolls in.

The fantastic shapes and colors encountered on the endless coral reefs have now become so commonplace that I am a bit numb. However, a few experiences not concerned with marine biology stand out. While at Pulau Simueloe, Kasijan, Di Salvo and I, having heard a report from one of the returning parties of many orchids on small Pulo Bunan, decided to have a quick look at them. Just as we were about to land, it began to rain. The small boat offered no shelter, but I thought that the jungle might. How mistaken I was! The heavens opened up and the dense foliage simply concentrated the individual drops into innumerable streams that were impossible to dodge. Within five minutes, none of us had a dry stitch on us and our shoes were full of water. However, it was warm and not uncomfortable, and merrily we slogged along trails that had become small rivers, climbed trees in the face of dashing shower baths, had a marvelous time, and returned in about half an hour with ten different species of orchids.

On Pulau Nias we found the reef to be extremely abrupt and close to shore, the surf was breaking heavily against it, the water so turbid that visibility was reduced to one foot or less, in short, working conditions were impossible. The only way to get on shore was through the mouth of a small stream, and as we rounded the first bend of this, only a couple of hundred yards from the sea, we were surrounded by crowds of natives. They were an interesting lot, some of them in European clothes, some in native dress, a few with tattooed faces, or with bright red lips from beetle-nut chewing. One, in particular, was grand, and I suspect that he had adorned himself for our benefit. He wore an elaborately embroidered vest of many colors and carried a kris with a handsomely carved handle in an elaborately decorated brass-bound scabbard. Appended was a sphere of woven rattan about as big as an indoor baseball and garnished with crocodile teeth, each about three inches long. With Kesijan acting as interpreter, I found out that he had inherited the kris from his father. It would have looked very nice hanging on my wall at home, but, unfortunately, it was not available. With the help of the local populace we collected a few molluscs from the river and made a rather unsuccessful poison station. Then we invited the chief and a few others out to the ship for lunch. When we brought them back, we visited their village briefly. It was on the steep hillside bordering the stream and was reached by means of a series of stone steps. The houses were of a type that I have never seen before. Built of wood, with mortise and tenon joints,

secured by pegs, there was not a nail in the lot. The main rooms were elevated and supported by nicely curved beams which extended well out from the building, while the walls leaned outward at an angle of about fifteen degrees. The upper half of each end wall was a long window screened with a wooden lattice work. The effect was very decorative, and the whole gave somewhat the impression of the poop of an Eighteenth century galleon. Having made fast friends with the entire village by giving them rides in the Boston whalers and presenting them with Polaroid pictures of themselves, we had a hard time getting away and returning to the ship.

In the lovely Batu Islands, where the magnificent coral reefs engaged our attention for three full days, Captain Olsen and I decided that we had earned a couple of hours off and so we took one of the small boats to explore the mangroves surrounding Pulo Masa. Selecting an indentation in the solid front, we followed it into a twisting bayou which narrowed as it extended inland. Almost at once, we found ourselves in an eerie world of green shadow, stalked roots forming intertwining pyramids, brown water bedecked with floating dead leaves, and an oppressive silence broken at long intervals by the raucous call of some unknown bird. As the waterway narrowed, we cut off the motor and pulled ourselves along by the foliage on either side until we could go no farther. Here and there we stopped to peer into the impassable vegetation around us, to listen in the motionless air, or to collect some of the epiphytic orchids and ferns that grew on the mangroves within easy reach. Our little excursion gave us a sense of mystery and peace, somewhat like the experience one might gain from an hour of contemplation in an ancient cathedral. It didn't advance science at all, but it was good for our souls!

TE VEGA EXPEDITIONS
GENERAL NARRATIVE--INSTALLMENT 8

November 28th and 29th were spent in Padang, where we took on water and fuel as well as a few supplies, and gave those who could find the time an opportunity for an excursion to Bukit Tinggi. This inland town is at an elevation of about 3500 feet, and those who made the trip reported that the two-hour drive to reach it was through beautiful rugged country, lush with tropical jungle interspersed with terraced rice paddies. At Padang we took on board another guest, Sergeant Tobing of the Indonesian Navy, as an observer. Lt. E. H. Hanitayasa, Commander of the Naval Station in Padang, wanted him to gain some familiarity with the seldom visited islands in which we were to work. Sergeant Tobing proved to be a very personable young man and the best chess player on board.

Pulo Sipora provided good collecting on November 30th and Dec. 1st; one poison station in a shallow, largely sandy area provided more than forty species of fishes, most of them different from the hundred species taken at another station in a deeper-water coral area. Algae and invertebrates were abundant, and the bird situation was satisfactory.

South Pagi Island, where we spent December 3rd, was much the same. Here Dr. Rutzler, Kasijan and I had an interesting little diversion. Dr. Harold Coolidge, of the Pacific Science Board, had asked me to inquire into the status of the pygmy gibbon in the Mentawai Islands. We started out to seek information at a village, but since none could be seen, we decided to learn its location from the occupants of a canoe that was traveling parallel to shore. The Boston Whalers travel pretty fast with only three people in them, and we were closing distance rapidly when the canoe turned toward shore. I figured that there was a landing there, and I maintained speed. It was not until we were within about one hundred yards and the two children in the canoe jumped overboard and headed for shore to disappear in the brush, that I realized that the people were frightened. I cut the motor at once, just as the woman also jumped overboard. Kasijan shouted apologies to her as she was standing waist-deep in water holding onto the canoe. We had encountered shy natives previously, but this was the first time that anyone showed actual fright. At last the woman was calmed down enough to indicate the direction of the village, and we left her to collect her children and continue her journey. We soon found where the village was hidden away, back from the beach, and were guided in to the mouth of a small stream by the signals of two men on shore. The village was tiny, consisting of only a couple of thatched huts, and the men there could not give us much information. They suggested that we talk to the Chief at Kapong Baru and offered to guide us. I suspect that they very much wanted a ride in the Boston Whaler.

We started out down the upper reaches of Veeken's Bay, and if I had known how far it was, I would not have made the trip. It took us about an hour to reach the "port." This was a sheltered sandbeach behind a tiny mangrove islet. The "harbour master" and his family lived in a single thatched hut at the upper beach limit. We were immediately escorted to the main village about half a mile away. The highway consisted of a series of tree trunks and limbs which had been felled and that intersected each other any-which-way. Some of the trunks were a good foot in diameter; some of the smaller branches were less than three inches. The first part of the trail led through the mangrove swamp, the rest through cleared land on which the felled trees lay haphazardly like a giant pile of jackstraws. Sometimes the path was directly on the ground, sometimes it was six feet or more in the air. The natives trod the trail with utmost aplomb and were much amused by the frantic wagging of outstretched arms by which Rutzler and I kept from falling into the mud of the swamp or the uncertain tangle of taro and jagged sticks.

Kapong Baru was also a tiny village. The huts were widely scattered and there may have been more than the five that we saw, but there were not many. The friendly people, with tattooed faces and bodies and with their teeth filed to points, greeted us with much ceremonial handshaking, followed by the placing of the right hand over the heart. We wished that we could have stayed longer, but it was getting late, and after getting the information we desired, we headed back. We were able to unload our pilots into the arms of their waiting families just before it became pitch dark. As soon as we returned to the ship, the anchor was hoisted and we were away for Mega, taking a dredge haul on the way, which, on screening, yielded small molluscs, crustaceans and other animals.

Pulo Mega, at about 4° South Latitude, 101° E. Longitude, was the limit of our work in the Mentawai Islands. We had intended to continue to Engano, but after encountering poor working conditions at Mega and a rather heavy surf, and after reading in the Pilot that Engano was characterized by heavy breakers even in the calmest weather and that there were only two possible landing places even then, we decided to turn northwestward once more to where we knew from experience there were greener pastures. A short night run brought us to Sanding Island on the morning of December 3rd. This proved to be as good as Mega was poor, and for four days we raided the coral reefs for specimens and hunted the island for birds. The invertebrate people wanted a chance to spend more time than usual in one place in order to get a better picture of the total fauna, and this rich area was ideal. I believe that it was on one of the early days at Sanding Island that Dr. Kohn reported that he now had more than a thousand specimens of his cone shells, which he considers to be the most important mollusc, if not the most important animal, in the world. Previously, Dr. Rosewater had been

delighted to extend the known western range limit of the giant clam, Tridacna, with specimens that we had to lift on board by means of block and tackle. Dr. Rutzler is always satisfied because almost everywhere he finds more sponges than he can take care of properly. It appears to me that Dr. Colinvaux has more material than anyone else. At least tray after tray is stacked up in piles in the laboratory and often there is an overflow on deck, but woman-wise, she is never satisfied and always wants more and more Halimeda.

As the material piled up on board and the small boats were not in constant use, some of us took the opportunity to do a little sport fishing. Trolling with feathered jigs along the edge of the reef brought in groupers, barracuda, snappers, jacks and tuna. Some were preserved for science, but some, mainly too big for ready preservation, were pounced upon by our Chinese cook for the galley. His glee in getting them was paralleled by our gusto in eating them fresh from the sea. Poisoned fish also increased our collection. A station on the edge of the reef off the small detached islet of Pulo Stupai did not yield a particularly varied collection, but provided a beautiful seascape. The coral edge was particularly rough, with fragile-looking coral shelves extending outward and stone-hard shrubs growing everywhere. Damsel fishes and wrasses, usually the most numerous types, were relatively scarce, but many surgeon fishes, some jet black and others bright blue and yellow, made up for their lack, while bright angel fishes of several different kinds flaunted their yellow, black and white liveries, and vermilion soldier fishes invaded small caverns here and there. Over the lip of the reef myriads of large jacks, groupers and barracudas patrolled, and big parrot fishes nibbled at the coral cliff below us, beyond our reach because we were snorkeling and had left the scuba gear on board. At something less than one hundred feet, the large fishes became dim moving shapes merging into the deep blue background that looked as if it extended downward forever. The feeling of limitless space below, and the idea that it might contain vicious sharks or twelve-foot groupers that could swallow me like a vacuum cleaner sucking in a piece of fluff, gave me an uneasy feeling whenever I stopped to admire the view. I practically always feel the same way when I look down a very steep submarine slope into nothing.

Sunday, December 8th, was a day of calamity. We were approaching known good collecting grounds on Sipora when there was a thump, followed by vibration. The engine was stopped at once and an examination made. The propeller shaft had broken, and water was pouring in through the housing. Pumps were started immediately, a wooden plug was driven into the shaft and wedged to stop the leak, and divers went over the side to assess the damage. The propeller had shifted aft and was resting against the rudder, but they were able to shove it forward again and secure it in place. However,

we are now deprived of our engine and entirely dependent on sail in an area of little wind, and what there is, a head wind. As I write, we have been trying to make headway toward Padang for about thirty hours and have made little or none. The wind comes directly down the strait between Sumatra and the Mentawai Islands and by tacking we make some progress; then the wind dies down and we lose all that we have gained to the two to three knot current running directly against us. We are about twenty miles from where we started, but no closer to our destination. We are about to try towing TE VEGA with our own whale boat, but if the current is too strong for us, we may have to turn around and sail to Djakarta.

It is now December 13th, and at last we are tied up to the dock in Padang. The last few days have been nauseating, to say the least. It has been tack to the east and tack to the west, tow with the whale boat in periods of calm and hope that you are not losing ground, make ten miles today and then lose it the next. We have been stuck in the straits between the Sumatran coast and the offshore islands, and this is simply a river flowing southeastward and also serves to channel the wind in the same direction. We did a lot of looking at current and wind charts for the month of December and toyed with the idea of turning around and running for Djakarta instead of Padang. While it would have been easy to get to the southeast end of Sumatra, we would then encounter Sunda Strait with the same problems that we have here: adverse currents, adverse winds, and coral-confined waters. Our breakdown seems to have happened in the worst possible area. Although I may not be able to appreciate fully the difficulties of making westing around Cape Horn, I shall, from now on, be able to lend a sympathetic ear to any yarn of difficulties in the equatorial doldrums. It is astonishing how difficult it can be to push a sailing vessel across the Equator.

At last, after five days of futile sailing and after trying, without any luck, to get a tug out from Padang by radio, we put Ron Jensen, the Third Mate, with Sergeant Tobing as interpreter, in a Boston Whaler with an extra outboard motor, lots of gasoline, water, food, foul weather gear, compass, flashlights, etc. and sent them out to see what they could do. They made the more than thirty mile trip in a little over three hours, and by daylight this morning we were under tow. By four o'clock this afternoon we were tied up.

Although crippled, we held open house on Saturday, December 14th. At about eleven in the morning, we were favored by a visit from Governor Rangkkto of West Sumatra, who came with an entourage of about twenty officers. He was a military man who had spent a year at school in Fort Levenworth, and he spoke excellent English. Intelligent, interested and friendly, he was a most welcome guest. Almost immediately after his departure three busloads of students from the Universitas Andalas descended upon us, shepherded by two lecturers. I explained the general working of the

ship and our program, after which they were divided into groups of about fifteen or twenty and shown the vessel by our own students. In the early afternoon, I was driven to the University and delivered a lecture, discussing the need for oceanographic research, the TE VEGA program as part of it, and the favorable position of Indonesia as a potential exploiter of the sea's wealth. I was amazed at the audience. Although this was on Saturday, a normal holiday, and although the sun was shining brightly as it had no business doing during this normally wet season, well over three hundred students gathered to hear what I had to say. After the talk of about forty-five minutes, I was bombarded by a lot of very good questions. It appeared that the students were really interested, and I had a very good time.

We have taken on fuel, water and supplies, and on Monday we expect to be towed out of the harbor and set sail for Colombo. We feel confident that we can make it alright by sailing westward for a few hundred miles where we shall find wind conditions more favorable and the currents tending toward the north. However, we may not arrive until well into January, so it is necessary to send those students who have commitments home from here. Seven of them and four of the Senior Scientists will leave for Djakarta by ship on Monday, and from there they will proceed by air. Mr. Gill, Miss Williams and I, will be the only scientists left. I wonder when we shall be able to complete a cruise with a full complement on board?

TE VEGA EXPEDITIONS
GENERAL NARRATIVE--INSTALLMENT 9

On Monday, December 16th, we saw our departing members sail for Djakarta, but we, ourselves, did not get away. The Captain spent the entire day dickering with the captain of a freighter going northwest for a tow to the northern end of Sumatra, where we could expect the steady northeast monsoon. With the help of our agent, the price was slowly worked down from a ridiculously high figure to a fairly reasonable price. However, before a firm bargain could be struck, the freighter's chief engineer demanded a personal cut, and then the other members of the crew began to put in claims for additional cumshaw so that the price climbed beyond all reason once more. We finally quit dickering in disgust.

Meanwhile, as news of our presence in the harbor spread, local interest seemed to increase, and we played host to another large group from the University.

Finally, at 0300 on Tuesday, the harbor tug towed us out into the strait and dropped the lines at noon. We were on our own, eighteen miles from Padang and almost fourteen hundred miles from Colombo. The first twenty-four hours we made sixty miles, not quite in the right direction, but close to what we figured we would do in distance. According to the wind charts for December, one can expect calms and light variable airs about nine per cent of the time in this area; we have had them about seventy per cent of the time. It took us more than three days to clear the islands and to get into open water with plenty of room to maneuver in any direction, and even then we didn't progress appreciably better. Disappointing daily mileages piled up, 26 miles, 22, 76, 62, 47, 45, 28; Colombo is still a long way off!

Christmas came, and in spite of rolling sluggishly in the long oily swell of a mirror-like sea, we celebrated. Christmas greetings were passed throughout the ship, and messages from home were read. The saloon was decorated with Christmas ornaments, colored paper streamers, and balloons. "Snow" blanketed the colder regions of the world map that is our blackboard and frosted the portholes, while the cook prepared a tremendous dinner with turkey, ham and steaks. Cakes, nuts and candies were displayed for the taking, and an anonymous "poem" was pinned on the bulletin board:

CHRISTMAS ON TE VEGA, 1963

'Twas the night before Christmas
And all through the ship
Not a creature was stirring,
Not even a blip.

The sails were raised
On the masts with great care
In hopes that St. Nicholas
Would fill them with air.

I in my oilskins
The mate in his hat
Stood back at the wheel
A-chewin' the fat.

Down in the galley
Voices raised in a shout.
The eight-to-twelve watch
Was a-pourin' the stout.

Out on the horizon
There rose such a clatter
I sprang to the rail
To see what was the matter.

I threw back my hat
And raised up my glass,
Saw a sleigh and 8 reindeer
Make a galloping pass.

They lit on the masthead
So dainty and light,
To my old sea-dog eyes
'Twas a glorious sight.

A figure with sea bag
Stepped out from the sleigh
And looked at the deck
Several fathoms away.

He slid down the halyard
So fast and so quick
I knew by his lines
It must be St. Nick.

With a fancy red jumper
And bell bottoms to match,
He sprang to the foc'sle
And slid back the hatch.

He looked all around
And then went below
His sea bag to empty,
His gifts to bestow.

Along through the passage
Without glancing back,
A new tops'le jib
For a mate who's called Jack.

For our jolly chief scientist
At his feet would he lay
A flapping old coelacanth
To brighten his day.

He flew up the ratlines,
Jumped into his sleigh,
North by northwest
Was the course that he lay.

And he shouted to the crew
As he cast off a bight,
MERRY CHRISTMAS TO ALL,
AND TO ALL, A GOOD NIGHT!

Day after day, we had light variable breaths of air and averaged less than fifty miles for twenty-four hours. December 28th was the worst, with only thirteen miles logged. Then came a couple of days when we did better than seventy, and the contrast was such that everybody talked about having found the monsoon at last. It really wasn't, but we got stronger bursts of wind in the squalls, and in one of them the mainsail split, giving us a two-day sewing job to get it fixed. In spite of everything, spirits kept bright enough so that the entry in log for the first watch of the new year appeared in the traditional verse, as follows:

By the old Mentawai Island,
Lying off Sumatra's coast,
We were cruising gayly northward
Like a diesel-perfumed ghost,

When there came an awful thumpin'
And we stopped the engine quick;
The propeller shaft was busted,
And the Chief was feelin' sick.

Well, we hoisted all the stout sails
Like a schooner's s'posed to do,
And we tacked to East and tacked to
And cussed at all the crew. West,

But we couldn't make no
 northing
Cause the winds would all
 blow wrong
And when the damn things
 didn't blow
The current south was
 strong.

Five days we tried, and had no luck;
The sails would slap and bang.
At last we got a filthy tug
To tow us to Padang.

Here we discharged our scientists
And took on fresh supplies,
And bargained for a tow up North,
And cursed the dripping skies.

At last the tug hooked on once more
And towed us out to sea,
Where we set sail for Ceylon, fair,
As happy as could be.

Oh fools we were! We did not know
How dole could doldrums be!
We tacked and drifted night and day
And made not a degree.

Our daily runs were pitiful,
A score of miles, or ten,
As we sailed circles 'round the squalls
And drifted back again.

Ten days we tried to go to North,
Northwest, or even West;
The wind blew wrong, or just died out,
It was an awful pest!

At last we neared Sumatra's tip,
And caught the bless'd monsoon;
The sails filled out, we streaked along
Beneath the tropic moon.

But then the blasted mainsail split
With the awful crack of doom,
And here we sit and sew her up
As our hearts are filled with gloom.

The moon tonight is full and bright,
The weather calm and clear.
A very pleasant night for us
To ring in the New Year.

The heavy swells of yesterday,
Thank God, are getting less,
But alas! The winds that brought
Have gone, I must confess. them

The shipping lanes from East to West
On yonder skyline be;
The lights of westbound merchantmen
Go past us speedily.

The headsails and the fisherman
Are pulling us along
To West Northwest at full two knots,
And so I end my song.

At last, on January 5th we finally did hit the monsoon, and then our daily log read 142, 230, and 180 miles for consecutive daily runs, to bring us to Dondra Head, the southernmost tip of Ceylon. It was wonderful while it lasted, but the wind has died again, probably because we are now in the lee of the land. Now we are slowly creeping along the coast with the lights of Ceylon strung along in a line to starboard and a lot of traffic around us. Colombo is less than a hundred miles away and it looks as if we will make it, possibly tomorrow if the wind picks up; if not, surely the next day.

Of course it was impossible for us to end a cruise in a nice quiet and reasonable fashion. It was like trying to get into Padang all over again. Day after day, we tacked to west and to east and in the intermittent periods of dead calm drifted back south. For a couple of days, we made a few miles--a very few. Then, on the evening of the 10th, we found ourselves within twenty miles of our noon position on the 7th. We decided that we would give the wind another twenty-four hours to show itself and to call a tug if it did not cooperate. At just about noon on the 11th, a light breeze sprang up and we began to move slowly through the water. Stronger and stronger it became, howling down from west-northwest, and we were in for a wild night of tacking back and forth with the lee rail under on either tack, of cleaning up things that broke their securings, of fighting for a foothold on the steeply canted decks or trying to keep from being thrown out of our bunks. At 0600 on the 12th, we were creeping into Colombo harbour under a dying wind that finally gave up the ghost and made it necessary for us to drop the hook just off the end of the breakwater. Aside from a bit of water here and there, and having the paint locker hatch, combing and all, torn away by a boarding sea, we seem to have suffered no damage. At the same time, I have gained new respect for sailors. The sight of the first mate, Jack Thomsen, and two sailors, George Colyer and Tom Kantrud, aloft at the height of the blow, furling and securing the main topsail, was too much for me. I had to go below, but they took it all as part of the day's work.

After a while a tug came out and hooked a cable to us, but before we could get started they had fouled our anchor chain in their propeller! If anything can happen to a ship, I have concluded, it will happen to TE VEGA. Anyhow, another tug was sent for and soon we were securely tied up to the wharf.