

G. T. Corley Smith

Galapagos



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G. T. Corley Smith

INTRODUCTION

Gerard Thomas Corley Smith was born in July, 1909, in Lancashire, England, and passed away in October, 1997. Educated in Cambridge, he graduated in modern languages, joined the British Consular Service in 1931, and continued a full diplomatic career that would carry him all around the world. His final destination was as ambassador to Ecuador, where he was able to develop one of his passions: bird-watching. That interest put him in contact with French ornithologist Jean Dorst — and with the activities of the Charles Darwin Foundation for the Galapagos Islands.

His first visit to the archipelago was in 1964, alongside the Duke of Edinburgh, on board the Royal Yacht *Britannia*. He became involved with CDF's work and when he retired, he joined the organization's executive council. In 1972 he assumed the role of CDF's Secretary-General, which he managed from his house in Essex.

In 1984, he handed over his position, and was awarded the Order of Merit by the Ecuadorean government. The CDF's library, located at the very heart of the Charles Darwin Research Station (CDRS) near Puerto Ayora (Santa Cruz Island), is named in his honor.

During his years in Galapagos, Corley Smith was very interested in the islands' history, and produced a number of texts both on the archipelago and the CDF — some of which were published in *Noticias de Galapagos*, CDF's official organ, which he edited himself.

However, some of them were not.

In 2018, as part of my tasks as the newly-appointed coordinator of the CDF's library at the CDRS (nowadays, the Library, Archive & Museum area), I extensively reviewed the many unpublished manuscripts kept in the library's "special collections." Among the treasures kept in those shelves, one called my attention: a badly-damaged photocopied version of a typewritten work titled *Galápagos: A manuscript*.

The name of the author, Corley Smith, was familiar to me — as a matter of fact, I read it every morning, on the library's threshold. I patiently went through the manuscript's 254 pages, and what I found was a precious first-person narrative about the Galapagos Islands, the history of their human occupation, the description of their biodiversity, and the many adventures and challenges of their conservation and survival.

The text was clearly a draft: incomplete, full of typos and hand-made corrections, sometimes repetitive... Anyway, it was interesting and well-structured; somehow, it reflected the passion and interests of its author. Therefore, I decided to scan it and to slowly transcribe it.

By the time such a process was complete — and it took its time, I have to confess —, I had already started a series of publications edited by the CDF Library, Archive & Museum area, aimed at recovering the Galapagoan memory and the history of science and scientific endeavors in the islands. I saw in Corley Smith's manuscript an ideal candidate for the project, so I searched the mandatory permissions for publication. Corley's son, Peter, and his partner, Elizabeth Adams, after contacted, gladly accepted the proposal. They actually kept the typewritten original version of the manuscript — the basis for my photocopy. Hence, together, we double-checked the text and decided what was the best way to publish it.

For a number of reasons that would be too long — and even too personal — to explain, Corley Smith had decided not to publish his manuscript. However, seen from a contemporary perspective (and from a library-based one), his words are more than valuable. They are the words of an insider in the small universe of Galapagos' conservation — actually, the experiences and ideas of one of the persons that made such conservation possible. His prose is rich, and his historical narrative is compelling. He carefully selected some of

the most remarkable milestones in the local history and presented them with the art of a skilled storyteller. In a world of short attention-span, where stories are reduced to a sad handful of characters in social media, this kind of tale is as enchanting as knowledgeable.

A number of minor corrections were performed during the editing process, mostly regarding punctuation marks and typos. For the rest, the text was left untouched. A final note was added with a commented bibliography, for the interested readers to be able to continue their travel through the events surrounding the Enchanted Isles and the many documents that give an account of them.

I want to thank Peter and Elizabeth for their help during the process of recovering, editing and publishing this book, and to the Charles Darwin Foundation, for the continuous support to Galapagos' knowledge, memory and cultural heritage — which are as important and necessary as biodiversity.

May these pages encourage present and future generations to engage in the recovery and the preservation of the archipelago's history.

Edgardo Civallero
Coordinator, CDF's Library, Archive & Museum
Puerto Ayora, Galapagos Islands, February 2023.

GALÁPAGOS

A MANUSCRIPT

By G. T. CORLEY SMITH, Secretary General of the Charles
Darwin Foundation for the Galápagos Isles

Written in 1970

Chapter One

OUT OF THIS WORLD

Perhaps the most fascinating expedition of all was a four-day visit to the Galápagos Islands, forever associated with Darwin's great work, the Mecca of naturalists and a veritable paradise for bird- and animal photographers. It is here above all that the whole problem of conservation becomes most obvious.

H. R. H. The Duke of Edinburgh.

Las Islas de los Galápagos, the Islands of the Tortoises, was the name given four centuries ago to the lonely group of volcanoes, mostly extinct, that lie athwart the equator, far out in the Pacific Ocean. In spite of being mispronounced by most English-speaking people and misspelt in a score of different ways, and in spite of well-meaning official efforts to give them a more dignified title, that stubbornly remain the Galápagos Islands for the world at large. And this is right. It was the giant land-tortoises (*galápagos* in Spanish) that made the biggest impression on Bishop Tomás de Berlanga, the reluctant discoverer of the archipelago; it was their tasty flesh that attracted

the buccaneers and, alas, the whalers; it was the differences between the races of tortoises on the various islands that first started the itch in young Charles Darwin's mind which drove him willy-nilly to writing *The Origin of Species*, thus radically changing man's understanding of life; and it is still the tortoises that attract visitors to the islands, although today they have to work hard to see one in the wild. Even so, while the tortoises are the symbol, they are only a small part of the fantastic Galapagoan wildlife, which is like nothing else in this world.

In the Galápagos, nature seems all topsy-turvy. Where else would you find creatures normally associated with the Antarctic — albatrosses, penguins, fur seals — breeding right on the equator? Where else does the cactus grow taller than the trees? Where else do the gulls feed at night, like owls, or the lizards swim and feed on the bottom of the sea?

Over millions of years, though relatively recently as geologists measure time, the islands were thrust up from the deep ocean bed by persistent volcanic action. The winds and the great ocean currents, sweeping westward from the South American continent, brought seeds, insects, birds and beasts which somehow or other succeeded in establishing themselves. The islands were remote enough from the mainland, and indeed from one another, to permit the evolution of distinct new species. Most of the native forms of life in the archipelago are found nowhere else, many of them on a single

island. If, for the sake of argument, any one of the great National Parks of Africa were to be utterly destroyed, it would obviously be a calamity; but almost all the species in it could still be found in the other parks. If the wildlife of the Galápagos were destroyed, it would vanish forever from the face of the Earth. It is unique and irreplaceable.

When the islands were first discovered by Europeans, there were very few mammals, and these did not include man. There was a long-term balance of nature, and it had not been necessary for the instinct of fear to develop to any notable degree. The birds settled on the sailors' heads and shoulders. The sailors killed them. Despite centuries of such persecution, the birds and beasts are still amazingly tame and apparently lack the ability to acquire a sense of fear adequate for their defence against the intruders. Man plundered the wildlife, particularly the tortoises. Some races are already extinct, others in imminent danger. Given the outlook of their time and the harshness of their own lives, it may not be too difficult to understand the callous brutality of the pirates and whalers who played havoc in the Galápagos long ago. It would not be so easy to excuse ourselves if, in our enlightened age, we allowed the sad story of decline to continue because of quite petty economic interests or — perhaps worse — because of indifference and apathy.

It is surprising that these remote and desolate islands should have so much history. This history is full of violence and conflict: conflict

of man with the hostile sea and the inhospitable land; conflict between man and man; and conflict between man and beast. The men were wild and fierce, the beasts tame and gentle — but in this unequal struggle, the beasts had at least the advantage of being well adapted to the bleak and arid terrain, whereas, for men, existence in the Galápagos has always been harsh and painful. This, together with the remoteness of the islands, has saved representatives of most of the unique native creatures until the present day. But from now onwards, their survival will depend on the conscious efforts of man to restore, in so far as this is possible, the balance of nature which he has so disastrously upset.

Chapter Two

THE BISHOP

To unpath'd waters, undream'd, most certain
To miseries enough.

William Shakespeare.

The bishop was a brave man, but his spirits must have dropped as his caravel drifted closer and closer to the island. The little ship was within half a degree of the equator and when, hours before, the lookout had sighted land on the horizon, every man on board had eagerly expected an island with streams trickling down to the shore through lush tropical vegetation, where he could at last quench his desperate thirst. Instead, there was a black desolation such as the bishop had never seen before, whether in the most arid parts of his native Spain or during his long voyages in the New World. The sea broke against a wall of charcoal grey rock and, beyond this, great slabs of the same basaltic lava lay tumbled in hopeless confusion; otherwise, nothing but a few leafless shrubs was to be seen. What the bishop was praying for was water, but the chances of finding any on this desiccated wasteland seemed slender indeed.

Brother Tomás de Berlanga was an important figure in the early days of the Spanish conquest of America. Prior of the Dominican Order in the island of Hispaniola (today divided between Haiti and the Dominican Republic), the Provincial of his Order throughout the New World, in 1530 he was given the additional appointment of Bishop of Panama, or Castilla del Oro as it was then called. His diocese was one of the most extensive on earth — in fact, as most of it was blank on the map, neither he nor anyone else quite knew what came under his ecclesiastical jurisdiction. But the important mission which had brought him across the equator was political rather than ecclesiastical.

The bishop was making his hazardous voyage at the personal request of King Charles I of Spain, better known under another of his many titles as the Emperor Charles V of the Holy Roman Empire. He was also lord of wide but scattered realms in what we know now as Austria, Germany, Italy, France, Belgium and the Netherlands, and ruler of all the lands of the New World, discovered or to be discovered, that the Pope has bestowed upon Charles' grandmother, Queen Isabel of Castile, at the time of Christopher Columbus' great voyages. His dominions were much the widest that the world had ever known, but to say that he *ruled* them would perhaps be overstretching the meaning of the word. Apart from his life-long struggles with his European subjects, most of the Americas had not yet been explored; and there was the distressing problem that, even where Spanish forces had succeeded in subduing the native

populations, their captains, the robustious conquistadores, paid scant attention to his royal commands.

At this time, King Charles' most pressing American problem was the future of Peru. He was inadequately informed about the situation there, but it is perhaps surprising that he knew even as much as he did because the conquest of America had gone ahead with such speed; it was, in a very real sense, a 'new world.' In 1492 Columbus discovered the West Indies and in 1498, had his first sight of the American mainland. In 1513 Balboa crossed the Isthmus of Panama and discovered the Pacific Ocean. In 1524 Francisco Pizarro and his partner Diego de Almagro began to probe southwards along the Pacific coast and, only eight years later, their forces marched inland into Peru. Having strangled the Inca sovereign, Atahualpa, and possessed themselves of gold and land beyond their wildest dreams, the two old friends and comrades in arms began quarrelling over their shares.

While the King was delighted by his own Royal Fifth of the fabulous spoils which would help to pay the debts incurred in pursuing his European ambitions, he was distressed by the fierce disputes between his commanders and also by the rumours filtering through of the barbarous way in which both of them were treating the native inhabitants. Neither problem was new. From the earliest days of the discovery, the Spanish chieftains had fought one another, and Queen Isabel the Catholic had felt it necessary to reprimand the

great Columbus himself for making slaves in Hispaniola — but both quarrelling and enslavement continued unabated. Nevertheless, King Charles decided that this time he had to intervene, and he chose Bishop Tomás de Berlanga as his agent, instructing him to find out what was really going on and to use his best endeavour to settle the disputes.

As it was only twenty years since the first European had set eyes on the Pacific, the shipbuilding industry on the coast must have been in a pretty primitive state, even by the standards of those days. Brother Tomás somehow managed to build or acquire a caravel, recruit a crew and collect provisions and horses — animals of enormous importance to the Spaniards in the early days of the conquest. There could have been little comfort in this tiny, overcrowded vessel, and the dangers of making the long voyage through uncharted seas must have been plain to all but, whatever their other qualities, the Spanish conquistadores, swashbucklers and priests alike, were brave men. On the twenty third of February, 1535, the bishop set sail for Peru.

For the first week, the voyage prospered. Like the few other navigators who had preceded him in the Pacific, the ship's master hugged the coastline, never losing sight of land. It might not be quite the fastest route, but it was the safest; while latitude could be fixed with reasonable exactitude even in those early days of ocean navigation, the calculation of longitude involved a high degree of

guesswork. "What can be more difficult" wrote Martín Cortés, a contemporary of the bishop, "than to guyde a shyppengoulfed, when only water and heaven may be seen?" This ship was fortunate to have Brother Tomás on board as he enjoyed a considerable reputation for learning, not only in theological matters but also in astronomy and navigation. Still, the coastline was the surest guide, and the little ship could put into the shore whenever there was need of drinking water and fodder for the horses. The winds were good, and for seven days the caravel moved southwards with gratifying speed; if all went well, they would soon be crossing the equator.

Then came a dead calm, and the sails hung limply. This was a common enough experience and would not have caused immediate worry if the ship had not begun to drift away from the land. Gradually the shore, then the mountains, disappeared from the horizon as the caravel was swept out into the unknown waters of the Pacific. For a week, the becalmed vessel drifted out of the helmsman's control and in the grip of a relentless current. This current was in fact much stronger than the bishop suspected; he guessed that they had been carried out twenty or thirty leagues from the mainland, whereas in fact they have drifted some two hundred leagues or six hundred miles, deep into the Pacific. Quite apart from the growing anxiety, conditions on board had become progressively more difficult. Men and horses, packed into the little ship all day long under the burning equatorial sun and with never a breeze even at night, must have suffered abominably. Worst of all, the water was

running out. Then, on March 10th, an island appeared on the horizon, and the ship drifted towards it.

The island was not in any way inviting but, as the bishop later reported in a despatch to his royal master, "because there was only enough water left for two days, it was agreed to lower the boat and go on shore for water and for grass for the horses; but those who landed could only find sea lions, turtles and tortoises so big that each would carry a man on its back, and many iguanas which are like snakes." We do not know which island it was that Tomás de Berlanga had reached, and his laconic account tells us no more about it except that he thought it four or five leagues in circumference. What is striking is that so much of his report is devoted to the strange wildlife, particularly the gigantic tortoises, weighing anything up to a quarter of a ton. Those who today follow the bishop to his little island — whichever it was — will probably find it little changed. The rollers will still be breaking on the black lava slabs, on which the fierce-looking iguanas bask in the torrid heat — but they will no longer find the giant tortoises lumbering along by the shore. Brother Tomás, who was gentle and human, could hardly have foreseen that his discovery brought with it the threat of extinction to these extraordinary creatures, which had known no enemies until the advent of man.

But the pressing problem was water, and there was no prospect of finding any here. So, the ship weighed anchor and went on.

"Another day," wrote the bishop, "we sighted another island, bigger than the first and with great mountains and believing that because of its size and its mountainous nature it must have rivers and springs, we made towards it. At this point we had drunk all the water that there was on board and it took us three days to reach the island because of the calms, during which time both men and horses suffered greatly. When the anchor was dropped, we all went on shore, some setting to work to dig a well, others to seek water in the island. The water that came from the well was more bitter than that of the sea; further inland they could not find any water for two days and our men were in such need that they gathered the leaves of a sort of thistle, like prickly pears, and as these were juicy, though not very palatable, they began to eat them and to squeeze them to get the liquid out. It looked like the lye used for washing clothes but they drank it as though it were rose-water."

Anyone who knows the Galápagos needs little imagination to fill out Brother Tomás's bald account of the anguished search for water. Quite simply, if they had not found it, they would all have died — and they probably knew it. So, they scrambled inland, the hot and jagged rocks cutting and burning their feet, the heat and their own exertions making the torment of thirst more cruel with every hour. If the centre of the island was as high as Berlanga suggests, there must have been some water towards the summit, as the higher volcanic peaks cause condensation and mist or drizzle. But how were the sailors to reach the upper slopes even if they guessed this? Away

from the shore, the endless jumble of broken rocks became ever more thickly studded with leafless, thorny bushes and cactus. The only paths through this nearly impenetrable scrub were those worn by the carapaces of the giant tortoises as they pushed through the tangle.

On the first Sunday on the islands, the bishop brought the holy vessels on shore to celebrate mass and then sent the men off again in twos and threes to continue the search. "The Lord deigned that they should find in a ravine among the rocks a whole cask of water, and after they had collected that they found more and more. In the end, eight casks were filled, and the barrels and jugs that were in the boat." The bishop had every reason to be thankful; his crew was luckier than some later mariners. Even so, two men and some of the horses died of thirst.

The bishop and his men seem to have spent ten days in the archipelago, about a week of this on the second island, which they estimated to be ten or twelve leagues in circumference. "On this second island" wrote Berlanga, "the conditions were the same as on the first; many sea lions, turtles, iguanas, tortoises, many birds like those in Spain but so stupid that they did not know how to flee and many were caught by hand. Among the sand on the beach were some pebbles, which as we were landing, we thought were diamond chips and others the colour of amber; but in the whole island I do not think that there is any place where one could sow a bushel of corn,

because most of it is full of very big stones, as though at one time God had caused it to rain stones, and the earth is like the driest cinders on which not even a bit of grass can grow, only thistles, the leaves of which we ate, as I said before."

Two other islands were sighted in the distance, one of them very large, but no attempt was made to land on either; the bishop was a reluctant explorer and anxious to get back to the mainland and carry out his official mission. He did however take the latitude and satisfied himself that the islands he visited laid between half a degree and a degree and a half south of the equator. This admirable calculation of the latitude was not accompanied by a similar precision in the matter of longitude. He was still convinced that they were only about sixty miles from the mainland, not six hundred, otherwise he would have insisted on filling more of the ship's water casks. After sailing with moderately good weather for another eleven days, there was still no sign of land. Then the ship's master announced that they had only one cask of water left and asked the bishop where they were. Brother Tomás again took bearings and found that they were three degrees south. At last, he realized that they were far out in the ocean. He ordered a change of course and rationed the water — half for the men and half for the surviving horses. In this way, the last cask was made to last another eight days. Shortly after the water finally ran out, they made landfall, and although another calm held them up for two days, the sight of the mainland buoyed up their spirits, and they managed to survive on

what was left of the wine. Finally, on the ninth of April, they reached the Bay of Caragues (in the present Republic of Ecuador), seven weeks after being carried away from the mainland.

The ordeal over and safe in harbour, the good bishop philosophically noted: "Here we met men of a ship from Nicaragua who had left eight months before, so we thought our voyage good by comparison with theirs." It is difficult to know which to admire more, the hardihood or the sheer courage of the early Spanish pioneers. Brother Tomás could not have known that, if his involuntary course had been different by half a degree, his ship would not have touched the Galápagos but would have been carried out and out into the Pacific with no other land for thousands of miles and death by thirst the only end — but he probably had few illusions about the fate from which they had so narrowly escaped. It was here that he wrote the account that brought the Galápagos into history. He wound up the story of his great adventure in true sixteenth-century Spanish style: "The Lord fill Your Sacred Majesty with holy love and grace for many years and conserve your realms and increase them with new ones, as I hope. From this new town of Puerto Viejo, this twenty-sixth day of April, in the year fifteen hundred and thirty-five. I am your Sacred Imperial Catholic Majesty's most faithful servant and subject and Perpetual Chaplain who kisses your royal feet and hands."

Loyalty to the King was accepted by the Spaniards of the Conquest as unquestioningly as loyalty to the Catholic Church, and by Pizarro and his swashbuckling warriors as automatically as by the dutiful bishop — but acceptance of authority did not imply obedience to instructions, and in practice, the conquistadores paid scant attention to the commandment of either God or King. "We obey but we do not comply" might well have been their motto, as Berlanga found when he reached Peru. The conquistadores were incredibly brave, but also cruel, quarrelsome, and insatiable in their greed for gold, lands and serfs. Backed by the King's instructions, the bishop urged moderation in the savage exploitation of the "Indians" but with so little success that the problem still bedevils political life today. Nor did he fare any better in his role as a peacemaker between Pizarro and Almagro. Soon after he left, civil war broke out between the two Spanish conquerors; Almagro was strangled in jail by Pizarro's brother; Pizarro died when one of Almagro's followers ran him through the throat with his sword. Within a few years, four of the five Pizarro brothers died violent deaths, and the fifth was languishing in a Spanish gaol while Almagro's son was executed on the same spot as his father. They were unbiddable men.

Brother Tomás, who had his share of the Spanish conquistadores' courage but not their greed, refused Pizarro's lavish gift and returned disillusioned to Panama. He gave up his see in 1537 and went home to Spain, where he founded a monastery. He died in 1551 and was buried in his native village of Berlanga, from which he took his

name. He is credited, a little uncertainly, with the introduction of the banana in the New World. Quite certainly he gets the credit for bringing the Galápagos into history, however unintentionally. A hundred and fifty years were to pass before there was any better account of the islands than that given in his letter to Charles V, but unfortunately, it lay buried among the mountainous archives of Seville until it was discovered and published by the great Spanish historian, Marcos Jiménez de la Espada, towards the end of the last century. But although unpublished in Spain, and apparently ignored or forgotten in Peru, his discovery of the islands was known at least to a few European scholars and cartographers of his own time.

Chapter Three

THE INCA LEGEND

What seest thou
In the dark backward and abysm of time?

William Shakespeare.

Tomás de Berlanga was the first man to record the existence of the Galápagos in writing. But was he the first to discover them? When the Spaniards arrived in Peru, they heard persistent rumours of islands far out in the Pacific called Avachumbi and Niñachumbi, which had been visited by the Inca monarch, Topa Inga Yupangui, grandfather of the ill-fated Atahualpa. The story was investigated by the historian and explorer, Pedro Sarmiento de Gamboa, who satisfied himself and quite a number of other people that it was true. In his *History of the Incas* (written about 1570, but not published until this century), he related how the Inca sovereign, having conquered Túmbez and Manta on the mainland coast immediately opposite the Galápagos, met "some traders who had arrived by sea from the west in *balsas* with sails. They informed him that they came from islands called Avachumbi and Niñachumbi, where there were many people and much gold." At first, the Inca was sceptical, as

traders were "people who talked a lot," so he consulted his necromancer who, among his many attributes, included the art of flying. The magician took to the air, made a quick reconnaissance, and confirmed that the islands were rich and well-populated.

Thus reassured, the Inca determined to incorporate the islands in his vast empire, adding them to the many territories he had annexed on the mainland. He assembled a large number of *balsas* (native rafts with sails) and embarked twenty thousand of his best soldiers. He found the islands and returned a year later, bringing with him "black people and much gold and a chair made of brass and the skin and jawbone of a horse, which trophies were kept in the fortress of Cuzco until the time of the Spaniards."

Parts of Sarmiento's narrative strain our credulity. Dismissing the air-borne magician and the logistics of a fleet greater than the Invincible Armada, we are still left with the problem of the trophies. There were no black people, gold, brass, or horses in the Galápagos. The equine remains troubled even Sarmiento because the one thing every Spaniard knew was that there were no horses in America before the conquest. He personally interrogated the old man who previously had charge of the trophies and who vouched for the truth of the story. "I mention this," he writes, "because anyone who knows anything about the Indies will find this difficult to believe." This is indeed the case. To prove the incredible, Sarmiento had an interpreter read and translate his manuscript to an assembly of fifty

Indian notables and descendants of the Inca royal family, who solemnly confirmed the truth of his account. He certainly believed it himself, and for the rest of his life he was obsessed with schemes to visit the legendary islands.

There is so much arrant nonsense in Sarmiento's narrative that we might easily dismiss it as a fairy story; but it could have some basis — at least its origin — in fact. Let us suppose that under the Inca Empire, or even long before, some sailors did reach the Galápagos and found their way back; in the course of time and repeated telling (there was no written language), it would not be unnatural to attribute the adventure to the Inca himself. After all, in our own highly documented era, far too many good stories were attributed to Winston Churchill — it made them sound even better. And did not George IV come to believe that he had personally taken part in the battle of Waterloo? As for the gold, slaves and horses — well, these were the things that the conquistadores valued most highly and would most like to hear about. Then, as now, there was a notable tendency among the people of the Andes to tell an enquirer what they thought he would like to hear — not out of any real desire to deceive but simply so as not to disappoint him. At the time of the conquest, there was an additional incentive to oblige because natives who were believed to be withholding information about gold or other hidden treasure were pitilessly tortured; their anxiety to please, to say the right thing, must have led to many fruitless treasure hunts and the deaths of hundreds of brave Spaniards. The conquistadores

wanted to be told about gold in large quantities, they expected to be told about it, so, in the end, that was what they were told. In the Galápagos there was no gold, slaves, or horses — but these could have been more embroideries to the old legend, tacked on for the benefit of the Spaniards, who all too obviously liked to have their stories flavoured with such spices. Be that as it may, such distinguished authorities as the historian, Don Marcos Jiménez de la Espada, and the geographer, Sir Clements Markham, came to the conclusion that, stripped of its trimmings, the story of pre-Columbian visits was probably true.

It was definitely possible for the native sailors to reach the Galápagos on board *balsas* and Manta, where Sarmiento's story begins, was about the nearest point on the mainland. A *balsa* was a large raft (up to eighty feet in length according to some early records) with a large square sail, a deck house and a hearth. It was made by lashing together trunks of the balsa tree, the lightest of woods — the Royal Air Force's famous Mosquito aircraft was built of it. Such a raft, buoyant as a cork, could certainly have made the islands in the same way that Bishop Berlanga did — unintentionally, highly reluctantly, a helpless prisoner of the current when the wind failed. In the general region of Manta, the currents seep out towards the Galápagos and it would be surprising if, over the years, unfortunate sailors had not been carried there in their *balsas*. As recently as 1965, an international crew set out from the Guayas estuary, not far from Manta, to emulate the exploits of the *Kon-Tiki* and sail to Polynesia

in a carefully constructed replica of an Inca *balsa*. Despite months of effort and considerable help from the Ecuadorian Navy in the way of towing, nothing could keep them from drifting to the Galápagos, where they were finally forced to abandon their adventure.

The latest and most concrete contributions to the solution of this prehistoric mystery story come from Mr. Thor Heyerdahl. To begin with, he demolished the theory that *balsas* could not sail such a distance (because, it was alleged, their logs absorbed water) by himself sailing ten times as far in the *Kon-Tiki*. Also, he tells us, "I have during recent experiments in Ecuador rediscovered the lost Peruvian and Ecuadorean art of centre-board navigation. With correct use of centre-boards such as are historically and archeologically known from Peru and Ecuador, the large aboriginal *balsa* can sail and tack into the wind and it is abundantly clear that the range to and from the Galápagos was fully within the capacity of the aboriginal cultures of the North West coast of South America." This means that if a *balsa* was unwillingly carried out to the Galápagos by the current during a prolonged calm — and there surely must have been such cases — its crew would still have a fair chance of getting back when the wind rose again; later, they might repeat the journey deliberately.

When Heyerdahl heard of a huge primitive carving on one of the islands, he set out with a team of archaeologists to clinch the matter. The stone carving turned out to be the inexpert relaxation of a recent

German settler, but the expedition did find four ancient occupied sites with some two thousand potsherds and flints, belonging to more than one period. As there are no native flints in these volcanic islands, it does look as though seafarers reached the Galápagos while still using stone-age tools. Heyerdahl is satisfied that "ample remains are left in various parts of the group to show that South American aborigines called at the islands equipped with water jars, cooking vessels, ornamented vases, whistles and flint tools before the Europeans." The pottery seems to belong mostly to the Chimu and Mochica cultures, which flourished in pre-Inca times on the Pacific coast opposite the Galápagos, in what is now Ecuador or northern Peru. This evidence does not solve the mystery of whether or not the Inca personally visited the islands — he may have annexed the story when he conquered the coastal tribes, in the same way that the Eighth Army "captured" the song, *Lili Marlene*, from the Africa Korps — but it does show that there was some basis for the legend, however lost in the mists of time.

Chapter Four

THE ENCHANTED ISLES

...magic casements, opening on the foam
Of perilous seas, in faery lands forlorn.

John Keats.

For a century and a half after their discovery by Tomás de Berlanga, the Galápagos were rarely visited. His despatch gathered dust in the archives of the Council of the Indies and was not published until 1884, but its contents must have been known to a few men of learning. In his *Orbis Terrarum*, published in 1570, the great Flemish cartographer, Abraham Ortelius, showed the *Insulae de los Galopegos*, where the bishop had placed them, as did Mercator in his map dated 1587; and at this time, and for many a long year after, the bishop's account gave the only reliable information available. Among the Spaniards in America, the pioneer voyage was largely, if not entirely, forgotten. At this time, they were busy exploring more promising lands, trying to amass quick fortunes, subduing new tribes and, above all, fighting one another. For most of the conquistadores, life was short, so there were few Spaniards in Peru with long memories. If the bishop had found gold, his story would

have attracted attention; but the chips he picked up on the shore turned out not to be diamonds after all and tortoises, however gigantic, meant little to the get-rich-quick adventurers.

Even Pedro Sarmiento, better known as the early historian of Peru than as a navigator and explorer (though he also distinguished himself in these fields), seems to have been unaware of Berlanga's adventure. His long and passionate interest in the lost islands far out in the Pacific amounted to an obsession but his pleas to be put in charge of an expedition to rediscover them were based, not on the bishop's clear and precise account, but on the vague and mist-enshrouded legend of the Inca's visit to Avachumbi and Niñachumbi. He pestered the authorities so effectively that, in the end, he had his way — more or less. In 1567 the governor of Peru equipped two ships, the *Los Reyes* of 250 tons and the *Todos Santos* of 107 tons, to find these islands, which Sarmiento claimed were the outposts of greater lands to the westward. To his chagrin, the governor gave the overall command to his young nephew, Alvaro de Mendaña, and Sarmiento had to be content with the captaincy of the larger ship. In a furiously indignant letter to King Phillip II, he claimed that he had discovered the islands "where Topa Inga Yupanguí went" and that they were situated "two hundred-odd leagues from Lima and fourteen degrees from the equator" but that he had been cheated of his prize by his commanding officer, who would not allow him to land and take possession of them. He alleged

that this was a low plot on the part of Mendaña, who intended to return and claim the islands for himself alone.

It was no consolation to Sarmiento that the expedition went on across the Pacific and achieved fame by discovering the Solomon Islands. All his days, he remained obsessed with the idea of the Inca's fabulously rich islands and, like a true conquistador, he wanted to receive them as a fief by right of discovery and thus to govern and exploit them for his own benefit, subject only to a vague allegiance to a distant sovereign. We have only Sarmiento's word for it that he saw the islands of his dream though it seems churlish to deny that he saw anything at all. But what islands did he see? There are none where he claims. He was a respected navigator (the first man to take a ship through the Magellan Straits from west to east) and could hardly have placed the Galápagos fourteen degrees south of the equator, so if the islands of the Inca legend were the Galápagos, as seems probable, then he did not rediscover them. Thor Heyerdahl is convinced that the islands Sarmiento saw without landing were in the Easter Island group.

Even if we were to admit that Sarmiento reached the Galápagos, his was certainly not the first, nor for that matter the second, Spanish ship. His only distinction in this connection is that he was the first European who actually wanted to go there; all the other early mariners were taken there by irresistible ocean currents very much against their will. Eleven years after Bishop Berlanga's voyage, the

civil war among the rival conquerors of Peru had reached a new peak of intensity. Gonzalo, the last of the five Pizarro brothers (apart from the one that was incarcerated in a Spanish prison), had appointed himself governor of Peru and was fighting desperately to retain his position. Naturally, as a loyal Spaniard, he claimed to be fighting in the King's name, but so did his opponents. In 1546 his troops, under the redoubtable Francisco de Carbajal, whose incredible bravery, combined with a cruelty remarkable even by the ruthless standards of the age, had earned him the nickname of the Demon of the Andes, roundly defeated one of the rival forces. A dozen of the fleeing soldiers under Captain Diego Rivadeneira reached the coast at Arica (in modern Chile) and seized a small sloop.

The ship was inadequately provisioned, had no compass, maps or navigator but, with the terrible Carbajal on their heels, Rivadeneira and his men hurriedly set sail for Nicaragua. For fear of interception by the Pizarro faction, the soldiers kept out of sight of the coast, and the Humboldt Current swept them out to the Galápagos — to their great surprise and consternation. At first, they could not believe that they had left the mainland, but when they had sailed for three days along "a large island with high mountains," they realized that this could not be one of the Peruvian coastal islands. They did not land on it (probably these temporary sailors found the treacherous currents and sharp reefs more than they could cope with), but they did set foot on a smaller island.

Pedro Cieza de León, a conscientious chronicler of contemporary history, who was also a remarkably tough soldier and had himself made desperate forced marches through unknown country, describes their landing with a touch of contempt: "As they had little water and realized that they were not as near Nicaragua as they had previously thought, they set out in different directions to look for some water; but each one fearing that he would be left behind by the others, they soon came back to the shore and re-embarking continued on their way, very sadly on account of their lack of water and food ... It seems to me that if they had calmly sought for water, they would have found some." But Cieza de Leon did not know the Galápagos, and the odds are that this island was waterless.

Rivadeneira and his little crew of soldiers pushed on, and their sufferings increased. A large turtle floated alongside their little vessel, and a young man clambered onto its back while the others made it fast. Unfortunately, through some change of wind or current, the turtle and the ship drifted apart. The poor boy could not swim, and they had to leave him there, sitting astride his turtle, until he was lost from sight. What a strange death! The others contrived to catch sharks and other fish with harpoons, which they resourcefully fashioned, using their spurs to make the heads. Even so, they had been four days without food or water when, more dead than alive, they finally made land, not in Nicaragua, but in Guatemala.

We have no record of this voyage from Rivadeneira's own pen; like his late commanders, Pizarro and Almagro, he probably had never learned to write. However, his story is told in a letter from the royal treasurer of Guatemala, reporting the adventure to the son of Charles V, who was to become King Phillip II: "On his way, Captain Diego de Rivadeneira discovered an island. It is below the equator, with high mountains; he said its coast was eighty leagues long. He landed on a smaller island where he found tortoises, turtles, iguanas, sea lions, some birds called flamingos, doves and other birds, among them a very beautiful gyrfalcon, which has not been seen in this country nor I believe in Peru, although there are other falcons." Owing to his hasty departure without nautical instruments, Rivadeneira could not give any accurate bearings, but the treasurer's letter, with its emphasis on the wildlife, leaves no doubt that the islands were the Galápagos.

Rivadeneira became a sailor against his will and a discoverer by pure accident and one would have thought that, after his devastating experience, he would never want to see the Galápagos again. But no, this rugged soldier clearly had not had enough; the royal treasurer's letter goes on to make Rivadeneira's formal petition to be granted the right to explore, settle and govern the islands. We do not know what, if any, consideration his request received, but the Spanish crown never at any time attempted to occupy or settle these grim and lonely islands.

It is interesting to note that neither Rivadeneira nor the historian Cieza de León, nor the royal treasurer seem to have been aware that Bishop Berlanga had discovered the Galápagos eleven years earlier. In those days, reports were not made in multiple copies and circulated, and presumably, no copy of the bishop's letter remained in the Americas. Few of the Spanish conquerors were given to writing, or even reading, and it may well be that others reached the islands without their odysseys and sufferings ever being recorded. In fact, we do get an occasional glimpse — tantalizingly inadequate — of the kind of adventures that gave the archipelago its second name of "The Enchanted Islands."

One such intriguing detail occurs quite accidentally in a description of a little fleet the Portuguese explorer, Pedro Fernandes de Queirós, fitted out in Peru about the year 1604 for his pioneering voyage into the South Seas. "The third ship," the anonymous chronicler relates, "was a tow-masted vessel of smaller tonnage, which had recently come from the Island of the Tortoises, where it had gone to take off people who had been lost there." But who were these unfortunate people, presumably victims of a shipwreck — and how did anyone know that they were lost on the Galápagos unless visits were more frequent than the records show? One of these castaways may have been the lay brother of the Dominican Order whom an early historian mentions in a casual aside, which merely whets the appetite for more: "Brother Martín Barragán, a lay member of the order, a fire and brimstone preacher and the terror of sinners, solid in virtue,

a great penitent, was in my time a porter at the monastery. He was one of those who had spent three years on the Galápagos Island, an experience which brought about his conversion." A surprisingly large number of people have been powerfully influenced by the Galápagos — but not all in this way!

Apart from such passing references, the Galápagos faded out of history for over a century, and this was natural enough. On the mainland, the richest mine ever known had been discovered at Potosí — a mine so rich that it deeply affected the economy of the Old World as well as the New — while the little that was known of the Galápagos was calculated to discourage the ambitious. There was no sign of precious metals or gems; there were no inhabitants and, therefore, neither slaves to take nor souls to save; the land was infertile, and there was next to no water; in short, there was nothing but strange birds, outsized tortoises and lizards, all of them so silly that you could kill them without weapons, but offering little prospect of profit to get-rich-quick adventurers.

Moreover, mariners feared and distrusted the islands. Not only were the sharp reefs alarming, but the strong and capricious currents made their little sailing ships virtually unmanageable unless they had a very favourable wind; so much so that the legend grew up in those early days that it was not the ships but the islands themselves that were drifting — there was something eerie, supernatural about them and they were actually floating about in the sea. The sailors called

them *Las Encantadas*, the Enchanted Islands — not "enchanting" as so many would-be settlers later discovered to their bitter cost, but "enchanted" in the sense of "bewitched" or "under a spell." They were considered good places to avoid, and for a little while longer the giant tortoises were left to lumber peacefully through the wilderness, following the trails their heavy armour had worn in the rough lava through uncounted centuries.

Chapter Five

A CLUSTER OF VOLCANOES

Take five-and-twenty heaps of cinders dumped here and there in an outside lot; imagine some of them magnified into mountains and the vacant lot the sea; and you will have a fit idea of the general aspect of the Encantadas, or Enchanted Isles.

Herman Melville.

At this point, where we are emerging from legend, hearsay, and imagination into recorded history, it may be convenient to anticipate later discoveries and describe the Galápagos as they are. Those readers who are not interested in the physical characteristics of the islands can take up the story again in the next chapter.

The archipelago lies right across the equatorial line, some six hundred miles west of the coast of Ecuador (the Republic of the Equator, to give the country its full title in English). There are ten or sixty islands, depending on the individual judgement of the point at which a rock becomes big enough to be dignified by the name of island. Large or small, they all have one thing in common — they

are entirely of volcanic origin. Beyond this, there is no general agreement on the geological history of the archipelago. There are three main schools of thought. Most geologists believe that the islands erupted relatively recently from the ocean bed as separate volcanic peaks. Then there is a minority opinion that the archipelago was once joined to the mainland of Central America by a land bridge that later subsided. Finally, there is what we might call the intermediate view — that the archipelago, while always oceanic, was once a single island and that subsidence resulted in its separation into a number of individual peaks. The problem has claimed the attention of scientists from Darwin to the present generation.

Someday science may come up with clear-cut evidence to decide the question one way or another; meanwhile, we had better leave the controversy to the geologists, although it is of obvious importance in considering how distinct forms of life evolved around these lonely craters. One thing, however, can be said: the islands are not inhabited by very primitive creatures which have elsewhere become extinct — they are not the "prehistoric monsters" of popular parlance. Neither the reptiles nor the birds belong to primitive families: like the islands themselves, they must be considered as "modern" in terms of geological and biological time. Due to their isolation and the peculiar conditions of the archipelago, they have evolved along different lines from the animals on the mainland. Because of this isolation and the unusual simplicity of the plant and animal communities, this "little world within itself," as Darwin

described it, constitutes a unique natural laboratory for ecologists and students of evolution.

The land area of the archipelago is about 3,000 square miles, but it is scattered over 23,000 square miles of sea. Much the largest island is Albemarle, on the western fringe of the group, which occupies half the total land area. It is seventy-five miles long and forty-five in breadth at its southern end. The equator passes through its northern tip. Together with the neighbouring Narborough Island, it has the biggest volcanoes. These rise steeply as much as a mile above sea level and plunge down a further two miles to the ocean bed of the Pacific. Albemarle is really a chain of five huge and one smaller volcanoes which, over time, became joined together by lava flows. One of its craters is five miles in diameter. Narborough, the second largest island, is a single enormous volcano, nearly 5,000 feet high and with a crater some 3,500 feet in depth. It is the one which has been most active in historical times. Until quite recently, it was particularly noteworthy on account of the lake in the floor of its great crater; rising out of this lake there was a smaller crater which, in turn, enclosed another lake. So it was until the last great eruption in 1968, when the floor of the crater collapsed and fell another thousand feet deeper; geologists consider this the greatest caldera collapse for over half a century. The main lake shifted to the other side of the great crater, and the cone of the smaller crater was breached, allowing the water to drain out. Although it is the biology of the Galápagos that has attracted world attention, the islands are of major importance

geologically and are rated as "one of the most active volcanic fields in the world."

The other main islands in order of size are Indefatigable, James, Chatham, Charles, and Hood. With the possible exception of Charles, James is the only one of these that has been active volcanically in historic times. On the rest, the main craters have broken down through long inactivity and are no longer well defined. It is difficult to generalize about the islands, as one of their charms is that they are so different in character. Each one presents a surprise. Seen from the air, much of their surfaces vividly recall the photographs recently brought back from the moon. Immense congealed lava flows descend the flanks of the mountains like dark glaciers or broad, rippling rivers of mud, so that at first glance it is difficult to believe that they are not still flowing into the sea. Seen at closer range, even the lava flows are all different. Some are black, some brown, some weathered by the ages, others with a vitreous surface that makes them look as fresh as though they had been newly poured out of the bowels of the Earth. Apart from the main craters, there are hundreds and hundreds of minor craters, fumaroles and vents.

We talk of lava in a general way, but it comes in all sorts of colours, shapes and sizes. The great lava flows of geologically recent vintage still look like great stone rivers rolling down the flanks of the volcanoes, their ripples frozen forever — perhaps glaciers offer a

better analogy, as they too are static to the human eye. The flows have their irregularities, their escarpments, their crevasses. Some are more broken and jumbled than others; some are black, others brown, and the two occasionally intertwine. With age, the huge masses break up into blocks, rubble, or powder so that in the course of a day, one walks over many different terrains: now over cinders, now over boulders like the moraine of a glacier, and again over great thin slabs that crack and give a metallic rattle beneath the feet as though they were iron plates. At times, the lava has formed strangely beautiful patterns: great coils that look like monstrous, wrinkled seashells; others almost as if they had been woven like baskets. There are caves, towers and pinnacles, as though the volcanoes had vied with the glassblowers in producing strange shapes.

The main craters have their names, but there are many hundreds of lesser cones, varying in size and shape from a huge old-fashioned kiln to an empty *vol-au-vent* case — but one made of bubbly black glass. The bleak landscape is diversified by other volcanic vomitings which are not precisely lava. There is the porous pumice that was once the froth of the lava before it congealed into an aerated stone, lighter than water; being soft, the weather and the sea can sculpt it into the most diverse shapes. Then there is the red, sandstone-like tuff, which originated when volcanoes threw up mud without lava. Tuff, like pumice, is very susceptible to erosion and provides an engaging variation both in shape and colour to the usually drab shores of the islands.

There are islets, little more than rocks, on which no man has yet been rash enough to set foot, but all those worthy of the name of island have now been explored to a greater or lesser extent. Wenman and Culpepper Islands, lonely outposts well to the north of the equator, have rarely been visited, but the interiors of all those in the main group are now fairly well known. Until today, the inaccessibility of the higher reaches of the great volcanoes has been a providential factor in preserving some of the wildlife, but during this century, all of them have been climbed by scientific expeditions.

Since the Charles Darwin Foundation established its permanent scientific station on Indefatigable in 1960, exploration has gone ahead in a more methodical fashion, but it would be an unpardonable exaggeration to suggest that the less accessible parts of the islands are now well known. This is due less to the abominable difficulties of the terrain than to the lack of water. While a man can survive for weeks without food, desiccation can kill him in a day. Climbing up the naked lava slopes, the body loses moisture at a prodigious rate. The climber must carry enough water to meet emergencies, and the more he carries, the more effort the climb demands. Every gallon weighs ten pounds and a man needs a gallon a day, so long explorations have their logistic problems. Eric Shipton, who has a greater and more varied experience of mountain exploration than anyone else has ever had, including climbs on Albemarle and Narborough, considers that the danger of death from desiccation on the Galápagos volcanoes is generally underestimated.

However, the Darwin Station can still boast that it has not yet lost a scientist.

Such extreme conditions are encountered only by the hardy few and are rarely met near the coast; indeed, there are a number of authenticated stories of sailors, marooned or shipwrecked, who lived there for months and even years — miserably, in all conscience, but they survived. Given the latitude, the climate is remarkably temperate. This is of course due to the water of the Humboldt Current, which still retains something of its Antarctic chilliness as it laps the shores of the islands. To some extent, this is offset by the warm current flowing southwards from the Gulf of Panama but, in spite of this, the Galápagos archipelago must be the coolest place anywhere on the equator at sea level. Because of the way the black lava absorbs the sun's heat, it can on occasion be painful to bathers' feet — but the sea is always deliciously cool.

The vegetation varies to an incredible extent, not only from island to island but even more so within each island — at least, this is so on the bigger ones. Soil is one obvious factor: where the lava is of recent origin, obviously little or nothing can grow, but where it has been weathered down through the ages, small or even large pockets of soil have accumulated from eroded rocks or volcanic ash. But it is the winds and the ocean currents, particularly the Humboldt, that are the key to the development of plant life. The Humboldt Current is still cool when it reaches the Galápagos, cooler than the land in

the lower parts of the islands, so the moisture it brings does not normally fall near the shores, which remain more or less deserts. But inland, at higher altitudes, where it is cooler, clouds form, and there is a persistent mist or drizzle, known locally as *garúa*.

If we climb from the sea to the highest point of Indefatigable Island, which is just under three thousand feet, we have to pass through an astounding series of completely different vegetational zones. After the bare lava of the shore comes the arid zone, where tree-cactus and leafless scrub grow in the interstices between the broken slabs. Next, there is a more humid intermediate belt where there are fair-sized trees but, owing to the shallowness of the soil in which the roots cannot get a proper grip, they tend to grow sideways, propped up on their branches. As we struggle upwards — it is more of a scramble than a walk — the temperature falls and the humidity rises, the volcanic dust becomes mud, the moss on the trees grows longer, and the world around us gets greener and greener. We are now entering the cloud forest, a lush jungle where everything grows like weeds. Still farther up is the *Miconia* belt, with its vivid green but not very tall plants, and finally, open moorland, with bogs and ferns. There are even patches of reindeer lichens, an incredible approximation to tundra within such a small compass. Only a few miles separate the peak from the coast as the crow flies — but it should be remembered that there are no crows in the Galápagos and that this is a strenuous excursion for creatures without wings.

No two islands are alike, and nothing that is true of Indefatigable is necessarily true of the others. It is not even true of Indefatigable all the time. There are periods when even the jungly zone is struck by drought; the volcanic soil is so porous that it does not retain the water and dries up unless constantly replenished. There are also times, admittedly infrequent, when heavy rains fall on the coast and, for a short time, the desert blooms and the dry scrub puts out fresh green leaves; seen from the air at such a moment, the island is scarcely recognisable.

But even a spell of heavy rain makes little difference to the face of Narborough Island. Whereas the Indefatigable volcano has long been dormant, so that over the millennia its lava flows have crumbled and weathered, and its great crater has disintegrated to the point where it is scarcely distinguishable, thus making plant life possible wherever and whenever there is moisture, Narborough has remained active. There are many records of eruptions in the last two centuries, and even without them, the evidence of activity is there for all to see. Mighty rivers of lava have poured down its flanks through the ages, but many of them are very recent as geologists measure time: a cataclysmic eruption was witnessed at close quarters in 1825 and, as we have seen, activity continues to the present day, altering the floor of the huge crater with its curious little lakes. Even by desert standards, little can grow on this new lava, although here and there, islands of greenery exist at places which have been missed

by all the geologically recent lava flows. Taken as a whole, Narborough is a gigantic slag heap.

In historical times, Narborough has been much the most active of the volcanoes, but this does not mean that the others have all been quiescent. Not one of the main craters of the five great volcanoes which together form Albemarle Island has been in recent eruption, but secondary craters on some of their flanks have exploded from time to time; there are also permanent geysers and fumaroles that occasionally blow out steam. Fumaroles on James, Bindloe, Barrington and Abingdon Islands have all been spouting vapour in the present century. As the whole group is basically a single volcanic mass, there is no obvious reason why, over the ages, some other islands should not take over from Narborough the status of being the Galápagos' most active volcano.

On the coast, the temperature varies only within a narrow range. At Academy Bay, the Darwin Station's meteorological records show occasional readings as high as 86 and as low as 65 degrees Fahrenheit, but such extremes are rare, and temperatures are usually in the seventies, with little difference from one month to another. The *garúa*, a heavy overcast of dismal cloud, affects the coastal area very little, and the records at the Darwin Station show only about twenty sunless days a year. The light is usually of such an intensity as to make amateur photographers doubt the accuracy of their meters. Higher up on a few of the larger islands, the *garúa* is almost

as regular a feature as the sunshine on the coast; the constant condensation produces a lush vegetation and makes agriculture possible, but those who have settled there spend their lives amid moisture and mildew. This is yet another of the strange contrasts found in the Galápagos.

Rainfall, and therefore vegetation, is affected not only by altitude but also by whether or not a particular area faces the prevailing south-easterly winds. As the Galápagos are situated in a gale-free zone, the winds are usually gentle, and storms very rare indeed.

The names both of the archipelago and the individual islands are a source of confusion. In the earliest maps, those of the sixteenth century, they appeared simply as an ill-defined group called the Galápagos Islands. A little later, they were called the Enchanted Islands; this has remained as an unofficial, subsidiary name, a kind of nickname. Finally, to celebrate the four-hundredth anniversary of the discovery of America, the Ecuadorian government gave them their official name of the Archipelago of Colón. This is an awkward name for English-speaking people, particularly if they do not know that Colón was the last of several variations that the great Genoese navigator gave to his original name of Colombo. Although he himself never used the form "Columbus", we could presumably call it the Columbus Archipelago — but nobody ever does. So, as it is under the name of Galápagos that the islands have always been known to the world, a name more familiar to most people than that

of the republic to which they belong, it seems best to keep to it in this book.

As for the names of the individual islands, this is an even more complex question. The first rough map showing the islands separately was made by the English pirates, and they named them after their kings and the big-wigs of their day; many of these names are still current. Later, various ships of the Royal Navy and, to a lesser extent, the United States Navy, added to or changed the names on their charts. The Spanish Navy also paid a brief visit, but neither their chart nor their names proved acceptable. When the Republic of Ecuador annexed the islands in 1832, it gave some of them new titles, and then in 1892, when it renamed the archipelago after Columbus, it also gave most of the islands' names connected with his voyages. This was perhaps unfortunate, as the great explorer never knew that the islands or even the Pacific Ocean existed, though he got a lot nearer to them than the Stuart monarchs did. Nobody can dispute the right of Ecuador to call the islands by whatever name it pleases, but all these changes have resulted in confusion. For instance, the one the pirates named Duke of Norfolk's Island was changed by the Royal Navy to Indefatigable after the warship of that name, then to Porter Island after the captain of the *U.S.S. Essex*, then to Valdez, Chavez, San Clemente and finally Santa Cruz by the Ecuadorean authorities. The inhabitants of the Galápagos in practice use some Spanish and some English names. But as most of the literature about the Galápagos, both

general and scientific, is in English and uses English names for the islands, it will perhaps lessen confusion in an English book to keep the names used by Charles Darwin and most of his successors. The following list gives the English names of the principal islands and their current Spanish equivalents.

Albemarle: Isabela

Narborough: Fernandina

Indefatigable: Santa Cruz

Chatham: San Cristóbal

James: Santiago

Charles: Floreana

Bindloe: Marchena

Abingdon: Pinta

Tower: Genovesa

Hood: Española

South Seymour: Baltra

Duncan: Pinzón

Jarvis: Rábida

Wenman: Wolf

Culpepper: Darwin

Chapter Six

THE BUCCANEERS

Wee lay at Lobus [Lobos Island, Peru] above eight and forty houres, and knowing that wee had more than a hundred prisoners on board and not knowing where to get water, nor where to find a place of making a Magazeene for flour but that wee should be hunted out and have our flour destroyed, wee sailed away to the Westward to see if wee could find those Islands called the Galipoloes, which made the Spaniards laugh at us telling us they were Inchanted Islands, and that there was never any but one Capitano Porialto that have ever seene them, but would not come neare them to Anchor to them, and that they were but shadowes and noe reall Islands.

Captain Edward Davis (1684).

The cartographers Ortelius and Mercator marked the archipelago in its approximate position on the globe, but it was the English buccaneers who "put the Galápagos on the map" in the colloquial sense. The Elizabethan sea dogs were indirectly responsible, though

they themselves thought little or nothing of the islands. Sir Richard Hawkins, who sailed up the Pacific coast in 1593, dismissed them in a single sentence: "Some forescore leagues to the westward of this cape lyeth a heape of Illands the Spaniards call Illas de los Galapagos; they are desert and bear no fruite." When, in the same latitude, Francis Drake captured a Spanish galleon with booty including "80 pounds weight in gold, 26 tunne of uncoyned silver," tradition has it that he divided it up on a little island close to the coast of modern Ecuador, which still goes by the name of Isla de la Plata (Silver Island). He went no nearer to the Galápagos. Nevertheless, it was the stories of Drake's rich spoils and the hope of looting other treasure ships that drew the buccaneers to the Pacific nearly a century later and made the Galápagos one of their favourite bases.

The question of whether the buccaneers of Stuart times were pirates or not is highly involved. Some were, some were not; probably most of them were for some of their time. A true pirate, such as the notorious Captain Kidd or Blackbeard Teach, was an outlaw who, in time of peace or time of war, attacked ships of any nation, including his own. A privateer was an independent man-of-war, privately financed but duly commissioned by its government to attack enemy shipping and ports, and to reward its owners and crew out of prize money. Apart from the financial arrangements, there seems little difference between the objectives of the English privateers in the War of the Spanish Succession and those of Captain Porter, of the United States Navy, in the war of 1812-1814, or

Count von Luckner, of the Imperial German Navy, in the war of 1914-1918. All of them made free use of the Galápagos in the execution of their task of raiding enemy commerce.

The whole problem of what was piracy on the Spanish Main was further bedevilled by a fundamental divergence of views between Spain and the other maritime nations of Europe. When the Spanish Pope, Alexander Borgia, solemnly bestowed on Spain the whole of the Americas, this naturally pleased the Spaniards — but not the other nations who were excluded from this handsome share-out. They denied the Pope's authority to parcel out this world, all the more so when the English and the Dutch turned to Protestantism. Injury was added to insult as Spain debarred all foreign ships from trading with her possessions. This conflict over the legality of the Spanish claims led to a state of endemic warfare in the New World, even when England and France were at peace with Spain in Europe, and it was tacitly accepted that there was "no peace beyond the line" — that is, roughly speaking, west of the Azores. In these circumstances, the efforts of the English, French and Dutch authorities to suppress buccaneering were less than half-hearted. They could not accept the Spanish pretensions and anyhow, in case of official war, today's pirates might be needed as tomorrow's naval auxiliaries. Meanwhile, the Spaniards continued to plunder the natives and the buccaneers to plunder the Spaniards.

Even the name "buccaneer" is a bit ambiguous. Originally the French *boucaniers* were men who killed wild cattle in Haiti and dried the flesh over a slow fire on wooden crates, which the native called *barbecus*. This smoked meat was known as *boucan* and was very useful for provisioning pirate ships. Some *boucaniers* joined the pirates from time to time, but the French pirates never called themselves *boucaniers*; it was the English who took this name, although they were not engaged in the smoked meat business, and they have come down through history as the "buccaneers". The French returned the compliment and adopted for themselves the older English name of "freebooter", which they mispronounced as *flibustier*. In due course, we got this back as "filibuster" — thus, both languages were enriched!

But even among the English, the word "buccaneer" seems to have been given rather different meanings; usually, it is a portmanteau expression to include both pirates and privateers. But Captain Woodes Rogers speaks of Dampier's previous voyages "when he was with the buccaneers." This is a polite way of saying "when he was with the pirates," but also implies that Rogers, a privateer with a royal commission, did not consider himself to be a buccaneer. Whatever meaning we attach to the word, it looks as though that distinguished buccaneer, William Dampier, was a pirate, liable to hanging, on his first voyage round the world, but a royal and legitimate privateer on his second and third circumnavigations.

In their outlook and behaviour, the buccaneers who came to the Galápagos had a great deal in common with the conquistadores, and there is little point in trying to judge either of them by standards other than those of their time. They were patriotic and loyal to their king, but they consistently disregarded his and any other laws. They were brave, hardy, ruthless, unscrupulous, quarrelsome, and greedy for gold. There may have been a few exceptions, but when Captain Bartholomew Sharp wrote "...gold was the bait that tempted a pack of merry boys of us, near 300 in number, being all soldiers of fortune," he spoke for the vast majority.

Conditions on the west coast of South America had changed a good deal since the Elizabethan sailors had raised brief havoc there. Defences on land and at sea had been strengthened. It was no longer prudent for freebooters to make prolonged stays on islands within sight of the mainland, so remote hide-outs such as Juan Fernandez and the Galápagos became favoured haunts. Bart Sharp went there in 1680, but was unable to land owing to the usual difficulties with winds and currents. The first of the buccaneering ships to use the Galápagos as a base was aptly called the *Batchelor's Delight*. That had not always been her name. When Captain John Cook and his seventy buccaneers set out from the Chesapeake in 1683 to go raiding in the Pacific, they thought that their own ship, with only eighteen guns, was hardly adequate for the work in prospect. So, they made a detour along the coast of Africa, where "we alighted upon a ship of forty guns, which we boarded and carried her away.

We found she was very fit for a long voyage, for she was well stored with good brandy, water, provisions and other necessaries."

This "lovely ship" was a Danish merchantman carrying slaves, which was considered a respectable commerce in the seventeenth century, when virtually the whole world accepted slavery as an institution. At any rate, the slave trade was perfectly legal, and Denmark was a friendly country, so the seizure of one of her vessels was an act of downright piracy. The flagrancy of the crime no doubt explains the reticence of those pirates who kept journals when dealing with this particular exploit, and our natural curiosity to know what they did with the sixty black girls they found on board the ship, which they now named the *Batchelor's Delight*, is forever frustrated.

It may seem odd that these pirates should keep diaries, but, whatever their other qualities, they were a surprisingly literary lot. They created a vogue for travel books and had a very considerable influence not only on contemporary knowledge of geography, but also in such diverse fields as hydrography, botany, and the novel. It was from the buccaneers that the world received the first descriptions of the Galápagos, while Bishop Berlanga's admirable account gathered dust in Seville. The *Batchelor's Delight* was outstandingly rich in writing talent. Admittedly, most of the unruly and dissolute crew could be — and no doubt were — described as the scum of the earth, but they had among them Eduard Davis, Lionel Wafer, Basil Ringrose, William Ambrosia Cowley, and

William Dampier, who all published accounts of their voyages, which enjoyed great popularity in their day — and even a century later, young Horatio Nelson considered Dampier's *New Voyage round the World* the best travel book he had ever read.

Dampier tells us that he thought it too risky to try to take the *Batchelor's Delight* through the Magellan Straits without charts and with a crew of undisciplined ruffians, and it was decided to sail right round Cape Horn. They had a rough passage. Cowley gives some illuminating details of how the pirates whiled away their leisure hours during this long ordeal:

...haling away South West we came abreast of Cape Horn the 14th day of Feb. when we chusing of Valentines and discoursing of the Intrigues of Women, there arose a prodigious Storm, which did continue till the last day of the Month, driving us into the latitude of 60 deg. and 30 min South, which is further than ever any Ship hath sailed before South; so we concluded the discoursing of Women at Sea was very unlucky and occasioned the Storm.

Perhaps they had tempted fate in naming their ship the *Batchelor's Delight*, but this did not deter them from dedicating themselves conscientiously to their other celibate pursuits. Cowley recorded that "the Weather in the lat. of 60 deg. was so cold that we could

bear drinking 3 quarts of Brandy in 24 hours each Man, and to be not at all the worse for it, provided it were burnt."

Eventually, they fought their way through to the Pacific, where, after a few weeks on the island of Juan Fernandez to recover from fatigue and scurvy, they set about their business of raiding shipping and towns along the coast, either alone or in company with other plunder-loving crews. The *Batchelor's Delight* spent two years in the Pacific without making any spectacular captures and then made her way back round the Horn to Maryland, where some of them were thrown into gaol. However, not a man was hanged, though Lionel Wafer had to pay a fine of £300, which helped to build William and Mary College; thus, piracy contributed significantly to the intellectual development of the United States. Dampier and Cowley were not among those who stood trial, as they had switched to other ships and made their way back to England by sailing right round the world. But during those two years on the coast, the pirates used the Galápagos as a base and a refuge, which enabled them to give us first-hand records of what the islands were like before man came to them.

When the first buccaneers landed, the Galápagos were still virgin territory. The fleeting visits of the bishop and the various castaways to one or other of the islands, or, for that matter, those of the aboriginal sailors in their *balsas*, had made virtually no impact. In all probability, no man had ever set foot on most of the islands until

the pirates came. It is, therefore, doubly fortunate that they included among their number men who not only had an itch to write but also possessed enquiring minds. The intellectual climate of England had changed a good deal since the days of the Elizabethan sea rovers. Francis Bacon's scientific principles, his insistence on observation and the assembly of facts, had slowly permeated the more intellectual sections of society. There was now a number of distinguished amateur scientists in the country, and Charles II had given them his official blessing by founding the Royal Society. In short, science had become fashionable.

This change is reflected in the literature of the two periods. Whereas for Shakespeare, Prospero's island was a place of magic and mystery, as unreal, as "enchanted," as the Galápagos were for the Spaniards, Daniel Defoe's *Robinson Crusoe*, for all the invention he employed, is factual and down to earth. Both drew their inspiration from actual historical events, but their treatment is entirely different. Many of the buccaneers shared the enquiring spirit of their age, and this was particularly true of William Dampier, who, without any scientific training, became one of the first modern field naturalists out of sheer curiosity and the desire to accumulate knowledge.

Dampier was not a very successful buccaneer. He failed when he rose to be a captain, and on his last visit to the Galápagos in 1709, as on his first in 1684, he was back in the subordinate position of navigator. He may well have been happier without the responsibility

of trying to command an ungovernable crew, as he could devote more time to compiling his precious notes on the strange lands he visited. To protect these, he tells us, "I took care to provide myself with a large joint of bamboo, which I stopped at both ends, closing it with wax, so as to keep out any water. In this I preserved my journal and other writings from being wet, though I was often forced to swim." His bamboo was probably the only possession he never lost in his lifetime at sea, during which he sailed three times round the world. A man of little formal education, he made significant contributions to hydrography and meteorology, in particular with his *Discourses of Winds, Breezes, Storms, Tides and Currents in the Torrid Zone*. Wherever he went, he noted all that was curious and new in trees, plants, and animals. He may have been an indifferent pirate, but he was a remarkable navigator, and a pioneering naturalist. The best testimony to his enthusiasm is the mere fact that he continued for years to compile his journal in the cramped quarters of little ships, which he shared with as hard-bitten and dissolute crews as ever put to sea.

He recorded his first impressions of the Galápagos: "They [the islands] are of good height, most of them flat and even on the top; four or five of the easternmost are rocky, barren and hilly, producing neither tree, herb nor grass, but a few dildo trees, except by the sea side. The dildo tree [a giant cactus] is a green prickly shrub that grows about ten or twelve feet high, without either leaf or fruit. It is as big as a man's leg, from the root to the top, and it is full of sharp

prickles, growing in thick rows from top to bottom; this shrub is fit for no use, not so much as to burn. Close by the sea there grow in some places bushes of Burton-wood which is very good firing. There is water on these barren islands, in ponds and holes among the rocks."

Dampier was lucky. In all the records of visits to the Galápagos, his is one of the few that has any good to say about the supply of water. He must have arrived after one of the abnormally heavy rains that occur at long intervals. On later visits, he was to find very different conditions, and even on this first voyage, his companions who landed on other islands constantly complained of the lack of water. As we now know, there are few permanent sources of water in the entire archipelago. Dampier's scope for exploration was restricted on this occasion, as he spent almost the entire time on a single island, looking after his sick commander. Captain Cook had never recovered from the hardships of the passage round Cape Horn, and the pirates stayed in the Galápagos in the hope, which proved vain, of saving his life. Being debarred from wider exploration, Dampier had all the more time to study the wildlife on the shore.

"The north part of this second inland we anchored at" he wrote, "lies 28 minutes north of the equator, for I took the height of the sun with an astrolabe ... As soon as we came to an anchor we made a tent for Captain Cook, who was sick. Here we found turtle lying ashore on the sand; this is not customary in the West Indies. We

turned them on their backs that they might not get away. The next day more came up; when we found it to be their custom, we never took care to turn them afterwards but sent ashore the cook every morning, who killed as many as served for the day; this custom we observed all the time we lay here, feeding sometimes on land-turtle, sometimes on sea turtle, there being plenty of either sort ... The sea about these islands is plentifully stored with fish both large and fat; here are particularly abundance of shark." Dampier then continues for several pages with a discourse on turtles, comparing those on the Galápagos with those he had noted in other parts of the world. He describes and discusses the different varieties, their size, weight, shape and colour; he notes their feeding habits and their sex-life, and even gives each species a carefully considered gastronomic rating.

When it came to the giant tortoises and iguanas, he was hard put to it to find anything comparable either in his own experience or in the stories of other travellers, although he had heard vaguely of some very large tortoises on islands in the Indian Ocean. "I do believe that there is no place in the world that is so plentifully stored with these animals. The guanoes [iguanas] here are as fat and large as any that I ever saw; they are so tame, that a man may knock down twenty in an hour time with a club. The land-turtles or tortoises are here so numerous that five or six hundred men might subsist on them for several months, without any other sort of provision. They are extraordinarily large and fat, and so sweet that no pullet eats more pleasantly."

Yet Dampier, held by his duties close to the barren shore, obviously never saw any of the really big tortoises, as he describes them with surprise as weighing up to two hundred pounds, and comments that he had never seen any weighing more than thirty pounds in other countries. As usual, he gives culinary details such as that, the tortoises being so fat, they yield large quantities of oil which "served instead of Butter to eat with Doughboys or Dumplins." Dampier had little to say about the birds, but he strikes a note that is typical of his day and of many, many days to follow: "There are great plenty of Turtle-Doves so tame, that a man may kill five or six dozen in a Forenoon with a stick." It has to be remembered that the pirates, like the somewhat more respectable sailors who followed them, were on cruises of upwards of two years' duration and could not carry provisions for the whole voyage. One of the great attractions of the Galápagos was the incredible abundance and tameness of the wildlife, which made it so easy to re-stock ships with fresh meat.

William Ambrosia Cowley had transferred to a prize ship, captured off the coast of Peru, and was able to see far more of the archipelago than Dampier. Although not particularly interested in natural history, he also records the astonishing numbers of tortoises, turtles, and fish which struck all the early voyagers. "Here are also" he adds, "abundance of Fowls, viz., Flemings and Turtle Doves; the latter were so tame, that they would often alight on our Hats and Arms, so as that we could take them alive, they not fearing Man, until such time as some of our Company did fire at them, whereby they were

rendered more shy." But Cowley's chief interest lay in charting the islands. Until then, they had been marked on the maps merely as an ill-defined archipelago. Cowley made a detailed chart. He was always mysterious about his background, but he was obviously a man of considerable education and perhaps, as he claimed, a Master of Arts of Cambridge University. If so, "*que diable allait-il faire dans cette galère?*" Whatever it was that drove him to piracy, he produced the first map of the Galápagos. By modern standards, it was, of course, a rough affair, but even a century later, it was still much the best in existence. Considering the difficulties under which it was produced, it was a remarkable achievement.

A patriotic pirate, he named the islands after members of the English establishment, whose laws and authority he was flouting. In spite of repeated efforts to change them, most of Cowley's names have stuck to this day. He began with a proper respect for precedence: "The first that we saw lay near the lat. of 1 deg. 30 min South. This Island maketh high land, the which I called King Charles's Island." Another he named after the Duke of York but, on learning that he had succeeded to the throne that year, he dutifully changed it to King James's Island before publishing his chart. The nobility were not neglected and "a fine round island" was named after the Duke of Norfolk, though today it is usually known as Indefatigable or Santa Cruz. Cowley even made a modest attempt to include himself among the great. As he explained, "to the Westward of the Duke of York's Island, lieth another curious Island, which I called the Duke

of Albemarle's; in which is a commodious Bay or Harbour, where you may ride Landlock'd: and before the said Bay lieth another Island, the which I called Sir John Narborough's; and between York and Albemarle's Island, lieth a small one, which fancy led me to call Cowley's Enchanted Island." Posterity has dealt justly and, although the Duke of Norfolk has been several times superseded, the little island is still called Cowley.

At the end of a fortnight, the pirates had stocked their ships with as much fresh meat as they could carry. At the same time, they had cached five thousand sacks of flour and eight tons of jam, taken from captured Spanish ships. This was to prove a useful reserve for later visits, in spite of the fact that the turtle doves got a lot of it. Captain Cook's health showed no improvement so they headed for Mexico, where they buried him shortly after their arrival. Edward Davis, yet another literary pirate, was elected to succeed him. There was a rough if turbulent democracy in the pirate ships. The crews were a mutinous lot, and often dismissed their officers and appointed new ones. Men were also more or less free to leave their ship and transfer to another which took their fancy. Dampier must have served in a dozen ships during his first voyage round the world. When he set out, circumnavigation was far from his mind, but his insatiable curiosity led him on from one adventure to another. After nearly two years buccaneering in the *Batchelor's Delight*, he threw in his lot with Captain Swan of the *Cygnets*, not, he explains "from any dislike

of my old captain" but because Swan offered him the chance of sailing across the Pacific to the East Indies.

After a journey which, in all, took more than twelve years, Dampier arrived back in England, almost as poor as when he set out. It was the publication of his *New Voyage round the World* in 1697 that brought him fame and modest prosperity. The book, dedicated to the President of the Royal Society, ran into several editions, started a new literary fashion and brought him into contact with many distinguished men of science. The caption under his portrait, which hangs in the National Portrait Gallery, describes him as "Pirate and Hydrographer." He would no doubt have preferred to be considered as a writer and naturalist than as a pirate but at least the painting shows him holding, not a cutlass, but a book. This book gave the first printed account of the Galápagos Islands and, together with Cowley's chart, at last made them known to the world.

As Dampier elected to go back to England by way of the East Indies, he did not return to the Galápagos with Captain Davis and the *Batchelor's Delight*, and it was over twenty years before he saw the archipelago again. He was never tried for the numerous acts of piracy in which he had been involved, whether because of the amnesty which King James II, at his coronation, had granted to all pirates who repented and abandoned their evil ways, or because, on the analogy of poachers making the best gamekeepers, the authorities wanted his advice on how to suppress piracy. Instead, after the great

success of his book, the Admiralty gave him command of a ship to explore Australasia. Although his name has been perpetuated in Australia — Dampier Strait, Dampier Island, Dampier Archipelago — the voyage achieved relatively little. His second voyage round the world as captain of a privateer in the early years of the War of the Spanish Succession was a complete disaster. Having failed as a commander, he seems to have been quite happy to continue his roving career in a subordinate capacity. He made his last great voyage (1708-11) as "pilot" or navigator, a lesser but honourable post, in an expedition commanded by Captain Rogers.

Woodes Rogers, though a much younger man than Dampier, was a highly competent officer. He had command of two vessels, the *Duke*, of 320 tons and 30 guns, and the *Duchess*, 260 tons and 26 guns. Each had a crew of rather more than a hundred men. The ships were sound, well equipped and provisioned, and had a commission from the Lord High Admiral to wage war against the Frenchmen and Spaniards. In short, they were privately owned warships and in no way pirates — not that this made them any more welcome along the coast of South America, where they proposed to attack shipping and towns. The two ships rounded Cape Horn, "the furthest for aught we know that anyone as yet has been to Southward," the crews suffering as usual from scurvy and the bitter cold weather. They were greatly relieved to reach the island of Juan Fernandez. A light on shore, which they at first feared meant that French ships were there, proved to be a fire, lighted to attract their

attention by a marooned sailor, Alexander Selkirk, of whom more later.

After two weeks for his crews to recover their health on Juan Fernandez, Captain Rogers sailed northwards up the Pacific coast. By this time, he had licked into reasonable shape his crew of "tinkers, tailors, hay-makers, peddlers, fiddlers — not twenty sailors." He had also established some more or less effective discipline; otherwise, his operations in the coming months were not very different from those of the pirates. He captured a few rather small prizes to swell his fleet, and then headed for the port of Guayaquil — a much-favoured target in those days. From a letter taken in one of the captured vessels, he learned that their presence was already suspected. This letter from the Viceroy of Peru to the Corregidor of Guayaquil warned that a squadron of seven ships, from forty-four to seventy-four guns each, was sailing from England under Dampier. It is odd that Dampier should have been the terror of the coast, second only to the legendary *El Draque* (Sir Francis Drake); he was never outstanding either as a pirate or a privateer. He had taken a subordinate part in a projected attack on Guayaquil in 1684, which was mismanaged and called off; and on the present occasion he advised Woodes Rogers against attacking the town when it became clear that the alarm had been given and surprise was impossible.

However, Rogers was not to be deterred. His men took the town with trifling losses, exacted a modest ransom of 30,000 pieces of eight after a lot of bargaining, and hurried off to the Galápagos before the French and Spanish squadrons could be alerted.

On the way, they found that they had picked up more than pieces of eight. A "malignant fever" ran through the crews; most of those who had landed at Guayaquil were sick, and despite the ministrations of Thomas Dover, "a doctor of Physick," many of them died. Doctor Dover was a renowned physician, the inventor of the celebrated Dover Powders, still used today, and one of the financiers of the expedition, but Rogers seems to have been somewhat sceptical of the value of his prescriptions. "Finding that Punch did preserve my own Health, I prescribed it freely among such of the Ship's Company as were well, to preserve theirs." Neither pharmaceuticals nor rum did much good, and Roger's journal covering his stay in the Galápagos is studded with notes such as: "This Day Tho. Hughes a very good sailor died." A lot more were buried in the Galápagos than at Guayaquil, and the crews were sadly depleted; so much so that the captain offered freedom to thirty-five of the slaves he had just taken from the Spaniards, on condition that they learned to use arms and fought in future battles: thirty-two of these "lusty fellows" accepted the offer. This seems to have been a purely practical arrangement, as neither the pirates nor the privateers comment on the institution of slavery, which, like others of their age, they simply took for granted.

Rogers would have liked to stay longer in the Galápagos to rest his men, but he could not find the spring that the pirate captain, Edward Davis, had used (it had probably dried up), and lack of water drove him back to the mainland. Three months later, he was again on the islands, and again the failure to find water caused distress. His journal shows his frustration and his dislike for the Galápagos, but he, like so many others, went there because they offered such a convenient hiding place to rest and recuperate and, above all, because the unparalleled abundance of tortoises and turtles made it possible to re-victual his ships with ease and speed.

Woodes Rogers liked to think of himself as a blunt, no-nonsense sea-captain, though he was obviously intelligent and widely read. He protests, rather too strenuously, that he has no interest in natural history. There were strange plants and trees, he records, "but it being out of my Road to describe such things, I refer 'em to such whose talents lie that way." This sounds like a jealous dig at Dampier, his fellow officer (and fellow author), whose book, crowded with descriptions of natural phenomena, had enjoyed such popularity.

But Rogers belonged to the same enquiring, curious age, and his resolution to avoid the fashionable trend of his day broke down from time to time. The giant tortoises were too fascinating to be ignored, as he watched some of the smaller ones being brought on board and even laying eggs on the deck. "I don't affect giving Relations of strange Creatures so frequently done by others already in print" he

writes defensively, "but where an uncommon Creature falls in my way, I shall not omit it ... These Creatures are the ugliest in Nature, the Shell not unlike the Top of an old Hackney Coach, as black as Jet, and so is the outside Skin, but shrivel'd and very rough; the Legs and Neck are long, and about the bigness of a Man's Wrist, and they have Club Feet as big as one's Fist, Shaped much like those of an Elephant, with 5 thick Nails on the Fore Feet, and but 4 behind; the Head little, and Visage small like a Snake, and look very old and black; when at first surpriz'd, they shrink their Neck, Head and Legs under their Shell. Two of our Men, with Lieut. Stratton and the Trumpeter of the *Duchess*, affirm they saw vast large ones of this sort about 4 feet high; they mounted 2 Men on the Back of one of them, who with its usual slow Pace carried them, and never minded the Weight. They suppos'd this could not weigh less than 700 Pound." This is not bad going for a hard-bitten sea dog with no interest in nature! But then, the Galápagos Islands and their peculiar wildlife have influenced many men, and provoked them into strange thoughts. Woodes Rogers even asked himself how the tortoises came to be on the islands, seeing that there was nothing like them on the mainland. Naturally, it did not occur to this orthodox, God-fearing captain that such a straightforward question might have heretical implications; still, less than two and a half centuries later, scientists would be arguing about the answer.

During both of his visits to the Galápagos, Captain Rogers spent much of his time cruising round the islands, partly in a fruitless

search for water, but chiefly in the hope of finding Simon Hatley, one of his mates, whom he had put in charge of a small bark captured near Guayaquil. Hatley, with a crew of five and an equal number of prisoners, had reached the Galápagos about the same time as the rest of the squadron, but had presumably been carried away by one of the notorious currents.

Chapter Seven

ROBINSON CRUSOE

I am monarch of all I survey,
My right there is none to dispute.
From the centre all round to the sea
I am lord of the fowl and the brute.

William Cowper.

The lonely and forbidding Galápagos have affected the great world in surprising ways, but surely the most unexpected is that they should be even remotely connected with the development of the novel as a literary form. The great novel of the early eighteenth century, a break-through in the history of literature, was Daniel Defoe's *Robinson Crusoe*, a book that would never have been written but for the Galápagos' buccaneers, particularly Dampier and Rogers, and, of course, Alexander Selkirk himself. Two of the Crusoe themes occur again and again in Galápagos history down to the present day: the problem of the physical survival of a man marooned or shipwrecked on an uninhabited island, and the riddle of whether a civilized man can adjust to living alone in the wilderness and achieve contentment.

As already mentioned, when Woodes Rogers and Dampier had rounded Cape Horn in 1708 and drew near to Juan Fernandez, they were alarmed by the sight of a fire on the shore of what they believed to be an uninhabited island, and feared that French warships must have got there first. However, on investigation next morning, it turned out that the fire had been made by "a Man cloath'd in Goat-skins, who looked wilder than the first owners of them," as Rogers recorded in his journal. "He had been on the Island four years and four months, being left there by Capt. Stradling in the *Cinque-Ports*; his name was Alexander Selkirk, a Scotch-man, who had been master of the *Cinque-Ports*, a ship that came here last with Capt. Dampier, who told me that this was the best man in her; so I immediately agreed with him to be a Mate on board our Ship."

Selkirk had been marooned following one of the usual quarrels between buccaneers. Loathing Captain Stradling, and anxious about rounding the Horn on the homeward journey in their leaking ship, he asked to be left on shore. When, on reflection, he wanted to change his mind, Stradling refused to have him back. Perhaps this heartless decision was a good thing for Selkirk. His fears about the state of the ship were fully justified, and Stradling had to beach her and surrender to the Spaniards on the mainland, where he spent more years in a wretched gaol than Selkirk did in the solitude of his island.

Rogers was fascinated by Selkirk's story, which he gave at length in his published journal. "He had with him his Clothes and Bedding, with a Firelock, some Powder, Bullets and Tobacco, a Hatchet, a Knife, a Kettle, a Bible, some Practical Pieces, and his Mathematical Instruments and Books." He was miserable for many months while he adapted to the solitary life, but at least he did not go hungry or cold. Somebody, possibly Juan Fernandez himself when he discovered the island, had brought a few goats on shore and these had rapidly multiplied. Selkirk learned to outrun and catch the goats, which provided him with food and clothing. When his rescuers came on shore, they found that he had prepared an enormous goat stew for them, a delightful change after months of living on the unappetizing fare of ships at sea.

According to Rogers, Selkirk ("the Governor" as his rescuers nicknamed him) was less appreciative of the other introduced animals on his little island kingdom. "He was at first much pestered with Cats and Rats, that had bred in great numbers from some of each species which had got ashore from Ships that put in for Wood and Water. The Rats gnawed his Feet and Clothes while he was asleep, which oblig'd him to cherish the Cats with his Goat's flesh; by which many of them became so tame that they would be about him in hundreds and soon delivered him from the rats; so that by Care of Providence and the Vigour of his Youth, being now but 30 years old, he came at last to conquer all the Inconveniences of his Solitude, and to be very easy."

"The Governor" had so far accustomed himself to his lonely existence that it was some little time before he could get back to his old ways. "At his first coming on board us, he had so much forgot his language for want of Use, that we could scarce understand him, for he seemed to speak his words by halves. We offered him a Dram but he would not touch it, having drunk nothing but Water since his being there, and 'twas some time before he could relish our victuals." However, he quickly recovered his power of speech and, after playing a useful role in the successful attack on Guayaquil, he was given command of one of the vessels captured there. It was in this ship that he went to the Galápagos, where the buccaneers healed or buried their sick. He visited the islands twice and, on each occasion, as his crew searched in vain for water, he must have thanked his lucky star that it was not on one of these that he had been marooned.

When Selkirk returned to Scotland in 1711 with Rogers and Dampier, he enjoyed a brief period of celebrity. His amazing adventure was made the subject of a brilliant essay by Richard Steele in *The Englishman*, and it attracted the attention of other less famous authors. After being a nine-day wonder and then forgotten, he returned to the sea and died in 1721, off the coast of Africa. But shortly before his death, Daniel Defoe had conferred upon him literary immortality by making his experience the basis of *Robinson Crusoe*, a novel which publishers still find some justification to call "the greatest adventure story in the world."

The circumstance which fired Defoe's imagination seems to have been the publication of a new edition of Woodes Rogers' journal, which had a very considerable success, like that of Dampier's books. Realizing that there was a vogue for travel stories, Defoe, one of the great journalists of all time, determined to cash in on their current popularity and, as a professional writer, to tell a much better tale. He plundered the journals of the buccaneers as enthusiastically as they had plundered the Spaniards, taking whatever he found useful in the narratives of Dampier, Rogers and the rest, and possibly some unpublished notes by Selkirk himself. Anyone reading both the journals and the novel will be struck by the liberal way in which Defoe helped himself.

Defoe's imagination enlarged and embroidered the buccaneers' straightforward stories, and he wove their various accounts into a new and ingenious pattern. He changed his hero from a marooned pirate to a respectable, shipwrecked merchant, altered the position of the island, expanded the period of Selkirk's exile to twenty-eight years and eventually gave him Man Friday as a companion. Selkirk was, of course, entirely alone. There can be little doubt that Defoe got the idea of Friday from Dampier's *New Voyage*, in which he describes how, in 1684, he and his piratical comrades rescued a Mosquito Indian named William, who had been left by accident on Juan Fernandez. This story did not attract special attention in the way that Selkirk's did; although William showed just as much resourcefulness, his adventures were of less interest because he was

an aboriginal American, a "savage." What fascinated the public was the impact of the wilderness and a life of solitude on a civilized man, a man like themselves, and this Defoe gave them in good measure.

Having developed this theme at length, Defoe, ever unwilling to leave a good story untold, introduced the second theme of Friday and the relationship of two or more men living outside of organized society and beyond the reach of the law. This was the problem which was later to bedevil settlement in the Galápagos, with its tyranny, violence, and bloodshed. However, Defoe neatly side-stepped the real issue by making the barbarian Friday utterly submissive. His first act was to prostrate himself and place Crusoe's foot on his head; the first word Crusoe taught "my man Friday" to pronounce was "Master." Thus simplified, their relationship presented few problems! (To be fair to Defoe, he did deal with rivalry and conflict in the second and less successful part of his novel, published at a later date).

Robinson Crusoe is full of nuggets mined from the buccaneers' journals. The tale was magnificently told by a master of English prose, but it ill became Defoe to speak contemptuously of the men to whom he owed so much, and it is hard to forgive him the sneer that "a very good sailor may make but a very indifferent author." Obviously, Defoe was a much better writer, and *Robinson Crusoe* was a landmark in the history of literature. Not only did it have a powerful influence on the development of the English novel, but it

also created a new literary genre, as distinct as the thrillers of today. Translated into various languages, it inspired scores of imitators, particularly in Germany, where these desert island stories were known as *Robinsonaden*. This was largely escapist literature, arising from a desire to "get away from it all." But there was also a restlessness, not entirely unlike that of our own day, when more and more people want to visit distant places, or at least to see them on television. Whatever else the buccaneers may have done, their tales enlarged men's minds and made them, as never before, conscious of faraway lands, strange peoples, curious animals and plants. The buccaneers themselves had more than their share of the restless, enquiring spirit of their age, and the motives that drove the best of them to join in hazardous voyages with a better-than-even chance of dying on the way, certainly included the lure of untraveled seas and unknown lands.

If we may violate chronology just a little, this could seem the most convenient place to consider another "Robinson Crusoe," whose story is such a striking contrast to that of Alexander Selkirk. We know nothing about Patrick Watkins' origins and almost as little about his end. He was an Irishman who apparently arrived in the Galápagos about the end of the eighteenth century, quarrelled with his captain and left the ship to become the islands' first settler. According to the graphic account of Captain Porter, a brilliant officer in the youthful U.S. Navy, he settled on King Charles's Island where he "built himself a miserable hut in a valley containing

about two acres of ground capable of cultivation, and perhaps the only spot on the island which affords sufficient moisture for the purpose. Here he succeeded in raising potatoes and pumpkins in considerable quantities, which he generally exchanged for rum or sold for cash. The appearance of this man, from the accounts I have received of him, was the most dreadful that can be imagined; ragged clothes and covered with vermin; his red hair and beard matted, his skin much burnt, from constant exposure to the sun, and so wild and savage in his manner and appearance that he struck everyone with horror. For several years this wretched being lived by himself on this desolate spot, without any apparent desire than that of procuring rum in sufficient quantities to keep himself intoxicated and, at such times, he would be found in a state of perfect insensibility, rolling among the rocks. He appeared to be reduced to the lowest grade of which human nature is capable, and seemed to have no desire beyond the tortoises and other animals of the island, except that of getting drunk."

The tortoises had been on the island for millennia and were adapted to its peculiarly harsh conditions. Men have found it more difficult to adjust. Those with the qualities of mind of Alexander Selkirk are few and far between; he eventually came to terms with his environment. In one way, his ordeal was more severe than that of Patrick Watkins, in that his isolation was absolute, whereas Patrick was not utterly deprived of contact with his fellow men. On the other hand, Selkirk did not have the problem of adjusting to contact

with other human beings under abnormal conditions; there was nobody who might try to dominate him or whom he might wish to dominate. Defoe got around this difficulty with his fictional Crusoe by making Friday a humble and willing servant; but it may not be entirely irrelevant that when, after the 1914-1918 war, a few Europeans, anxious "to get away from it all," settled on Patrick's island, they were less unhappy when they had no contact with their neighbours.

Somehow or other, Patrick got hold of a musket and used it to kidnap a negro who had landed from an American ship. He intended to use him as a slave, but the negro chose a convenient moment to overpower Patrick. The captain of a British smuggler, who happened to be anchored there, sentenced Patrick to the possibly unique punishment of being flogged on board both an American and a British vessel on the same day. While this may have qualified him for inclusion in the Guinness Book of Records, it does not seem to have improved his character. The resourceful Patrick merely changed his tactics. Instead of his musket, which had been confiscated, he used rum; he got individual sailors insensibly drunk and hid them in his rocky wilderness so that they could not be found and their ships had to sail without them: "when, finding themselves entirely dependent on him" writes Captain Porter "they willingly enlisted under his banners, became his slaves, and he the most absolute of tyrants. By these means he augmented the number to five."

In due course, by a ruse, Patrick and his gang contrived to steal a boat when a visiting ship sent a party on shore to buy vegetables from him. In his hut was found the following remarkable letter.

Sir, I have made repeated applications to captains of vessels to sell me a boat, or to take me from this place, but in every instance met with a refusal. An opportunity presented itself to possess myself of one and I took advantage of it. I have been a long-time endeavouring, by hard work and suffering, to accumulate wherewithal to make myself comfortable but at different times have been robbed and maltreated, and in a last instance by Captain Paddock, whose conduct in punishing me and robbing me of about five hundred dollars, in cash and other articles, neither agrees with the principles he professes nor is he such as his sleek coat would lead one to expect.

I sail from the enchanted islands in the *Black Prince*, bound to the Marquesas.

Note: Do not kill the old hen; she is now sitting and will soon have chicks.

[Signed] Fatherless Oberlus

We know little of the allegedly brutal Captain Paddock except that he belonged to the Society of Friends and even less of why Patrick Watkins should give himself the peculiar name of Oberlus. What we do know is that Patrick and his little band never sailed to the distant Marquesas Islands, but headed in the opposite direction to Guayaquil on the mainland. Another infuriating gap in our knowledge is what happened on that six-hundred-mile voyage; because Patrick was alone in the boat when it arrived. Did the others simply die of a terrible thirst which only the alcoholic Irishman could survive, or did he push them overboard when the water barrel began to run low? A fertile mind can imagine even nastier solutions to the mystery. It is said that Patrick found a lady in Peru, with whose help he hoped to populate the Galápagos, but he never returned there, and fades out of the record in an obscure Peruvian gaol.

Patrick Watkins was the first settler, but he was in no way typical of those who followed him; in fact, there never was a typical Galapagoan settler, as the successive waves of colonists had so little in common, some seeking profit, others trying to escape from a world they disliked, others again simply dumped there against their will. But Patrick's miserable story does give a foretaste of the horrors to come during the many long years in which the settlers lived pretty much outside the law, like the pirates before them.

Chapter Eight

CAPTAIN COLNETT R.N. AND CAPTAIN PORTER U.S.N.

They that go down to the sea in ships, and occupy
their business in great waters; these men see the
works of the Lord and his wonders in the deep.

Psalm CVII.

The Galápagos enjoyed a period of relative tranquillity for most of the eighteenth century, but during the Napoleonic era, both the Royal Navy and the United States Navy arrived on the scene. Two distinguished naval officers, Captain Colnett and Captain Porter, both paid long and fruitful visits — that is to say, fruitful from their particular points of view. Their purposes were very different, though it might be said that whaling provided a link between them: but Colnett was hunting whales and Porter was hunting whalers. Between them, the two captains did irreparable harm to the Galápagos, one by encouraging the whalers to go there, the other by introducing goats. Neither was to blame, in the sense that neither could foresee the consequences of his actions and, in any case, it seems fair to say that if they had never gone to the islands, other

people would have done the same things before many years had passed. There were no ecologists to utter warnings; nobody thought of such things.

Buccaneering along the Pacific coast had gradually faded out after the War of the Spanish Succession. There were occasional acts of piracy during the Spanish-American Wars of Liberation, and even later, in which the Galápagos were again involved, but they ceased to be regular haunts for British pirates and privateers. Yet, as the story of Patrick Watkins shows, by the end of the century, ships of various nations were using the islands with greater rather than less frequency. Piracy gave way to smuggling, and the smugglers, in their turn, found the archipelago a useful base for careening their ships and supplying themselves with fresh tortoise meat. By this time, the mariners had a more accurate knowledge of some of the individual islands and knew where to find a good beach or anchorage, though the supply of water still remained problematical.

Conditions and attitudes on the mainland had changed a good deal. The Spanish government still insisted on its monopoly of trade with the colonies, but the colonists were increasingly restive under the restrictions and were only too anxious to buy from British and other foreign traders goods which they could not get from Spain, or could not get at such favourable prices. The traffic was often viewed with tolerance by the local authorities, so smuggling flourished. Such ships as called at the Galápagos, still conveniently remote from the

effective authority of the Spanish crown, continued to take their toll on beasts and birds, but, except in limited areas, probably not at a rate greatly exceeding nature's power to make good again. But towards the end of the century, there was an ominous development: the whalers began to arrive.

The great Humboldt Current sweeps up the west coast of South America from near the Antarctic icefields until, on approaching the equator, it swings out to the Galápagos. Its waters are cold but extraordinarily rich in minerals, vegetable matter, and minute animal life. This, in turn, supports a correspondingly dense population of fishes and birds and, once upon a time, it also supported a vast number of whales. Reports of the abundance of whales in various parts of the South Seas had first reached Europe from such buccaneers as Dampier and Cowley. The latter wrote that "we also saw an innumerable company of Seals with abundance of large Whales, there being more of these in the Southern Seas, as I may say, by a hundred to one than we have to the Northward of us." Nearly a century later, far more comprehensive information was received from Captain James Cook (the great explorer, and no connection with Captain Cook of the piratical *Batchelor's Delight*). These reports became of increasing interest to the whaling industry in the eighteenth century because the catch in the northern hemisphere was steadily declining, owing to over-fishing.

To the northern whalers, the Pacific Ocean was a completely unknown region full of strange perils, real or imaginary, but the stories filtering through from the explorers tempted the more daring to try for rich prizes in these distant waters. Hardy pioneers set out from England, France, and the United States but they were few in number, largely owing to the traditional fears of a hostile reception by the Spaniards. In 1790, the London firm Enderby and Sons, the leading British whaling company, approached their government with a request for printed copies of a treaty recently concluded with Spain, allowing ships in distress to call at Spanish ports in the South Seas; these, it was urged, should be printed in both Latin and English so that they could be produced to the Spanish authorities in proof of the new agreement, because "at present, we have not been able to persuade more than two of our Captains to go round Cape Horn as they are fearful if they meet with any accident or sickly crews and are in want of water or go into any Spanish Port they will be made slaves for life."

Two years later, the British Admiralty, ever anxious to promote sea-borne trade, loaned Captain James Colnett to Enderby and Sons and sold them the *H.M.S. Rattler*, for the purpose of investigating the possibilities and collecting information that might be of value to the whaling industry. Colnett's instructions are summed up in the ponderous but then fashionably long title of the book he published in 1798 about his mission: *A Voyage to the South Atlantic and around Cape Horn into the Pacific Ocean for the purpose of extending the*

Spermacetic Whaling Fisheries and other objects of commerce, by ascertaining the Ports, Bays, Harbours and Anchoring Births, in certain Islands and Coasts in those seas at which ships of the British merchants might be fitted.

"Knowing it to be an object of the Board of Admiralty that I should visit the Gallipagos Isles," Captain Colnett reported that he spent a considerable time there. He improved on Cowley's map and gave some of the islands new names. One he named after the Earl of Chatham, others after Admirals Hood, Barrington, Duncan, and Jarvis; they are all still in current use. To the modern reader, less interested than the eighteenth-century merchants in the facilities for careening ships, the most striking passage in his account is this reference to the whales: "I have also seen the whales coming, as it were, from the main, and passing along from the dawn of day until night, in one extended line, as if they were in haste to reach the Gallipagos." Today, with so few whales left in any seas, it seems scarcely credible that such sights were once possible. Colnett was concerned not only with the whales but also with the suitability of the Galápagos for whaling vessels; he reported favourably on them as a place "in every respect calculated for refreshment or relief for crews after a long and tedious voyage," in spite of the water problem and the fact that "the watering-place of the Buccaneers is entirely dried up."

Encouraged by Colnett's report, whalers invaded the Pacific in increasing numbers, and visits to the Galápagos to fill their holds with tortoises became customary. Or so they did until the war which broke out in 1812 between Britain and the United States put a rude stop to the industry — or at least to the British part in it. Captain David Porter in the *U.S.S. Essex*, a frigate of 860 tons, with 32 guns, sailed round Cape Horn to harass British shipping. There were about two dozen British whaling ships operating there, but no warships. Militarily, the whalers were easy prey for Captain Porter; his problem, in those days of sail, was how to find small vessels cruising in the immensity of the Pacific. Then he learned from American whalers about a curious institution, in fact the only institution then existing in the Galápagos, uninhabited since the departure of Patrick Watkins. This was a "Post Office" on Charles Island. It was entirely unofficial and consisted of a barrel fastened to a tree. Whaling cruises might last anything up to five years, so outbound sailors left letters for their families, which were picked up and delivered by home-bound ships; also, one ship's captain could communicate with another.

This unsupervised, private-enterprise post office (which still exists today) was respected because it met a real need. In particular, the need of Captain Porter, who wanted information on the movements of the British whaling ships — and there it all was, waiting for him, conveniently collected in a single barrel. Thus armed, he succeeded in capturing twelve British whalers, half the fleet then in the Pacific,

and effectively chased the rest out of that ocean. In so doing, he created a new problem for himself — how to find enough of his own men to take command of his prizes without depleting the crew of the *U.S.S. Essex* beyond bearable limits. Even the ship's chaplain and the doctor were put in command of captured vessels, not to mention a twelve-year-old midshipman, David Farragut, who thus put his foot on the ladder that he was to climb to become the U.S. Navy's first full Admiral. It was therefore a double tragedy for Porter when his Lieutenant, John S. Cowan, was killed in a duel with Lieutenant Gamble of the Marines over some hastily spoken words. This very promising officer, aged twenty-one, was buried on James Island. The Galápagos beaches have been the setting of many sudden deaths, but this is the only known instance of a formal duel.

David Porter was a man of parts. In addition to being one of history's most successful commerce raiders, he, like the buccaneers before him, wrote a fascinating book about his adventures in and around the Galápagos. We may well ask whether it is the isolation of life at sea or the professional habit of keeping a log that inclines sailors to write such good journals. In spite of the strains of war, Porter's account of his months in the Galápagos was by no means confined to actual operations. He observed and recorded an astounding variety of natural phenomena. As he himself put it on one occasion: "Notwithstanding the great interest I felt for the critical situation of my prizes, as well as that which every officer must feel when in pursuit of the enemy, I could not help remarking the

operations of Nature on the south side of Narborough, which appeared to have undergone great changes since our last visit by the violent irruptions of its volcanoes; and at this time there were no less than four craters smoking on that island. I should have before mentioned, that a few hours after leaving Charles' Island, a volcano burst out with great fury from its centre, which would naturally lead to the belief of a submarine communication between them."

Captain Porter wrote at length about his most pressing problems, water and scurvy. For scurvy he found that some relief could be obtained by chewing prickly pears; the juice of this cactus, he wrote, "when stewed with sugar, made a delicious syrup, while their skins afforded a most excellent preserve, with which we made pies, tarts, etc." Water, or the lack of it, remained a constant preoccupation, as it had been to almost every seafarer since Bishop Berlanga. Porter made a more thorough survey of points of supply than any of his predecessors and devoted pages to evaluating temporary and more permanent sources. But there were rarely enough for his needs on any of the islands where he stayed.

The *Essex* and her crew were, in a high degree, dependent on the continuing capture of British vessels; while they found tortoises in plenty (on one occasion, they loaded nearly five hundred), they were in constant need of other supplies. The well-found British whalers, equipped and provisioned for cruises lasting three years or more, met this need. From them, Captain Porter supplied himself handsomely

with rope, canvas, tar, paint and foodstuffs, though on one occasion, two barrels of delectable Jamaican rum regrettably led to a brief breakdown of discipline. It therefore gives some indication of the severity of the water problem when Porter warns other captains to lay in a good stock before visiting the Galápagos, "as they may not be so fortunate as myself in capturing vessels with a large quantity on board, which, although contained in the oily casks of a whale-ship, and from them derived no agreeable taste or smell, but in the contrary produced nausea when drunk; yet we considered it the most valuable part of our prize." To assure a constant flow of prizes, Captain Porter used all the stratagems of war at sea. He constantly changed the appearance of the *Essex* by painting her in different colours and by building false structures, so that British whalers should think her a merchantman and not a man-of-war — a device the German Navy used in our own century.

During his searches for water, Porter also noted the wildlife. "This part of the island abounds with tortoises, which frequent the springs for the sake of the water, and upwards of thirty were turned on their backs by us as they came down to drink during the short time we remained there, which was not more than an hour and a half. But we were enabled to bring down only one. His weight was exactly one hundred and ninety-seven pounds, but he was far from being considered a large size." Porter was the first to notice (or at least the first to record) that the tortoises were not all of the same race but differed considerably from island to island, a fact which was later to

be of great scientific importance. He was constantly amazed by the richness of life along the shore. "The rocks" he relates "were everywhere covered with seals, penguins, guanas and pelicans and the sea filled with green turtles, which might have been taken with the greatest of ease, had we been enabled to take them into the boat, for we sometimes rowed right against them, without their making any exertion to get out of our way. Multitudes of enormous sharks were swimming about us and from time to time caused no little uneasiness, from the ferocious manner in which they came at the boat and snapped at our oars. But we guarded as much as lay in our power against the danger, by thrusting boarding pikes into them as they came up."

Other creatures were less aggressive. "Doves peculiar to these islands, of a small size and beautiful plumage, were very numerous and afforded great amusement to the younger part of the crew in killing them with sticks and stones, which was nowise difficult, as they were very tame." Captain Porter describes this sport without any hint of disapproval. He was a man of his age and by no means an inhumane one by its standards. Twenty years later, in this same part of the world, Charles Darwin, who had enjoyed more fun shooting partridges than most boys, gave up killing for sport; but Darwin was ahead of his time in this and other ways.

Porter's young sailors could have done little lasting damage to the bird population, and in a couple of years, the doves were no doubt

back to their original numbers. Oddly enough, it was the captain himself who was unwittingly responsible for the permanent damage to the indigenous flora and fauna of the Galápagos, and all because his naval education, though obviously sound in most respects, had not given him a sufficient understanding of the mentality of goats. He tells us that he put a male and three female goats ashore to graze on James Island. As they were tame, he did not trouble to have them hobbled and was surprised when they disappeared into the interior. Search parties spent several fruitless days looking for them.

Captain Porter accepted the loss philosophically enough, adding that "future navigators may perhaps obtain here an abundant supply of goat's meat; for unmolested as they will be ... it is probable their increase will be rapid." His complacency is understandable; he could hardly be expected to foresee what destruction goats would wreak among the scant vegetation on which the unique native wildlife depended. In any case, it is not even certain that Porter's goats were the first to be introduced. There were lots of goats on Juan Fernandez, and the buccaneers could easily have brought some with them to the Galápagos and deliberately freed them as a source of meat on future visits, just as they left caches of flour and other provisions. There were stories to this effect, and it was also alleged that the Spanish authorities on the mainland introduced fierce dogs in the hope that they would kill off the buccaneers' goats. On the whole, it seems more likely that these stories apply to Juan Fernandez, where there were goats in plenty but no tortoises.

No record of goats on the Galápagos has been left by the buccaneers or other early visitors, who found that the tortoises and turtles provided more tender meat than the athletic goats — and were much easier to catch. What is certain is that the rats, cats, pigs, dogs and donkeys which man intentionally or unintentionally introduced are today a greater menace to the indigenous life of the Galápagos than man himself. And the pity of it is that, even now, when we have the knowledge that David Porter lacked, men are still deliberately releasing goats on islands hitherto free of them.

Captain Porter continued his successful career as a commerce raider for several months. He needed all his ingenuity not only to capture enemy shipping but to maintain his own ship and crew so far from his home base. Finally, his leaky ship had to leave the Galápagos. The copper was coming off her bottom, and she was swarming with rats, which were destroying food and clothing and were even gnawing at the vital water barrels. To carry out the necessary repairs and cleansing, the *Essex* sailed 3,000 miles to the Marquesas Islands. On returning to South America, Porter found that British warships had entered the Pacific and the *Essex* was captured at Valparaiso by *H.M.S. Phoebus*.

Captain Porter was released on parole and allowed to return to New York in one of his prizes. He was a man of great determination and independence of mind, and it is scarcely surprising that he occasionally found himself at odds with his superiors in rank. It is

said that he annexed the Galápagos; if so, it was an act of little historical consequence as it was never ratified by the government of the United States. Porter certainly took formal possession of the Marquesas by a treaty with the friendly natives. He did this without any authorization, and his action was disowned as the U.S. Senate refused to ratify the treaty. The Galápagos still remained, nominally at least, a Spanish possession, claimed by no other country.

David Porter was in further trouble over an incident in Puerto Rico in 1824, when he was again accused of exceeding his authority. A court-martial suspended him for six months, whereupon he resigned from the U.S. Navy. He later organized and commanded the infant Mexican Navy and led it to victory in the war of independence from Spain. Perhaps the strangest thing in his career was its end. Reconciled with his government, which had belatedly formed a truer estimate of his past services, he was appointed Minister Plenipotentiary in Constantinople. It was an odd choice.

Chapter Nine

THE VOYAGE OF THE BEAGLE

...yearning in desire
To follow knowledge, like a sinking star,
Beyond the utmost bound of human thought.

Alfred Tennyson.

Charles Darwin arrived in the Galápagos aboard His Majesty's Ship *Beagle* in 1835, just three hundred years after Bishop Berlanga. This is the most important date in the history of the islands; it is also a highly significant one in the history of human thought because, when Darwin left, the seed of an idea had begun to take root in his mind, which grew to be his theory of evolution and gave man a new conception of how life developed on our planet. A monument to him was erected in the Galápagos in 1935 to mark the centenary of his visit. The bust shows Darwin as the elderly sage, the invalid who had long been the hermit of Downe House in Kent. It is difficult to recognise, under the great flowing beard, the vigorous, fresh-faced young man who landed from the *Beagle*, who had recently galloped for hundreds of miles across the wild Argentinean pampas, had

braved the ice and gales of Tierra del Fuego and crossed the high Andes by the arduous and dangerous Portillo pass.

Nobody would have been more surprised than young Darwin, as he scrambled onto the broken field of black basaltic lava, if he had been told that this was the turning point of his life or that his visit was to mark a turning point in the history of science. During the last three and a half years, he had journeyed far in the little *Beagle* and had visited much of South America. Thanks to his great physical exertions when on shore, few travellers of his time had seen so much of the interior of the vast continent, still fewer had observed it with such a keen eye. After the splendour of the Andes, Chatham Island must have been a bit of an anti-climax. As he commented, "nothing could be less inviting than the first appearance." The parched landscape, the noonday heat like the breath of a stove, the bare, sun-baked brushwood, offered little encouragement to Darwin in his efforts to collect plants; he found nothing but a few "wretched looking weeds which would have better become an arctic than an equatorial flora." From one point, he counted sixty small, black, conical craters, none of them rising more than a hundred feet above the plain of lava. "From the regular form of the many craters, they gave to the country an artificial appearance, which vividly reminded me of those parts of Staffordshire, where the great iron foundries are most numerous."

The going was hard even for so energetic a young one, but he plodded on, scrambling across the great fissures, the hot lava ringing beneath his boots as though he were tramping over iron plates. Then, his efforts were suddenly rewarded by what he called a "strange Cyclopean scene." He met two tortoises, each weighing at least two hundred pounds — not very large by Galápagos standards, but enormous to the young naturalist who was seeing them for the first time. "One was eating a piece of cactus, and as I approached, it stared at me and slowly stalked away; the other gave a deep hiss and drew in its head. These huge reptiles, surrounded by the black lava, the leafless shrubs and large cacti, seemed to my fancy like some antediluvian animals. The few dull-coloured birds cared no more for me than they did for the great tortoises." Within the next few weeks, these drab finches and these aloof reptiles were to start the train of thought which was to dominate Darwin's mind for the rest of his life.

When he set sail in *H.M.S. Beagle* in 1831, Charles Darwin was not exactly a promising young man. True, he had great charm of manner, and his sisters adored him, but his father was frankly disappointed and worried about his future. It had been intended that he should become a doctor, like his father and grandfather before him, but after two years at Edinburgh University he gave up medicine; he disliked the subject, found the lectures a great bore and could not bear to watch surgical operations, which must have been pretty grim affairs in those days before anaesthetics. He did attend

lectures on zoology and geology, though again, he found them dull. But then he always did find lectures a waste of time.

The same thing happened when his father sent him to Cambridge with the hope of making him into a clergyman. The study of divinity bored him, and he felt no real vocation for the church. Still, the life of a country parson was agreeable enough and would not interfere with his great pleasures: shooting partridges, hunting, and collecting all kinds of specimens — flowers, rocks, beetles, moths. Also, by complying, he would avoid an unpleasant showdown with his physically enormous and rather overbearing father, whom he both feared and loved; in any case, he could not think of any other profession that he really wanted to follow. It never seems to have crossed his mind that he might become a scientist: scientists were academics, and that was the last thing he wanted to be. Until he was offered the post of naturalist on the *Beagle*, he never even thought of himself as a scientist, and perhaps not even then.

Yet, it was all there. From early boyhood, he had been fascinated by everything he found in the fields and woods around Shrewsbury. Many boys go through a period of collecting eggs or butterflies, which are in due course relegated to a boxroom; with Darwin, the addiction grew stronger with every year. He may have found the course on geology stupid, but he did follow it. He got to know the curator of the Edinburgh University Museum; he learned to stuff birds and even read a paper on microscopic marine animals to the

Plinian Society. At Cambridge, he regularly went for walks with his friend, the Reverend Professor John Henslow, who lectured on botany. Adam Sedgwick, professor of geology, took him on a field expedition through Wales. It is hard to believe that these distinguished men of science would have taken young Darwin with them on their excursions if they had not found, or at least suspected, some unusual aptitude in spite of his open contempt for established academic methods. For Darwin, however, natural history was simply a hobby. Somehow or other, he scraped through his B.A. degree with a humble pass and gaily went off to enjoy a good holiday before settling down to the life of a clergyman. He might well have followed in the footsteps of the Reverend Gilbert White of Selborne and written with charm and discernment about the birds of his parish.

Then everything happened suddenly. His whole life was changed by a letter, and so was the history of science. Professor Henslow had been invited to join the *Beagle* on a hydrographic mission round the world in the capacity of naturalist. He would have jumped at the chance, but his wife felt differently about the prospect of separation for two or more years — five, as it proved to be in the event. So Henslow offered to recommend Darwin to take his place. The difference in scientific standing between the two men needs no comment, but Henslow's recommendation does suggest that he saw more in the young man than his modest academic achievements would have warranted or than most other people would have

admitted — his father in particular. In fact, Dr. Darwin, without formally forbidding the venture, made it abundantly clear that he disapproved of his son's wasting the next few years bug-hunting instead of establishing himself in his new career.

Charles dutifully wrote declining the invitation and went off to shoot partridges at the home of his uncle, Josiah Wedgwood, of the famous pottery family. His uncle took a very different view of the offer. He bundled Charles into his coach and together, they went back to Shrewsbury to tackle the formidable Dr. Darwin. They seem to have won more easily than either anticipated. The father consented and, as the post was unpaid, agreed to continue Charles's allowance for the duration of the voyage. Charles wrote the next day cancelling his refusal and asking Hensley to submit his name.

The next obstacle was the captain of the *Beagle*, Robert FitzRoy, on whom the appointment entirely depended. Why should he choose Charles Darwin? Obviously, not on account of his academic or scientific achievements; there was at least one other candidate who was a naturalist of some standing. His youth — he was twenty-two — was perhaps an unexpected factor in his favour, for FitzRoy himself was not much older; he had established a reputation as a hydrographer and had assumed command of the *Beagle* on a previous voyage when he was only twenty-three, so Darwin's youthful enthusiasm would have appealed to him. More important, perhaps, was Charles's intention to become a clergyman.

FitzRoy was a deeply religious man with a pronounced bent for missionary work. He accepted literally and uncompromisingly every word in the Bible, and may well have hoped, ironical as it may seem in retrospect, that this budding parson with a taste for natural history would find some convincing illustrations of the truth of the book of Genesis. This must be one of the reasons for the fury of his attack on Darwin after the publication of his theory of evolution. There was no deception on Darwin's part because, at the time, he had not begun to doubt that the world had been created in six days in the year 4004 B.C. However, the decisive factor must have been that Charles was a very charming young man. After all, Captain FitzRoy knew that he and his naturalist would be cooped up in the cramped cabin they were to share in the 235-ton *Beagle* for a matter of years and that, if they did not get on together, life would be very painful. In the event, despite a few bad quarrels, they were still on amicable terms at the end of the voyage.

If *H.M.S. Beagle* had sailed directly from Plymouth to the Galápagos, Darwin's visit to the islands could not have had the same effect on his thinking that he later attributed to it. He would of course have experienced a similar excitement — even the humblest naturalist gets thrill upon thrill as he makes his way through this strange world, so different from anything he has seen before. He would have botanised with the same ardour, climbed about craters with the same vigour, collected birds and examined tortoises and iguanas with the same enthusiasm and astonishment and with much

the same acuteness of observation; but it is highly improbable that what he saw in 1835 could have raised the same nagging questions in his mind if he had seen it in 1831. Years later, he jotted down in his notebook: "Had been greatly struck on character of South American fossils and species on Galápagos archipelago. These facts (especially latter) origin of all my views." His years as a travelling naturalist had immeasurably broadened and deepened Darwin's mind. Whereas his academic studies in Edinburgh and Cambridge had bored him profoundly and (why not say it? — his father did) turned him into a bit of a loafer, his field work in the jungles, on the seashores, the pampas, deserts and mountains had roused him to feats of courage and endurance in pursuit of scientific facts. Time and again during his interminable bouts of seasickness, he must have longed to escape from the cramped life in the little, heaving brig and return to the comforts of home; but he did not because he had found a new purpose in life. One might say that his voyage in the *Beagle* had turned out to be his true university and had given him an insatiable appetite for knowledge.

His exciting discoveries in South America had prepared him for his even more exciting experiences in the Galápagos and made his mind ready to receive the impact of what he was now to see. Moreover, he had had unlimited time to read and to think during the endless, dreary days at sea in the tiny brig. He wrote later in life that he considered it a great pity that the very best men devoted so much of their time to their own investigations and that they had too little left

to read what other people were doing and thinking: "I have often thought that Science would progress more if there was more reading." During the voyage, one book in particular had influenced his thinking — Sir Charles Lyell's *Principles of Geology*. Lyell was one of the founding fathers of the modern science of geology. By patient, cautious accumulation and weighing of facts, he destroyed the old biblical assumptions of instant creation. He refused to accept the alternative theories of a series of cataclysmic extinctions and new supernatural beginnings to explain the evidence visible in the rock strata and fossil remains. Instead, he advanced the concept of slow change through the gradual elevation or subsidence of parts of the Earth's crust, the wearing down of mountains by water and frost over millions of years, or the formation of coal beds by the endless accumulation of fallen leaves.

While Darwin mulled over Lyell's revolutionary ideas during the long months at sea, on shore he industriously sought direct evidence of his own. Caught in a shattering earthquake on the coast of Chile, he saw for himself how the level of the land can be raised or lowered. As he climbed higher and higher into the Andes he found, one after another, visible demonstrations of Lyell's concepts. "In most parts, perhaps in all parts, of the Cordillera" he noted "it may be concluded that each line has been formed by repeated upheavals and injections, and that the several parallel lines are of different ages. Only thus can we gain time at all sufficient to explain the truly astonishing amount of erosion." As he camped by the roaring torrents, listening at night

to the clatter of the stones the water ceaselessly carried down and "calling to mind that whole races of animals have passed away from the face of the Earth and that during the whole period, night and day, these stones have been rattling onwards in their course," he gained a new sense of how, given limitless time, change can take place gradually, almost imperceptibly. Another stimulating discovery was fossil shells "which were once crawling on the bottom of the sea, now standing nearly 14,000 feet above its level." FitzRoy could explain that they were deposited there by the Flood, but Darwin was now definitely convinced that they had been raised there by the slow elevation of the surface of the earth.

In the matter of fossils, Darwin was particularly lucky in Argentina, where he unearthed the bones of a whole series of pre-historic animals embedded in a single gravel beach near Bahia Blanca. They included a giant sloth, a giant llama, a giant armadillo — animals that no longer existed. Then there was the skeleton of a kind of horse: when the Spaniards arrived in America, there were no horses there, yet here was evidence that there had been at some time in the remote past. Darwin was puzzled as well as elated by his discoveries. "Certainly" he wrote "no fact in the long history of the world is so startling as the widespread and repeated extermination of its inhabitants." No doubt the fundamentalist Captain FitzRoy, once again, could easily explain such matters: these creatures had been drowned in the Flood because, for some divine reason into which it would be presumptuous to enquire, they had not been taken into

the Ark. This reasoning could no longer satisfy Darwin. He now accepted the clear evidence that species had become extinct long before the Ark was supposed to have been built: but had he also begun to consider the possibility of the development of new species? At this stage, apparently not. It took the Galápagos to give his mind the necessary twist in that direction.

Chapter Ten

DARWIN IN THE GALÁPAGOS

The archipelago is a little world within itself, or rather a satellite attached to America.

Charles Darwin.

Out of the five years of the *Beagle's* round-the-world cruise, Darwin spent a scant five weeks in the Galápagos archipelago. Even today, scientists bemoan the high proportion of their precious time wasted in getting from island to island; in the days of sail, when the little brig had to struggle with calms and the capricious currents, the loss of productive time and the consequent frustration must have been all the greater. But how much Darwin did see in those short weeks! If he had been nothing more than an enthusiastic field naturalist, he would be remembered only by specialists; students would still find his name tacked onto some of the many new botanical or zoological species he discovered and might — or might not — pause to enquire who Darwin was. Nevertheless, considered purely as a field naturalist, he was outstanding. Those who visit the islands today, with the benefit of another 135 years of scientific investigation, can hardly fail to be impressed by the volume, diversity, and penetration

of his observations. Some minor errors have since been corrected, and a vast amount of additional information has been compiled, but Darwin's account in his *Voyage of the Beagle* still remains a most useful introduction to the geology, botany and zoology of the Galápagos.

Darwin was unable to land on most of the islands, but he did manage to spend a whole week camping on James Island while the *Beagle* sailed off in search of water, and it was here that his best work was done. He was not a specialist; he was an old-fashioned natural philosopher, and his *Origin of Species* was one of the last great scientific works which could be understood by an educated layman with no specialized scientific training. All nature was grist to his mill. He not only describes the climate and the geological structure but also gives us intimate details such as that, when the trade winds failed, the temperature in his tent stood for hours at 93°. The thermometer placed in some brown sand rose to 137° and stopped there as it was not graduated any higher — so there was no point in trying it in the black sand as this was still hotter and burned through his thick boots. He tells us of his great pains to collect insects and of his disappointment at finding so few, but his collection did include twenty-five species of beetle, almost all of them new to science. He also found time to collect sixteen kinds of land shells and fifteen kinds of sea fish — again, all but one of them new species.

On the mammals, he inevitably had little to report, as there were so few of them until man deliberately or accidentally introduced Old World species. The flora was more interesting. True, the pickings were small, though he "indiscriminately collected everything in flower on the different islands;" but what a curious and thought-provoking collection it turned out to be! Not only were the majority of the species to be found nowhere else in the world but, with few exceptions, the species on one island were not to be found on any other. For instance, there were six species of *Scalesia*, a tree-sized genus of Compositae, and not one of these species grew on any two islands. Darwin warned that his collections were so small that too much confidence should not be placed in conclusions to be drawn from them and that much remained to be done in the botany of the Galápagos (he would no doubt be delighted to know that, after all these years, the botanists are still toiling away there), but the evidence was, to say the least, provocative.

However, it was the birds and the reptiles that really captured Darwin's imagination. Never before had he seen reptiles in such numbers. There were not very many species, but all of them were of absorbing interest to the young naturalist, as indeed they had been to the bishop, the pirates and all other visitors before or since; but Darwin approached them as a scientist. On the lava slabs and cliffs by the shore, herds of giant lizards were basking in the sun. They looked like smaller versions of mediaeval dragons, measuring three or four feet when fully grown. They were dirty black in colour,

matching the lava they were lying on, with a ridge of spines running down their backs, from their scale-studded heads to the tips of their tails. The lizards were incredibly tame, and their fierce looks were belied by their gentle behaviour; they could not be induced to bite, and although they breathed vapour from their nostrils, it was composed of seawater instead of the legendary fire of the dragons.

These strange creatures were marine iguanas, the only sea-going lizards. Captain Colnett of the *Rattler* had recorded that "they go to sea in herds a-fishing, and sun themselves on the rocks," but Darwin looked into the matter more closely. With the help of the ship's surgeon, Mr. Bynoe, he opened up the stomachs of several specimens and found them full of minced seaweed and nothing else. The lizards were purely vegetarian, and on these islands with such meagre vegetation, they had adapted themselves to finding their food at the bottom of the sea. They swam easily, gracefully, propelled by their long flat tails and the sinuous movement of their bodies; their short legs were tucked into their flanks and not brought into play when they were swimming but with their strong claws, they were admirably suited to clambering over the rocks. The fact that they were thoroughly aquatic was demonstrated by a sailor who tried to kill one by sinking it in deep water with a weight attached; when he pulled it up an hour later, it was still quite active.

Yet, when Darwin tried to chivvy one into the sea, he failed completely; it would go anywhere else but not into the water — not

even to avoid capture. So, he threw one out as far as he could, but again and again, it swam straight back and crawled up onto the same rock as before. Obviously, it did not like the sea any more than Darwin himself did and, like him, only went to sea when it was absolutely necessary for its purposes. He concluded that the iguanas had no enemies on land but often fell victim to the sharks at sea and so, by some hereditary instinct, automatically made for the shore when frightened, whatever the cause of their fear, like a child running to its mother across a dangerous street. They lived their placid lives near the shoreline, never going more than a few yards inland and venturing into the water only as far as was necessary to feed. Darwin found them "hideous-looking, stupid and sluggish" — but what fascinating creatures, unlike anything else on earth!

Further inland, Darwin found another member of the same lizard family, but one with very different habits. Just as the marine iguana had solved the problem of nutrition in an arid and largely desertic terrain by feeding on seaweed, so its cousin, the land iguana, had adapted itself to a diet of prickly cactus and such leaves as the stunted shrubs bore. They were, on average, a little smaller, had round instead of flat tail, and were of a yellowish orange colour underneath and a more brownish red above. This was very much the colour of their favoured haunts. They liked to dig the burrows where they spent the night and laid their eggs in the soft tuff formed by accumulations of volcanic ash. Their method of digging delighted him: they would scrape away with both left legs until they were tired

and then change to their right legs. Darwin complained that, when crossing lizard warrens, the soil was so perforated by the shallow tunnels that it was constantly giving way, to the annoyance of the tired walker. In those days, the number of land iguanas on James Island was still immense, so much so that for a long time he and his party could not find a spot free from burrows on which to pitch their tent. Unfortunately, this is no longer a problem that besets visiting scientists: the James race of land iguanas is extinct. Darwin noted that their eggs were sought after as food and that, when cooked, the lizards yielded a white meat "which is liked by those whose stomachs soar above all prejudices."

Darwin obviously had a keen eye, but it is still a source of wonder how, with all the collecting and measuring and note-taking he did, he found so much time for the patient observation of the habits of the birds and animals. He had fun throwing pieces of cactus to little groups of land iguanas and watching how they scrambled for these titbits like hungry dogs for a bone. He noted that they ate very deliberately but without chewing their food. While their marine relatives had learned to swim, they had acquired the knack of climbing trees in search of food. Neither species of iguana seemed to drink in the normal way, but the one took in a good deal of seawater in the course of its submarine feeding, while the other, living in its arid zone, seemed to derive all the water it needed from the succulent though spiky cactus. Darwin found that the little birds fully appreciated that these fierce-looking reptiles were harmless and

described how he watched a finch pecking at one end of a cactus pad while an iguana munched at the other. Even when he took one by the tail, it never tried to bite him. He laughed at the awkward gait of the big lizards as they shuffled towards their burrows; had he been born a century later, it might have reminded him of the rear view of Mr. Charles Chaplin, retreating into the distance in the closing shot of one of his comedies.

The giant tortoises were even more fascinating than the iguanas and Darwin studied them intently. In addition, he closely questioned the few inhabitants who had recently been banished to Charles Island for political or other offences. He was astounded by the size of the tortoises — it took as many as eight men to lift a big one, he was told. Their numbers were still enormous, although, he says, less than what the buccaneers had reported. This was inevitable as Charles Island, when the news of relatively satisfactory water supply spread, became a favourite anchorage for all types of ship, and Darwin heard of a frigate which had loaded two hundred tortoises in a single day. He was also told that, while the island was now full of wild pigs and goats, the staple diet of the reluctant inhabitants was the meat of the tortoises — which of course were much easier to catch — so that two days' hunting gave food for a week. While on an excursion into the interior of James Island, Darwin and his party lived entirely on tortoise meat, which he found palatable enough when roasted in the shell "as the Gauchos do," but otherwise rather insipid.

The other islands had fared better, and Darwin learned, to his surprise, that there were tortoises on most, if not all, of them, even on those that were completely waterless. Apparently, they could do with the moisture in the cactus pads just as the land iguanas did. Yet, on the larger islands, where the central volcanoes rose high and attracted mist or rain on their upper slopes, the tortoises loved water. Where it was available, they drank large quantities and wallowed for hours in the mud. Darwin was puzzled by the well-worn trails up the mountain until he discovered that these were the routes along which the tortoises travelled from the bone-dry lowlands to slake their enormous thirsts. "Near the springs" he wrote "it was a curious spectacle to behold many of these huge creatures, one set eagerly travelling onwards with outstretched necks and another set returning, having drunk their fill."

Characteristically, Darwin calculated the speed of the tortoises on these long treks, during which it lumbers along night and day with undeviating purpose. He timed one over sixty yards; it took ten minutes, or four miles a day, allowing few breaks for eating on the road.

Darwin also gave some more intimate details. He guessed that the tortoise's bladder served as a reservoir in which it stored moisture to serve it over long periods. The inhabitants, he discovered, when overcome by thirst in the arid regions, killed a tortoise and drank the water from the bladder and the pericardium. He sampled it in

one he saw killed and found the fluid "quite limpid and with only a slightly bitter taste." The great monsters seemed to have no power of hearing. When he overtook one as it plodded along its path, it paid no attention until he drew level; then it gave a deep hiss, drew in its head and fell heavily to the ground. Darwin was fortunately present during the breeding season and found that the female scratched a hole in the sand and there laid her spherical white eggs "seven inches and three eighths in circumference, and therefore larger than a hen's egg." Several times he tried mounting a tortoise and, after giving it a few raps on the hinder part of the shell, it would rise and walk; but although he was an accomplished horseman, Darwin admits that he found it difficult to stay in his saddle.

As we have seen, Darwin eagerly supplemented his extraordinary powers of observation and experiment by questioning the settlers. Throughout his life, he was an ardent advocate of the art of picking other people's brains. Like Molière, he might have taken as his motto: *je prends mon bien là où je le trouve* — I take my material wherever I find it. He had read the books of the literary buccaneers (even though he quotes "Wood and Rogers" when he surely means the privateer captain Woodes Rogers) and the accounts of Captain Colnett and Captain Porter. But much more significant was a chat with "Mr. Lawson, an Englishman and vice-governor of the colony." Nothing else seems to be known about Lawson, not even his first name, nor how an Englishman came to be in charge of a foreign settlement in the Pacific. He enters the history of science without

introduction and disappears again without trace, but he dropped a pebble into the pool of Darwin's thinking, and the ripples spread wider and wider with unforeseeable consequences. When Darwin was questioning him about tortoises, Lawson mentioned that each of the various islands had its own variety and that he could tell at a glance which island a particular tortoise came from.

This chance remark did not greatly impress Darwin at the time it was made, but it kept recurring in his thoughts both during the rest of his short stay and during the long, long voyage home. Step by step, he came to appreciate that what was true of the tortoises was true of much of the other fauna and, indeed, of the flora, and that this was by far the most remarkable feature in the natural history of the archipelago. He had begun by treating the group of islands as a single unit. He had, for instance, assiduously collected "Galápagos" birds without at first bothering to label them with the name of the individual island where they were taken. "I never dreamed" he afterward wrote, "that islands, about fifty or sixty miles apart, and most of them in sight of one another, formed of precisely the same rocks, placed under a quite similar climate, would have been differently tenanted;" but he now realized that several of the islands possessed their own species of tortoises, mockingbirds, finches and numerous plants. Fortunately, his botanical specimens had been correctly labelled, and he had a pretty good idea which of his birds came from which island. These birds, which had at first seemed such

a dull lot, now began to look like the most important single element in his collection.

In the first place, the birds, though most of them were species unknown elsewhere, were definitely American in the sense that they were related to families on the mainland. Darwin would have expected them to be similar to the birds of the Cape Verde Islands because that group was similar in its general conditions to the Galápagos; but the Cape Verde birds were clearly African types, and the Galápagos birds, American. Yet, although they bore the impress of America, they diverged from the continental species; stranger still, different islands had different species.

The more Darwin thought about the birds, the more intriguing they became — especially the finches. He found thirteen species, all very similar (the males mostly black, the females brownish) but with peculiar differences. "The most curious fact is the perfect gradation in the size of the beaks of the different species." One had a huge bill like a hawfinch, another like a chaffinch, others again like a parrot or even a warbler. These beaks fitted the various species for obtaining different kinds of food — for cracking large seeds or picking up small ones, for digging into cactus pads or for catching insects. "Seeing this gradation and diversity of structure in one small, intimately related group of birds" Darwin pondered, "one might really fancy that from an original paucity of birds in this archipelago, one species had been taken and modified for different ends." With

this, he started on the long trail that eventually led him to his theory of the origin of species by natural selection.

Chapter Eleven

INTIMATIONS OF EVOLUTION

He ne'er is crown'd
With immortality, who fears to follow
Where airy voices lead.

John Keats.

Charles Darwin's theory of evolution did not come to him like a blinding flash of lightning. There was no moment of sudden conversion such as St. Paul experienced on the road to Damascus. So far as we know, and presumably so far as Darwin himself knew, he still believed, when he left the Galápagos, that species were immutable, that all living creatures were the same as their distant ancestors were when first created. And yet, even at this early stage, as the *Beagle* weighed anchor and the dark volcanic hummocks of the Enchanted Isles slowly sank below the horizon, doubt, uncertainty, or at least puzzlement must already have entered his questing mind.

On the American mainland, it was geology that had most excited him; in the Galápagos, it was biology that captured his imagination.

Of course, the birds and the reptiles were fascinating in themselves, as they must be to any naturalist, but there were also things about them that called for explanations which he could not then provide. It is hardly too much to say that he spent the rest of his life in working out answers to his Galápagos riddles. He would have loved to stay longer, to explore more of the islands, to fill out the gaps in his hastily collected data. If he had suspected at the beginning what he knew at the end of his five weeks, he could have organised his work much better, particularly in analysing the differences which, to his surprise, he eventually found to exist between the creatures on each individual island. He lamented that "it is the fate of most voyagers, no sooner to discover what is most interesting in any locality, than they are hurried away from it; but I ought, perhaps, to be thankful that I obtained sufficient material to establish this most remarkable fact in the distribution of organic beings."

What Darwin wrote in the *Voyage of the Beagle* about his experiences in the Galápagos is not necessarily what he was thinking when he was there. The return journey across the Pacific took over a year, as it included stops at Tahiti, New Zealand, Australia, and the Cape of Good Hope. Frequently seasick and increasingly homesick, he had plenty of time to sort out his thoughts as well as his specimens. Shortly before his marriage, he wrote to his future wife that he hoped she would excuse and, if possible, cure him of his "peculiar egotism," which consisted of "building theories and accumulating facts in silence and solitude." The long, empty days and nights at sea gave

him ample scope to indulge this habit, if they did not actually form it, and there can be little doubt that the seed sown in his mind by his Galápagos experiences began to germinate during this period. Many years after, the fundamentalist Captain FitzRoy told of how he had several times warned the young man that his dangerous thoughts could only lead him into heresy. But whether he wanted to or not, Darwin could not dismiss from his mind the nagging problem posed by the Galápagos: "Considering the small size of these islands, we feel the more astonished at the number of their aboriginal beings and at their confined range. Seeing every height crowned with its crater, and the boundaries of most of the lava-streams still distinct, we are led to believe that in a period, geologically recent, the unbroken ocean was here spread out. Hence, both in space and time, we seem to be brought somewhat near to that great fact — that mystery of mysteries — the first appearance of new beings on this earth." That was the problem: the archipelago had obviously not been there "in the beginning," yet most of its plants and animals were distinct from those to be found elsewhere in the world; there were even marked differences between island and island. How, then, was he to explain the origin of these new species? The fossilised skeletons Darwin had found on the American continent showed that some species had become extinct; was it also possible that new species could "evolve" — and, if so, how?

"Evolution" was not a completely novel idea to the scientists of this era. In 1809, the year of Darwin's birth, Jean Baptiste Lamarck had

published his *Philosophie Zoologique*, in which he propounded a theory of evolution. Darwin must have known something of this and presumably rejected Lamarck's ideas (as his great mentor, Lyell, had done) because there was too much speculation based on inadequate factual evidence. For similar reasons, he had little respect for the evolutionary notions of his own grandfather, Erasmus Darwin, who had enjoyed a considerable though brief fame as a naturalist in the eighteenth century. For Charles, it was not enough to propound a theory of evolution; he had to show how it worked, and for this, he needed to assemble solid, rigorously checked, and demonstrable facts. In the Galápagos, he had discovered a number of facts but also a number of riddles to which as yet he had no answer.

Darwin assumed that the Galápagos Archipelago had been formed by volcanic action beneath the floor of the Pacific Ocean, which had gradually thrust the islands up above the level of the sea. There is the other view that the Galápagos were once connected with the mainland, but majority opinion among geologists still supports Darwin's view. Given this assumption, Darwin had to explain how life began on these remote islands. He worried about different aspects of this puzzle for years, but neither he nor any later investigator has produced an entirely satisfactory solution; there probably always will be a good deal of surmise. Still, a general pattern emerges. After the volcanoes had been sufficiently weathered, small pockets of soil would form, capable of sustaining a

little vegetation. Seeds could be carried to the islands on rafts of tropical vegetation, such as one commonly sees in the estuaries of South American rivers, drifting out into the ocean on the great currents that wash the shores of the Galápagos. Other seeds might be carried by birds in their intestines or adhering to their feet. Some might have been brought by the wind. Of course, at this early period, only seabirds could survive, as any land birds reaching the islands would perish for lack of food.

When the vegetation had reached certain stages of development, survival would become possible for insects and land birds. Their chances would be slim, but over periods of a million years there would be a few successes among the many failures. It was more difficult to account for the larger creatures, such as the giant tortoises and iguanas. Perhaps the ancestors of the present giants were much smaller; in any case, the young tortoises are quite tiny; or perhaps just eggs were carried. Certainly, these huge rafts of vegetation drifting from the mainland are capable of making the journey in the same way that becalmed ships and balsa rafts are definitely known to have done at least from the time of Bishop Berlanga to the present day. As long ago as 1793, Captain Colnett recorded that "on several parts of the shore there was driftwood of a larger size than any of the trees that grow on the island; also bamboos and sugar canes." These must have come from the American continent. By whatever means the tortoises and iguanas reached the islands, the cactus must already have preceded them — or, more accurately, must have preceded

those that survived to live and breed — as the cactus is the only source of moisture and provides almost the only vegetable food along the lava shores, apart from the seaweed to which the marine iguanas eventually adapted themselves. The odds against survival were astronomic, but, over the millennia, there nevertheless were survivors.

By whatever means the plants and animals had reached the Galápagos, they were there; what fascinated and puzzled Darwin was why so many of them should be different from the species found anywhere else. They were not primitive animals that had become extinct elsewhere. Having worked for over three years on the South American mainland, he could see that they were related to the living continental species; yet they were clearly different. Could they be descended from common ancestors? To suggest this was rank heresy. Scientific and religious opinion were at one in accepting that species were immutable; they were the same today as when they were first created. Sir Charles Lyell had daringly demonstrated that the Earth itself was constantly changing and that the changes revealed by geology had taken millions of years rather than the six thousand years of orthodox opinion; but Lyell could not bring himself to accept that living creatures — particularly man — had likewise slowly evolved. Darwin, too, hesitated to accept it but the evidence he had gathered, particularly in the Galápagos, drove him relentlessly towards this conclusion, though when he finally accepted the fact of evolution, "it was like confessing to a murder"

and it was many years before he could bring himself to make his confession public.

The most impressive single piece of evidence was the group of birds now known as "Darwin's finches". Here was a group of a dozen birds, clearly different species with differently shaped bills adapted to different types of food, yet basically so alike that Darwin could not long resist the conclusion that they were descended from a common ancestor. If different species could be derived from a single ancestral stock, then, for Darwin, species were not immutable, even if this meant questioning the whole mechanism of Creation and, thus, the most fundamental scientific theories and religious beliefs.

New species did evolve, but how? After his return to England, Darwin hit on the explanation of "natural selection" while reading Malthus's *Essay on Population* — "for amusement," as he records in his *Autobiography*. From this unusual form of light entertainment, he derived the idea of the survival of the fittest, as Malthus argued that human populations would increase in geometrical ratio if they were not restricted by the slower growth of the means of subsistence. Darwin saw that this applied not merely to man but to the whole of nature; only the more successful individuals, those best adapted to their environment, would survive. Variations in plants and animals did occur, and the pigeon fanciers and dog breeders had shown that, by deliberate selection, varieties could be developed. In nature, such deliberate selection was ruled out, but, given the concept of almost

unlimited time to which Lyell had introduced him, natural selection could eventually produce similar results.

A small variation that was advantageous would give an animal a better chance of survival and reproduction and, if it was inheritable, this advantage would be passed on to its offspring; an unfavourable variation would reduce the chances of the offspring surviving and multiplying. Where a spontaneous change occurred — say, in the size or shape of the bill, as with the finches — it might lead to the elimination of the individual from the breeding stock, or it might open up the possibility of exploiting a new source of food. In the Galápagos, the original finches had unusual scope for diversification because there were so few competitors. If there had been warblers, tits, grosbeaks, woodpeckers and so forth in the islands, finches which became modified by random mutation, so as to resemble one of these other birds in certain ways, might not have been able to survive in competition with the established species; but as no such kinds of birds had reached the Galápagos, the divergent finches were able to fit into the unoccupied niches and play the ecological roles which were filled by a wide variety of species on the continent. Thus, the colloquial names of some of Darwin's finches — "warbler finch" or "woodpecker finch" — give a good general idea of the direction in which these species had evolved. Darwin's demonstration of how the finches had become adapted for complementary ways of life paved the road to the modern science of ecology.

Owing to the isolation of the Galápagos, the fact of variation was more obvious there than in any other place he visited — probably more so than anywhere else in the world. But isolation had another role that Darwin did not fully appreciate, though he saw the results of it. Complete isolation promotes divergence. Single oceanic islands, therefore, tend to have distinctive species, but they do not have groups of species descended from a common ancestor, as the Galápagos do. The archipelago, with its various islands separated often by considerable stretches of sea, provided a number of isolated compartments in which separate stocks could evolve and adapt to their different environments, until many of them became so distinct that they could no longer interbreed with other stocks and thus became specifically separate. As a former Director of the Charles Darwin Research Station in the Galápagos, Dr. David Snow, points out: "It is ironic that Darwin, in concentrating on the way in which species became modified, never fully realized the importance of isolation, because its role in species-formation is perhaps more beautifully shown in the Galápagos than anywhere else."

This imperfection would not have surprised Darwin. He was fully aware of the limitations to what a pioneer can accomplish in one lifetime when he wrote: "I look at it as absolutely certain that very much in the *Origin* will be proved rubbish; but I expect and hope that the framework will stand." This assessment of his lifework, if over-modest, has proved basically correct: the framework still stands. The knowledge that he was exploring unknown territory was one of

the factors that kept him for so many years from making public his theory of evolution by natural selection. If he had gone off half-cock, his greatest contribution would have been met by apathy or ridicule, so for twenty years he laboriously accumulated an astounding volume of supporting evidence. Even then, he was only forced into publication when his young admirer, Alfred Russel Wallace, flushed him out by sending him a short essay, which, though lacking Darwin's comprehensive documentation, independently arrived at the same general conclusion.

To Darwin, it was by no means a foregone conclusion that his conception of evolution by natural selection would prove acceptable to the scientific world. Indeed, until he read Wallace's essay, he had received little encouragement. In his *Autobiography* he wrote: "I occasionally sounded out not a few naturalists and never happened to come across a single one who seemed to doubt about the permanence of species. Even Lyell and Hooker, though they listened with interest to me, never seemed to agree. I tried once or twice to explain to able men what I meant by natural selection, but signally failed. What I believe was strictly true is that innumerable well-observed facts were stored in the minds of naturalists, ready to take their proper places as soon as any theory which could receive them was sufficiently explained." It was, therefore, only under pressure that he finally came out publicly with his views.

It was not only his fears about the reception of his revolutionary ideas in scientific circles that made Darwin hesitate. He was keenly aware that many, if not most, of his readers would regard his theory of natural selection as an attack on the very fundamentals of Christian doctrine as well as of biological science. If, as he naturally hoped, his ideas were treated seriously, then the churches would be up in arms against the logical conclusion which could be drawn from them, that the origins of man were in the primaevial forest and not in the Garden of Eden. He was questioning the whole mechanism of creation.

Darwin was by this time a permanent invalid in constant pain, living as "a hermit" and reluctant to become involved in the excitement of controversy. More than this, he knew that his ideas would cause great distress to some of the people he loved best, particularly to his deeply religious wife. Years later, when Karl Marx wanted to dedicate to him the English edition of *Das Kapital*, he wrote gently and courteously declining the offer: "It seems to me that direct arguments against Christianity and Theism hardly have any effect on the public and that freedom of thought will best be promoted by that gradual enlightenment of human understanding which follows the progress of science. I have therefore always avoided writing about religion and have confined myself to science. Possibly I have been too strongly influenced by the thought of the concern it might cause some members of my family, if in any way I lent my support to direct attacks on religion."

The bomb was finally exploded in 1859 with the publication of *The Origin of Species by means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*, and the repercussions were even greater than anticipated. The entire first edition of this ponderous work was sold out on the day of publication, and a second edition followed. It met with fierce criticism in both scientific and religious circles and provoked the greatest intellectual debate of the nineteenth century. Some religious thinkers were able to take it in their stride; the great Harvard botanist, Asa Grey, though a deeply religious man, was convinced by the scientific argument and simply accepted that evolution was God's way of creation. Others did not accept, and the battle shook the Victorian era as no other controversy. Today it is difficult to think oneself back into the pre-Darwinian state of mind, but *The Origin* completely undermined many previously cherished and unquestioned beliefs. Yet such was the weight of Darwin's well-organised evidence that, by the time he came to publish *The Descent of Man* in 1871, it is fair to say that biology had become an evolutionary science. Outside the world of science, the effects were more gradual, but slowly the evolutionary idea permeated human thought until it had subtly altered the thinking of people all over the world, mostly people who had not read *The Origin* themselves nor even heard of it. It gave man a new conception of the world and of his own destiny.

It is idle — but fascinating — to ask whether Darwin would have been the author of a world-shaking intellectual revolution if he had

never visited the Galápagos. He himself said that "it was such cases as that of the Galápagos, which chiefly led me to the study of the origin of species." Darwin had extraordinary powers of observation, penetration, and speculation, combined with enormous industry. He saw with the eye of genius; but even the eye of genius could see more clearly in the Galápagos Archipelago, "that living laboratory of evolution," than anywhere else on earth.

So those lonely heaps of lava, far out in the wastes of the Pacific, take their special place in the history of human thought. Because there was something peculiar about the Galápagos, something that drove men to ask themselves strange questions. Darwin was not the only one, nor even the first, to be provoked into speculation about the origin of the species unique to these islands. Even that bluff, matter-of-fact, privateer captain, Woodes Rogers, had raised the question. He was a fine sailor and an able leader of men but no naturalist — in fact, as we have seen, he rather prided himself on leaving that sort of thing to others; however, he found the wildlife of the Galápagos so extraordinary that for once he allowed a few pages of nature notes to creep into his journal. He even indulged in a little speculation: "There are guanas in abundance, and Land-Turtles [tortoises] almost on every island. 'Tis strange how the latter got here, because they can't come on themselves, and none of that sort are to be found on the Main." Here was a plain man asking himself a plain question.

A century later, Captain Porter went further — very much further. "I shall leave others" he wrote "to account for the manner in which all those islands obtained their supply of tortoises and guanans and other animals of the reptile kind; it is not my business even to conjecture as to the cause. I shall merely state, that those islands have every appearance of being newly created, and that those are perhaps the only part of the animal creation that could subsist on them ... Nature has created them elsewhere and why could she not do it as well on those islands?"

David Porter was a man of unusual independence and originality of mind — if he had not been an enterprising young naval officer, he might have been a brilliant naturalist. He had something in common with Hans Anderson's obstreperous little boy, who refused to join in the general admiration of the Emperor's new clothes because he plainly saw that His Imperial Highness was naked. In spite of the manifold hazards and problems he faced in harassing the British whaling fleet, he had surplus energy and curiosity for geological and biological observation and even for speculation — though he diffidently pretended to deny it. Porter saw something in the Galápagos that no one else had seen, though many had looked at it. He asked a fundamental question even if, like jesting Pilate, he would not stay for an answer. That was left to Charles Darwin.

If, as was the accepted belief, the giant tortoise had landed on Mount Ararat with the rest of the animals from Noah's Ark, how had it

crossed the oceans, and why was it to be found only in such a remote place as the Galápagos? Such questions, if pressed, were of a nature to undermine the accepted scientific and religious ideas of the Christian world. Rogers, a militant Anglican churchman, may not have realized the heretical nature of his speculation; Porter seems at least to have suspected it and to have refused to follow it up; Darwin, though it took him some time, was ultimately driven into formulating his theory of the origin of species, which implicitly rejected the Book of Genesis.

It may seem remarkable that these awkward questions should have occurred to three such different men in the same place — they had little in common except youth and adventurous spirits. It is indeed remarkable — but less so if we consider that in the Galápagos Archipelago, the evidence of evolution is more compelling than anywhere else in the world. It is no disparagement of Darwin's genius to say that he owed his place as the greatest scientist of his age in some considerable measure to a run of lucky chances: with no obvious academic qualifications he was given the post of naturalist to the *Beagle*; his lack of formal training may have left his mind free from doctrine and more open to new ideas; he was rich enough to accept an unpaid job for several years; the voyage of the *Beagle* gave him an unparalleled opportunity for observation and reflection; finally, when his mind had ripened and he had acquired a wide if unorthodox education in science, he was landed in the Galápagos, where the isolation, the restricted number of species and the relative

freedom from human interference made it easier — and still makes it easier today — for man to observe the evolutionary process. There was an amazingly favourable conjunction of circumstances. Everything was right: the man, the place, the moment. Charles Darwin's contribution was his genius.

Chapter Twelve

THE WHALERS

Nantucket is a very striking and peculiar portion of the National interest. There is a population of eight or nine thousand people, living here in the sea, adding largely every year to the national wealth by the boldest and most persevering industry.

Daniel Webster.

When peace returned at the end of the Napoleonic wars and the *U.S.S. Essex* was no longer the terror of the Pacific, whaling was resumed and on a far larger scale than before. The Spanish-American wars of liberation no doubt created problems for shipping but, as Spain's hold weakened, more and more ports were opened to foreign vessels. The Galápagos had lost the original attraction they had had for the pirates when Cowley "sought for a place to lie still for five or six months, to make the Spaniards think we had sailed out of the South Sea." No longer a convenient hiding place, notoriously difficult for navigation and lacking in water, the islands nevertheless attracted ships in ever-increasing numbers: the attraction was the giant tortoises. Of course, as Captain Colnett had reported, whales

were plentiful in that part of the Pacific; but in those days, there were still lots of whales elsewhere. What set the Galápagos apart was the lavish supply of meat, freely available to all comers; and the tortoises were so helpless that there was little trouble and less danger in capturing them, though as they grew scarcer near the shore, the toil of carrying them down across the lava became progressively more severe.

The tortoises' misfortune was that they were more desirable than any other form of meat because they kept so well. Piled into the dark holds of the whaling ships, they would remain alive for months, in some cases for more than a year, without food or water and without any appreciable loss of weight or quality. It is easy to imagine what this meant to sailors on long cruises under sail, out of sight of land for months on end. Fresh meat was a rare treat and would not keep long without refrigeration, so week after week they would have to put up with salt pork from the brine barrels or whatever delectable substitute their owners had provided. We only need to think of the number of times the words "scurvy," "weevils" and "worms" occur in English sea stories to convince ourselves that the diet aboard sailing ships left much to be desired. And, apparently, tortoise meat was a great favourite in its own right. Woodes Rogers was one of the few who did not readily take to it, but even he believed that it did his men's health a power of good. Colnett spoke for the generality of seafarers when he reported that "we had no seine to catch the fish, if wanted, but I believe no one would eat them that could get turtle."

The hungry sailors have our sympathy — but so have the tortoises. The whaling ships took them in quantities that greatly exceeded their powers of regeneration. In 1818, when the whaling business had got underway again, Captain Donald Mc Lennan of the brig *Colonel Allen*, a British smuggling ship, reported that the whaling masters visiting the Galápagos had a strong preference for tortoises "and generally supply themselves with five or six hundred at a time." He added that they weighed from one hundred and fifty to three hundred pounds each, "that is those which they consider fit for their purpose, otherwise they are to be had from half an ounce weight to six hundred pounds." Whether the bigger ones were less tender or less palatable is not explained, but it may just have been that they were too difficult to handle. We hear of as many as twelve men struggling to carry a really heavy one across the broken lava, and it must have been quite a feat to load one into a small boat and then take it out to the ship.

A single haul of five or six hundred tortoises would make little difference to the enormous population — it was the increasing number of the whaling ships that caused the havoc. Research done on the logbooks of the American whalers, admittedly incomplete, shows that there were some seven hundred ships operating in the Pacific between 1811 and 1844. This figure does not include the hundreds of whalers from other countries, nor the sealers. The *U.S.S. Potomac* reported that, in the year before Charles Darwin reached the Galápagos, thirty-one whaling ships had stopped at

Charles Island alone. It is therefore hardly surprising that when *H.M.S. Herald* called there in 1846, the ship's naturalist, Berthold Seeman, found not a single tortoise on the island. Charles was a special case as it was a favourite anchorage and the site of the first settlement, but the tortoises became extinct on Jervis and Barrington about this same period. The whalers were not to know it, but each of these islands had its own distinct race of tortoise, and they were gone forever, vanished irretrievably from the Earth.

In 1684, Raveneau de Lussan, a French traveller who visited the Galápagos, wrote that "it is difficult to step without finding land-tortoises and hordes of lizards lying about." In 1835, Darwin was still amazed at the tremendous numbers though, even then, he noted that they were not as plentiful as in the buccaneers' accounts. But there are limits to the attrition that even the most numerous species can stand. What saved the remnant of the tortoises was, curiously enough, the ruthless greed of the whalers. They killed so many whales that they virtually destroyed their own occupation.

This is not intended as an indictment of the whalers in particular. It is simply part, even if the worst part, of the melancholy story of the Enchanted Isles, and one among so many examples of the consequences of man's irresponsible exploitation of land and sea. In their day, the Yankee whalers plundered the sea with as few misgivings as the English buccaneers plundered the Spaniards or the Spaniards plundered the aboriginal Americans. Herman Melville,

who gave the whalers literary immortality, saw their greed and cruelty with a clearer eye than most, but in *Moby Dick* he also paid tribute to their more admirable qualities, particularly their courage. The crews were almost as wild and lawless a lot as the pirates and even more heterogeneous, being drawn from every corner of the world. They lived fierce lives and often died terrible deaths. They were mutinous and deserted with such frequency that, more often than not, a man returned in a different ship from the one he set out in. Melville, who himself spent years in a whaler's fore-castle, found life such hell that he jumped ship in the Marquesas and lived for months among the cannibals; later, for his part in a mutiny, he was gaoled in Tahiti and even enjoyed the experience of a period in the stocks. Since the time of Jonah, men have been fascinated by stories of the whale, and the nineteenth-century whalers gave colour to the age they lived in. The very word "Nantucket" has acquired a patina of romance. And it was on board a whaler, sailing before the mast, that Melville came to the Galápagos.

The whaling ships ceased to visit the Galápagos because there were no longer enough whales left in those parts — they had finished off the whales before they had exterminated the tortoises. Leaving the devastation behind them, they moved on to fresh woods and pastures new. The whaling masters were not concerned with the long-term consequences of their practices, even to their own industry; they took today's profits and let tomorrow take care of itself. Improvidently, they killed the pregnant mother and the

nursing calf as well as the old male. In this, they were all too typical of the nineteenth century's attitude towards the exploitation of natural resources. However, in fairness, we ought to ask how much better we of the twentieth century have done, even with the evidence before our eyes of the havoc earlier generations had wreaked. In the case of the whaling industry, of course, we now have an International Whaling Commission to control the catch, but such is the level of the quotas that there are now fewer whales than ever, and some species are declining towards the point of no return. With moderation, whaling could have continued to be a substantial factor in feeding a hungry world; instead, its contribution is now insignificant.

In its heyday, the industry was immensely profitable. The whaling port of New Bedford in Massachusetts had the highest *per capita* wealth of any town in the world. As Herman Melville put it, more eloquently if less statistically: "nowhere in all America will you find more patrician-like houses, parks and gardens more opulent than in New Bedford. Whence came they? Go and gaze upon the iron emblematical harpoons round yonder lofty mansions, and your question will be answered. Yes: all these brave houses and flowery gardens came from the Atlantic, Pacific and Indian Oceans. One and all, they were harpooned and dragged up hither from the bottom of the sea." After the American Civil War, the glory of New Bedford faded and now the whaling industry itself has faded due to the over-kill. Nobody can blame the Yankee whalers for the

mechanized depredations of our present century, as the United States no longer has a whaling fleet. New Bedford is a summer resort, and Nantucket a whaling museum.

It was this same attitude of wholesale, indiscriminate slaughter that brought about the cataclysmic reduction in the swarming population of giant tortoises. The Yankee whalers were the chief culprits. Not that their ways were any different from those of other whalers, but simply because there were more of them. The buccaneers, the Royal Navy and the U.S. Navy helped themselves with the same enthusiasm — but their visits were few and far between, while Nantucket was the world capital of the whaling industry. Dr. Townsend of the New York Aquarium, after studying the logbooks, estimated that in one period of thirty years, the whalers took over 200,000 tortoises. In the second half of the century, whaling as a whole declined, and the best catches were henceforward in the Antarctic. The whaling ships found less and less incentive to visit the Galápagos, as can be seen from this laconic extract from the report of the schooner *Kamaile*: "Arrived at the Galápagos on the 1st January 1874. Cruised about two weeks without seeing whales." It looked like a reprieve for the tortoises, as there was still a nucleus sufficient for breeding on most of the larger islands and fair numbers on the higher peaks which had still not been climbed. But new dangers awaited them.

Chapter Thirteen

HERMAN MELVILLE

In no world but a fallen one could such lands exist.

Herman Melville.

The Galápagos have had no great painter. Gauguin — fortunately, no doubt — went much further out into the Pacific and produced his great work in the lush atmosphere of Tahiti. It is pointless but intriguing to ask how the Galápagos would have impressed Gauguin's one-time friend, Van Gogh, had he gone there. The grey-black lava — the colour of the heaps of potatoes and old boots he loved to paint at one time —, the tortured rocks, the stunted trees, the writhing cactus, and the spider-legged mangroves, might well have inspired him to great achievement. But this is idle speculation. No great painter came, and the strange, astringent qualities of the islands were left to become the unencumbered heritage of the photographers. Much of the Galápagos is stark and unlovely, but carefully chosen conjunctions of sea and land and the subtle play of light on lava and vegetation can provide the material for pictures of great beauty, as Eliot Porter has shown in his illustrations to the lavish volumes published by the Sierra Club of California.

If the islands have had no painter, they have had their poet — a prose poet. Herman Melville reached the Galápagos six years after Charles Darwin, serving as an able seaman on board the whaling ship *Acushnet*. Out of this voyage arose his great epic of the sea, *Moby Dick* — more of a saga than a conventional novel. Its literary value has been much debated. In Melville's own day, it was little thought of and lost him the popularity earned by his earlier novels *Typee* and *Omoo*; some later critics have rated it as the greatest American novel of the nineteenth century or as the greatest sea story ever written. Despite differences of taste, few would now dispute its inclusion in a short list of American classics. The same cannot be said of his Galápagos sketches. They created no stir when they first appeared — in fact, so low had Melville's reputation sunk, that he published them under the curious pseudonym "Salvator Tarnmore" — while today, few people have read or even heard of them.

There is nothing of the tourist guide in Melville's stories *The Encantadas* or *Enchanted Isles*. He did not write about the islands until many years after his visit, and he reproduced with imagination rather than accuracy the impressions which the islands had left so deeply etched in his memory. There is something mystical in his approach, as he sees them by "the light that never was on land or sea." His intensely individual vision of the Galápagos is not that of most people who visit the islands, yet those who know them best would recognise the truth, the poetic truth if you like, of the picture

he builds up in his opening paragraphs, as he reduces to words "that air of spell-bound desertness which so significantly invests the isles."

"It is to be doubted whether any spot on earth can, in desolateness, furnish a parallel to this group. Abandoned cemeteries of long ago, old cities by piecemeal tumbling to their ruin, these are melancholy enough; but, like all else which has but once been associated with humanity, they still awake in us some thoughts of sympathy, however sad ... but the Encantadas refuse to harbour even the outcasts of the beasts. Little but reptile life is here found: tortoises, lizards, immense spiders, snakes and that strangest anomaly of outlandish nature, the *iguana*. No voice, no low, no howl is heard; the chief sound of life here is a hiss."

The human figures in these stories are incidental. What gripped Melville's imagination was the islands themselves "looking much as the world at large might, after a penal conflagration." There is no trace here of the common confusion of the words "enchancing" and "enchanted;" for Melville "enchanted" means being under an evil spell — "that intangible malignity which has been from the beginning." Against this terrifying background, the characters in his Galápagos stories, "Runaways, Castaways, Solitaries Etc" seem shadows — less real than the birds and the tortoises.

The tortoises made an indelible impression on Melville's mind. He describes how the firsts he saw were brought on board his ship after

dark: "behold these really wondrous tortoises — none of your schoolboy's mud turtles — but black as widow's weeds, heavy as chests of plate, with vast shells medallioned and orbed like shields, and dented and blistered like shields that have breasted a battle, shaggy, too, here and there, with dark green moss. These mystic creatures, suddenly translated by night from unutterable solitudes to our peopled deck, affected me in a manner not easy to unfold. They seemed newly crawled forth from beneath the foundations of the world. Such worshipful venerableness of aspect! ... I no more saw three tortoises. They expanded — became transfigured. I seemed to see three Roman Coliseums in magnificent decay."

He was particularly impressed by their "dateless, indefinite endurance." As he watched them holding inflexibly to their path, they had in them the same unshakeable obstinacy as Captain Ahab. They became a symbol to Melville, but of what he never chose to explain. Could he have meant that they were the symbol of humanity, blindly butting with irrational persistence against inexorable fate? And of what are the myriad birds on the towering Redonda Rock the symbol — the "bandit birds," the "hermit birds" and especially the white Tropic Bird? "With ear-splitting cries the wild birds celebrate their matins. But down through all this discord of commotion, I hear clear, silver, bugle-like notes unbrokenly falling, like oblique lines of swift-slanting rain in a cascading shower. I gaze far up, and behold a snow-white angelic thing, with one long, lance-like feather thrust out behind. It is the bright, inspiring

chanticleer of the ocean, the beautiful bird, from its bestirring whistle of musical invocation, fitly styled the Boatswain's Mate."

Melville's Galápagos are not the islands of reality; rather, they belong to mythology. But, like all good myths, they have their roots in truth. Whatever we read into his mystic vision of the islands, it is clear enough that they left a deep mark on his mind. Other people may not share his feeling of having wandered on to "evilly enchanted ground;" some may be repelled; some may yield to a powerful attraction. But less visionary mortals will have at least one thing in common with Melville: nobody who has once been there ever forgets the Galápagos.

Chapter Fourteen

THE FIRST SETTLERS

Another feature of these islands is their empathic uninhabitableness.

Herman Melville.

[There are four missing pages in the manuscript of this chapter. Although incomplete, the editor decided to publish it. For missing contents, refer to *The Enchanted Islands: The Galapagos Discovered* by John Hickman (Oswestry: Anthony Nelson Ltd., 1985)].

When Captain Colnett in the *Rattler* explored the Galápagos in 1793, he reported that "it is much to be regretted that the isles have to this period been so little known but only to the Spaniards." In this, he was mistaken. Up to this time, it was the English and, to a lesser extent, the French sailors who had contributed what little was known. The Spaniards had lacked interest, and this was natural enough. Spain had a vast continent to conquer, explore, organise, and exploit, and millions of Indians to convert. Her new dominions contained fabulous mines, beyond the dreams of Midas, the pride of Spain and the envy of the rest. But they never produced enough

gold, silver, and precious stones to meet the needs of the home government.

The dynastic wars of the House of Hapsburg, the campaigns they fought for their family possessions in Austria, Italy, the Low Countries or France and the great armadas sent to Africa, the Levant and the English Channel drained the treasury, so that the Kings of Spain were constantly and deeply in debt. More was always needed from the Americas. It is easy to understand that successive Viceroys of Peru, where the richest mine in the world had been discovered, had little incentive either from motives of duty or of personal profit, to concern themselves with remote and barren rocks, reputed dangerous to navigation, if not actually enchanted and floating in some diabolical way on the face of the ocean. There was no gold and, for that matter, no inhabitants and, therefore, no souls to save.

So, the Spaniards did little about the Galápagos, though probably not quite so little as the written records suggest; while there was a keen demand for the published journals of the English buccaneers, the printing presses in Spain and Peru were anything but active, and there must have been Spanish visits of which no account has survived. It is, for instance, significant that, in the seventeenth century, Charles Island had a Spanish name, *Santa Maria del Aguada* — literally, if clumsily, Saint Mary of the Watering-place; so, the Spaniards must have known of the existence of the spring that some of the buccaneers used. There seems to be no record of the Spanish

crown taking formal possession of the Galápagos, though of course Spain would have automatically claimed them and all other territories in that region, on the authority of the Papal Bull of 1493 and the subsequent Treaty of Tordesillas, dividing the New World between Spain and Portugal. However, the conquistadores were usually so punctilious about the formality of taking possession that neglect to do so strongly suggests a lack of interest.

The first recorded visit of the Spanish Navy was that of Captain Alonso de Torres, who went there in 1793 on the instructions of the Viceroy of Peru. He gave new names (including his own) to some of the islands and made a chart of the archipelago, but this was so far inferior to that of the pirate Cowley, a century before, that it was entirely useless for purposes of navigation and it is even difficult to guess to which islands he attached the names. A more promising visit in the same period was that of a considerable scientific expedition under the command of Alessandro Malaspina, a Sicilian in the service of Spain. He was chosen, according to the Minister of the Navy, "for his knowledge, birth, nobility, the elegance of his person and manners, his arrogant presence, his affability and his strength of character" — perhaps not the most appropriate qualifications for a scientist, but he was highly regarded by Alexander von Humboldt, which seems recommendation enough. This was the first deliberate scientific investigation of the Galápagos, and it is therefore particularly disappointing that we know nothing of its findings, as the unfortunate Malaspina was thrown into gaol

on his return to Spain, where he languished as a prisoner of state, presumably because of some political offense.

Malaspina and Torres arrived in the early years of the French Revolution. By the end of the Revolutionary and Napoleonic Wars, Spanish rule in South America was crumbling. The armies of Simón Bolívar liberated the northern part of the continent and, in 1824, founded the Republic of Great Colombia, but this soon split into three parts. In 1830 *La República del Ecuador* — the Republic of the Equator — broke away from Colombia and began its existence as an independent state. One of the earliest acts of the young nation was the annexation of the Galápagos Islands, which, like the republic itself, received the name of Archipelago of the Equator. In colonial days, the territories that were now Ecuador had at different times been under the administration of the Viceroyalty either of Peru or of Colombia and, in theory at least, so had the Galápagos. The new republics of Peru and Colombia might conceivably have raised objection to the annexation but did not do so, either because, like the Viceroyalty, they had little use for these grim volcanoes or because they were obviously nearer to the coast of Ecuador. Spain recognised the annexation in 1840, and Ecuador's title has never been seriously challenged.

The formal acts of annexation took place in 1832 on what Cowley had named King Charles II's Island, but for the occasion it was renamed Saint Charles Island, a promotion which would have

amused that not-very-saintly monarch. The name was then changed to Mercedes, after the wife of the republic's first President and again to Floreana, after President Flores himself. The initiative for the annexation came from General José Villamil. Born in Louisiana when it was a Spanish colony, he left after the territory was acquired by the United States and

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hunters from Charles had extended their activities to James, owing to increasing scarcity on their home island. The Charles Island race of tortoise was the first to become extinct.

These were the halcyon days of Villamil's enterprise. According to Darwin: "The inhabitants, although complaining of poverty, obtain without much trouble, the means of subsistence. In the woods there are many wild pigs and goats; but the staple article of animal food is supplied by the tortoises. Their numbers have of course been greatly reduced in this island." The colonists had enough to eat but otherwise were unhappy.

Villamil was ambitious to expand his colony. The government sent him some of their political opponents, some common criminals, and some surplus prostitutes. In this way, the population rose to nearly three hundred, but morale sank lower and lower. Life in the Galápagos is difficult even for those who want to go there, but as a

place of banishment, it could be hell. The riverfront of Guayaquil in the eighteen-thirties may not have had as much gaiety to offer as Paris, but whatever its attractions were, most of the exiles missed them. For naturalists, from young Darwin onwards, the islands have had an undeniable fascination — though few, if any, would care to be sent there for life — but for those who lack such special interests, a habitat of cinders and cactus can be trying.

It may not have been a happy colony, but, thanks to General Villamil's zeal, a fair degree of material success had been achieved, considering the soil and the kind of men he had to govern. He had his problems, and it is said that he went about surrounded by a pack of fierce dogs for his protection and that he had to shoot several of his rebellious subjects who had taken to the hills and were a threat to the settlement. Villamil stuck it out for five hard years and then handed over the management of his enterprise to General Mena and the

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crew to escape. Now in full control, they forced the captain and crew to take them to Chatham, the residence of General Mena, who had by this time become governor of the Galápagos. They plundered the place, took the general on board, murdered him, and then set sail for the mainland. At this time, General Flores, the first president of the republic but now in exile, was preparing a come-back. In Peru,

he gathered and armed a group of supporters and embarked them in five small ships. Briones met the first of these off the coast of Ecuador, boarded it and killed the twenty-nine Flores men on board. He then sailed triumphantly into Guayaquil, expecting a cordial welcome from the authorities for having destroyed the vanguard of the revolutionary forces. Perhaps he did not know much history, otherwise he would have realised that Guayaquil could put up with revolutionaries but had had more than enough of pirates. He was quickly disillusioned, tried and hanged.

At this point, it is legitimate to ask why the government of Ecuador had allowed such chaos to develop. The short answer is that it could not prevent it. There was chaos enough in mainland Ecuador. It is hard to imagine conditions more difficult than those the young country had to face in its early years. Carved out of the crumbling ruins of the Spanish empire, it had no natural frontiers nor any that its neighbours did not dispute. Its population was anything but homogeneous; the bulk of the people were aboriginal "Indians," speaking Quichua and various other languages; neither they nor the African slaves had any great affection for the heirs of the conquerors, the minority of more-or-less European descent who had inherited the power of Spain. Even the ruling elite was divided, the landowners living in the temperate climate of the high Andes having little in common with the merchants of tropical Guayaquil. Spain had left no tradition of elections and representative government. In view of all this, the surprising thing is not that the republic was badly

governed but that it survived at all. With mounting problems, dissention and violence at home, the rulers of the day had little time to think about these remote possessions with their handful of settlers, still less to organize government there. Communications were rudimentary, and those in power in the capital knew little of what went on in the islands or even what they were like, except that they provided a convenient place to dump political opponents and other undesirable characters. For practical purposes, the Galápagos were beyond the law, much as they had been in buccaneering days.

The seizure of the *George Howland* by the Pirate of the Guayas raised the question of the government's responsibility in a concrete way because the United States demanded 40,000 dollars as compensation to the owners and crew of the whaling ship. In making this demand, the Chargé d'Affaires, Mr. Courtland Cushing, pointed out that Ecuador was not in a position to protect the distant islands, which were used chiefly by American ships, and enquired whether the government would like to consider ceding them to the United States. Nothing came of this almost casual suggestion, but it started a hare that was to be chased for many long years to come.

For successive governments, the Galápagos presented a delicate problem. On the one hand, they seemed of little economic value, in fact rather the reverse, as one enterprise after another ended in financial disaster; Ecuador was not a rich country that could afford

to lose its investments and, in any case, it had thousands of square miles of more promising undeveloped land and much unexplored territory. The little news that came from the islands was usually of bloodshed, suffering and oppression, while the total population never seemed to rise above that of a village. On the other hand, there was a fierce pride in having this overseas possession, combined with an irrational conviction rising above all evidence that there must surely be rich possibilities in a place called the Enchanted Islands. Whenever the question of disposing of the archipelago arose, pride won.

Other nations had no such strong feelings. During the nineteenth century, the European powers were collecting islands and territories all over the world, but the Galápagos had few attractions — they were off the trade routes, lacking in economic potential and unsuited to settlement. Nobody really wanted them, but, at the same time, everybody was opposed to anyone else acquiring them; after what Captain Porter had done to the British whaling fleet while using the islands as a base when they were still nominally a Spanish possession, their reluctance to see them ceded to another naval power is understandable.

The most serious negotiations had their origin in a new scheme of General Villamil. Age and recurring disappointments had not diminished his zeal nor his faith in the Galápagos. This time he secured rights from his government for the exploitation of the guano

deposits which, he declared, were enormous. About the same date, he was appointed Chargé d'Affaires in Washington and, in this or some other way, the State Department became aware of the guano possibilities. This quickened American interest in the Galápagos because the only other available source of this rich fertilizer was Peru, which used its monopolistic position to secure the highest possible prices for its guano, a procedure which gave no joy to anyone except the Peruvians. After some confusing interchanges, bedevilled by contradictory claims and refutations regarding the extent of the deposits, a convention was signed which, without giving the United States sovereignty, accorded rights to the guano together with certain extra-territorial privileges in the archipelago in return for three million dollars — by the standards of that day, a very considerable and badly needed succour for the Ecuadorean exchequer. The representatives of Britain, France, Spain and, naturally, Peru, at once protested, and there was a great deal of unpleasant diplomatic pressure, but this did not prevent Ecuador from ratifying the agreement. However, it never got as far as the United States Senate because American interest evaporated when investigations showed that, in fact, the guano deposits simply did not exist. When the United States failed to ratify, Ecuador formally annulled the convention in 1855.

There were a number of other negotiations during the second half of the century. The British bondholders, who had financed a loan to the young Republic of Great Colombia and had not yet been

repaid, wanted to take the Galápagos as payment for the debt, a proposal that made little appeal to Ecuador when compared with the American offer of cash. There was a secret offer of the islands to Napoleon III, another to lease them to the United States as a pledge for a loan of ten million dollars, and many other obscure bargainings; but they all came to nothing. One reason was that none of the powers really wanted the archipelago; they were content if no rival power controlled it. That was the situation at least until the construction of the Panama Canal gave the Galápagos strategic importance. An even more potent reason for the failure of negotiations was that successive presidents, however much they needed money, knew that they were risking their political lives if they renounced Ecuador's sovereignty.

Meanwhile life in the Galápagos followed the familiar tragic pattern as though the Enchanted Isles really were under an evil spell. In 1870 Don José

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inland but was defeated by the thorny scrub. He might well have been rescued by a passing ship had it not been for the notices in Spanish and English which read: "Do not take this man away. He is twenty times a criminal." The rescuers came too late to save another man marooned on James Island, but an American scientific expedition found his skeleton sometime after.

About this same time, there was a grisly tragedy of a different kind at the far side of the archipelago, near the southern tip of Albemarle Island, where a small colony had recently been established, complete with a garrison to prevent the violence which had occurred elsewhere. For the average soldier, life in such a place was apparently no more attractive than it was for most of the unwilling settlers. Eleven members of the garrison deserted and escaped into the interior. They were pursued, but the hunt was fruitless in so wild a region. Nothing more was heard of the deserters and after a time, it was assumed that they must have been taken off by some passing ship — until one of them staggered into the settlement in the last stages of exhaustion. He told how they had confidently expected to find water higher up the volcano; when they failed to do so, they had scattered in desperate search, but anyone who knows the pitiless country they had plunged into can easily imagine the slow and terrible end of the story, as one by one they collapsed somewhere among the black, broken lava. That their bodies were never found, even if sought for, is not surprising.

In the Galápagos, the nineteenth century was a period of almost unrelieved tragedy for man and beast. By its end, the incredible abundance of its unique wildlife was no more, while the brave efforts at colonization had, at enormous cost in human suffering, produced a total population that could have been accommodated in a single village street; more men had died in the struggle than had survived to people the islands, and the survivors were poor and usually

miserable. With the benefit of hindsight, we can now see that the government should have given protection to such an invaluable national asset as the unique wildlife — but in those days, what other countries gave serious thought to conservation?

In fact, the government was hardly able to protect human life, let alone wildlife; it certainly could not protect its citizens in the archipelago from inhuman exploitation and tyranny. If this sounds shocking, perhaps a few dates will help to bring one important aspect of the problem into perspective. The British parliament outlawed the slave trade in 1807, but while this prevented the introduction of new slaves into its colonies, existing slaves were not freed until 1834, only a year before that passionate anti-slavery, Charles Darwin, reached the Galápagos. In Ecuador, chattel slavery was abolished in 1852, but a form of serfdom, introduced by the Spanish conquerors, lingered on almost to the present day; as this one part of the *mores* of the mainland, it is hardly surprising that forced labour and despotic bosses should have been recurrent features of the various attempts to develop the islands.

Again, there was little effective administration in Ecuador itself. Governments were overthrown by violence, and the main concern of most presidents was self-preservation; there were periods of something near to anarchy, even of civil war. With such chaos at home, the government, far away on top of the Andes, was simply not in a position to impose effective administration in the

Galápagos, even if it knew (which it rarely did) what was happening to the tiny groups of people living there. Of course, it was wrong in principle to send convicts, but it was hard to find voluntary settlers. In the same way, it was asking for some trouble to have a dozen men to every woman, but these desolate islands offered little to attract women freely.

Then there was another factor beyond the control of any government — the perennial difficulty most human beings find in leading a contented life in the Galápagos. If the repeated failure of the nineteenth-century attempts at colonization was due solely to the inadequacy of the social structure of Ecuador, how are we to account for the fact that the tale of woe continued when European settlers, with quite different backgrounds, arrived in the twentieth century?

Chapter Fifteen

THE MECCA OF THE SCIENTISTS

Let knowledge grow from more to more,
but more of reverence in us dwell.

Alfred Tennyson.

The bloody dramas of the settlements aroused only fleeting concern in Ecuador and not even that beyond her frontiers. For the rest of the world, the islands were mainly of scientific interest. In provoking the greatest intellectual controversy of the century, Darwin had made their strange name familiar to men of learning everywhere so that the Galápagos were better known than the republic itself. Not only his own books but the writings of the array of distinguished British scientists who had described and analysed his collections brought the archipelago to the attention of their colleagues in other countries. Hooker wrote up the flora, Gould the birds, Bell the reptiles — and so forth. The Galápagos became the Mecca of scientists, difficult though the pilgrimage still was.

One "scientist" whose contribution to our knowledge of the archipelago tends to be forgotten in the general acclaim of Darwin

is Robert FitzRoy, the captain of the *Beagle*. FitzRoy was an outstanding hydrographer, and the purpose of the *Beagle*'s long voyage was hydrography — young Darwin and natural history were almost casual adjuncts to the expedition. FitzRoy's instructions from the Admiralty were forthright: "Of this kind of half-knowledge we have had too much; the present state of science, which affords such ample means, seems to demand that whatever is now done should be finally done; and that coasts which are constantly visited by English vessels should no longer have the motley appearance of alternate error and accuracy." And this is precisely what FitzRoy did in charting the Galápagos as well as many hundreds of miles of other treacherous coasts.

The pirate Cowley in the *Batchelor's Delight* had made the first sketch of the Galápagos archipelago, rough and incomplete. Captain Colnett of the *Rattler*, though primarily concerned with whaling, had produced the first chart that mariners could consider as workable. Captain FitzRoy made what was almost a definitive navigational chart, used by all countries until quite recently. No more generous praise could be given than that of his fellow hydrographer Louis Henri, Comte de Gueydon, the captain of the French brig-of-war *Le Génie*, who followed him in 1846: "Nothing escaped the perspicacity of this conscientious observer" he reported; "the smallest details are all indicated with really astonishing precision and following his drawing one can visualize in the most accurate manner the shape of the coast. Coming after him, there is

not even an opportunity to glean." According to Joseph Slevin, the herpetologist of the California Academy of Science and also the historian of the exploration of the Galápagos, "it is truly amazing that the modern chart of the Galápagos made in 1942 by the *U.S.S. Bowditch*, equipped with every modern device, should so closely approximate the survey made by Captain FitzRoy over a hundred years ago." It is as the brilliant and gallant young captain of *H.M.S. Beagle* that we like to remember Robert FitzRoy, rather than as the embittered admiral who was outraged by *The Origin of Species*, who deeply regretted having given Darwin the opportunity to develop his heretical ideas, and who ended his own life in a fit of madness and despair.

It was still a major undertaking for scientists to reach the distant Galápagos but, once there, FitzRoy's maps made their investigations much easier and safer. The flow of scientists increased as the century advanced. In 1868, Dr. Simeon Habel spent six months in the archipelago and returned to Vienna with large collections of birds, reptiles, insects and molluscs. The German scientist, Dr. Theodor Wolf, made two important visits while he was teaching in Quito. Professor Agassiz of Harvard conducted what may be considered the first organized expedition, when he led a group of specialists on board the *Hassler* in 1873. It would be wearisome to list them all and unbearable to try to summarize their findings; by the end of the century, there was already a considerable body of scientific literature on the Galápagos, though admittedly nothing to compare with what

exists today, when the mere list of publications produced by the Smithsonian Institution's computer weighs several pounds.

Around the turn of the century, a new twist was given to zoological investigation by Lord Rothschild's great interest in giant tortoises and his desire to have a representative collection of all the species in his museum at Tring — now part of the British Museum of Natural History. At his instance, an expedition sailed from San Francisco and returned ten months later with sixty live tortoises. In 1901 another expedition further enriched his collection; this time, it was led by Rollo H. Beck, who soon became the outstanding authority of his day on the giant tortoises. He not only studied their habits but also produced the first estimates of the relative scarcity of the various races and their chances of survival. This did not lead directly to attempts at conservation, though such studies were an essential preliminary. On the contrary, Beck was so pessimistic that the immediate result was an intensification of collecting for museums and zoos so that specimens might be preserved for posterity before the unique Galápagos reptiles were exterminated in their native habitat.

The buccaneers and whalers had caught their tortoises as near as possible to the shore to save the heavy toil of carrying them through the thorny scrub and over the broken lava. As they became fewer, the sailors had to go further inland and on favourite islands, such as Charles, the tortoise soon became extinct. Beck and his party were a

hardy lot and had months at their disposal. They pushed up into the interior of the larger islands and probed all but the most inaccessible reaches of the volcanoes. On Albemarle, Beck discovered tortoises in numbers such as he had never found near the coast and which he believed no longer existed. Not only that, but he had never seen any of such enormous size. Though satisfactory from the point of view of his collecting expedition, the outlook for the future of the species seemed to him beyond hope. To start with, at least on Albemarle, he could find no young tortoises because they were all being eaten by the wild dogs. "From the time the egg is laid" he wrote "until the tortoise is a foot long, the wild dogs are a constant menace, and it is doubtful if more than one out of ten thousand escapes. We certainly saw none." On Duncan Island, it was the rats that were killing off the defenceless youngsters with the same ruthless efficiency.

So much for the long-term prospects of the species. The short-term outlook was no better: Beck found that the commercial exploitation of the remaining giants for their oil was well underway. When he stepped on shore in southern Albemarle, he found casks containing 1,200 gallons of oil waiting for shipment. As each large tortoise gives one to three gallons of oil, the scale of the destruction can easily be imagined. With the oil selling in Guayaquil at a dollar a gallon, it would hardly seem to justify the cost of collection and transport, let alone the extermination of a rare and fascinating creature, but wages were low and the trade was considered profitable. There was also killing for food and Beck noticed with distress that not more than

five pounds of meat would be taken from each huge tortoise, the rest being left for the wild dogs. "At the rate of destruction now in progress" he noted "it will require but a few years to clear this entire mountain of tortoises ... It is only within the last few years that the home of these very large tortoises has been invaded by man, but the rapidity with which they are being killed, and the reason for their destruction, leaves us but little hope that they will survive any longer than did the American bison after the hide hunters began their work of extermination." The same fate seemed to him to be awaiting the seals and the land iguanas at no great distance in time.

We now know that Beck's gloom was a little exaggerated — but not much. Perhaps he did not give sufficient weight to three factors which favoured the tortoise: there were still a few remote fastnesses where even he had not penetrated; tortoises may be defenceless but, if undisturbed, they are exceptionally long-lived; finally, there is the matter of diminishing returns — when there are only a few tortoises left, it ceases to be worth hunting them for a few pints of oil. Nevertheless, he saw that it was only a matter of time — and this is still true today — before the giant tortoises and other species were exterminated, unless they were given protection. In 1900, protection was quite out of the question. Anyone, native or foreign, could go to the islands and take what he wanted. The government had no means of preventing this even if it had so desired — and it is most unlikely that it had even thought of it. So, the despoliation continued. To the scientists, it seemed better to collect as much as

they could of what remained than to wait for the survivors to be slaughtered for small monetary gain. At least the skeletons would be of greater value in the museums than clogging up the water holes.

It was in these years, around the turn of the century, that California began to take a very special interest in the Galápagos. At first, it may have been due to the convenience of San Francisco as a base before the Panama Canal was cut; both of the expeditions sponsored by Lord Rothschild started from there and thus avoided the long and difficult passage round Cape Horn. Then, in 1905-6, the California Academy of Sciences mounted the biggest and most extensive scientific survey the archipelago had ever known. Charles Darwin, though an honoured guest in *H.M.S. Beagle*, had been something of a supernumerary member of the crew, and inevitably had to fit his own work into the schedule of Captain FitzRoy's hydrographic mission during the scant five weeks they spent in the scattered islands. This time, a group of specialists travelled around the Galápagos for an entire year in the schooner *Academy*, equipped to enable penetration into the interior of the islands and investigation in the surrounding waters, under the experienced leadership of Rollo Beck. They returned with much the largest and most representative collection of birds, reptiles, insects and plants that had ever been made there. It included 8,691 specimens of birds, 266 giant tortoises embracing all the surviving species and skeletons of those that had become extinct — to take but a few examples.

It may well seem that collection on this scale was merely making a bad situation worse. It probably was. Scientists cannot claim a plenary indulgence to kill for their high purposes while denying the right of others to kill for lower motives — such as hunger. Nevertheless, it must be recognized that the scientists of the Academy expedition were doing what seemed best to them and probably to all other scientists of their time. Beck himself had seen the devastation of the surviving tortoise population for the sake of a few shillings' worth of oil from each carcass. The government of that day was not concerned with giving the wildlife protection against the hunters or, for that matter, against the scientists; if it had any policy at all on the matter, it was to encourage the introduction of exotic animals and plants to supersede the endemic species. International action to advise and help was hardly even a dream. True, the Fauna Preservation Society had just been founded in London, but its early activities were confined to the British Empire and, for practical purposes, to Africa, where, through personal and official contacts with colonial administrators, its members hoped to limit the depredations of insatiable trophy hunters by a judicious mixture of persuasion and pressure; "missionary" work in foreign lands was not contemplated.

And that, no doubt, was the attitude of the Academy expedition, because they seem to have taken no advantage of the great opportunity, which chance presented to them, for doing effective propaganda for conservation. The governor of the archipelago at

that time was General Plaza, with whom they established cordial relations. Joseph Slevin gives a colourful account of their meeting, which throws a good deal of incidental light on island conditions at the beginning of the century. The governor received them officially, seated at his desk, which was an old kitchen table with the drawer missing. In spite of the fact that they looked like badmen from an early Western, as none of them had been able to shave or wash in fresh water for four months and their clothes were only so-so, he invited them to join him in a drink of his home-made liquor, so strong that it quickly became apparent that the hirsute scientists were not as tough as they looked. When he returned their courtesy visit on board the *Academy*, the learned crew found to their consternation that, for some inexplicable reason, the supply of medicinal whiskey had run out; but they quickly concocted a substitute — alcohol from the barrel with a dash of prune juice to give it the correct peaty tint — and poured it into a whiskey bottle. It must have been a remarkable beverage because even General Plaza declined the offer of a second glass, though he showed keen interest in the work of the expedition. In this atmosphere of comradeship, it would have been possible to discuss the preservation of the wildlife and the control of the excesses of both natives and scientists. Apparently, the question did not come up; the time was not yet ripe.

Although it may have achieved little or nothing in the way of conservation, the *Academy* expedition did what no previous scientists had attempted: it visited in a systematic way every one of

the islands, small as well as large, and emerged with the first comprehensive account of the archipelago as a whole and the distribution of its flora and fauna. Scientists worked on the expedition's collections and on those in England and elsewhere, and gradually over the years, their results were published. The expedition also began the shift in the centre of gravity of Galapagoan collections, which eventually resulted in California rather than England becoming the main repository. This was no flash in the pan, and California's special interest has been maintained until this day — fortunately, without any diminution of British interest. In recent years, California has sent the largest number of scientists; the British have stayed the longest time. They have increasingly been joined by researchers from Europe and Asia; yet there is work for still more, particularly, it may be hoped, for the young generation of Ecuadorean scientists.

Chapter Sixteen

ORDEAL ON INDEFATIGABLE

All in a hot and copper sky,
The bloody Sun at noon,
Right up above the mast did stand,
No bigger than the Moon.

Day after day, day after day,
We stuck, nor breath nor motion;
As idle as a painted ship
Upon a painted ocean.

S. T. Coleridge.

Visiting scientists saw something of the wildlife of the Galápagos in more senses than one. Darwin interrupted his description of the biology of James Island to tell how he came across the skull of the captain of a sealing vessel, who had been murdered by his crew. On the same island, the Academy expedition found the skeleton of one of the men marooned there, as a punishment, by Manuel Cobos, the autocratic boss of the settlement inaptly named *Progreso*. On James, the Californian scientists were too late to be of help; on

Indefatigable, just too early. Had they visited Indefatigable a little later in their tour of the Galápagos or even if they had been a few miles further north on their last day there, they would have been involved in a strange and cruel odyssey; instead, while their visit is perpetuated in the now famous Academy Bay, they sailed away believing that the island had no human inhabitants.

We have many records of maroonings, wrecks and castaways on the Galápagos, and there must have been so many more about which we know nothing because nobody lived to tell the story. But the story of the *Alexandra* has been told at length — in fact, there are different versions, which is natural enough as they were not written down until much later; but they agree tolerably well in their essentials. The Norwegian bark, *Alexandra*, of 1,505 tons, built in Aberdeen in 1874, sailed from Australia in November 1905. She was bound for Panama, where the canal was under construction, with a cargo of coal. The captain, Emil Peterson, was a Norwegian, and Scandinavians predominated in the crew, but there were also two Americans, a German, a Frenchman and a second mate from Glasgow.

Owing to the uncertainties of voyages under sail, the ship was well provided for contingencies, but this particular passage across the Pacific took more than double the usual seventy days, owing to persistent calms. However, the situation was still not desperate when, in April, they finally sighted the American coast near

Guayaquil, after five long months at sea. Then the wind fell again and the sails hung limply. Day followed day, but the bark remained helpless in the doldrums, a mere plaything of the Humboldt Current. It was once again the story of Bishop Berlanga and of so many others, recorded and unrecorded. The land faded from the horizon as the ship drifted out into the ocean.

The men sat idly on the torrid deck. At this stage, their sufferings were as least as much mental as physical, just as in Coleridge's evocation of the fate of sailors caught in an equatorial calm:

Down dropt the breeze, the sails dropt down,
'Twas sad as sad could be;
And we did speak only to break
The silence of the sea!

They told one another the stories of their lives until they had nothing more to tell.

The only movement was the invisible but remorseless flow of the Humboldt Current, on which they drifted deeper and deeper into the Pacific. In the baking heat, the men's thirst was intense, but the drinking water was running low, and the captain prudently rationed it. He eked out the supply for a time by using the ship's condenser — until the bottom fell out. Short of subjects of conversation as well as water, the crew's minds dwelt more and more upon their

predicament. They quickly lost faith in their elderly captain and demanded with growing insistence that they abandon ship and try to reach land in the small boats. The captain resisted, not only because of his sense of duty as master of the ship but also, as he argued, because it would be difficult to make any headway rowing against the powerful current that was sweeping them along; moreover, the calm could not last forever and, in any case, there was a good chance that they would be carried out to the Galápagos. Indeed, on the tenth day of drifting they sighted land — it must have been Albemarle — and their spirits revived; but the calm was unbroken, they could not steer the ship and when the pitiless sun rose next morning, the island had disappeared.

Distrust of the captain now turned to mutinous opposition. He and the two mates had to draw their guns to keep the crew from lowering the whale-boats. On the 8th of May, the captain finally succumbed to the increasing pressure. He knew that they had passed the Galápagos and that there was no land for thousands of miles in the direction they were drifting. Only the wind could save them, yet there was still not a breath of air to fill the sails, and the sun beat down relentlessly on a glassy sea. According to the captain's own account — contradicted elsewhere — he made a last appeal for volunteers to remain with him on the ship, but not a man stepped forward. He then reluctantly gave orders to abandon ship.

There were two whaleboats, each with ten men, one commanded by the captain, the other by the first mate; each had food, compass, sextant, awl, clothes and a tank with about twenty gallons of water — not much, but with luck it would see them through. Having nailed notices to the mast explaining why they had deserted the ship and giving their proposed destination, they slowly drew away from the *Alexandra*, as she rocked idly in the swell. Rowing, as they were, against the current, the captain could allow no rest and the men at the long oars were changed every hour, day or night. They held on for three days and then had their first sight of land — one of the high peaks of Albemarle Island — but still far away. Somehow or other, they closed the distance and eventually found a gap in the rugged wall of lava where they managed to beach their boats. The exhausted men stumbled out in search of water like the bishop's crew long before them — and once again it appeared as though "it had pleased God to rain stones." There was no water, not even a green leaf.

The men, unused to volcanic islands, were in despair. The captain told them that they must be on the southern tip of Albemarle and that if they could manage another fifty miles, they could reach Charles Island where, he vaguely remembered, the buccaneers had found water. After a good rest, they set out again, but the two boats lost touch during the night; they never met again, nor did either of them reach Charles. Then the captain's boat suffered a shocking

disaster — the cork in the water tank had been left loose, and the tank was nearly empty.

And every tongue, through utter drought,
Was wither'd at the root.

Thirsty, weary, their hands cracked by salt and sun, the men could no longer row strongly enough to beat the currents. Twelve days after abandoning ship, they were far off course and, when at last they reached a shore, it was not Charles but Indefatigable. They hoped that this would be the end of their sufferings; it was barely the beginning.

They landed on the 20th of May and began a frantic search for water. Here and there, they found a few mouthfuls of brackish liquid in holes in the lava, but nothing like enough to slake their thirst, let alone to re-fill their water tank. Nevertheless, the captain decided that they must continue by sea and search for some more hospitable shore, possibly even some settlement — they did not know which islands were inhabited nor that Indefatigable was not one of them. The men agreed that they could not stay where they were, but they wanted to make their way by land and not by sea, as the captain urged. The argument was rudely settled for them. In their haste to find water and, no doubt, in a condition bordering on stupor from sheer exhaustion, they had not tied up the whaleboat properly. When they got back to it, the tide had risen and splintered it against

the jagged lava. They could salvage next to nothing; all they had was what they stood in. They had to live off the land, and both the land and the living were poor. It was touch and go. Perhaps they were saved by the fact that four of the sailors were wearing their knives.

The ten developed their own survival techniques. When they were lucky, they caught turtles, drinking the "sweet" blood as it gushed out and eating the raw meat. Turtles were not very numerous on the shore but, in time, the two men who could swim found ways of seizing and up-ending them in the sea — no mean feat. The seabirds they killed were a last resort as they tasted foul and made the men sick. Marine iguanas were far superior in flavour, but had little flesh on them except for their tails. When the castaways learned how to kill sea lions (they called them "seals" but were surely mistaken as, by this time, the seals were nearly extinct in the archipelago), they found them an invaluable addition to their resources. The meat was tough and fishy, but the skins met a pressing need.

In their search for water, food and human habitations, the stronger members of the crew first tried to push inland, as the prospects there seemed less dismal than along the barren shore. They did not get far, and they found nothing to their advantage; their clothes were ripped to shreds by the thorny scrub and the cactus, their shoes torn by the sharp edges of the broken lava. Accustomed as they were to the smooth decks of ships, the sailors found the going desperately difficult over one of the roughest terrains in the world. This is where

the sea lions came to their rescue. They soon discovered that several thicknesses of the soft skins, bound round their feet with strips of hide, protected them from the thorns and the jagged rocks, though such elephantine footwear made them clumsy in a land where even the best boots seem inadequate. They might even have been better off in the long run without these heavy trappings. The British ornithologist, Dr. Bryan Nelson, and his wife, June, who deliberately marooned themselves for a year on the waterless islands of Tower and Hood in order to study the seabirds, found that when their shoes disintegrated their feet hardened to resist the lava. At the end of their vigil, when the Duke of Edinburgh called on them and invited them to lunch in the state apartments of the Royal Yacht, they were in splendid shape, physically and mentally, albeit barefoot and a trifle ragged.

But the Nelsons were equipped both physically and mentally for their adventure. The sailors were not. "The jungle is neutral" and morale is at least half the battle, as F. Spencer Chapman has argued so convincingly. Nevertheless, most of the crew seem to have held out very well, considering how poorly prepared they were for such an ordeal; what harassed them most was not the daily hardships but the utter uncertainty about when, if ever, their ordeal would end. The Danish able seaman, Christiansen, told his story to Dr. William Beebe eighteen years after the event; his account differs at many points from that of his captain, written many years before, and no doubt time and memory were responsible for gaps and inaccuracies,

but there is a ring of truth in passages of his artless narrative, such as:

Nights was the bad time. All day we was pretty busy and travelling along, climbing over the rocks and watching sharp both on the land and the sea sides of us. Once in a while Morrison (the Scot) and the Swede and I would think we could get inland, so we'd start off and pretty soon we'd be back, clothes torn off us, scratched and bloody, and just as wise as we were before. Nights was the worst. We'd lie there and think about things, and wonder how much longer we could drink blood instead of water; then we'd get up and look at the sea and think where we was, and suppose a ship didn't ever come. Nights was the time we felt it.

Hopelessness and lethargy were the worst enemies. Captain Peterson insisted that they should leave their first involuntary "camp" and look for some bay that a ship might possibly visit. Progress was excruciatingly slow as they stumbled along in their clumsy footgear. Sometimes they found a little scummy water in a hollow rock; more often a turtle and once, but only once, a tortoise. It was the turtles that kept them going. When they were lucky in their hunting, they could stay a few days before plodding on again. Two or three of the men had conserved their strength reasonably well, but, on the march, the other straggled out behind in varying degrees of exhaustion. There was no continuous beach; in fact, any patch that

could be called a beach was an infrequent relief. Once, they came upon a little cove where someone had cooked a meal — it might have been a party from the *Academy*. This was the only human vestige they ever found. Otherwise, it was all slog, climbing up and down over cliffs and boulders or wading across inlets. According to Christiansen, it was while making a difficult crossing that they lost the young German, who could not swim; in the captain's version, he was drowned while trying to land a turtle. So now they were nine.

The weary weeks dragged on. They came to what we now know as Tortuga (Turtle) Bay. Here, as the name suggests, food was more plentiful. It was better, too, in another surprising way. For some hygienic or other reason, the old ship's cook decided at this point to take off what remained of his flannel shirt, or rather shirts, as he wore two. It seems incredible that a man should have continued to wear two thick shirts in such heat, but he was apparently attached to them both and had not removed either since they abandoned ship three months before. However, what fascinated the other castaways was not the revelation of the second shirt but the packet of matches that fell out of the pocket of the inner garment. The matches were patiently dried in the sun; and miraculously, they still worked. From that time onward, the sailors could eat their turtle meat roasted instead of raw.

Life at Tortuga Bay was a little easier, but they had not sighted a single sail, and the captain wanted to push on further in the hope of

finding some more likely anchorage for a visiting ship. Christiansen's great friend, the young American, Fred Jeff, refused to budge, arguing that they were as well off and as likely to be found where they were as anywhere else. Neither threats nor cajolery could move him. Captain Peterson later wrote that he offered to remain behind with Jeff if any others would stay too, but that nobody would volunteer. Christiansen, on the other hand, says that his chum, Jeff, died before they left and was buried under a pile of clinkers. Whatever the truth, now they were eight.

Finally, the crew reached a more promising place which, though they did not know it, had just been named Academy Bay by the Californian expedition. Here they settled down, hoisted a distress flag and prepared a fire for signalling. There was even water — brackish but just drinkable. Day followed interminable day. Their lethargy grew so deep that the men now rarely spoke to one another. They were there for another three months before, at last, they spied a sail. The flag was run up, the smoke signal was lit — and the little schooner turned away. But then they realized that she was only tacking to get into the bay. The eight were saved.

To pick up the loose ends: the second whaleboat had also failed to find Charles Island but, so capricious are the Galápagos currents, it was rescued by a fishing vessel not far from the mainland on the same day that the first boat reached Indefatigable, 500 miles away. It was due to the report of the second crew that the schooner had

been sent to search for the castaways. The bark *Alexandra* had not drifted across the Pacific but had run aground at Iguana Cove on Albemarle and had become a complete wreck. If the crew had stayed with her, no doubt all would have been well.

It is difficult to understand why, after picking up the survivors, the rescue vessel did not immediately go a few miles further along the coast to find out what had happened to Fred Jeff if, as Captain Peterson claimed, he was still alive when they left him. Eventually, a search party was organized in Guayaquil but never actually set out; in any case, it was a bit late in the day, and the survivors were no longer there to indicate the spot. Thirty years after, Jeff's skeleton was found by Victor Wolfgang von Hagen, the American writer and naturalist who did so much to encourage the pioneer efforts at conservation in the Galápagos.

Chapter Seventeen

GALAPAGOS - WORLD'S END

The thrill of one's first desert island is a quite indescribable thing and the fascination of these barren Galapagos is inexplicable.

William Beebe.

In the long succession of ships which have made the Galápagos known to the world — the *Batchelors' Delight*, *U.S.S. Essex* and *H.M.S. Beagle* prominent among them — it is doubtful whether any has done more to popularize the islands than the *S.Y. Noma*. She was a luxury yacht before the 1914 war, during which she had seen gallant service in the Atlantic. After being laid up for a couple of years, she set out for the Galápagos in 1923 on a short cruise of scientific investigation. On board were Dr. William Beebe, of the New York Zoological Society, and his party of a dozen scientists, hunters, writers and artists, with all the most desirable modern equipment. The yacht was two hundred and fifty feet at the waterline, had a crew of fifty-eight and gave promise of every comfort. Above all, she had steam.

This was the obvious solution to so many of the problems of scientific research in the Galápagos. The earlier scientists had not had it nearly so good. Dampier had to keep his notes in a length of bamboo to protect them from the elements and, no doubt, from his fellow pirates. Darwin had to dissect and write in the cramped cabin which he shared with FitzRoy for five years and which had to serve as study and laboratory as well as living quarters. Even as late as 1905, the hardy though learned crew of the schooner *Academy* was not much better off, wasting so many precious days when they were thwarted by calms and currents. Steam was the thing; you could go where you wanted, when you wanted!

However, it did not work out quite like that. True, the Panama Canal was now open, there was no battling round Cape Horn, and after a bit of trouble with machinery and deserting stokers (who were scared at the prospect of the wild islands), the eager party reached the archipelago in fairly good time. But the redoubtable Galápagos did not yield easily to the advance of technology. Even steam did not prove an unqualified blessing. To make steam, you needed coal and water, and there was no coal and precious little water in the islands, as so many more primitive mariners had found to their cost. The search for fresh water became the principal preoccupation of the scientists. Here and there, they found a trickle and rather more at Academy Bay, but although castaways (and, for that matter, the present inhabitants) can adapt to drinking it, it was too salty for the delicate boilers of the *Noma*. Only once did they have the boon of

rain, and then only briefly. In hunting for water, the yacht burned up her reserves of coal and had to return to Panama for more. This consumed them as well as coal and water, with the result that, out of the three months' cruise, less than a hundred hours were actually spent on shore in the Galápagos. As Dr. Beebe wryly commented: "The spectacle of a large steam yacht hurrying to and fro in the Pacific hoping to overtake some rain, has its comic aspects."

What the party lost through these technical snags, they tried to make up by an unparalleled display of energy and enthusiasm. Although they had luxurious quarters on board, once on shore they cheerfully accepted the harsh conditions that their predecessors had known — and most of their successors were to know. Their water was rationed, and they knew thirst. They climbed the hot, fragmented lava, cutting hands and feet. They climbed a little further along the cliff than they ought to have done, in order to photograph the bird from just the right angle — and just escaped disaster. They had jolly little sessions removing one another's thorns and cactus spines. When the breakers soaked their clothes at a tricky landing, they left it to the sun to dry them again. Luxury was only relative.

From the point of view of scientific research, the expedition made only a modest contribution — and William Beebe was much too good a naturalist to claim otherwise. Considering the time available, the number and variety of the specimens collected were impressive and included some previously unknown to science; but inevitably,

the work lacked depth. On the subject of collecting, Beebe sounded an unfamiliar note — perhaps he was the first to suggest that in the Galápagos scientists had no divinely accorded licence to kill unlimited numbers of whatever species interested them. Dealing with the controversy over the various endemic species of mockingbirds he wrote: "Knowing that no more material was necessary to decide this question (the California Academy Expedition alone took six thousand skins of land birds which have not yet been worked up), I collected only the individuals which were of special interest to me, thirteen all told, together with nestlings and embryos." By today's standards, Beebe's own collection seems rather generous — and he took the only tortoise that his expedition found — but his advocacy of some restraint on collecting was to find increasing support in the years between the wars.

If the scientific harvest was meagre, the expedition had a phenomenal literary success. Beebe and his team quickly produced a lavish volume, nearly five hundred pages of text and a hundred illustrations — which is a lot to derive from a hundred hours in the field. The book, entitled *Galápagos - World's End*, is a mixture of history and natural history, adventure and misadventure. Beebe himself describes some fascinating nature-walks, with delightful vignettes of birds, flowers, fishes, insects — a charming hotch-potch of travellers' tales and popular science, all told in a lively style. After half a century, it is still eminently readable, so no wonder it sold like hot cakes as it ran through one edition after another.

Through lack of time, they were never far out of sight of their yacht and thus never experienced the hardships and hazards that face those who venture into the interior of the larger islands, but they did come close to danger, even though at second hand. While hunting for fresh water at Academy Bay, they came upon a recent wreck — a schooner stranded high on a reef, dismasted and breaking up under the pounding of the surf. A little further on, they met a small steamship which the Ecuadorean government had sent out to search for survivors. They were told that the schooner had struck the reef only a week or so before and that news of the disaster had reached the authorities when two men who had escaped in a small boat were picked up many miles away by a passing ship. The rescue party had found no trace of castaways, nor did the *Noma*, and the only conclusion to be drawn was that the missing twenty-two men, women and children had drowned. A more highly coloured account was that three men had escaped in the boat together with a dog and a two-year-old girl and that they were rescued near Panama by a United States naval vessel. The men, who were close to death when found, had eaten the dog and drunk the child's blood. There are so many Galápagos tales that pass the bounds of probability that normal scepticism should perhaps be suspended in these islands — even so, there are some points in this latter version of the story that do not seem to have the ring of truth.

If anyone had been malicious enough to describe the expedition as "The Rover Boys in the Galápagos," he could have pleaded

justification — and Dr. Beebe's sense of humour would have appreciated the taunt. Yet the voyage of the *Noma* set the shape of things to come. Despite the "comic aspects," Beebe had shown that this was the best way to see as much as possible of the varied wonders of the straggling archipelago in a limited time. Thousands and thousands of the readers of *Galápagos - World's End* must have wanted to follow in the wake of the *Noma*, in fact as well as in imagination. Of course, there was a small catch — not everyone could afford a luxury yacht. Eventually, some provision was made for the moderately rich when the *Stella Polaris*, formerly the yacht of Emperor William II, was converted for use as a passenger ship and included the Galápagos in its cruises; but between the World Wars, the most notable visitors were the millionaires, who came in their own magnificent yachts. The opening of the Panama Canal had reduced the Californians' special geographical advantage — but not their interest in the promotion of trips to the archipelago, and cruises now started from the Atlantic as well as the Pacific coast of the United States. From the scientific point of view, the most important voyages were those of Captain Allan Hancock, of Los Angeles. Stirred by reading *Galápagos - World's End*, he went to see the islands for himself in his *S.S. Oaxaca*. Later he built the motor cruiser *Velero III*, well designed and equipped for research, and made a series of visits between 1931 and 1935, always offering hospitality to numbers of students anxious for experience in this exciting field. Most, if not all, of the great yachts had scientists as guests and collected for museums and zoos. William K. Vanderbilt went there

in the yacht *Ara* and again in his *Alva*. Governor Gifford Pinchot of Pennsylvania joined the procession, followed by Mr. Mellon in the *Vagabondia*. The Vincent Astor Expedition of 1930, in the yacht *Nourmahal*, explored the difficult interior of Indefatigable Island; in 1969 Mrs. Vincent Astor recalled those distant days by an act of generosity which made possible the building of the Charles Darwin Foundation's research vessel, *Beagle III*, based at the recently established scientific station on that same island. There were many others, culminating in the visit of President Franklin D. Roosevelt on board the *U.S.S. Houston* in 1938: this marked the end of an era.

Among the yachtsmen who responded to the call of the Galápagos in the twenties and thirties were a few who preferred to take their yachting the hard way. The most famous of these was Alain Gerbault, who paused there in 1924. Another member of this adventurous breed, who received a more resounding though unsought publicity, was William Albert Robinson. He got to know and to love the islands during a lonely round-the-world trip in his little ketch, the *Syaap* (Sanskrit for "dream"), "the smallest little vessel that ever circumnavigated the world on her own bottom, under her own sail, in all history." By a romantic chain of circumstances, he also came to know and to love Frances Crane, the sister of the Chicago yachtsman who picked up the mail which he had dropped into the old barrel at Post Office Bay. Nothing could be more natural than that he should return to the islands with his young wife and his cousin, Dan West. The three arrived on board

the *Syaap*, intending to spend the better part of the year 1934 studying and filming the wildlife. The accent was definitely on observation, not on collecting, a subject about which young Robinson had strong views. "These islands" he wrote "have been the scene of so much killing that we were almost religious in our policy of taking no life. The impoverishment of the invaluable and irreplaceable wild life of the Galápagos, first by the buccaneers and whalers who knew no better, and more recently by yachtsmen and selfish scientists, who should have known better, is a sad record. Here was a unique group, a well-equipped laboratory where Nature, the scientist, had performed the most perfect experiment on the differentiation of species ... And this group has been so thoroughly raped and robbed that on many of the islands whole species that flourished abundantly not long ago are now extinct or nearly so." Robinson was not alone in sounding this new note; in fact, a whole chorus of voices took it up and, as we shall see, it was in these years that the first attempts were made, inside and outside Ecuador, to save what was left of the biological treasures of the islands.

The Robinsons found a small, secluded cove on Albemarle Island, where man had rarely if ever set foot, and there they began a strenuous life of observation and photography among the iguanas and penguins. At night "the moon shone with a glorious soft radiance on the usually grim lava beds ... and we would lie down to sleep, tired but at peace with the world." Such a zoological idyll could not last forever. Robinson was afflicted with acute

appendicitis. Somehow or other, his wife and cousin sailed the *Syaap* to Tagus Bay and there, with "Robbie's" recurrent good luck, they found not merely a fishing boat but one equipped with a wireless transmitter. They managed to make contact with the U.S. Navy and received instructions to pack the patient in ice and move him at once to the nearest hospital. The first part was surprisingly easy, considering that they were anchored between two desertic islands, right on the equatorial line, because the fishing boat had tons of ice to preserve its catch; but the nearest hospital was ten days or a fortnight away, even if Robbie had been fit to navigate the ketch. Then peritonitis set in. The U.S. Navy rose to the occasion. No aircraft had ever flown to the Galápagos, but the navy sent surgeons in two sea planes followed by a destroyer with more surgeons — and fuel for the planes to make the thousand-mile return journey. Five days after the onset of the pains, the surgeons performed the delicate operation on the dining table in the wardroom of the *U.S.S. Hale*. Unlike so many Galápagos stories that end in death, this is a fairy tale and ends with everyone living happily ever after.

Chapter Eighteen

THE EUROPEAN SETTLERS

'Have mercy on me' the wailing spirit of the
Encantadas seem to cry.

Herman Melville.

The influence of Dr. Beebe's book was not confined to the millionaires of his home country. It had a much wider vogue and was read in many countries. It was an outstanding hit in Norway, where it appeared in translation as *Galápagos, Verdens Ende*. At first sight, it may seem strange that this equatorial archipelago should have made such a dramatic appeal to Norwegians, of all people, but for someone who lives in a northern country with long winters and wants to get away from it all, what is more natural than to try to escape to a tropical island at the end of the world? Most of them were content with escaping in their imaginations, simply by reading the book as an earlier generation had read *Robinson Crusoe*, but a large number were so carried away that they decided to go and make their lives in the Enchanted Isles.

It is difficult to understand the mental processes that led from reading *Galapagos - World's End* to believing that the islands were a suitable place for human settlement. Certainly, in his lively account, Dr. Beebe conveyed the impression that they were a fascinating place for scientific research, but he made no attempt to prettify them or to gloss over the stark realities of living there — if anything, he over-emphasized the hardships, good story-teller that he was. His descriptions (and photographs) of the settlement on Chatham are anything but flattering; he is never reticent about the inhospitable terrain with its naked lava, thorns and cactus; the lack of water is a constantly recurring refrain in his book, and he tells how the party took, to quoting Coleridge, "water, water, everywhere, nor any drop to drink," words which were so opposite as to be positively painful. More specifically, he tells of meeting on Chatham three fellow-Americans who wanted to be taken to Indefatigable Island to explore the agricultural possibilities; Beebe says: "We who had so recently and painfully explored its devastated shores listened to them speechlessly." In the end, "after painting a word picture of Indefatigable which made Purgatory look like the Elysian fields," he bluntly refused to take his compatriots there as he wanted no responsibility, however indirect, for what he feared might be the catastrophic consequences of so mad an adventure.

How then did it come about that large numbers of Norwegians rushed to destruction in the Galápagos, like so many of their native lemmings? Dr. Beebe's book was long, and perhaps they did not

read it all, or perhaps their minds only retained those parts that pleased them; or they may have relied on second-hand accounts, for they were mostly simple folk. What did take hold of their imaginations was the publicity put out by an Oslo businessman named Harry Randall, who was responsible for one of the most chimerical promotion schemes since the South Sea Bubble. In support of his proposed company, the *Kolonisation Paa Galápagos Oerne*, his publicity material described the islands as an earthly paradise; the climate was the best in the world, water was plentiful, food grew easily, and the islands could support a hundred thousand inhabitants. While it is true that there are pockets of rich soil, these are small and difficult to reach; they are confined to the higher reaches of some of the islands where in normal years there is enough moisture to grow crops, thanks to the *garúa*, a form of persistent drizzling mist. Even here, the soil is so porous that the collection and storage of water for drinking is a constant problem and during the occasional dry spells, life is difficult for men, cattle, and plants. Near the coast, rain is a rare phenomenon, and the vegetation is limited to what can survive in desertic conditions. As for the booming settlements, Victor Wolfgang von Hagen, who visited both mainland Ecuador and the islands about this time and did so much to make them better known and understood, reported that in the "capital" on Chatham Island, "the people actually lived only four degrees removed from troglodytes." Life was hard and dangerous, and the material rewards were small.

In spite of all the harsh facts, Harry Randall drew his Norwegians on like a modern Pied Piper of Hamelin. He had never been to the Galápagos, so there was nothing to restrain his fertile imagination. If he did not know the truth, it was simply because he did not want to; the evidence brought back by visitors over four centuries was plain enough. Nevertheless, he proceeded to collect four thousand kroners from each would-be settler. The first contingent set out with cows, chickens, seeds, farming tools, fishing gear, canning equipment, materials for house-building, even, it is said, a tractor. They landed on Charles Island. Here, the rascally Patrick Watkins had been the first resident; here, Villamil had founded the Haven of Peace, the first settlement, which collapsed in a blood bath after a dozen years; here, Valdizán had formed his colony which likewise ended in violence and death. The ruins of their enterprises could still be traced, but the auguries for success were hardly convincing.

If the Norwegians had expected islands like Tahiti or the Marquesas, with picture-book, palm-fringed beaches, they must have been thoroughly disillusioned before they ever set foot on the shore, where a mile-wide river of frozen lava runs into the sea. They had indeed arrived at the World's End and knew that they had been duped. The Galápagos could maintain a population of a hundred thousand tortoises because they were adapted to the terrain, but not a hundred thousand human beings who needed a different sustenance. The Scandinavians nevertheless set to work, laid out their village and erected their frame houses. They built dams and

storage tanks in an effort to eke out the thin trickles of water from the small springs they found further inland. But it was a vain fight against overwhelming odds. Men of the same race that had achieved such remarkable success as pioneer settlers in North America were soon driven to defeat by this implacable land.

Disheartened by the hopelessness of their venture, they began to quarrel among themselves. Some died, some deserted, many of them drank too much. The community broke up. It was the story of Villamil and Valdizán once again — but with a difference. The earlier settlements had consisted largely of convicts and others who could not readily escape from what was in fact an island prison; the Norwegians had come voluntarily and were free to go home if they still had money enough to pay their fares. Some of the survivors went to Guayaquil, some back to Norway. At the end of two years, only three of the original one hundred and thirty-four colonists were left on Charles, but there was still a small group who were making a last stand on Indefatigable.

One cannot but admire the courage of the men who, after the bitter disappointments of the Charles experiment, nevertheless chose to make a new effort on Indefatigable. By this time, they knew full well that "this other Eden, demi-paradise" was in fact a very difficult place for men to live and that few could ever hope to enjoy here the standard of living of a labourer on a Norwegian farm. Therefore, if they stayed it was not for comfort, certainly not for material gain.

Perhaps it was stubborn pride that would not let them admit defeat, or some strange affection they had acquired for this untamed land. Whatever the driving force, they set to work again, this time at Academy Bay, which Dr. Beebe had compared unfavourably with Purgatory. They must have learned to drink brackish water as there was nothing else there. They installed their fish cannery. But they could not escape the evil enchantment that broods over the islands; the cannery boiler exploded, killing, or injuring several of them. The end of the little community was near. The series of disasters had resulted in all sorts of denunciations, investigations, and lawsuits — between individuals, against the promoter and finally with the Ecuadorean authorities, who apparently confiscated the settlers' equipment and buildings on the grounds that they had failed to carry out their obligations to establish basic public works. By 1929, there were only three Norwegians left on the island.

This was the last attempt at settlement by communal effort. Those who came later were on their own — often very much on their own. They were a mixed bunch — romantics, misanthropists, adventurers, beachcombers, refugees from Hitler and Stalin, convicts, political offenders, and poor folk from the mainland who hoped to better their condition. Several visitors to the islands between the wars make passing mention of them in their travel stories, some hilariously, others with compassion, but while the scientists were diligently amassing accurate material about the flora and fauna, little that was reliable was recorded about the human

population. Perhaps the most understanding account was that of Señora Paulette de Rendón. As the French-born wife of an Ecuadorean citizen, speaking Spanish and knowing the conditions and the way of life of the poor on the mainland, she was in a better position than most tourists to get close to both European and native settlers. She also spent more time in the islands. In 1940 she went to the Galápagos with her husband for two months on an adventurous camping trip, but, as they could not find a ship to take them back to Guayaquil, they actually spent six months there and visited all the settlements. Señora de Rendón fell in love with the Galápagos — "the last enchanted isles" as she called them, "a little corner of this earth where one is still allowed to dream." She had no scientific pretensions, but her imagination was captured by the austere beauties of the wilderness, which she recorded with skill and feeling.

She was less happy about the inhabitants. With few exceptions, she frankly disapproved of the Europeans. Most of them were pretentious, claiming some specious superiority over their neighbours with whom they were rarely on friendly terms. Like other visitors, she mentions their eternal feuds. Some who had settled on the humid upland plateau of Indefatigable, worked hard, had built tolerable homes, and had carved out productive plantations in the wilderness, though there was little market for their produce; but she found them, on the whole, a sad and lonely lot, bored with themselves yet disliking or despising one another. The

one who appealed to her most, an Icelander called Finsen, told her that the Galápagos were "the last refuge of the madmen of this earth," yet she felt that despite his cynicism, he was perhaps the only one who was not mad in this strange little colony. She asked him if he liked living on his island, and he answered with an abrupt, monosyllabic "No."

For the Ecuadorean settlers, the *cholos* and *indios*, Señora de Rendón felt real affection, but her sympathy was deeply tinged with pity. She found them kindly, helpful, generous with the little they had, and accepting their miserable lot with resignation. She stayed not only in the tiny ports of Chatham and Albemarle but also in their upland settlements, Progreso and San Tomás. Everywhere she was appalled by the wretched living conditions and the ugliness introduced into a land she found so beautiful. She was glad to flee from the hovel of the *majordomo* of San Tomás because all the attentions his wife bestowed on her could not compensate for the bedbugs, the swarming rats and the sight of the family's pathetic poverty. When an outbreak of smallpox forced her to leave the coast of Chatham for Manuel Cobos's old settlement of Progreso, she saw with dismay the mean huts set along streets of purple mud, liberally sprinkled with refuse. The people, mostly Indians from the Ecuadorean highlands, who had been attracted by the illusory offer of higher pay, seemed terribly sad and without hope of return to their native villages, where at least they had their traditional feasts and religious ceremonies to break the monotony of a life of poverty. Here in this

"hamlet of serfs" (anyone refusing to work for the plantation company was denied access to the only shop), the only consolation was the weekend alcohol. More than any other traveller, Señora de Rendón was distressed by the contrast between the wild beauties of nature in the islands and the horrid mess man was making of them — and with so little material gain or human happiness to show for it.

Chapter Nineteen

MURDER IN PARADISE

And Wilderness is Paradise enow.

Edward Fitzgerald.

The classic English detective story is set in an isolated country house, and this isolation restricts the number of potential murderers to those gathered in the house at the time the ghastly deed was perpetrated. By convention, everyone present in the house has an open or hidden motive and also opportunity to commit the crime. The situation on Charles Island in 1934 provided a close parallel to the country house setting. There were eight people divided into three groups, each at odds with the other two, and these eight persons were shut off by the sea in their lonely island. The atmosphere was heavy with hate and fear.

Where the Charles Island mystery diverged from most fictional stories was that neither Scotland Yard nor a celebrated private detective arrived immediately to solve the mystery — in fact, no enquiry was held for nearly a year, and by that time, sudden death had claimed most of those concerned and only one of the three rival

groups remained to give evidence. So, the mystery was never satisfactorily cleared up and as only one of the characters in the drama remains alive — and remains reticent about the events — we are never likely to know the whole truth. Nevertheless, it may be worthwhile summarizing what is known, as the riddle has not lost its fascination with the passage of time and, if the story does nothing else, it illustrates some of the problems of "civilized" people trying to find a new paradise in the wilderness of the Galápagos.

Charles is a medium-sized island — perhaps a hundred square miles in extent. Like the rest of the Galápagos, the coastal area is arid but, in the centre, the extinct volcano rises to 1,700 feet. On its slopes there are a few fairly reliable springs and there is sufficient moisture to make cultivation possible in the oases which exist in a few spots amid the boulder-strewn terrain. As we have seen, the history of the island had been one of violence, crime, and suffering. The first resident, Patrick Watkins, set a lamentable example. The settlements of General Villamil and Don José Valdizán collapsed in tyranny and bloodshed; all that remained of their brave efforts was the wild cattle, wild dogs and orange groves degenerated into jungles. In our own century, the Norwegians had tried and had failed even more rapidly than their predecessors, so that by 1929 their model village was already a little ghost town, and Charles was again uninhabited. In spite of this black record, three small groups of Germans, not one of them with experience in agriculture or other manual labour, decided that this was the place to create a new Garden of Eden.

All those involved in the drama of 1934 were unusual people, at least in the sense that they wanted to break with the life they had known and start again on a lonely island. Their motives in so doing seem to have been very different, as were their backgrounds, though each group tried to belittle the others' social origins in their struggle for status. What we do know is that they all spoke German (so any misunderstandings were not of a linguistic nature), they all sought solitude, and yet they all hungered for publicity.

The first to arrive on Charles Island were the Ritters. Strictly speaking, they were not "the Ritters" as they left behind their less adventurous or more straight-laced spouses when they decided to escape from an over-organized society. Dr. Friedrich Ritter was a successful Berlin physician, according to his companion — or "a dentist" or "at the most a dental mechanic," according to the two rival groups, though they both made calls on his medical skill. His main interest lay in the seemingly impossible task of reconciling the philosophies of Lao-tse and Nietzsche and he thought he could best accomplish this while leading "a life of absolute simplicity." He was a vegetarian and a nudist, and if hard physical labour and the rocks, thorns and insects of the Galápagos induced him to renounce one or both of these ideals, it does not seem either surprising or discreditable. No doubt he was a crank, but there is equally no doubt that he was an idealist, sincerely hoping to find a new way of life in his Garden of Eden. Of all the little bands on Charles, he seems to have been the one who most genuinely sought solitude.

Not absolute solitude, because when he set out in 1929, he took with him the young wife of an elderly schoolmaster. Dore Strauch (her maiden name) had been trained as a teacher but had never found a teaching post and was dissatisfied both with her job in a bank and with her uninspiring husband. She became Ritter's philosophical disciple and volunteered to join him in his escape from the world. In her book *Satan came to Eden*, Dore Strauch explains that it was "William Beebe's excellent and deservedly famous book about the Galápagos that led to our choice of these islands." Poor Beebe was again to blame! It is difficult to understand how two well-educated people could read his story and yet decided to settle in the Galápagos. It took Dore some time to realize why man has found the Enchanted Islands so difficult to live in, but after five years of it she wrote: "I believe that these islands are in truth one of those places on earth where human beings are not tolerated." They really were under an evil spell.

The Ritters arrived in 1929, and for a time things went reasonably well. Of course, it was a fierce struggle for this city-bred couple to clear a plot, grow food and build a hut to live in, but at least they found a pretty reliable spring, and the soil was very fertile for the first two years. But however deeply Ritter desired to get away from the world, he could not resist telling the world about it. His articles under such titles as "Adam and Eve in the Galápagos" and "Robinsons in the Galápagos" attracted the attention of Heinz and Margret Wittmer, who had already been reading — yes, Beebe

again! According to his wife, Wittmer was secretary to Dr. Konrad Adenauer, then Burgomaster of Cologne. He had a twelve-year-old son from a previous marriage, who was delicate and half-blind, and the doctors recommended that he should spend two years in a sanatorium. Frau Wittmer says that they were unable to afford this treatment and therefore decided that two years in the Galápagos might be just as good for the boy's health. The economics of this seem as dubious as the medical argument but, however that may be, they joined the Ritters in 1932. They were given a chilly welcome.

The two ladies have written extensively about their relations. Their accounts are utterly contradictory, though they do throw a great deal of light on the characters of the writers; one of the few points on which, by implication, they agree is that they hated one another's guts from the day they met. Both wrote with pens dipped in vitriol. Dore Strauch's version of their first meeting was that Heinz Wittmer called alone on the professed nudists, dressed only in shorts and slippers. "Friedrich and I behaved as hospitably as we could to this curiously attired person but it could not be helped if we showed him somewhat clearly that his get-up had not won our sympathy." Margret Wittmer, on the other hand, insists that she and her husband called together, she in her best frock, and that Dore made fun of her for being overdressed for the Galápagos.

These trivialities at least show that "getting away from it all" is not just a question of a change of location, and that attitudes of mind

cultivated in suburbia are not automatically shed on the lonely slopes of a volcano. Dore immediately tried to assert her superiority by discussing Nietzsche, a subject which might well have disconcerted a woman with higher intellectual pretensions than Frau Wittmer, who was longing to have a heart-to-heart chat about desert island cookery. Whatever else Margret Wittmer was, she was a good German *Hausfrau*; but she was something more than that. In deciding which of her belongings she could take with her to this desert island, she had to choose between her sewing machine and her typewriter. She chose the typewriter.

The Wittmers went to Charles at least partly because Dr. Ritter was already there and could provide medical attention, though they soon came to want the island to themselves. The Ritters never at any time wished to share "their" island. "We had begun to think," Dore wrote "that nobody but ourselves could stand the island for very long ... We were highly resentful of the Wittmers and would gladly have put them on the next boat." The men got on together somewhat better than the women. As Ritter wrote: "Generally it is the woman who cannot stick it out and needs company." The men had more than enough to do in wringing a living out of the stony wilderness and seem to have found considerable satisfaction in their struggle with nature; Ritter also had his philosophical masterwork to occupy him. He wanted the island to himself but, otherwise, he had nothing much against Wittmer and scarcely mentioned him in his writings.

So, the two men managed somehow to share the island, occasionally meeting and exchanging seeds, produce and gardening tips.

The women had a less satisfying existence. To them, with their German housekeeping standards, life in a cave or a primitive hut must have been a severe trial, a constant series of exasperations. However, they lived well apart, over an hour's rough walk each way and, as Dore was lame and Margret pregnant, they could loathe and despise one another from a distance. Dore even grew more charitable towards Heinz and pitied him for having a wife "who was neither so well-bred or so kindly as he ... She was a rather ordinary type of woman and a great gossip." The only women on the island, they rarely met. On this basis, life was tolerable; with several square miles to each inhabitant, the island was not exactly overcrowded, though the atmosphere was not what one would have hoped for in the Garden of Eden.

Then, not long after the Wittmers, the "Baroness" and her retinue arrived. Who she really was hardly concerns us here — nor whether or not she was a baroness, though Dore Strauch, anxious as ever about her status in island society, went to great trouble to cast doubt on such pretensions. The lady called herself Baroness Eloïse Wagner-Bousquet and said she was an Austrian aristocrat with a French husband. She brought three men with her, but these did not include Monsieur Bousquet. Dore Strauch suggests that she had been a *poule de luxe* in Paris. Her declared purpose in coming to

Charles was to establish a luxury hotel, to be called "Paradise Regained," for the entertainment of American millionaires. She never even began this, but she did start a lot of mischief. One of the few points in this story on which everyone seems to agree is that she was flamboyant, arrogant, and domineering. Complaints were made to the distant authorities that she drove unwelcome intruders off "her" island at gun point, damaged or appropriated other people's property and generally tried to rule this little roost — by right of her aristocratic origins and her superior firepower, according to Frau Wittmer. She established her camp close to the Wittmers, who were too afraid to protest; they even discussed moving to another part of the island, which would have involved an enormous sacrifice after the work they had put in clearing a plot and building a hut. Ritter was made of sterner stuff and even threw the Baroness and one of her consorts off his premises when they drove him too far.

One of the main bones of contention was the presents distributed by the millionaire yachtsmen who called at the island from time to time. You have to live in the Galápagos to know the true value of a pair of shoes, a reel of cotton, a common medicine or a block of chocolate — "the treasures of the Earth," as Frau Wittmer described them. With varying degrees of decorum, everybody does a bit of scrounging. The simple life is splendid, but even the idealistic Ritter was highly appreciative of the visitors' bounty and no doubt apprehensive that his share should dwindle as the number of rival recipients increased. To Frau Wittmer and the Baroness, the

distribution of largesse was a matter of obsessive concern. Margret accused the Baroness — but not to her face — of trying to prevent people from visiting her and of appropriating a crate of condensed milk which Mr. Allan Hancock had left for her newborn child. The Baroness, for her part, angrily — but vainly — demanded that Ritter should share with her the gifts generously left by Mr. Vincent Astor. And so it went on.

Another source of jealousy was desert island publicity. Until the arrival of the others, Ritter had naturally enjoyed a monopoly. True, some of the publicity was not at all to his liking. The newspapers were interested in his love life and his nudist and vegetarian tenets rather than in his more abstract philosophical studies, and what caught the popular imagination particularly was that he had had all his teeth extracted before leaving Germany and had made himself a strong steel denture — an unusual but perhaps justifiable precaution on a desert island. However much he might protest against the invasion of his privacy, the fact remains that he did publish articles about his life with Dore in their Garden of Eden and won for himself a niche in the international press. He had no competitor until the Baroness came. She stole the limelight. She possessed just the attributes that the more sensational newspapers love to exploit. Meanwhile, little Frau Wittmer was not only last in the social pecking order but, having no very visible eccentricities to sell, she was overlooked by the press and found no profitable employment for her typewriter. Both Margret and Dore quickly came to hate the

Baroness as fiercely as they hated one another. The men, too, regarded her presence on the island as a major disaster.

Nobody was going to the moon in those days, but the Galápagos seemed almost as remote and romantic. Added to that, the Baroness was a gift to the popular press both by her character and way of life and by her deliberate efforts to supply what the public liked to read on a Sunday morning; and as the Galápagos were so far away and hard information lacking, there was nothing to restrain the wildest flights of journalistic imagination. Her harem of young males, the horsewhip she carried in her hand and the pistol in her belt provided the necessary backdrop, and her autocratic actions, such as driving off a honeymoon couple in a small boat or destroying the raft of a Norwegian who had landed to hunt cattle, inevitably led to screaming headlines such as "Revolution on Pacific Island - Baroness Seizes Control of Galapagos Island - Woman Proclaims Herself Empress."

This was, of course, a lot of nonsense, but the Baroness certainly was able to act in an arbitrary way, thanks to the support of her little band of male consorts. These were not all permanent. One left quite early after a quarrel, another when he was shot in the stomach; Dr. Ritter reported to the distant authorities that the medical evidence proved conclusively that the Baroness fired the shot, though she denied that her gun was responsible. However, we only need to consider two of her men, those who were with her the whole time,

the two Germans, Philipson and Lorenz. Their status is a little obscure, as the Baroness apparently referred to Philipson as her "husband," though Lorenz seems to have been the reigning gigolo at the beginning of this island idyll. The three of them (and the less permanent henchmen) shared a cabin which they put up near the Wittmers' spring. They called it *Hacienda Paradiso*. There is something pathetic about the names chosen by the people on Charles. The Wittmers lived at the old "Haven of Peace," the site of Villamil's first disastrous settlement. Friedrich and Dore called their home "Friedo," a combination of their names but also, and quite deliberately, a play on the German word *Frieden* — peace. They constantly referred to their island as "Eden." The Baroness called her cabin "Paradise." Soon there was trouble in Paradise, not merely trouble with the other groups but trouble within the group. Lorenz was not only superseded by Philipson as favourite, but he was treated as the party's scullion, made to do all the menial tasks and beaten when he failed to please. He did not get a fair share of the food and, whether from physical or emotional causes, grew sick and emaciated.

About a year after the Baroness's arrival, Lorenz took refuge with the Wittmers. Frau Wittmer says she was reluctant to take him in because she had come to the conclusion that the Baroness and Philipson "must both be insane" and she was afraid of what they might do to anyone protecting their victim. "His groans and their shrill abuse sometimes penetrated to us from Paradise." However, when he finally arrived, weeping like a child to and in a deplorable

state of health, she says she found it impossible to refuse him. In spite of her fears, Frau Wittmer says the Baroness raised no objection to Lorenz's defection and the two visited one another frequently.

This happened during what was a trying period for everyone on Charles. Even in the normally cool and humid uplands, where the three groups lived, no rain fell for month after month; the heat was unbearable, the animals died, the flies multiplied, the crops withered, and the vital springs dwindled almost to nothing. It was against this background, so harassing for people unaccustomed mentally or physically to these harsh conditions, that the strains generated by hatred and jealousy became unbearable, and something cracked.

We shall probably never know just what happened in March 1934. Frau Wittmer says that she was alone in the house when the Baroness called and asked to see Lorenz. As he was out, she said she could not wait for him to return, because friends had come in their yacht and were taking Philipson and herself to Tahiti, where they would have better prospects for starting their hotel. Would Frau Wittmer tell Lorenz to look after anything she left behind until she returned or sent instructions? When Lorenz received this message, Frau Wittmer quotes him as saying: "It's a trap to lure me down there and when I get there, they'll bump me off. I know too much about her." This seems an odd reaction, as Margret tells us that Lorenz had been going "down there" regularly the whole time he

lived with the Wittmer family, and on this occasion the Baroness had not even suggested that he should go to see her off. Nevertheless, in spite of his intense fears and the fact that he had not been invited, Margret says he eventually summoned up his courage and set off for Paradise.

According to Frau Wittmer, she did not see Lorenz again for two days. Then he returned and told her that he had found Paradise deserted and most of the contents gone. He had hurried down to the shore but, despite two days of searching, he could find no trace of a ship or of the Baroness and Philipson except "some footprints in the sand." Why he should have spent two days hunting for them if he believed they had left by sea, is not explained; nor are we told why, if he concluded that there had never been any ship, he should not have alerted the Wittmers instead of searching alone for people who intended to bump him off. Besides, there really was nowhere else in the drought-ridden island where the two missing persons could have hoped to survive.

Frau Wittmer continues her account by telling how they took the news to the Ritters. Dore danced for joy in spite of her lame leg, but Ritter was incredulous. He had seen no ship, though admittedly, he could only see one of the two anchorages from his home. (The Wittmers could see neither from their place). According to Margret Wittmer, Ritter insisted most officiously on drawing up a report for the authorities, embodying all the evidence available: "We had no

objection to her departure being recorded, though it dawned on us later that he was decidedly anxious to set himself up as the island's legal authority, guardian of law and order ... It struck us again what a hurry he seemed to be in to put in writing what was after all far from proven fact." To many people, it will seem no more than reasonable that, on an island where there was no resident authority, Dr. Ritter should want to set down the little that was known, particularly if he suspected murder.

Frau Wittmer was the sole source of the story that the Baroness said she was leaving for Tahiti; nobody else had been present when she was informed. Nobody saw the ship at Charles Island, and no visiting yacht was reported anywhere in the Galápagos. The Baroness never reached Tahiti. No ship ever reported carrying her as a passenger, though her disappearance aroused worldwide interest. The "friends" who came to take her away remained silent. Even if this flamboyant, publicity-seeking woman had had a surprising change of heart and sought obscurity, some member of the crew would surely have told about picking up this strange couple on a lonely island. Nothing more has ever been heard of the Baroness and Philipson. The only reasonable conclusion is that they never left the island.

Why, then, should the Baroness have invented the story of the voyage to Tahiti? There is no reason for thinking that she was a devotee of truth but, as she was living close to the Wittmers, it seems

pointless that she should lie about leaving in a non-existent yacht when she would still be on the island for all to see. Moreover, one has to explain the extraordinary coincidence that, although there was no yacht, the Baroness and Philipson did disappear that very day as completely as if they had sailed off into the Pacific.

It is interesting to compare the versions of the Baroness's disappearance as given by Dore Strauch and Margret Wittmer. Dore wrote that Margret told her that not only did the Baroness call and announce her departure but that she could also hear the voices of the visiting friends at the nearby Paradise. Margret, in her book *Floreana*, makes no mention of hearing anything of the sort. Margret wrote that the Baroness and Philipson had taken most of their things with them. Dore's version is that she was told that they had taken most of their belongings, yet to her surprise, she saw that family photographs were still where they had always been; the trunks and suitcases were piled up as they had always been; "and there was the Baroness's hat on the table!" It would, in fact, have been a quite incredible feat to carry "most of their things" in one day to the anchorage, four hours away over a difficult trail.

Frau Wittmer must have been writing loosely about these goods and chattels because she goes on to say that they all went over to Paradise where "Ritter opened up the crates and boxes with complete assurance," as though he definitely knew that the Baroness would never return. She adds that he bought what he fancied from Lorenz,

while Heinz bought what was left. In fact, the Wittmers seem to have got most of it, including the materials with which the cabin itself was built. And as Margret wrote that they only had twenty marks when they reached the island, they must have acquired the goods at bargain prices. Nobody seems to have worried much about the possibility of the redoubtable Baroness coming back; otherwise, the Wittmers would hardly have dared to dismantle her home. Even Frau Wittmer says that "sinister suspicions long pushed to the back of our minds began to come to the surface," and that she and Heinz began to discuss possible ways in which Lorenz might have killed his tormentors and disposed of their bodies.

Lorenz left no first-hand account of what happened. The two women who wrote about him were each concerned to imply that the other's man had been involved in the disappearance of the Baroness and Philipson. Consequently, on most points their evidence conflicts, though they both suggest that Lorenz, unaided, was too weak to have killed two much stronger people.

Whatever part he had played, Lorenz was now anxious to leave the island — indeed, he had wanted to do so for a long time — so when the writer and explorer, Rolf Blomberg, arrived a few months later in the rather decrepit fishing boat, *Dinamita*, owned by the Norwegian, Trygve Nuggeröd, he begged them to take him with to Indefatigable. There he hoped to find another ship but, failing to do so, he persuaded Nuggeröd to take him on to Chatham Island.

Nuggeröd was reluctant, as he thought his boat was in too poor shape; rightly so, as this proved to be the *Dinamita's* last voyage. Whether the motor broke down or the fuel ran out will never be known, but it is clear that the little boat was carried helplessly in the current to Bindloe, one of the more northerly islands of the archipelago. It is a harsh place, even by Galápagos standards. Many weeks later, American tunny fishers saw a white rag fluttering by the shore. They found the *Dinamita's* dinghy and the mummified bodies of Lorenz and Nuggeröd on the beach. They had died of thirst. The ship and the young Ecuadorean deckhand had disappeared without a trace.

The evil spell on this enchanted island had not yet worked itself out. In November, nine months after the disappearance of the Baroness and four months after Lorenz's death, Dora Strauch struggled painfully over to the Wittmers to ask their help; she thought Ritter was dying. Both women have described the deathbed scene in detail, but their accounts are again so different that it requires an effort to believe that they are dealing with the same lamentable event.

Dora Strauch had set out for the Garden of Eden with high ideals and equally high hopes. Life in Eden had not worked out as delightfully as she had expected. It was not merely the harshness of a primitive life to which she was unaccustomed; her relationship with Ritter in these strange conditions proved unexpectedly difficult as "every trace of tenderness departed from Friedrich's attitude

towards me" once they had settled on the island. Not long after his death, she wrote that "he did not even see that I needed to be loved and treated kindly. And so I lived beside him in a solitude too bitter to be described." She loved flowers, but Friedrich objected to them as "foolish decoration." She disobeyed him and planted seeds. When she fell ill and begged him to water her plants, he went out and tore them all up. For philosophical reasons, he would not let her have a child. She explains that Friedrich's intentions were idealists and that as he was "the great crusader against the dominance of self in all men, he was determined to cast out the foe in me as in himself." To the outside observer, it sounds more as though Ritter, a disciple of Nietzsche and the will to power, simply wanted to dominate. In spite of the bitterness of her solitude, Dore seems to have been incapable of finding an escape in the company of other women. Margret was beneath her contempt. She was attracted to the Baroness — "at least she was no little bourgeois *Hausfrau*," like Margret — but the Baroness wanted to lord it over her; so she hated her too. For five years, she was without any emotional outlet.

Frau Witter is quite categoric that the partnership was breaking up, that Dore had decided to leave the island by the autumn of 1934 and that even Friedrich told her that their constant quarrels were getting on his nerves. Dore Strauch states equally categorically: "Friedrich had become considerate and tender. All storms had ceased. A stillness and happiness that we had never known before united us in that last month in more than human oneness."

The two women wrote equally irreconcilable accounts of Ritter's death. On almost every point, they are in flat contradiction. According to Frau Wittmer, he died of meat poisoning — and she puts real gusto into deriding the hypocrisy of this backsliding vegetarian. In her detailed account, she tells how her husband saw him potting chickens that had died of poisoning; he insisted that, with a good boiling, the meat would be perfectly edible. When she reached his bedside, his tongue was so swollen that he could not speak and had to write what he wanted to say. As Dore had delayed calling her, she says it was too late to use the stomach pump she had improvised. Dore, for her part, states that Ritter died after a stroke. He asked her to give him his revolver, but she refused as she thought he would recover. It does seem almost incredible that a qualified physician should insist on eating obviously tainted meat but Dr. Ritter was a very odd as well as a very opinionated man. The editor of his papers wrote that, from his last deathbed scribblings, it was clear that he died of botulism from eating bad meat and that he asked for his revolver because he knew there was no hope of recovery. No doubt Dore was unwilling to admit that the much-publicised vegetarian had died of meat poisoning.

Frau Wittmer expresses surprise that, while Dore claimed that she too had eaten some of the poisoned meat, she seemed none the worse for it; however, as she had already mentioned that it was Ritter himself who insisted on eating the chicken, this cannot really be taken to imply that Dore poisoned him. Margret nevertheless

speculates at some length on the alternative possibilities that Dore poisoned Friedrich or that she deliberately refused to seek help until she knew it was too late. She admits that "all this was mere conjecture, of course" but she does insist that Friedrich's "last emotion" as he lay dying was hatred for Dore. She tells in her book that Ritter raised himself on his bed with a last desperate effort, glared at Dore, "his eyes gleaming with hate" and wrote on a piece of paper: "I curse you with my dying breath." Dore Strauch could not challenge this account as she died long before Margret Wittmer wrote it. Her own version of Friedrich's end was: "Suddenly he opened his great blue eyes and stretched his arms towards me; his glance was joyously tranquil."

A few weeks later, Mr. Allan Hancock arrived unexpectedly on board his yacht, *Velero III*. He said he had received a letter from Ritter asking him to come quickly because dreadful things had happened that he could not put into a letter as he had no proof. Mr. Hancock arrived too late to hear the full story of Ritter's suspicions, and all he could do was to take Dore Strauch away from the island. She returned to Germany, where she had Ritter's writings published as well as her own book, *Satan came to Eden*.

Consequently, when the governor of the Galápagos arrived to make his official enquiry nearly ten months after the disappearance of the Baroness, the only people left on the island were the Wittmers. Frau Wittmer relates that the Governor bluntly accused Heinz Wittmer

of having killed the Baroness and Philipson; he apparently based his charge on a communication that Ritter had made before his death. She says that they had little difficulty in refuting this, and the governor accepted their statements. There were no longer any other witnesses, and there was no formal trial.

In her book, Margret Wittmer is at some pains to suggest that Ritter had a hand in the murders. As she puts it without undue delicacy: "he may well have at least encouraged Lorenz to carry out the crime; perhaps more." When she published *Floreana*, a quarter of a century after the events, her deep loathing for the Ritters was still manifest every time she mentioned them. She made fun of Friedrich's teeth, derided him as a lapsed vegetarian and nudist, scorned his "pretentious outpourings of pseudo-scientific philosophy" but, above all, she showed her abiding hatred for the man who, she says, "tried with such meanness and malice to drive us out of our beautiful island," so that he could be the only recipient of American gifts. Apart from this, Frau Wittmer presents no evidence that would make Ritter a principal or an accessory in the disappearance of the Baroness and her companion.

Ritter's report of his suspicions of murder has not been published, and there is nothing in Dore Strauch's book to suggest that he had any direct evidence. She does tell about them hearing "a long-drawn shriek" as they stood in their garden about midday on March 19th, but if this was the Baroness's dying cry, she must have been killed

somewhere in the wilderness, a long way from Paradise; otherwise, the Ritters could not have heard her, as their homes were miles apart. In any event, it is hardly evidence against any individual. Similarly, the allegation that, a few days after the shriek, Heinz Wittmer called on them "in a raving fury" against the Baroness and declared that "we've got to take our protection into our own hands. It's no use appealing to Ecuador," inevitably lacks any confirmation. So, the charges and counter-charges are unsupported by evidence.

If we consider the question of motive, we get nowhere; everyone on the island had cause enough to hate the Baroness and none of them had disguised the view that it would be a better place without her. It can be said that Lorenz had the strongest motive after the way he had been treated, but the others, too, had deep grudges against her, particularly the Wittmers, as she had installed herself so close to their little spring. There were three men, two women and a fourteen-year-old boy, who might theoretically have done the deed — though the boy was half blind. Ritter was the least likely suspect, not so much because he lived further away or liked the Baroness any better but because of his behaviour throughout the events. From the beginning he refused to believe the story that the Baroness had gone to Tahiti; yet, if he had been involved in her death, the story would have provided him with admirable cover. But for Ritter, it would have been accepted that she had gone away in a yacht and the authorities would never have worried about what happened to her. It was Ritter

who provoked the enquiry, though he was dead by the time it took place.

This leaves Lorenz and the Wittmers. Heinz Wittmer was hardy and habitually hunted wild cattle and boars with his rifle. Lorenz was weak, sick and, it seems, cowardly. It has been argued that he was incapable of killing Philipson and the Baroness and altogether too feeble to dispose of their bodies; but this is far from certain. There is such a thing as the courage of despair and in the Galápagos there are ways of dealing with corpses that are not available in most places. Suppose, for instance, that his two tormentors were bathing, leaving their revolvers on the beach. It would not require expert marksmanship to kill them in the water — and the sharks would do the rest. Or if they had wandered off the beaten track, the broken lava is full of places where bodies would never have been found.

Long after, there was another strange case of a disappearing woman not far from the Wittmers' home. In 1963, Mrs. Rice, an elderly American lady, landed on Charles Island from a cruise ship. She was walking up the trail with friends when she stopped to remove a stone from her shoe, telling the others she would catch up with them. She was never seen again. Communications with the Galápagos had improved immeasurably since the Baroness's disappearance. The U.S. Embassy was alerted, search parties were organized, and a helicopter was sent to join the hunt. It was all in vain. Her disappearance has never been explained.

Frau Wittmer was to be involved in yet another mystery. By now, her two children, born on the island, were grown up. Her daughter had married an Ecuadorean, who came to live with them on Charles Island. He too disappeared. Frau Wittmer said that he went off with his donkey to collect firewood; the donkey came back but he did not. This time the authorities acted. She was arrested and taken to Chatham for interrogation together with her son and her hired labourer. After ten days, they were all released and returned to Charles Island. No further explanation has been forthcoming, and the son-in-law's body has never been found.

The combined deaths of the Baroness, Philipson, Lorenz, and Ritter in such strange circumstances led to tremendous press interest, and Frau Wittmer returned to Germany to write for the newspapers and give lectures about her strange experiences. After a year's absence, she returned to Charles Island. She said that she disliked the changed atmosphere in Germany, where Adolf Hitler had recently come to power; but this could hardly have been her prime motive for leaving again, as she displayed a portrait of Hitler on her wall, at least until he declared war on the United States and American forces arrived in the Galápagos. There seems little doubt that she preferred her solitary eminence on Charles to obscurity among a million city dwellers. The years after the holocaust of 1934 were the best from her point of view: "I like very much to live on Floreana [Charles Island] alone," she bluntly told Frances Conway, a later and more temporary settler. And she is still there. Her stepson was drowned,

her husband died, her son-in-law disappeared, but Margret Wittmer is approaching her fortieth year on the island.

It seems curious that, alone of the little band of settlers, the Wittmers should have endured. They had the least obvious reason for going there and only intended to stay for two years, whereas the Ritters had abandoned the world for good and the Baroness apparently imagined she could make a living there with a hotel. There is little to suggest that the Wittmers were misfits in lower middle-class Germany; but they were nobodies. On Charles, after the Ritters and the Baroness had gone, they were the lords of the manor. They met the rich and the famous. Frau Wittmer's book is crowded with accounts of important people who had praised her cakes and coffee and there are anguished pages about her failure to meet President Franklin D. Roosevelt when he visited the Galápagos. She enjoyed being a large fish in a small pond — preferably the only fish. As Frances Conway put it: "Frau Margret never rides in the back seat." In order to achieve and keep this position, she showed great fortitude and endurance. Despised as an "ordinary" woman by the intellectually pretentious Dore and the socially pretentious Baroness, she alone was able to survive in this lonely island outside the law.

A few other settlers have found a similar satisfaction in the Galápagos, but most seem to have failed. People who were misfits in their own society have rarely found contentment just by "getting

away from it all" — they were equally misfits in the Galápagos. Friedrich Ritter and Dore, disillusioned with life, no doubt said, like King Lear,

Come let's away to prison;
We two alone will sing like birds i' the cage.

but they do not seem to have been any happier in their solitude. When they had neighbours, though miles away, things were even worse. It is perhaps no coincidence that people who want to escape from society should have trouble with their neighbours, however few they be. Preoccupation with status and the desire to dominate others seem to be at least as strong in the wilderness as elsewhere. Only the fictional Robinson Crusoe found a completely satisfactory Friday, who was prepared to kiss his feet and submit to him slavishly in all matters. The story of the lonely Galápagos is one of never-ending rivalries, feuds and violence, and the clashes between the Ritters, the Wittmers and the Baroness's group are merely the most notorious. Their drama has its special interest because it shows something of the strains to which people from highly civilized communities are subjected when they find themselves outside the effective reach of the law. Heinz Wittmer is quoted as saying "In the Galápagos ... each man is his own government," and this was very much the situation on Charles Island in 1934. Also, as Dore Strauch put it, "it may also be that in a wild place like Charles, the primitive character

in each person came out more strongly than elsewhere, so that everybody showed his true face."

Chapter Twenty

WAR AND THE PANAMA CANAL

How beautiful it would be if the Isthmus of Panama should become for us what the Isthmus of Corinth is to the Greeks.

Simón Bolívar.

The various attempts made by foreign governments and companies in the middle of the nineteenth century to secure rights of one kind or another in the Galápagos had been rather vague, half-hearted affairs, but when the long-heralded proposal to cut a canal through the Isthmus of Panama began to take practical shape, interest in the islands likewise became more positive as, potentially, they commanded the Pacific approaches. Even so, foreign countries seem to have been more concerned to prevent the archipelago from falling under rival control than to possess it for themselves. While the canal was of obvious interest to all the naval powers, its defence was of particular interest to the nation financing it. France was first in the field, when Ferdinand de Lesseps began his courageous, if misguided, project to dig a sea-level canal. A treaty was signed in Paris giving France the right to establish a naval base in the

archipelago, but the canal company was already headed for bankruptcy and the treaty failed to obtain French parliamentary ratification. Nevertheless, it aroused acrimonious controversy in Ecuador for many years; accusing opponents of treasonable intentions to yield the nation's sovereign rights became a constant theme of Ecuadorean political life.

When De Lesseps' project failed, the United States inherited both the construction of the canal and the main interest in the offensive and defensive possibilities of the Galápagos. There were various obscure negotiations towards the end of the last century and well into this, about which little undisputed information is available; they had to be conducted in secrecy owing to the dangers they engendered for any Ecuadorean politician's future. None of them came to anything, such was the nation's pride in its little island possession.

One of Ecuador's outstanding and most enduring Presidents, Eloy Alfaro, was particularly concerned about the Galápagos. For years it remained one of his principal preoccupations. In 1911, he pointed out in a confidential letter to all provincial governors that, "although in 1856 nobody would accept the archipelago as a guarantee for a three million dollar loan," it was daily acquiring new importance as the construction of the canal went forward. The islands were largely barren, he continued, and had never brought the country any profit; on the contrary, they had been a financial and administrative

burden. Nevertheless, like so many of his countrymen, he believed that the Enchanted Islands must ultimately prove to be an *El Dorado*; the cod fisheries, he confidently asserted on quite inadequate evidence, were much richer than those of Newfoundland and one day the islands would become an obligatory port of call for international shipping — but that day, he argued, was distant, perhaps a century away. Meanwhile, a small country like Ecuador could not defend the islands against imperialistic aggression. (The manner in which the United States had acquired rights to the Canal Zone must have been very much in his mind.) Certainly, he argued, if war broke out between Asiatic and American powers, the Galápagos would be occupied without Ecuadorean consent and without compensation. "For us, the archipelago is a distant hope and an immediate danger."

In view of all this, President Alfaro begged the governors to give careful consideration to a suggestion he had received, that Ecuador should lease the islands to the United States for ninety-nine years. In return, the United States would guarantee Ecuadorean territorial integrity. The price offered was fifteen million dollars (twice as much as the United States has paid for the outright acquisition of Alaska), a sum which would contribute very substantially to the development of mainland Ecuador, constantly impeded by lack of capital. Half the money, the president proposed, should be spent on cleaning up Guayaquil, where the prevalence of yellow fever, malaria and bubonic plague was denying the port, and therefore the nation's

commerce, the future that it merited; the rest would be spent on building railways and roads. There was tremendous opposition to Alfaro's scheme and it was dropped, although it meant a considerable sacrifice of material prosperity.

Washington was probably not unduly perturbed by this failure. As late as 1906, when Elihu Root asked what the State Department's attitude to the islands was, he was told: "We don't want them ourselves and won't allow any European (or extra-American) power to acquire control of them" — though this may have been before the full implications of the Japanese naval victory over Russia sank in. However that may be, the Galápagos came through the 1914-1918 war virtually undefended and without any major incident. Admiral Graf von Spee, with the German Asiatic Fleet, called briefly to buy meat on his way to meet his doom at the Battle of the Falkland Islands, and there were other stories about German warships using that as a temporary base. Don Carlos Manuel Larrea wrote in his book *El Archipiélago de Colón* that the daring German commerce raider, Graf von Luckner, repeatedly used the islands to escape the British cruisers, but von Luckner himself merely noted that "we steered almost to the Galápagos Islands" before turning west along the equator to harass Allied shipping. In any event, the Galápagos played a much smaller role in the First World War than in the War of the Spanish Succession or even the War of 1812. But the war period did bring one novelty: in 1916, for the first time in

Ecuadorean history, the President of the Republic visited the Galápagos.

The military situation in 1939-1945 was utterly different, with the Pacific becoming a major theatre of world war. It may — or may not — have been pure coincidence that President Roosevelt should have gone to the Galápagos in 1938 on a holiday cruise aboard the *U.S.S. Houston*, but the number of less glamorous naval visits strongly suggests a quickening American interest in what various writers now called "the Achilles heel of the Panama Canal." Nevertheless, when the disaster of Pearl Harbour occurred, the Galápagos were, from the defence point of view, in very much the same condition as when Ecuador annexed them in 1832. Legally the islands were still under undiminished Ecuadorean sovereignty. No rights or privileges of any kind had been conceded to any foreign power, and little material progress had been made. There were only a couple of hundred inhabitants, few permanent buildings, and no installations of military value, such as an adequate wharf. In a very few months there was a revolutionary change, at least in one small corner of the archipelago.

What real chance there was of the Japanese occupying the wild and rugged Galápagos and using them as a base for launching an attack on the Panama Canal, nine hundred miles away, is a matter that can now be left to the arm-chair strategists; certainly, Ecuador alone could not have resisted such action if it had been contemplated. On

the other hand, a U.S. air base would provide the means of watching the distant approaches to the canal in case an attack by sea was attempted, and it would clearly be convenient as a look-out post for commerce-raiding submarines. Ecuador put the little, uninhabited, flat-topped South Seymour Island at the disposal of the Americans. Thousands of North American combatants and South American workers swarmed in and effected bigger changes in weeks than any of the islands had experienced in a century. The engineers did things to the lava almost as violent as the original volcanic eruptions, and laid out a six-thousand-foot landing strip. A prefabricated town sprang up, with machine shops, Quonset huts and a plant for distilling seawater. The Galápagos' first newspaper, *The Rock*, was published to reduce the boredom of living on this volcanic aircraft carrier, where there was more hard work than military glory.

In granting the United States the use of Seymour, the Ecuadorean government had not yielded one scrap of national sovereignty and, as soon as the emergency was over, the Americans punctiliously pulled out. They left no garrison, but they did leave a large airfield and a number of buildings; and they also left a desert, even by the harshest Galápagos standards. Dr. Beebe, who had once described a delightful little nature walk he took there, would not have recognised the place. The land iguanas had vanished and were replaced by proliferating house mice. Not only the autochthonous wildlife, but even the scant vegetation had disappeared. This was inevitable with so many men crowded on a small island. Fortunately,

this was one of the rare occasions when biologists and construction engineers might have reached reluctant agreement. If there had to be an airbase, this island was both relatively flat and of less biological or scenic interest than most of the others. Separated from Indefatigable by only a narrow channel, it had no species of animal or plant not to be found elsewhere. Another island had been ruined, but at least it would have been worse if it had been one of the others.

After the war, the installations, which had cost millions, were of little interest to mainland Ecuador. Most of the buildings were removed and the landing strip was scarcely used. Potentially, however, the construction of this airfield was the most important material development in Galápagos history: it could determine the whole future of the islands — for better or for worse.

Between the wars, the Galápagos had been the happy hunting ground of the millionaire yachtsmen. For those who lacked millions or yachts, the journey there by sea was slow and highly uncomfortable. Every literary traveller from Guayaquil seems to devote a long chapter to the miseries of the voyage in an elderly vessel packed with humanity and livestock of one kind and another. Sailings were infrequent and unreliable, so a short visit was out of the question — and so was touring in the ordinary sense. It is now possible to fly to Seymour from Guayaquil or Quito in two or three hours, and flights are becoming both more frequent and more regular, making the Galápagos accessible at least to the well-to-do

tourist. This could be a great good or a great evil. Everything depends on the uses to which the new technology is put.

Chapter Twenty-one

THE DARWIN FOUNDATION

The art of conservation stems from the science of ecology, a delight in knowing how nature works and a love of beauty which may or may not be conscious. Every acre ... of the globe demands thought before its biological and visual relations are altered.

Frank Fraser Darling.

For the Galápagos, the century that followed their annexation by Ecuador and the visit of Charles Darwin was a period of almost unrelieved disaster. Foreign sailors ravaged the wildlife without restraint and, when they had reduced it to a level at which it was no longer worth their while to call, the Ecuadorean oil hunters stepped in to finish the job of exterminating the tortoises. The only protection afforded to the unique flora and fauna was the remoteness of the islands, the abominably difficult and dangerous terrain, and the fact that most of the species had no commercial value. While nature had been devastated, man had not prospered. The few settlers from the mainland who had survived the hardships, the tyranny and the bloodshed, lived for the most part in a state of

misery not far removed from serfdom. Death and disillusionment had eliminated all but a handful of European settlers. Only the animals introduced from the Old World had thrived — the rats, goats, pigs, dogs, and donkeys had multiplied, wreaking havoc on the native species and gradually destroying the peculiar vegetation of the islands.

Until the turn of the century, nobody seemed to care; perhaps the worst of the trouble was that there was nobody whose business it was to care. The handful of soldiers who constituted authority in the archipelago were not interested in conservation and, if they had been, could scarcely have exerted control over the scattered islands. The worst of the damage was done without profit to Ecuador. The foreign sailors arrived, helped themselves generously to tortoises, turtles and whatever else took their fancy, and went on their way; at the most, the settlers earned a few *sucres* for the toil of carrying the monstrous tortoises down to the beaches. There was no official supervision or interference with this free-for-all, and apparently no protest was raised either in Ecuador or elsewhere.

This is in contrast to what happened in the case of Aldabra, an equally remote island in the Indian Ocean and the only other place where giant tortoises were still to be found in the wild. In 1874 a group of naturalists, including Charles Darwin, wrote to the Governor of Mauritius, who was responsible for Aldabra, expressing their concern at the proposed establishment of a wood-cutting

industry, which would have led to the extinction of the tortoises. This protest did not result in any legislation by the British authorities, as little interested in conservation as most others, but it did have a restraining effect by drawing public and governmental attention to the danger. Thanks to this and to the later generosity of the naturalist, Lord Rothschild, the Aldabra tortoises were preserved, and today there are a hundred thousand on the little atoll. When the British and United States governments jointly decided in the 1960's to construct an airfield on Aldabra, maintaining that this was of vital strategic importance, the leading scientific and conservationist bodies on both sides of the Atlantic rose in their wrath. The two governments suspended the project.

Yet Darwin and Rothschild were even more interested in the Galápagos than in Aldabra; they were aware of the worsening situation there and yet took no action. Presumably, they thought that while a public protest or private arm-twisting by British subjects might have some effect on British colonial authorities, it would be pointless to try such tactics in Ecuador. The attitude of the American scientists seems to have been very similar. It is true that at the beginning of this century conservation was the eccentric pursuit of a very small minority. There were only four National Parks in the world, but all four were in the United States and two of them in California, so if anyone knew about National Parks, it must have been the scientists from the California Academy of Sciences. Yet, like Darwin and Rothschild, they did nothing — or rather they

made things worse. Convinced that it was only a matter of time before much of the Galápagos wildlife became extinct, they — with the support of Lord Rothschild — deliberately collected as much as they could of what was left for preservation in museums and zoos. Today this seems misguided, but those were the men on the spot at the time; they were as deeply concerned about nature as any of their contemporaries and on the evidence available, they judged that the situation in the Galápagos was so hopeless that there was no better course. They explained their purpose to General Plaza, the governor, and he seems to have approved. The idea of a National Park in the Galápagos or indeed any kind of conservation would have been dismissed as chimerical. The authorities could only give a minimum of protection to people, let alone animals.

Between the two world wars, the decline continued. Several of the luxurious yachts, which made the increasingly fashionable cruise to the islands, offered hospitality to scientists anxious to study the flora and fauna before its final eclipse; they added to knowledge, but their collections reduced the surviving species still further. Yet in the nineteen-thirties a change of attitude in scientific circles was becoming apparent. The fact that the centenary of Charles Darwin's visit fell in 1935 was probably no more than a catalytic agent — but a most useful one. Victor Wolfgang von Hagen, writer and naturalist, with Ecuadorean, North American and British support, organized a memorial expedition and erected a monument to Darwin, near the spot where he first landed on Chatham Island.

This pious tribute was of less importance to the organizers than their hope of making a start with conservation. In this, they were disappointed, but with the benefit of hindsight, we can now see that the defeated visionaries of the thirties started something, even if no practical results were achieved for another twenty-five years.

The government of Ecuador joined the celebrations and brought out a special Galápagos issue of stamps. Much more important, the President issued a decree completely banning the export of a list of protected animals and birds, severely controlling the introduction of domestic animals, and establishing nature reserves on a number of islands. But this far-sighted law had little or no immediate effect, if only because there was no administrative organization on the archipelago with the knowledge, or for that matter the staff, to enforce the decree. Señora de Rendón mentions that in 1940 she saw giant tortoises in a pen at Chatham, waiting to be sold to the next visiting ship; the pen was not many yards away from the governor's office. It was difficult to convince officials, not to mention settlers and visitors, that the new law was not a lot of nonsense.

On the international front, good intentions likewise produced no immediate results. The Galápagos Committee of London, headed by Sir Julian Huxley, was anxious to set up a permanent scientific station in the islands, but war came in 1939 before sufficient support had been rallied. In the United States, Dr. Waldo Schmitt

continued the struggle until, like so much else, his plan was swept away by Pearl Harbour.

It was not until ten years after the Second World War that a new effort to save the Galápagos was begun. By that time, the idea of conservation was gaining an increasing number of supporters in many parts of the world. In 1955, the International Union for the Conservation of Nature and Natural Resources (IUCN) sent Dr. I. Eibl-Eibesfeldt to the Galápagos on a fact-finding mission. Two years later, alarmed by his reports, the IUCN, together with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the International Council for Bird Preservation, the New York Zoological Society and *Life* Magazine, financed another mission, which included Dr. Eibl-Eibesfeldt and Dr. Robert I. Bowman, to carry the investigations further and to choose a site for a permanent biological station with the approval of the Ecuadorean Government.

Again, a centenary — that of the pronouncement of Darwin's theory of evolution in 1858 — acted as a catalyst, and the International Zoological Congress of 1958 set up a Galápagos Committee. Out of this committee arose The Charles Darwin Foundation for the Galapagos Islands, an international body which was established in 1959 under Belgian law, thanks to the zeal of a number of organizations and individuals and particularly to Professor Victor Van Straelen, who became the first president of the Foundation.

The Government of Ecuador secured the support of UNESCO; several scientific bodies in Europe and North America pledged assistance and within a few months, the Foundation's representatives landed at Academy Bay on Indefatigable Island and began the establishment of the Research Station.

The early years of the Station, when it was under the direction first of M. Raymond Lévêque and then of Dr. André Brosset, might be called the heroic period, though some will maintain that scientific and conservation work in the Galápagos will always demand a good measure of heroism. Suffice it to say that in spite of all the obstacles, the little station arose amid the lava slabs and cactus. When the official opening took place in 1964, admirably marshalled by Dr. Harold J. Coolidge, the sweltering dignitaries could admire the laboratory, library, meteorological and seismological installations and even some simple accommodation for staff and visiting scientists. Ecuador was represented by two members of its ruling Military Junta and its Minister for Foreign Affairs, various European countries and the United States by their ambassadors, and California by the largest collection of scientists ever embarked in a single ship. Many of the supporting organizations sent delegates. Charles Darwin's granddaughter, Lady Barlow, was unable to undertake the arduous journey, but the family was represented by her son. For similar reasons, the Foundation's Honorary President, Sir Julian Huxley, could not be present, but Professor Van Straelen came all the way from Belgium to preside over the happy event for which he

was so largely responsible. It was his last voyage, and he died not many days after seeing the first fruits of his great endeavour. The presidency of the Foundation passed into the able hands of Professor Jean Dorst.

As the natural sciences have so few followers in Ecuador, it was a fortunate coincidence that the government's senior representative at the opening ceremony, General Gándara, should be a keen botanist. A few days later, a comprehensive agreement was signed in Quito between the Republic of Ecuador and the Charles Darwin Foundation, and this became the basis for all the fruitful co-operation of subsequent years.

The purposes of the Foundation can be grouped under two main headings: promoting scientific research and advising the government on conservation matters. However, as the government at first lacked any conservancy organisation, the Foundation became by consent more actively involved in protection than had originally been contemplated. It went to work from the very beginning without waiting for buildings and adequate equipment. Any valid conservation programme involves much fundamental and applied ecological research. Ten years of intensive work has taught us much about the wildlife of the Galápagos and its inhabitants, but it has also made clear how much is still to be learned. Only people who have not penetrated the waterless wildernesses of the more remote

peaks will be surprised at the new discoveries made as late as 1970 — and that doubtless will be made in the years to come.

Action could not wait on the completion of studies. With the generous support of the New York Zoological Society, the first conservation officer was appointed in 1964, not only to protect the tortoises from poachers and introduced animals, but also to study their breeding, feeding and migration. By making notches in their shells, without pain or damage to the animal, it has become possible to conduct an initial study of the structure and numerical fluctuations of the various populations as well as of their seasonal movements. Similar work has been carried out on a number of species of birds with fascinating results, valuable both to pure science and to conservation.

The problems of encroachment by settlers on the strict nature reserves and the damage done to both flora and fauna by the proliferation of the feral, exotic animals still remain largely intractable. Efforts have been made to control the depredations of goats. On a very small island, such as Plaza, this has been a complete success, and the elimination of the goats was quickly followed by the regeneration of the vegetation and the rescue of the land iguanas from imminent extinction; but on most of the islands, the task of control has proved too great for present resources. The year 1970 saw the most extensive efforts so far at goat control, but it also revealed the damage done in other islands by new introductions.

Ten years of the Foundation's activity have achieved so much, but they have also shown how much remains to be done.

On the scientific side, the Research Station has been a centre of continuous activity since its very beginning. The Darwin Foundation is a thoroughly international body. In addition to the unflagging aid of UNESCO and the World Wildlife Fund, it has received regular financial support from several national scientific bodies in Europe and North America. The scientists who make use of its facilities in the Galápagos come from all parts of the world and their publications yearly enrich science. Most of them are not directly concerned with conservation, but they make their contributions, as all ecological knowledge is grist to the conservationist's mill. The Foundation does not favour any particular discipline or line of study beyond a slight bias towards research in the Darwinian tradition and a more definite bias against work that could be done equally well elsewhere.

Perhaps the Research Station's greatest contribution is the simple fact that it is there. For centuries, the unique assets of the Galápagos were allowed to be despoiled because there was nobody responsible for preventing this despoliation. The pessimism of the early part of our own century was followed between the wars by a period of good intentions, but as there was no national or international organization to put the good intentions into effect, the decline continued. For the last ten years, there has been a body on the spot, which could at

least notify authorities when damage was being done and suggest how best to put things right. As an international body, the Foundation, of course, has no police powers but its constant patrols round the scattered islands in the execution of its scientific duties have had a salutary effect. These patrols were greatly facilitated when various bodies and individuals combined to present the Foundation with a Cornish lugger, named *Beagle II, in piam memoriam*. Unfortunately, the Galapagoan seas proved too much for this elderly sailing ship — but she had character and all who sailed in her regretted her passing. Again, friends of the Foundation rallied round and now the Station is endowed with the research vessel, *Beagle III*, specially designed for the purpose, to help it in its daily tasks.

The most encouraging thing about the writing of this book has been to compare Dr. Eibl-Eibesfeldt's report on his exploratory visit, which led to the creation of the Darwin Foundation, and the recent reports coming in from the Station. Complacency would be unpardonable, but ten years of uphill work have shown how much can be achieved as well as how much remains to be done. The presence of the Foundation may well have marked a turning point in the history of the archipelago.

THE GIANT TORTOISES

In the Galápagos, the land mammals are few and small — or at least they were so until man arrived, bringing with him his domestic animals. What impressed all the early mariners were the birds, the seals and sea lions and, above all, the reptiles. Obviously enough, it was easier for birds and seals than for deer or pumas to cross the wide oceanic moat separating the islands from the continent; it is less obvious how the large reptiles reached the Galápagos but, somehow, they did so and eventually prospered, becoming the predominant element in the wildlife. This unusual predominance of reptiles was responsible for the widespread but erroneous impression that the Galapagoan fauna was very primitive and that the islands were inhabited by creatures that had become extinct elsewhere. Although this predominance does produce a superficial resemblance to the Secondary Era, the reptiles are in fact no more primitive than the related species on the mainland. They are certainly very peculiar, and they were once extraordinarily numerous, but that was due to the way in which, in isolation, they had evolved and adapted themselves to the unusual conditions of the islands. The number of distinct species is not large. There is one genus of snake (non-

venomous), one genus of lava lizard which, through reproductive isolation, varies noticeably from island to island, and a gecko; but the outstanding reptiles are the giant tortoises and iguanas.

The tortoises have become the symbol of the Galápagos Islands, and rightly so, as indeed they gave the islands their original name. It was the multitudes of these huge beasts that impressed the Bishop of Panama and the buccaneers, and that attracted the whalers and the collectors; today, to our shame, it is only the more energetic visitor who can hope to see one in the wild. Whether it was ever literally possible to walk without touching the ground by stepping from the back of one tortoise to another depends on the credence one accords to early travellers' tales, but the numbers were certainly enormous. Most of the races still survive against all the odds, but only where access is difficult. In a way, we ought to be thankful that it requires such an arduous trek to reach their last refuges because, if it were not so, they would all have become extinct some time ago, and there would no longer be any *galápagos* in the Galápagos.

Whatever the means by which the tortoises reached the islands, in due course they found it a veritable paradise. They had no competitors for food except the herbivorous land iguanas, and no serious enemies at all. Such hazards as they faced were those of climate and terrain. Over the centuries, there must have been periods of unusually intense drought which would drastically reduce the food supply but, like the cactus on which it feeds, the tortoise

has an extraordinary built-in resistance to such conditions and can keep alive for many months without food or water. The rugged terrain presented its peculiar problems; there was always the possibility of falling into a steep-sided lava hole or becoming inextricably wedged in a crevice but, for the slow lumbering reptiles, born to this savage land, such dangers were not too great. From time to time, volcanic eruptions must have taken their toll. In 1901, Rollo Beck, when collecting specimens on one of the Albemarle volcanoes, noticed that almost all the old tortoises living around the summit had shells which were irregularly scarred and pitted, whereas the old ones living near the foot of the mountain had smooth shells — and so had the younger ones in both areas. The only explanation he could think of was that, at some time in the past, those near the top might have been showered with burning volcanic cinders. There were several craters close to where the scarred tortoises lived, but none which appeared to have erupted at all recently. So, if Beck's very tentative suggestion should be correct, the big tortoises must have been very old indeed.

The great age of the tortoises has always had a certain fascination for man with his traditional span of three-score years and ten. For the Chinese, they are the symbol of longevity. We can read of them reaching the age of five hundred years, but when we seek reliable supporting evidence, it is simply not forthcoming. Even with the giant tortoises of the Indian Ocean, about which the records are a little better, for instance the one reputedly given by Captain Cook

to the King of Tonga in 1774, there is no authenticated case of one reaching the two hundred mark — which is not to say that it is impossible, but merely that we have no proof. No method has yet been discovered of determining the age of the venerable patriarchs by studying their shells; for the first ten or twenty years, the carapaces of the younger tortoises put on annual growth rings, as trees do, but after that, it is no longer possible to trace them owing to the abrasion of the surface. However, if the giant tortoises can be saved from extinction, our great-great-grandchildren should have some more definite information, as the Charles Darwin Research Station is now marking the shells so that the tortoises will be individually identifiable. Meanwhile, if the elders lack birth certificates, they do at least wear a badge which distinguishes them from all other known animals — they, and they alone, have lichens growing on them. It is impossible for the lichens to adhere to the lower plate or to much of the upper plate owing to the constant scraping against rocks and undergrowth, but there is an area on the rear of the carapace where they grow freely; this only applies to the males, as any incipient lichens on the females are erased in the course of mating.

The giant tortoise has tremendous powers of endurance. Even when death comes to claim one of the patriarchs, a long time may pass before it yields. Miguel Castro, who was brought up in the islands and served as the first conservation officer of the Darwin Station, and who knows the tortoises more intimately than any other man,

says that when an ancient one reaches the point where it no longer has the strength to search for food, it lies down and remains in the same spot for months, completely immobile, until death finally overtakes it.

This is not the place to discuss whether the various kinds of tortoises in the archipelago should be classified as separate species or as subspecies. Leaving this problem strictly to the taxonomists, to whom it belongs, we can for convenience say that there were originally fifteen races in the Galápagos, falling into two main classes. First, there are those with relatively short necks and high, dome-shaped carapaces, which curve downwards, coming low over both head and tail. Then there are those with very long necks and carapaces which are rather flat on top but tilted up in front, like old-fashioned Spanish saddles. The dome-shaped races are found on Indefatigable, and on some of the Albemarle volcanoes; these have upland areas with plenty of moisture and the lushest vegetation in the archipelago, so that the tortoises can graze on the herbage. The saddle-backed races belong to arid areas such as Hood and Duncan Islands and the northern volcano of Albemarle, where there is no grass for most of the time and where the tortoises have to stretch upwards to get at the cactus and the scanty foliage of the bushes; it is an obvious advantage in these conditions to have a long neck and a shell which is canted upwards in front. While it cannot be proved that this is the reason why the races have evolved different shapes, it is an explanation that makes sense.

The biggest tortoises are to be found in the humid, cloud-swathed mountain zones. Beck tells of capturing one which needed twelve men to carry it down to the coast. There are periods of drought in the uplands, but the supply of food and water is generally much more abundant. And, where they can find it, the tortoises love fresh water, a fact which much impressed Darwin when he first saw them. "When the tortoise arrives at the spring" he wrote, "quite regardless of any spectator, he buries his head in the water above his eyes and greedily swallows great mouthfuls, at the rate of about ten a minute." It is not only for drinking that the tortoise loves the water; where it can find a pool, it will lie all night half-submerged in the shallows — or, failing a pool, it will make use of a damp spot, churning up the soil until it has made itself a mud-hole in which it can gratefully wallow. Buoyed up by the water, the tortoise can take some of its enormous weight off its feet, breathe more freely and make good the oxygen deficiency which it has run up during the exertion of travelling or feeding. For this elephantine creature, movement must be laborious, so whenever possible, it takes its ease, like its water, in great gulps, and does not move again until it has to. The later also serves to prevent the tortoise's skin from cracking, to get rid of parasites, to ward off mosquitoes, and for cooling in hot weather.

Although a specialist in slow-motion, the tortoise is capable of short bursts of what, to him, must seem like speed — for instance, in pursuit of a female. On these occasions, he also finds his voice. Herman Melville wrote that the special characteristic of the

Galápagos was that "no voice, no howl is heard; the chief sound of life here is a hiss." While this is an admirable generalization, strikingly expressed, there is an exception to it; during the act of mating, but at no other time, the male tortoise gives vent to mighty roars, which can be heard nearly a quarter of a mile away. Had Melville been a scientist rather than a poet, he might have written, more pedantically:

Except for these moments of conjugal bliss,
The voice of the tortoise is only a hiss.

Otherwise, he is correct, and the tortoise breathes by gulping air into its lungs under pressure and then letting it out again with a long, soft hiss. The female never roars, whatever the provocation.

On the cloud-capped volcanoes, where there is usually water in the higher reaches, there is a great deal of migration, and smooth trails have been worn in the lava by the rubbing of the tortoises' plastrons through countless generations. The frequency and the motivation for these migrations need further study, but one reason for leaving the lush, wet pastures for the arid lower slopes seems clear; the females like to lay their eggs in the hot, dry earth where the chances of successful incubation are better. To achieve this, they must often travel several miles over difficult ground. Darwin calculated that, on these treks, they can do four miles in a day. Having found a suitable spot, the tortoise scoops out a hole with her hind legs, moistening

the soil by urinating. She then lays her round, white eggs, often in layers separated by a thin coat of earth, and then fills in the hole. The damp soil dries in the hot sun to form a hard cap. The value of this sealing process is obscure from the point of view of survival because, unless there is rain to soften the soil again, some of the newly hatched young are unable to break through the cap — and rain is not a phenomenon to be counted on in the Galápagos. Given the long life of the tortoises, the number of eggs in a clutch (usually between five and twelve), the fact that a female may lay several clutches in a year, and the absence of enemies, this would not have been much of a handicap to survival in the past but, with all the new hazards introduced by man, it is now a factor of some significance. One possible explanation of the nesting technique is that it may be very difficult for the tortoise to dig an adequate hole without moisture to bind the dry, loose soil; or again, the soft, rather glutinous eggs might be damaged if the dry earth were tumbled in again without moisture.

On the smaller islands without heights to attract moisture, the tortoises must have a much harder time. They never reach the enormous size of those on the high, humid slopes. Except at long and irregular intervals, they drink no water. There is little herbage on which to graze — most of the time, none at all. Yet, they were numerous enough when the islands were discovered. They found adequate food in the pads and fallen trunks of the cactus, together with any foliage they could browse on the desiccated shrubs, and

from this Spartan diet, they were also able to derive enough liquid to sustain life. Now they have to compete for food with the introduced goats and, unlike their fellows on the larger islands, they have no moist pastures to which they can retreat.

Of the original fifteen races of tortoises in the archipelago, there were no less than five on Albemarle — one on each of the five great volcanoes that, in the course of time, became linked together to form this, the largest of the islands. The volcanoes were sufficiently isolated from one another to allow a different race to evolve on each of them. Survivors of all these five still exist. Each of the other ten races was found on a separate island. The race on Charles Island was hunted to extinction over a century ago; Charles was a favourite haunt of pirates and whalers, who took their toll. Nevertheless, the tortoises were still fairly numerous when the first disastrous Galápagos settlement was established there in 1832; only a few years later, there were neither tortoises nor men on the island. The tortoises on two of the smaller islands, Barrington and Jervis, may have survived a little longer, but all we know for certain is that they, in their turn, were exterminated. As numbers dropped rapidly in all the islands, it became more and more difficult and less profitable to hunt them on the grand scale, and so the remnants of the other tortoise populations lingered on in varying degrees of vulnerability. Only one race has been finally and irretrievably liquidated in our time: this was the Abingdon tortoise, which apparently became extinct shortly before the establishment of the Darwin Station.

This leaves us with eleven out of the original fifteen races — or, more probably, with ten, as the Narborough tortoise is something of a mystery. This race is known to scientists as *Geochelone elephantopus phantastica* and no doubt merits every word of its ponderous name, but particularly the last, because only one specimen has ever been recorded. This is an old male, collected in 1909 by Rollo Beck. It now resides in solitary state in the museum of the California Academy of Sciences; otherwise, the race remains an enigma. In the last few years, the Darwin Research Station has made several expeditions up this vast and formidable volcano in the hope of finding further specimens. As recently as 1970, Roger Perry, the director of the Station, made a particularly thorough search, accompanied by that indefatigable mountain explorer, Eric Shipton. Not a trace was found, though there is still a faint possibility that survivors may exist in some oasis in this wilderness of lava, but Shipton, who has vainly sought the Abominable Snowman in the Himalayas, now rates his chances of finding Narborough tortoises even lower. Perhaps the race was wiped out by one of the frequent eruptions of this still very active volcano. For once, man does not seem to have been to blame, as neither he nor his domestic animals have ever inhabited this huge and inhospitable heap of lava, nor are there any records of tortoises being taken for food.

So, from the point of view of practical conservation, there are ten races to be considered, five on the Albemarle volcanoes and five on individual islands. The degrees of danger to these ten populations

vary widely but, thanks to the explorations of the Darwin Station together with systematic marking and numbering, we are every year obtaining more and more reliable information about their present status. Not all the new intelligence is bad — in fact, there have been some very pleasant surprises, such as the rediscovery of a population of the Chatham tortoise, long mourned as defunct. But with some of the races, the situation is very bad indeed.

The two most numerous populations are those on the uninhabited central volcano of Albemarle (which is still active) and on Indefatigable Island, where human settlement is increasing. In each case, there are not less than two thousand survivors, and there may be more than three thousand. On each of the two southern volcanoes of Albemarle and on each of the islands of Chatham, James and Duncan, at least a hundred tortoises have now been found and marked. As a result of recent expeditions, there is growing evidence that potentially viable populations still exist on the two northern volcanoes of Albemarle, which previously had seldom been visited and which are among the least known areas of the archipelago. On the other hand, by 1970 the total population of Hood Island tortoises had been reduced to seven specimens.

Given adequate protection, all, or nearly all, these races could survive; as things are, each of them is faced by its own particular threat. In theory, all the tortoises are now given absolute protection under Ecuadorean law, but, in practice, it is difficult to enforce law

to this scattered group of islands. There are fishermen who want a change of diet and there are always those who are anxious to make a little money by selling tortoises which end up as pets or as exhibits in zoos, where the curators have enough zoological knowledge to be fully aware of the damage they are doing. But while it is still easier for the visitor to see a giant tortoise in Quito or Guayaquil than in the Galápagos Islands, progress is slowly being made toward eliminating this traffic. At least, it is easier to control men than the animals they have introduced, which are now many times more numerous than the human inhabitants. Wild goats, dogs, pigs, cats, donkeys, and rats are now the most pressing dangers to the native wildlife.

On southern Albemarle, fierce dogs roam around in bands and harm the tortoises. On Indefatigable, the wild dogs are less of a hazard and the main problem is the encroachment of settlers on what is legally a strict tortoise reserve. Their cattle, originally imported as dairy animals, are now raised for beef and have been turned loose in the uplands, where they are destroying the balance of the grasslands. Fires are started to clear more land for grazing, and they often get out of control. Introduced crops spread without restraint at the expense of the indigenous vegetation. On several islands, pigs have run wild and root out the tortoises' nests. Elsewhere, goats and rats are the chief enemies.

The two races facing the most immediate menace of extinction will serve as examples of the problems of conservation. Rugged, arid, little Duncan Island is infested with black rats which escaped from some ship. At the beginning of the century, Rollo Beek wrote: "We camped there for a week and captured nearly thirty tortoises which were later sent to Europe. We were much chagrined, however, at finding no very small specimens, but soon came to the conclusion that the large rats, of recent introduction, and now common everywhere on the island, eat the young as soon as they are hatched." He had little hope that the race would survive many years.

Beck was a little too pessimistic, but his diagnosis has been substantially confirmed by teams from the Darwin Station, who have been unable to find any tortoises under thirty or forty years of age; there can be no doubt that the rats kill off the young with great efficiency. The tiny, two-inch, soft-shelled hatchlings have little defence. The outlook for the Hood Island race is even worse. At the last count, only seven could be found. Here the problem is goats. Hood is a low island and virtually waterless. The tortoises are entirely dependent on the moisture they derive from eating cactus and leaves, and the goats are denuding the island. Fishermen have continued to poach tortoises on Hood until the present day, but the main trouble henceforward is going to be the lack of food.

Goats excite a great deal more human sympathy than rats, and few people appreciate the damage they can do. But let us take the case

of Abingdon Island, where, a few years ago, *machetes* were needed to cut a path through the scrub. In 1958, a male and two female goats were released by fishermen to provide meat on future visits. In 1968, the Darwin Station estimated the number of goats at between four and five thousand, and there were open stretches of half a mile or more where previously there had been dense bushes. At least forty-five of the two hundred and fifty plants endemic to the archipelago occur on this island. In the Galápagos, the introduced goats — and, for that matter, the donkeys and cattle — not only compete for food with the indigenous wildlife, but they have also started regressive trends in the vegetation of virtually all the lower zones of the islands where they occur. Species of plants unknown outside the Galápagos are disappearing, and if the spread of these foreign animals is not controlled, they will destroy forever much of the unique flora and the fauna that depends on it.

This is a dismal picture, but at least there has been a change of attitude, and it is no longer fatalistically accepted that nothing can be done and that extinction is inevitable. The islands can never again be quite what they were, but a very great deal can still be saved. The Darwin Station has only existed for ten years, much of that time taken up by organization, building and census work, but already there are solid grounds for hope. The government of Ecuador has now appointed wardens to work permanently among the tortoise populations of Indefatigable and southern Albemarle, under the direction of the newly created National Park Service. Pigs are hunted

in the nesting areas, and a systematic attempt is being made to exterminate the wild dogs in the worst-afflicted zone. It is hoped to station a warden on Chatham, at least during the nesting season. Within the limits of present resources, attempts to keep the goat population explosion under some semblance of control will be continued.

Where the situation is desperate, as on Hood and Duncan, emergency measures are being tried. While plans to fight the rats on Duncan were being worked out, a number of eggs were taken experimentally and placed in an improvised incubator at the Darwin Station in Academy Bay. This first modest batch, taken in 1965, was successfully hatched in converted bird cages, and further attempts have now raised the total to well over a hundred hatchlings. The first batch, having reached a weight of five to eight pounds, are believed to be big and strong enough to resist the rats; in December 1970, twenty of them were returned to their native island, where their development will be watched with some anxiety but also with considerable hope. For purposes of comparison, nine of the same batch have been retained in the Station's pens.

Encouraged by this provisional success, the Darwin Station, with the approval of the government, decided to try a desperate rescue operation to save the Hood tortoises as well. With only seven left and with poachers and goats, their final extinction could not be far away. So, a male and three females were removed to the Station's

pens in 1969. One clutch of eggs was laid but, though fertile, they did not hatch. Then, with the generous support of the San Diego Zoological Society, much improved incubators and rearing pens were installed. In 1970, all three females laid and in February 1971, the first twenty Hood tortoises were hatched at the Station, thus virtually quadrupling the number of Hood tortoises in the world.

If these heroic methods could succeed with the Duncan and Hood races, there was no reason, other than lack of resources, why they should not be applied to other endangered races. The funds have been forthcoming, and the experiments are under way. When the Darwin Station was set up in 1960, there was probably no knowledgeable person who thought that either of these races could survive, but now there are solid grounds for hope that all the ten remaining races of Galápagos tortoises can be saved for posterity. However, the problem is bigger than merely hatching and rearing youngsters. The tortoises cannot prosper if their habitat is destroyed. This means that the expansion of human settlements and the multiplication of goats, pigs, dogs and other exotic introductions must be brought under control.

Chapter Twenty-three

THE IGUANAS

Of all the strange creatures on the Galápagos, none fits into the fantastic landscape more aptly than the iguana. Both islands and beasts are "out of this world;" indeed, parts of the archipelago seem to belong to the moon, while the iguanas are like something out of science fiction. There are two species, one living in the arid desert zones, the other in and out of the sea. They may be descended from a single ancestral stock that reached the islands long ago but, if they are, they have diverged so far that they no longer look alike, and their habits are utterly different. One thing they do have in common — they are both vegetarians.

The land iguanas are not altogether unlike their relatives on the mainland, but they have evolved on different lines, and, for that matter, they vary from island to island. Some populations are more strikingly coloured than others; some are predominantly reddish brown and grey, others more brightly pigmented in a range of shades running from vivid yellow through orange to dark brown. The adults are about three feet in length, weighing perhaps fifteen pounds; with a crest of spines like a row of long, pointed teeth

running down their backs, they look very fierce but, in fact, they are mild creatures and will not bite unless molested. Their powerful jaws do, however, serve for crunching the cactus pads and fruits, which they swallow without chewing, together with a good proportion of the steel-hard spines — though they may remove some of these with their feet. The land iguanas are lethargic creatures, passing much of their lives in a torpid state, but, if frightened, they can change their usual undignified waddle into something approaching a burst of speed, when their gait becomes a really laughable spectacle. They can also climb trees to get at whatever foliage there is but, here again, their movements are not much livelier than those of a sloth. They dig shallow burrows between the slabs of lava or preferably in the soft volcanic tuff; to these they retire at night or when disturbed or to lay their large, elongated eggs. It has been their misfortune that, despite their appearance, so repulsive to many people, their white flesh is considered a delicacy by others. On James Island, where Darwin had difficulty in finding a place to pitch his tent, as all the suitable spots had been so thoroughly tunnelled by these great lizards, there are now no land iguanas. Populations everywhere have been reduced or eliminated by men and dogs, or by goats and donkeys pre-empting the food supply. When they are left free from interference, their powers of survival seem tremendous. Within twenty months of the violent eruption of the great Narborough volcano in 1968, the land iguanas were already repopulating the main crater.

If the land iguana, with its bold splashes of colour, is the gaudiest of the archipelago's reptilian inhabitants, the marine iguana can lay strong claim to being the drabbest. Like the sea-fringed lava on which it spends most of its life, it is shiny black when wet, dark grey when dry. This gives it wonderful camouflage, but what advantage this confers is obscure as, until the arrival of man, it had virtually no enemies on land to hide from — though, as it is cold-blooded and lacks the automatic thermostat of warm-blooded animals, it may be that its black hide is useful in absorbing more rapidly the heat of the sun after a long immersion in the sea. Darwin described it as "a hideous-looking creature, stupid, and sluggish in its movements," but he could not resist its fascination and devoted some of his very best pages to describing it.

Whatever its ancestry, the marine iguana has diverged radically not only from the Galápagos land iguana but from all other lizards in the world. It is the only sea-going lizard. It lives exclusively on seaweed, which it browses either on the tidal rocks or below water; skin divers say they have found it at depths of as much as thirty feet. It swims gracefully by undulating its body and its long, flat-sided tail. The feet, which are only marginally webbed, hang loosely, and are not brought into play in swimming, but their powerful talons are admirably adapted to climbing and clinging to the slippery rocks. While the land iguana has adapted to these arid volcanoes by contriving to get sufficient water from the cactus, the marine iguana has so adapted that it can process the seawater it swallows with the

algae it feeds on. It absorbs far more salt than its body requires, but it has desalination glands in its head. At intervals, it ejects a highly concentrated saline solution through its nostrils in the form of a fine spray, which makes it look even more like the legendary fire-breathing dragon.

Its fierce appearance is belied by its harmless behaviour, as Captain Porter, U.S.N. tells us in describing his first encounter: "In some spots a half-acre of ground would be so completely covered with them as to appear as though it was impossible for another to get in the space; they would all keep their eyes fixed constantly on us, and we at first supposed them prepared to attack us. We soon however discovered them to be the most timid of animals, and in a few moments knocked down hundreds of them with our clubs, some of which we brought on board and found to be excellent eating, and many preferred them greatly to the turtle." Porter, like so many other mariners, had his fun; but it did the marine iguana populations no good. Fortunately for this species, though not for others, his estimation of its culinary qualities was not shared by everyone. It is alleged that there is little meat on them apart from the tail — and they do look rather nauseating to the more sensitive gourmet. In any event, whether from a change in the human attitude towards animals or from other causes, the sport of iguana-bashing lost some of its popular appeal as the years went by.

The marine iguanas are still quite numerous and widespread in the Galápagos. Small groups or large herds are to be found on most islands, even including the lesser ones. They can still be seen sunning themselves on the black cliffs, packed side by side like sardines in a can, but all facing in the same direction. They seem to congregate, not in family parties but in age groups, all much the same size. Their whole life is spent along the shoreline. They rarely venture more than a dozen yards inland, and there is nothing to show that they ever go to sea at all except when hunger drives them. Their ability to swim may, however, be responsible for the small degree of divergence between the races on the different islands; some may have been carried from one island to another, resulting in cross-breeding. To the casual observer, there is no difference except in the case of the adult males — big fellows, sometimes exceeding four feet in length and weighing over twenty pounds. Instead of being a uniform dirty black, these monsters are a patchwork of striking colours, which vary from island to island.

Chapter Twenty-four

SEALS AND SEA LIONS

Alan Root, who made such an outstanding film of the Galápagos wildlife for Anglia Television's *Survival* series, says that of all the animals he had photographed up and down the world, the sea lion was the one that delighted him most. And he is not alone; photographers, scientists, and the rest of us, all succumb to the charm in greater or lesser degree. For the sentimental, there is the engaging sight of the female suckling their babies on the beach or of the young sea lions at play, chasing one another under the pellucid water, tumbling on the sand or playing "king of the castle," as one tries to knock the other off the top of a boulder. Nor is play confined to the youngsters because the adults, too, swim for sheer fun as well as for business reasons. And how magnificently they swim! They love to sport among the big rollers but, instead of coasting along on top like human surf-riders, they stay in the heart of the wave, their bodies showing darkly through the wall of limpid green, turning, rolling, and frolicking until the breaker dissolves in foam as it sweeps up the beach.

The sea lions have not always been such popular favourites; indeed, even now, when we know so much more about their habits and disposition, it is disconcerting — to say the least — to be charged for the first time by a half-ton bull sea lion, travelling through the water like a torpedo; and then, when you think he will stop at the water's edge, to find that he rushes up the beach ponderously, ludicrously, no doubt, but with a turn of speed that you would not have expected from a creature with only flippers instead of legs. Roaring and showing his fine, big teeth, he can strike fear into the hearts of the boldest. Consider that doughty sea dog, Captain Woodes Rogers, the most successful privateer of his generation, who was always ready to board an enemy ship or lead the attack on a town; how did he feel about it? He tells us with graphic detail:

A very large one made at me, 3 several times, and had I not happened to have a Pike-staff pointed with Iron in my Hand, I might have been killed by him; (one of our Men having narrowly escap'd the Day before). I was on the level sand when he came open-mouth'd at me out of the Water, as quick and fierce as the most angry dog let loose. I struck the point into his Breast and wounded him all the three times he made at me, which forced him at last to retire with an ugly Noise, snarling and showing his long Teeth at me out of the Water. This amphibious Beast was as big as a large Bear.

With all deference to the bold buccaneer, he was grossly exaggerating his personal peril. The history of the Galápagos Islands is full of blood and violent death, but the most painstaking research has failed to disclose a single case of a man being killed by a sea lion — though the contrary is common enough. Dr. Bryan Nelson and his wife shared a small beach for months with a herd of sea lions, which constantly disrupted their home life, but never did them any physical harm. Nelson grew contemptuous of their noisy threats and records that "we never met one that pressed home its attack, if you so much as flipped a handful of sand or water in its face; they always made off with an eye-rolling backward look and much roaring. Nobody needs pay much respect to a bull sea lion, whatever adventurers say." Nevertheless, those who lack the iron nerve of a Nelson or are unsure of the accuracy of their sand-throwing are well-advised not to come between a bull and his wives or between a mother and her pup. Surely so acute an observer as Dr. Nelson cannot have failed to notice the teeth marks on the leg of the Director of the Charles Darwin Research Station!

Because the sea lion is no respecter of persons, however eminent. One very large bull roared and charged at the Duke of Edinburgh in a particularly unseemly and menacing fashion, when he paid a courtesy visit to that part of Narborough Island where the bull exercised sovereignty. Eventually, however, he satisfied himself that His Royal Highness had no acquisitive motives — that he only wanted to swim in one of the sea lion's pools and was not trying to

appropriate his wives. Thereafter he ceased his hostile demonstrations and at lunchtime, even allowed his large family to gather round the picnic place among the mangroves, where they listened with rapt attention to the music provided by Karl Angermeyer on his mouth organ; such artistic events must be rare treats for the sea lions on the austere shores of Narborough.

If the bull sea lion rarely bites a man, it frequently bites and is bitten by other bulls. Fights to the death, if they occur at all, must be abnormal, but fighting for dominance is part of the bull's way of life. As with many other gregarious animals, the bull sea lion only maintains his mastery of the herd by fighting for it. There are far more adult males than there are herds, and the majority of the bulls are relegated to monastic seclusion on the less desirable and completely celibate sections of the shore; they naturally resent this and constantly try to depose the reigning monarch and take over his harem. The price of sovereignty is eternal vigilance, and the master bull must be on guard day and night. For much of the time, he patrols the sea frontier of his territory, in a series of shallow dives punctuated by hearty roars. This patrolling has a useful function apart from defending his seigniorial rights, because he chivvies back any youngster that may venture out too far, where it would run the very real risk of being eaten by a shark.

When driving off an intruder, a bull can show a turn of speed that his normal patrolling rhythm would not lead one to suspect. Clashes

sometimes result in severe wounds, but this is by no means always the case, the challenger usually finding discretion the better part of valour. But patrolling is an arduous existence and leaves little time for feeding — that is if the bulls feed at all during the mating season. According to Nelson's detailed observations, no bull on his beach kept it up without interruption for more than a few weeks. Either he got too hungry or was worn out by his conjugal duties — or possibly he grew bored with the never-ending sentry-go. Whatever the reason, the master would disappear for a time, and another bull would take over the harem and fight off new challengers until he was replaced in turn. The females did not seem to mind and accepted whatever master the fortunes of battle sent them, continuing unperturbed their leisurely existence, wallowing in the dry sand, scratching themselves and, above all, sleeping. So, the exclusive harem system is not quite so inequitable as it seems at first sight or as it would appear to anyone studying the home life of the sea lion over a short period: given enterprise, perseverance and a fighting spirit, every bull can have his day.

The Galápagos sea lion is not of the same species as the other South American sea lions, which live well to the south in much colder waters. It does, however, have two close though distinct relatives. Geographically, they are widely separated, one form being found in the Sea of Japan and the other along the coast of California. All the circus sea lions belong to this intelligent species. Naturally, they are at their best in the water, where they can display their grace and skill,

but even on land they are not without their clumsy charm. Emerging from the water and waddling up the sand or rock, their short velvety hair is nearly jet black but, as they dry in the sun, they become lighter and lighter, down to a pale gold.

Though some of us may admire the sea lion's skin, it has always been despised by the fur trade. This explains why Galápagos sea lions are still there in large numbers to give pleasure to all beholders. Only a few are brutally and inefficiently killed for their teeth in order to make necklaces for visitors, and if the visitors refused to buy them, this killing would quickly stop. But this is the old story of garments and articles made from so many beautiful birds, animals, and reptiles, and for that matter of the human heads, shrunk by the Jivaro tribesmen on the mainland and highly regarded as tourist trophies. Such killing is obviously wrong, but it does seem a little unfair to put all the blame on the killers and not on the people who, directly or indirectly, pay them to kill.

Fortunately, sea lion teeth have never been fashionable; unfortunately, seal skin coats have. Seals once abounded in the Galápagos. It is one of the many oddities of the islands that fur seals should live and breed right on the equator, but in all probability they made their way north in the cool waters of the Humboldt Current and gradually adapted to the local conditions. There was plenty of food, also caves and overhangs where they could escape the worst of the sun's heat, while the water temperature was lower than elsewhere

on the equator. Somehow, they contrived to overcome the natural difficulties and prospered to become the largest tropical colony of the southern hemisphere genus. Then man came. The sealers — and often the whalers and fishermen, when opportunity offered — took their toll. There is no reliable estimate of the thousands that were killed in the nineteenth century. In 1898-99 the sealing schooner *Julia E. Whaler* collected only 244 skins; the numbers were so depleted that hunting was no longer profitable and this was the last big commercial venture. During their twelve-month stay, the Academy expedition found only one and in 1930, Dr. Townsend wrote: "The peculiar fur-seal of the Galápagos, although formerly abundant, is probably near extinction as none have been seen during recent years."

Nobody would have been more pleased than Dr. Townsend to know that events have belied his dismal prophecy. He came at the end of what we might call "the age of despair," when the scientists thought that the Galápagos fauna was doomed and that the best thing they could do was to collect as much as possible of the little that remained and preserve it for posterity in museums. But the Ecuadorean government's prohibition of all killing and trading (better observed in the case of seals than most prohibitions) and the patrolling of the islands by the Darwin Station, have radically changed the situation — and if this can be done for the fur seals, why should it not be possible for other endangered species? It is difficult to assess the present population as, not unnaturally after such persecution, the

seals tend to live in remote and dangerous places, on steep and reef-fringed coasts, where landing is tricky or impossible. Yet it can now be confidently asserted that in 1971 the fur seals are no longer to be numbered in ones and twos nor even in hundreds — but in thousands. They are still understandably shy of man, at least, of man on land. You cannot walk among their recumbent bodies as you can with the sea lions. But that novel phenomenon, man in the water, is not recognized as an enemy and, when making their film, Joan and Alan Root swam with the fur seals in friendly intimacy.

Chapter Twenty-five

THE BIRDS

The giant tortoises and iguanas have always fascinated man, perhaps because of their great size, but the Galápagos birds are at least as fascinating to scientists and to most visitors; and there are far more of them, both in varieties and in total populations. Of course, oceanic islands never have the same wide range of species as continents, but the Galápagos are better endowed than most, partly because of the way in which, from common stocks, different species have evolved on individual islands. Fashions in taxonomy change. In 1931, Swarth reckoned that there were eighty-nine breeding species and sub-species, but by current standards it is considered that there are fifty-two breeding species, of which twenty-six are found nowhere else, while a good many others are distinct sub-species confined to the Galápagos. In addition, sixty-three species or regular migrants and occasional visitors have been recorded at the latest count.

Bird watchers from North America who visit the Galápagos, particularly during the northern winter, will recognise a number of old friends. As they sail through the islands, they can see flocks of

Red and Northern Phalaropes (which in Britain are respectively if confusingly known as Grey and Red-necked Phalaropes). In and around the lagoons, there are various familiar plovers, sandpipers, turnstones, willets, stilts, oystercatchers, dowitchers, sanderlings, wandering tattlers from Alaska and blue-winged teals. There are four breeding herons, which differ little from the northern races of the Great Blue Heron, Yellow-crowned Night Heron, Green Heron and American Egret. This last, under the name of Great White Heron, will also be familiar to Europeans, as will the Short-eared and Barn Owls.

The Galápagos Pintail, a very distinct sub-species of the Bahama Pintail, is found in good numbers; odd though it may seem, its favourite breeding place is in the lakes in the crater of Narborough volcano, to which it returns whenever that turbulent mountain's eruptions permit. In most upland areas, there is a relative of the little continental Black Rail and, more widely spread, there are two flycatchers, one closely related to the continental Vermilion Flycatcher, the other belonging to the same genus, *Myiarchus*, as the Great Crested Flycatcher, though smaller in size. There is also a local variety of the Yellow Warbler, distinct from the continental races but readily recognisable. The swallow family is represented by the Southern Martin, which nests in crevices in the lava cliffs.

On trips between the islands, boats frequently have a lively escort of dolphins, leaping, rolling, diving with consummate skill and

apparently whole-hearted enjoyment. There are also avian mariners, the shearwaters and petrels, flitting and gliding over the waves with stiff-winged mastery. Audubon's Shearwater nests on the Galápagos in cracks and tunnels in the lava, and there are no less than four species of petrels breeding there; true, the nesting area of Elliot's Storm Petrel (*Oceanites gracilis*) has not yet been discovered but, as the Galapagoan race is present throughout the year and is found nowhere else, there seems no reasonable doubt that it breeds somewhere in the islands, possibly on the Redonda Rock, where nobody has yet been able to land. The Madeiran Storm Petrel (*Oceanodroma castro*) is often to be seen, as it feeds by day on fish and cephalopods. It nests in slight hollows in the soil or inside small caves.

Two species of petrel are of particular interest to ornithologists, but for very different reasons. On uninhabited Tower Island there is a huge end thriving colony of the Galápagos Storm Petrel (*Oceanodroma tethys*). Although they are nocturnal feeders, day after day, from dawn until dusk, thousands of these tiny seabirds flutter around the sky above Tower, like dense clouds of gnats, but each of them banking, twisting and diving on its individual course — occasionally colliding with a dull thud. Nobody has yet been able to provide a satisfying explanation for this curious behaviour, but it is one of the ornithological sights of the Galápagos, and the mystery invites further study. If this prolonged communal flighting — it goes on for months — is carried out by successive relays of different

birds, the total population must be immense — anything up to a quarter of a million breeding pairs, according to Michael Harris.

The same cannot be said of the Dark-rumped Petrel (*Pterodroma phaeopygia*); in fact, it is under threat of total extermination. As a breeding species, it is restricted to the Galápagos and Hawaiian Islands, and it is considered to be in danger of extinction on all the latter. Until relatively recent years, it was safe enough in the Galápagos, where it nests in burrows and caves above the five-hundred-foot line, in areas more or less permanently shrouded in mist during the breeding season. There was no threat to the substantial colony on Indefatigable until the tragic failure of the Norwegian attempt to settle on the island. The settlers perished or left, but the pigs they introduced multiplied rapidly. The pigs included nesting petrels in their diet to such an extent that, during the breeding season, their flesh was so tainted by the taste and smell of petrels as to be virtually uneatable. Rats, dogs and the spread of cultivation speed up the process of extermination and, unless steps are taken promptly, this once not uncommon bird will be headed for inclusion in the IUCN's list of endangered species.

The seabirds must have been the first to establish themselves on the islands, as there was fish for them to feed on before there was vegetation and insects to support a population of land birds. While the great distinction of the Galápagos is the high proportion of its birds and beasts that exist nowhere else, there is a small number of

species of more widely distributed seabirds that have colonized the islands and which are no less interesting because they are to be found on other tropical shores. The Brown Pelican, which nests in the mangroves, is a constant source of delight; however clumsy-looking an impression it makes, when flying or fishing, it is a very efficient operator, whether in the air or the water. The Noddy, which nests on ledges and in cavities in the water-edge cliffs, looks the reverse of what a tern should look — like a photographic negative — with its dark body and pale cap; and it has a rounded instead of a forked tail. Another cliff-dweller, a bird of quite exceptional beauty, is the Red-billed Tropic Bird. There are few more attractive birds in flight, with the rapid beat of its white, finely-barred wings and its incredibly long, slender tail feathers streaming out behind.

The archipelago is fortunate in that two out of the world's five species of man o' war (or frigate) birds breed there; their ranges within the islands overlap to a small extent. Although the two species are quite distinct to the scientist, the newcomer may find it difficult to separate the adult males except at very close quarters — and they spend much of their day soaring around effortlessly at inconveniently great heights for the observer. The juveniles, with their white heads, dark breasts and white bellies, are also virtually identical. However, in the case of the females, though both species have white breasts, the Great Man o' War has also a whitish throat and fore-neck, while these parts are blackish in the Magnificent Man o' War. Both species are supremely well-designed flying machines.

They have a higher ratio of wing area to weight than any other bird; with a wingspan of up to eight feet, their bones weigh a mere quarter of a pound. This phenomenal aerodynamic specialization has been achieved at the expense of other qualities, and their small legs and feet will not serve either for walking or swimming. When they land, they choose the branch of a tree or a steep rock from which they can more easily take off again. Their plumage is not fully waterproof, so they rarely alight on the sea, but they can pick up a fish or a squid from the surface or from a fisherman's net without even touching the water. Fishing is their main source of livelihood, though they have achieved greater notoriety by their piratical practise of chasing other seabirds — particularly boobies — and making them disgorge their catch, which they then retrieve in the air by amazing feats of aerial skill and precision.

Most of the time, as it glides tirelessly across the sky, the male of either species seems simply a large black bird with a long pale bill and a barely visible dull red strip running down its throat. But when it wants to attract a female, its whole appearance alters dramatically; the little red gash swells and is blown up into a huge scarlet balloon. Throwing back its head and raising the astounding protuberance towards the sky, it reverses its long, outstretched wings to reveal the under-surfaces and agitates them furiously, at the same time giving vent to a prolonged high-pitched trilling yodel — an avian equivalent of the wolf whistle. Several males often perform together in competition to attract any female flying past, putting on a show

which is unique in nature. Whether in its ecstatic courtship display or performing its aerial acrobatics, the man o' war is an outstandingly spectacular bird.

The Galápagos have no less than three breeding species of boobies. The name probably derives from the Spanish *bobo*, meaning silly or stupid, and they are closely related to the gannets of the temperate latitudes. While all three can be found on other tropical islands, their presence adds much to the ornithological interest of the Galápagos and Bryan Nelson, who with his wife spent a year on the waterless islands where they breed, has described their fascinating colonies in detail in his recent book, *Galapagos: Islands of Birds*. While their total numbers do not remotely rival those of the Peruvian offshore islands, and therefore provide no basis for a guano industry, there are many tens of thousands breeding up and down the archipelago, and the Red-foot colony on Tower Island is probably the largest in the world for this species. Of the three species, the Red-footed Booby is unusual in that it nests in bushes. The White (or Masked, or Blue-faced) Booby and the Blue-footed Booby are more conventional and nest on the ground, like others of their family. They are a bit difficult to separate in the air, but at their breeding places, the deep red feet of the one, the vivid blue feet of the other, and the greater size, striking white plumage and dark mask of the third clearly indicate which name belongs to which adult.

The Galápagos Flamingo is not generally classed as a separate species, but it is, at any rate, a very distinct sub-species. Like certain other Galápagos specialities, it appears to have strong affinities with those found in the Caribbean area, but in other respects it resembles South American forms. Quite apart from its interest to science, it is a bird of outstanding beauty and, with adequate protection, its rich colours and stately walk can continue to give joy to the increasing number of non-specialist nature lovers who visit the islands. But it is just these visitors who may now constitute the gravest threat to its survival. In the past, it has been persecuted for food and fun. It should now be possible to put an end to such forms of persecution, but the numbers remaining are dangerously low, probably not more than about five hundred in all. By Galápagos standards, flamingos are shy birds and resent disturbance, particularly in their breeding places, where they build their curious nests of mud in the very limited number of suitable shallow lagoons. If, in addition to disturbance by fishermen, they have to face visits by large parties of tourists, the consequences could be fatal. The temptation for the photographer to get just a little closer or to flush the birds into flight may seem irresistible but it must be checked by wardens or competent guides. After all, survival is more important than home movies, and binoculars provide all the close-ups that the visitors themselves could reasonably desire.

Out of the world's forty-three gulls, only two breed in the Galápagos, but these breed nowhere else and are just about as

different from one another as two gulls can be. Gulls, as a family, are shore or coastal birds and the Lava Gull is typical in this respect and most others. It is at home near the tide edge; it makes its living as best it can, being nearly omnivorous and equally ready to scavenge on the beach, catch a fish in the shallows, steal an egg or gratefully accept a piece of your sandwich. It does none of these things very efficiently, according to Dr. Nelson, who observed it closely while suffering from its inquisitive and thievish habits, but it continues to exist in fair numbers up and down the archipelago. In appearance it is not unlike its mainland relative, the Peruvian Grey Gull; black below, with a bright white spot behind the eye and a striking flame-coloured gape. The value of its camouflage colouring is anything but obvious as it has no enemy other than the Man o' War Bird, which sometimes robs it. The camouflage may be of marginal help when the bird is sitting on eggs; certainly, the Lava Gull is expert in concealing its solitary nest, and it was not until 1965 that the first was found, in spite of the way the Darwin Research Station conscripted its guests in one vain search after another. It dive-bombs intruders into its nesting territory with alarmingly low attacks — but so far no casualties have been reported. A rather sedentary gull, it has never been recorded outside the Galápagos Islands.

If the Lava Gull is a typical member of its family, the Swallow-tailed Gull is highly untypical. Unlike most gulls, it is oceanic rather than coastal, travelling vast distances over the sea in search of food. Alone among gulls, it feeds at night like an owl. A further peculiarity is that

it is not a scavenger but depends for its food on fishing, chiefly for squids. Its voice, too, is unlike that of other gulls, and its tail is much more deeply forked than any other — in fact, more deeply than those of many terns. In addition to its peculiarities, the Swallow-tailed has the distinction of being the most beautiful in the world. The mantle is a lovely shade of grey, with a much darker grey hood and white underparts. The legs and feet are pink, the long-pointed tongue crimson. The most striking feature is the very large brown eye (for fishing at night) surrounded by a vivid vermilion orbital ring. The long, thin bill is black with a pale tip and a conspicuous white patch at the base; this last feature is more visible to the young at the nest when the parent returns from fishing in the night hours and, by pecking at it, the chick stimulates the adult to regurgitate the food it has brought. They are as beautiful in flight as in repose, their long, narrow, pointed wings having black tips and an easily recognizable white triangular patch. Their flight is powerful as well as graceful.

The Swallow-tailed Gull lays its single egg on the shingle, the rough lava or on cliff ledges; the nest is little more than a scrape. There is no summer or winter in these equatorial islands (at least, not in the sense that the words are used in temperate latitudes), and the gulls breed throughout most of the year. Moreover, their breeding cycle is not an annual one: David Snow, who methodically recorded their nesting dates, has recently shown that their internal cycle is in fact only about nine months. The Swallow-tailed Gulls nest in loose

colonies. When breeding, they are extraordinarily bold. They greet the intruder with their loud un-gull-like cries, which specialists have broken down into a number of distinct and significant calls, but which to the non-expert are simply a persistent racket. They hate to give ground if you approach their nest and will shriek and peck at a sea lion if it gets too close to their egg; Michael Harris has seen a gull suffer a broken leg rather than make way for a big bull. Fearless as they are near their nests, they are reported to be very shy when away from them — and, unlike the Lava Gulls, they leave the islands when they have finished breeding and wander over the ocean, particularly towards the coast of Peru.

We normally associate albatrosses with the icy gales of the Antarctic Ocean, but surprisingly enough, there is one species which breeds in the Galápagos, within a few miles of the equatorial line. This is the Waved Albatross, only found on Hood Island; it lights on no other land in the archipelago nor elsewhere in the world, though it roams the Pacific Ocean when not breeding. It is by no means the biggest member of its family, but is still a substantial bird, the size of a domestic goose and with a wingspan of eight feet or so. Built for ranging over the high seas, it is an impressive spectacle as it glides above the waves, but ungainly as it waddles through the boulders and spiny scrub of Hood, a smallish, low and arid island.

The Waved Albatross gets its name from the wavy grey lines which decorate the whole of its white underparts. Above, it is brownish

black, and its white head and neck are lightly washed with yellow. The most striking feature is the bright yellow bill, six inches long and hooked at the end. Such a large bird, admirably adapted as it is to sailing on the high winds, it is at a grievous disadvantage on land. When coming in from the sea, it often tumbles over, and injuries are common, sometimes fatal. In order to take off, it needs a long runway; it patters along with outstretched wings over the uneven ground, striving to reach a speed at which it can become airborne. A cliff edge is an obvious convenience for the take-off but as, for some less obvious reason, the Albatrosses frequently nest hundreds of yards inland, they would have a long and laborious trudge to reach one.

To speak of the Albatross's nest does the bird too much honour; the single egg, weighing half a pound, is simply laid on the bare ground. When hatched, the chick is brooded for a fortnight, after which it is left to its own devices, the parents returning only to feed it. Feeding the youngster is a big enough job in itself. Albatrosses have a sort of chemical plant in their stomach where they can convert fish into oil. This enables them to stay out at sea, ranging far from their "nest" for days on end, returning with an ample supply of liquid food. This is then pumped up into the chick. Feeds are few, often days apart, but enormous when they occur. Bryan Nelson found that a chick could take over four pounds of this nutritious pabulum at a single meal, lasting only a few minutes. Admittedly, at the end of it, the fortunate (or unfortunate) offspring, with its bulging belly, could no

longer stand on its feet. This high-pressure feeding goes on for week after week until, at the end of five months, the downy, chocolate-coloured chick weighs much more than either of its parents. As it emerges from downy babyhood to feathered adolescence, the youngster ("chick" seems such a ridiculous name for this huge creature) begins to slim and assume more aerodynamic proportions, but it will probably be thirty weeks old before it can take to the air and the ocean and so become self-supporting. How it finds its way back to the lonely, desolate island of its birth and the only place in the vast ocean where, in its turn, it can breed, is one of the mysteries of migration which still calls vainly for a satisfying answer.

These albatrosses have a remarkably elaborate courtship ritual which they persist in long after every egg in the colony has been hatched. It is a kind of formal dance in which a number of standard movements or positions are repeated time and time again, though not always in the same sequence. The two birds face one another and touch their great bills together. Now they weave their bills one round the other; now one of them stretches its long neck and bill vertically skywards; now they cross bills as fencers cross their foils; now one or both open their bills in a mighty gape. With variations and brief disengagements for ritualized walks, the ceremony can last for half an hour, punctuated with bill-clapping, grunts, whoops and something resembling laughter; and when the excitement increases and a number of pairs join in the display, the sound as well as the sight is something to be remembered.

What with courtship, incubation period and upwards of six months feeding the chick, the breeding season does not leave much out of the albatross's year for roaring the high seas. It is therefore not surprising that pairs do not breed every year. As far as present knowledge goes, every second or third year seems a likely average but, as these are long-lived birds, it will no doubt be some time before the ringing and recording operations of the Darwin Station produce reliable life histories and population statistics. The interval between layings, together with the single egg and the probability that these albatrosses do not breed at all until they are about five years old, makes reproduction a slow process at best. Then there are occasional bad years. In 1967, for instance, there were heavy rains and even the dead-seeming shrubs on normally bone-dry Hood burst into life; but the mosquitoes also burst into life — dense clouds of them — and Roger Peterson, as wide-ranging a voyager as any albatross, assures us that they were worse than the blood-sucking hordes of the arctic tundra. Maddened by the unaccustomed insects, most of the great seabirds abandoned their eggs.

Wet years on low-lying Hood are rare indeed, but there is always the danger of man. Theodor Wolf noted that in 1876 a group of fifty-odd workers, collecting orchilla moss, lived for a month on albatross eggs. This will not happen again (Hood is uninhabited), but tourists will arrive in far larger numbers than the orchilla gatherers and, unless accompanied by competent guides, over-enthusiastic photographers could harass the wretched birds almost as badly as the

mosquitoes. It would not be difficult to bring this new threat under control and, if it is, the outlook for this remarkable albatross colony is fairly encouraging. Michael Harris, who has been studying and ringing the birds for some years, has shown that total numbers are much higher than was recently feared. In the unlikely event of full protection producing a population explosion, there is lots of unused living space available on barren Hood Island.

If it is surprising to find an albatross breeding near the equator, how much more so to find a penguin! Yet the Galápagos Penguin nests in a tiny area straddling the equatorial line and is accordingly the only penguin to have crossed into the northern hemisphere — though not very far. Not only is it the sole equatorial penguin, but it was also the last species to be discovered, the one about which the least is known even today, the smallest and, sad to say, the rarest member of its family. That it should be the smallest penguin is in accordance with Bergmann's Law, which states that closely related species tend to be biggest in the coldest areas and smallest as they approach the tropics; thus, we have the ninety-pound Emperor Penguin breeding on the Antarctic ice and its tiny Galápagos relative on the equator. It is a safe guess that it arrived at the islands in the cool waters of the Humboldt Current, which has made it easier for a cold-climate bird to adapt to this geographically improbable habitat. Nevertheless, it remains a remarkable feat of adaptation and, as Robert Cushman Murphy observed, "the species is, indeed, a monument among vertebrates to the directive or selective power of

an environment, and to the fact that the filling of ecological niches is another warrant for the old say that nature abhors a vacuum."

There is something endearing about the little penguin, so tame, so friendly as it clammers awkwardly up the steep, wet lava, using its flippers to help its feet, or hops along on the flat slabs, or plops back into the sea feet first. Lubberly on land, it is in its element under the water where its wings, useless for flying, combine with its webbed feet to give it a pretty turn of speed. Perhaps "useless for flying" is an overstatement, as it sometimes shoots out of the water for short distances like a porpoise. Its numbers are small, perhaps two to three thousand; they probably never were very great nor ever will be, even in the best circumstances. There is little deliberate persecution nowadays, but too many are trapped and drowned in fishermen's nets. This delightful bird needs all the protection we can give it.

A neighbour of the penguins in the small corner of the archipelago where they both breed is an even more remarkable bird, the Flightless Cormorant. While the Galápagos Penguin is the smallest in the world, the Flightless Cormorant is the largest member of its family; it must be left to others to explain how this fits in with Bergmann's Law. As its name implies, this cormorant's wings are useless for flying; indeed, they no longer seem to serve any useful purpose whatsoever, as the bird does not use them even in swimming, as the penguin does, but keeps them closely tucked into its body, relying entirely on the powerful thrusts of its great webbed

feet. A true cormorant, nevertheless, on emerging from the water, it stands with its wings outstretched to dry in the sun, when the short, poorly feathered remnants look like the ragged sails of a derelict windmill. We can assume that this particular cormorant, finding abundant food in the water around its remote island, lived more and more in the sea. With no enemies to fear on land, the ability to fly lost its selective advantage and was subordinated to skill in the water; so, gradually, the unused wings atrophied.

The Flightless Cormorant is highly efficient in the water, but this high degree of specialisation could lead to its extinction in the event of a change in its environmental conditions. The arrival of man and his domestic animals could herald such a change. The late, lamented Dodo was flightless and failed to survive human invasion. While the penguins nest in caves and cracks that are difficult to find, the cormorants prefer flat areas of lava, open to the view. There, by the edge of the sea, they build their nests of seaweed, flotsam, and droppings. When a breeding bird returns from fishing, it courteously presents its blue-eyed mate with a piece of seaweed which may, or may not, be added to the nest. They are very tame, and during the breeding season, at least, it would be easy enough to kill cormorants with a stick — in fact, ships' crews often amused themselves with this facile sport. Today, the chief danger is the fishing nets in which the big birds, however unintentionally, are all too often killed. As ever-increasing numbers of tourists descend on this favourite target, there is also the new question of how much

close-up photography even the most tolerant of birds can withstand. There are probably less than a thousand pairs in the Galápagos and none anywhere else.

Another and very different bird in considerable danger is the Galápagos Buzzard. Although a distinct species, it is related to other *Buteos* on the mainland, most closely to the Zone-tailed Hawk. It must be the tamest hawk on earth and this, of course, is the cause of its undoing. Early accounts are full of travellers' stories of hawks alighting on their guns and the ways of killing them without even using these guns. As these hawks were never regarded as a gastronomic delicacy, the killing in those days was purely for pleasure, though perhaps this was combined with an innate hostility to birds of prey. These instincts have no doubt persisted, but the arrival of settlers added the more substantial motive of protecting chickens. Formerly common, it has lately become extinct on three of the islands where it previously bred, and it survives only tenuously on the others, with a total population of perhaps two hundred birds. It would be a thousand pities if the Galápagos were to lose their only hawk — and such a splendid one. The islands are surprisingly lacking in raptors, apart from this buzzard and the two owls; there are no kites, falcons or accipters, and for that matter, no vultures. This lack of predators is no doubt largely responsible for the extraordinary tameness of the birds and beasts — just as the absence of man, until biologically recent times, was responsible for the tameness of the Galápagos Buzzard.

There are two groups of birds in the Galápagos that attract the attention of every visitor and stir excitement in the breast of every self-respecting ornithologist; these are the finches and the mockingbirds. Not that their appearance is at all spectacular — in fact, they are a rather drab lot — but they were the catalytic agent that started the process in Darwin's mind that led him to his revolutionary theory and changed man's way of thinking about himself and the world he lives in.

To the Europeans, the mockingbirds may look like "a sort of thrush," but to the Americans they are quite obviously "mockers." Yet they differ in many ways from the North American species and from the one in the coastal region of Ecuador nearest to the islands. More important than this, they differ from island to island. Until such time as the specialists in systematics can agree among themselves, if they ever do, we must leave open the question of whether there are eleven species or four species or eleven races of a single species. The main thing is that they do differ not only from other species but from one another, in such matters as size, length and shape of bill, length of leg, colour, voice and probably habits. Yet, it is clear that they are all descended from the same ancestral stock and have developed in different directions during long periods of isolation on separate islands.

While there are differences of degree, it is a fair generalization to say that they are a bold, cheeky, inquisitive clan who make the thievish

magpie and the jackdaw of Rheims look like timorous and incompetent amateurs. They will steal anything, anywhere, edible or not — and they are nearly omnivorous, feeding on insects, crustaceans, fruit, eggs, lizards, dead chicks and anything in a lunch packet that comes within range of their rather long, curved bills. With their longer legs, they run more and fly less than the mainland species. Mockingbirds have prospered in this harsh environment not by specialization but by adaptability and, as few forms of passerines have been able to reach and establish themselves in the Galápagos, they have enterprisingly occupied and exploited niches which, on the mainland, belong to several different genera.

Few birds have had so much written about them and probably none has made such an impact on science as Darwin's finches. More or less sparrow-sized, black or grey-brown, at first sight they are not a very exciting group — until one looks a little closer and notices the extraordinary range of the shapes and sizes of their bills. Together they constitute the most remarkable living demonstration of the evolutionary principle of adaptive radiation. Most of them are sufficiently similar to suggest, very strongly indeed, that they are descended from a common ancestor, but at the same time, they are sufficiently differentiated in appearance and habits to be visibly members of separate species. It was Darwin's luck to have encountered this most beautiful illustration of species formation; it was his genius that enabled him to understand what he saw and to think what no one had ever thought before.

There are thirteen species and numerous sub-species; apart from one species on the Cocos Islands (a few degrees to the northward), they are confined to the Galápagos. Like the mockingbirds, they have taken over a number of ecological niches occupied by a variety of mainland avian families which have failed to reach or, at any rate, have failed to establish themselves in the archipelago. But they have evolved along rather different lines; whereas a single species of mockingbird exploits a number of niches, the finches have become more specialized.

This is seen, for instance, in the case of the "ground finches," which look very much alike, but which have developed a range of bills adapted to taking different types of seeds; at one end of the range (*Geospiza fuliginosa*), the bill is about the size of that of a Goldfinch and is suited to eating relatively small, soft seeds, while at the other end (*Geospiza magnirostris*), the bill is bigger than that of a Hawfinch; it is probably the most powerful bill of any finch in the world and is adapted to crushing the hardest seeds. Because of this differentiation in feeding habits, the two can live side by side. The same is true of a little group of "tree finches;" they all have more or less parrot-shaped bills, but these bills are sufficiently distinct to allow each to exploit a different range of food sources.

Other members of the family have diverged quite markedly from the typical finch pattern. One of them (*Geospiza scandens*) has a slim, tapered bill, well adapted to probing cactus flowers and pads, but

otherwise, it still looks very much like the ground finches. There are no titmice in the Galápagos, but their ecological role has been taken over by one of Darwin's Finches, which feeds and behaves in much the same way as a tit. In the same way, another member of the family has occupied the niche of the warbler and vireo; with its slender pointed bill, it flits restlessly around in search of insects and has not only come to behave like a warbler, but actually to look very much like one — so much so that Darwin at first had difficulty in believing that it belonged to the same family.

Perhaps even more remarkable, certainly more spectacular from the point of view of behaviour, is *Cactospiza pallida*, commonly called the "Woodpecker Finch." Of course, it is not a woodpecker, but as the woodpecker is absent from the islands, this finch has occupied the niche filled elsewhere by the nuthatches and the woodpeckers. Its strong, sharp bill enables it to dig into soft wood, like a small woodpecker, and open up insect burrows; but from this point onwards, the finch is relatively at a disadvantage because it lacks the long, barbed tongue with which most true woodpeckers winkle out the exposed insect from the bottom of the hole. The finch has largely overcome this disability by the extraordinary device of using a tool.

Having uncovered its prey, it looks for a cactus spine or a thin twig. Holding this in its bill, it prods the insect until it moves or is otherwise brought within range. It is most unusual that a bird should use a tool, but this finch is astounding and virtually unique

among birds in that it is not merely a tool-user but also a tool-maker. It may pick up a fallen spine but, if none is conveniently available, it will break one off the nearest cactus; or it may take a twig and break it to the right size and shape for its particular purpose. This suggests that we are faced not merely with an instinctive action but that the bird is using its intelligence to relate cause and effect. It is certainly an amazing manifestation.

It was this remarkable group of finches that so deeply impressed Darwin and inspired his much-quoted lines: "Seeing this gradation and diversity of structure in one small, intimately related group of birds, one might really fancy that from an original paucity of birds in this archipelago, one species had been taken and modified for different ends." With this penetrating observation, he was off on the long trail that led to *The Origin of Species*. The years have passed, and generations of scientists have continued to study the finches in museums and universities all over the world and increasingly in that "living laboratory," the Galápagos Islands themselves. With the establishment of the Darwin Station, such studies will be greatly facilitated. But in spite of all the work that has been done, those living scientists such as Dr. David Lack and Dr. Robert I. Bowman, who, in the field and in the study, have devoted most time to the problems raised by Darwin's finches, would be the first to insist on how much work still remains to be done. It is therefore vital that these birds, which have contributed so much to our understanding of the process of evolution, should remain undisturbed while our

knowledge is further extended. All the species and most of the subspecies still exist in good numbers, but their beautiful demonstration of adaptive radiation could be drastically upset by the irresponsible introduction of exotics. It has happened elsewhere. It must not happen in the Galápagos.

Chapter Twenty-six

SURVIVAL

For centuries, man has protected himself against the environment — now we must protect our environment against man.

Henry Charnock.

There is nothing in evolutionary history to suggest that instincts, in man or beast, are subject to rapid change — but attitudes and conduct can be changed to a noticeable extent. When describing the peaceful recreations of the privateers, William Funnel, one of Dampier's mates on his second voyage round the world in 1703-4, tells us that "the ordinary way of killing Sea-lyons was to clap a pistol just to his mouth as it stood open and fire down his throat." This was the most effective method; but, Funnel continues, "if we had a mind to have some sport with him, which we call Lyon-baiting, a group of sailors with half-pikes would prick him to death, which commonly would be a sport for two or three hours before we should conquer him." Men may be inherently as cruel as ever but few today would dare to publish such an account of their pastimes. Nor would a modern naval captain describe how he and his men beat in the

heads of hundreds of harmless marine iguanas nor how the beautiful and tame little doves "afforded great amusement to the younger part of the crew in killing them with sticks and stones;" yet Captain Porter records these activities with the same lack of censure with which his modern counterpart might mention that the younger end had luckily found a Galápagos beach wide enough for a game of baseball.

Attitudes *can* change; indeed, we actually see them changing in the case of Charles Darwin, who once regarded the first day's partridge shooting as the crowning event of each of his early years. Without condemning others, he explains how his outlook changed during the voyage of the *Beagle*: "During the first two years my old passion for shooting survived in nearly full force; but gradually I gave up my gun more and more and finally altogether to my servant, as shooting interfered with my work. I discovered, though unconsciously and insensibly, that the pleasure of observing and reasoning was a much higher one than that of skill and sport. The primeval instincts of the barbarian slowly yielded to the acquired tastes of civilized man." In our own day, the instinct to kill and collect trophies is being increasingly sublimated by capturing animals on film — although even here, at least one visitor to the Galápagos has occasional, and quite selfish, regrets that he spent on photography so many of the fleeting hours which he might have devoted to observation of plants and animals that he may never see again.

Attitudes *have* changed. Lyon-baiting and iguana-bashing are no longer the diversions of foreign sailors, and the slaughter of animals for the sole pleasure of inflicting pain is increasingly rare in the Galápagos. But the solution to the present and future problems of conservation requires more than the renunciation of a few sporting activities; individual interests will also have to be sacrificed.

Generally speaking, for inclusion in the United Nations' List of National Parks and Equivalent Reserves, the designated area must be set aside in perpetuity, under the control of the national authority, for the preservation of its flora, fauna, geological formations, natural beauties and anything else of aesthetic or scientific value; private property, individual rights and all hunting and destruction of vegetation should be prohibited. This is not yet the case in the Galápagos, and the present status of the "National Park" needs clarification, together with precise delimitation of those parts of the archipelago which are to be included within the park. It also seems highly desirable that there should be a National Park Service with sufficient staff and authority to see that the law is respected. Decisions on these matters are the most urgently required because on them depends the survival of one of the Earth's most valuable ecological entities. It should never be forgotten that oceanic islands are particularly vulnerable and have the melancholy distinction of the highest extinction rate of any habitat in the world. A few more years of *laissez faire, laissez aller* could have irreversible consequences.

It would ill become what Sir Frank Fraser Darling calls "the overdeveloped countries" to preach to underdeveloped countries on conservation matters. The mess that Britain, the cradle of the industrial revolution, or the United States, the most highly industrialised nation, have made of their environment in pursuit of quick profits calls for a considerable degree of humility. But that is no reason why the less developed countries should not learn from the short-sighted mistakes of the pioneers of modern economic development. When sober-minded men in the "advanced" countries become so alarmed at the projected effects of the present population explosion, combined with the technological explosion, that they ask whether man himself is not becoming an endangered species, it seems high time for governments everywhere to rethink their priorities.

Conservation almost always involves making a choice between conflicting interests, each of which can be justified. Such conflicts of interest exist in the Galápagos, but, fortunately, the balance of advantage seems clearer than in most cases. From the industrial and agricultural points of view, the economic potential of the archipelago is very low indeed. All the islands are entirely volcanic and without oil, coal or valuable minerals. There is a grievous lack of water. Most of their surface is barren, and even the crops grown in the few pockets of good soil could be produced more advantageously in mainland Ecuador — which, in any case, usually has a surplus of coffee and bananas. So, agriculture is largely

subsistence farming, and the standard of living it provides remains pathetically low. Charles Island, scene of so many attempts at settlement by foreigners and Ecuadoreans since Patrick Watkins dug the first vegetable patch over a century and a half ago, even now only supports a population of fifty — far less than the number who have died violent deaths there, not to mention the long history of human suffering. On the other side of the ledger, we have the extinction of a unique race of giant tortoise and much other wildlife, while there is hardly a spot where the native vegetation has not been irreparably disturbed by the introduction of exotic plants.

Any effective conservation programme will meet with resistance from various quarters even though, in the long run, conservation would be to the advantage of the objectors. Considering the pre-eminent importance of conservation in the Galápagos compared with the opposing interests, it should not be impossible to resolve these conflicts. To start with, the renewed use of the islands as a penal settlement can surely be dismissed from the list of dangers; very few prisoners have been sent there in the last ten years, and Ecuadorean public opinion would barely condone a return to the practices of earlier days. The threats that do have to be considered arise chiefly from the settlers and fishermen, the introduced animals now running wild, and the ever-increasing numbers of tourists to be expected in the future.

The nascent tourist industry should be the easiest to deal with, both because there are as yet few vested interests and because the intelligent development of tourism depends on conservation. Many friends of the Galápagos will regret that the islands should become a tourist attraction, but there seems no possibility of preventing this, even if it were desirable to deny thousands of nature-loving visitors a unique experience, hitherto reserved for the fortunate few. Ecuador is neither a large nor a rich country, and her development has been held back by a chronic lack of foreign exchange. Tourists are a rapidly increasing source of revenue in most parts of the world and, even with the prospect of vastly increased income from the recently discovered oil fields, Ecuador cannot be expected to forego the benefits of the tourist trade; her economy, for too long precariously dependant on a single export crop, will be greatly strengthened by diversification and this will also offer new and badly needed opportunities of employment for the rising generation.

The development of tourism in the Galápagos could contribute substantially to the prosperity both of the islands and of the mainland. Ecuador has many and varied delights to offer the visitor, but they are inadequately known and difficult to publicise because they lack any strong focal point on which to concentrate attention. Neighbouring Peru has Machu Picchu; tourists may only spend a few hours there, but it draws them to Peru in their thousands. The Galápagos, the part of the republic best known to the outside world, could provide a similar magnet to draw visitors to Ecuador and

popularise its other attractions. The remarkable wildlife films made by German, Canadian, British, and other photographers have brought the Galápagos onto the television screens in many millions of homes all over the world.

Quite obviously, there could be conflict between tourism and conservation. However, the small but expert mission sent by the British Ministry of Overseas Development in 1966, at the request of the Government of Ecuador, to examine the twin problems of conservation and tourism in the Galápagos, reported firmly in favour of tourist development — provided always that an adequate National Park Service was created with full powers to protect and control. Tourists and those who organize tours do not like restrictions any more than the local inhabitants do; but the long-term interests of conservation and tourism are so closely identified that this problem should not be too difficult to solve. The one thing that will attract visitors to the Galápagos is the wildlife. As a conventional seaside resort with hotels, nightclubs and casinos, the islands have little future; mainland Ecuador has endless miles of better beaches, much more easily accessible and with less acute problems of providing water, electricity and so forth. Not many people would make the long journey to the islands when they could find so many conventional resorts nearer to their homes. The drawing power of the Galápagos is wild nature; if this is destroyed, their special attraction goes.

Therefore, it is in the interest of the tourist trade to support conservation because, otherwise, it will destroy the very asset on which its future depends. The national authorities and the more responsible tourist organizations are well aware of this. It means accepting a certain discipline, as in all nature reserves. Tourists should be accompanied by guides both to show them what is most interesting and to see that they do not endanger the rare species. All visits to the reserves would properly come under the control of the Park Service, which could be financed by charging visitors an entrance fee, as is done elsewhere. A well-conducted tourist industry could therefore provide substantial aid to conservation, just as conservation could provide a basis for tourism.

The protection of wildlife from the tourist — or, for that matter, from the settler — has its peculiar aspects in the Galápagos owing to the extraordinary tameness of almost all the native species. Nowhere in the world are the birds and beasts so unafraid. Darwin was greatly impressed and devoted several pages of his *Voyage of the Beagle* to this peculiar phenomenon. Comparing current experience with the buccaneers' accounts, the birds do seem a little less confiding today and no longer "alight on our hats and arms." Nevertheless, they have been extremely slow in acquiring a sense of fear, whether because of something lacking in their stock of genes or some other factor. As Darwin prophetically concluded: "We may infer from these facts, what havoc the introduction of any new beast of prey must cause in a country, before the instincts of the

indigenous inhabitants have become adapted to the stranger's craft and power." What Darwin apparently did not realize was that the new beast of prey was man — or more accurately, man and the exotic animals he brought with him — because dogs, pigs, goats and, for that matter, man himself are all exotics in the Galápagos. So we have the paradox that the wild animals have remained tame while the introduced species, although domesticated for thousands of years, have quickly reverted to the habits of their distant ancestors and become "wilder" than the native creatures. The balance of nature has been upset as the "wild" immigrants are destroying and displacing the "tame" natives.

Because of this extreme tameness, large numbers of kindly tourists could also cause havoc from sheer ignorance. With such creatures, the temptation to get just a little closer with the camera is hard to resist — but it must be resisted. Most tourists are inclined to treat lions or elephants with a certain degree of respect, but the gentle natives of the Galápagos cannot inspire the same caution and restraint. There is a limit to the amount of harassment that even the tamest bird can endure, and large parties of boisterous visitors to flamingo or albatross colonies could do great harm, particularly during the breeding season. A telephoto lens may not be absolutely essential in the islands, but it is kinder to the birds than bringing the camera right up to them on their nests.

It is possible to reason with tourists. Goats are another matter. Yet, however much direct protection the wildlife receives and however successful the Darwin Station may be in the artificial breeding of endangered species, there can be no enduring victory for conservation if habitats are destroyed; today they are still being destroyed by introduced species, and new depredations remain a constant menace. With its own very limited resources, supplemented by the generosity of sympathetic friends, the Darwin Station has been able to chalk up some initial successes in limited areas but, at best, it will take years to bring all the prolific populations of rats, pigs, and goats under some semblance of control. And even while these modest victories are being won, goats are being introduced into islands hitherto free from them, where they rapidly multiply. While the Darwin Foundation can take legitimate pride in having saved the Duncan and Hood tortoises from extinction, its scientists fully realize that there is no long-term future for either as long as the rats devour the young and the goats destroy the vegetation.

Fishermen find it convenient to have a stock of meat on the hoof whenever they visit an island, and they have our sympathy. Like the pirates and the whalers before them, they lead harsh lives and, being at sea for long periods, they need fresh food. But when one compares the debits with the credits, the enormous damage done to a unique environment against the small gains to a few individuals, it does not make sense. Strict control by a National Park Service seems the only

reasonable answer. If we imagine the consequences of the introduction of black rats and goats on Narborough, one of the few islands which has so far remained virtually undisturbed, the moral seems crystal clear. Even from the most materialistic point of view, it is obvious that tourists will only travel great distances to the Galápagos to see what they cannot see anywhere else; they will not go there to see goats or rats, however numerous. The uncontrolled proliferation of introduced animals is thus incompatible not only with the preservation of the native species but also with the development of tourism.

In their report to the Ecuadorean government, the British mission suggested that the National Park should include a thousand-metre zone of the sea along the boundaries of those parts of the islands to be declared nature reserves — which means that no fishing would be allowed there — because the marine life around the coasts is almost as fabulous as that on the land; but considering that this would be hard on the island fishermen and believing that most of the damage was caused by foreign and mainland vessels, they recommended that an exception should be made and that the local residents should be granted free, annual permits to continue to fish as before. It would not seem unreasonable to make the renewal of such permits conditional on compliance with the National Park regulations.

The most intractable problem is that of the settlers. It might have been better for the republic if the islands had never been colonized, as they provide a more suitable home for tortoises than for men; but the settlers are there, and they now have their rights, which cannot be ignored. President Alfaro considered that in the nineteenth century the Galápagos had been a drain on the nation. The chief export had been live tortoises, but the foreign sailors had been allowed to take these without payment. The not-inconsiderable investments had produced little return, and, on the debit side, there was the long story of violence, misery, and death. After a century of attempted settlement, there were only a couple of hundred inhabitants in the whole archipelago, but since the war the population has shot up to about four thousand. The new settlers, like their predecessors, find life difficult and turn to the central government for alleviation of their condition. They very naturally want communications, public works, educational and medical facilities which their scattered communities cannot themselves afford. This is not a peculiarly Ecuadorean problem; every country knows it in one form or another. The question is how far it is wise for the national authorities to subsidize an increase of settlers if this is against the national interest.

Ecuador is suffering acutely from its violent population explosion and the crying need of the Andean peasants for more land. But the arid Galápagos can contribute little to the solution of this problem; even now, less than one in a thousand Ecuadoreans live there, and

many of these would be only too glad to return to the mainland if only they had the means to do so and land was made available to them. The country still has vast undeveloped zones which would be better suited to settlement than the Galápagos but development — even access — is often difficult or impossible for the individual peasant, though the recent discovery of oil in the Amazonian provinces should mean the opening up of new areas. Meanwhile, legally or otherwise, settlers continue to arrive and, finding it hard to make a living, have a compulsive need to occupy land which the authorities in the capital intend to set aside as sanctuaries. This is a very real problem. The trivial pecuniary benefits that the settlers obtain by encroaching on the nature reserves may seem to conservationists to be out of all proportion with the irreparable damage done to the unique flora and fauna; but to the settlers, these small gains are desperately important because they are poor and life is hard.

Once settlers are established and have occupied land, however illegally, they acquire rights — at least in their own opinion — so it is obvious enough that the best course for all concerned is to limit further immigration and to clearly define the boundaries of the nature reserves. Even so, there will be conflicts of interest between settlers and conservationists. Not many of the settlers have as yet derived material benefit from the creation of the National Park and very few have sympathy with the protection of nature; to most of them, nature is still the enemy which must be subdued. Yet, with

the growth of tourism, the prospects of a better standard of living are greatly increased, if only further immigration can be checked. At present, owing to the difficulty of marketing their produce, the islanders see little cash and largely live by consuming their own crops. There is more money to be earned, as some have already discovered, in taking parties from island to island in small boats or conducting them into the interior. Tourists provide an easy market for handicrafts and souvenirs of all kinds; they will also provide an increasing outlet for fruit, vegetables, and fish.

But to persuade the settlers will be no easy task. It requires patience and education. It is necessary not merely to show the potential material benefits, but also to explain what conservation is about, and to inculcate a sense of pride in the islands' unique features. The Darwin Station is already attempting such educational work and could do more if its resources permitted, both to instruct tourists and to convince the settlers that they are the guardians of great natural treasures. These duties will naturally be taken over by the National Park Service, once it is adequately staffed.

More information about the Galápagos is needed on the mainland as well as on the islands. Ecuadoreans have intense pride in their island possession but little accurate knowledge about it and even less understanding of the problems of conservation. This last failing is no monopoly of the Ecuadoreans, but it is of crucial importance in their case because they exercise sovereignty over one of the wonders

of the world. Ecuador is also handicapped because it has produced so few natural scientists, as the universities have been primarily concerned with the study of law. The whole country is of outstanding interest to geologists and botanists, and its mountains, forests, rivers and seas team with species awaiting zoological study but, with a few distinguished exceptions, the work has been left to foreigners, from the French Academicians in the eighteenth century, through Humboldt, Darwin, Wolf and Spruce, to the innumerable visiting scientists of more recent generations.

This is unfortunate because, all over the world, it has been the scientists who have spear-headed the conservation movement by making an ever-wider public conscious of the damage man is doing to his environment and the desperate dangers that lie ahead if he does not take thought unto the morrow. Ecuador has suffered from the lack of a strong scientific establishment to bring persuasion and pressure to bear on government and public opinion. It is very much to be hoped that the rising generation of Ecuadoreans will show an increasing interest in science and the almost limitless fields of research offered by their own country; the Darwin Foundation would welcome their collaboration and would gladly place the facilities of its Station in the Galápagos at their disposal. It is eminently desirable that conservation in Ecuador should be promoted by Ecuadoreans because foreigners, however idealistic their intentions, will always have difficulty in avoiding the charge of officious interference in national affairs.

Yet foreigners do have a part to play for some time to come. It is true to say that the Republic of Ecuador is the trustee, the custodian of one of the world's great natural treasures; but if this is true, then the whole world ought to help in its protection. A good beginning has been made by the establishment of the Darwin Foundation, a thoroughly international institution, sponsored by UNESCO at the request of the Government of Ecuador, and the Galápagos certainly merit further support from the United Nations and its various agencies, particularly in such matters as the training of conservation officers. Meanwhile, the Darwin Foundation is holding the line and needs all the backing it can get from organizations and individuals in every country.

What is so striking about the situation in the Galápagos is that, if action were taken now, the cost would be so small in proportion to the gains that could be secured. Given the will, almost all of what is left after centuries of neglect could still be saved and much could be restored. Admittedly, the record of the past is a black one but, for all that, there has been one constant theme in Ecuadorean history since the annexation in 1832 — and that is pride in this island possession. Given a clear-cut government policy, the archipelago could escape from its present anomalous position, qualify for inclusion in the United Nations' List of National Parks and become one of the great wildlife show-places and field research centres of the world. Is this too much to hope? As that dedicated conservationist, James Fisher, wrote shortly before his tragic death: "Man has

become the lord and master of the Earth, with prodigious power, pride and possibilities. As master of the Earth he has shown himself capable of global lunacy, but capable too of high altruism and thoughtfulness."

Ecuadoreans are not lacking in altruism, but the idea of conservation is new to all but a few of them. Their history has bent their thought in a very different direction. From the earliest days of the conquest, when Gonzalo Pizarro and Francisco Orellana plunged into the trackless forests and discovered the Amazon, to the present day, when the oil drillers are battling with the jungle, man has regarded the wilderness as his enemy. The idea that the few surviving wildernesses have become a precious and dwindling part of man's heritage is new. Yet, the Galápagos Archipelago is a wilderness of outstanding importance, which could still be saved for posterity and which could take its rightful place among the greatest National Parks in the world. Different people have seen the islands with different eyes: Charles Darwin had to tear himself away from its biological wonders; Herman Melville was moved to mystical meditation; Señora de Rendón found the Galápagos to be the last enchanted isles, a place where one could still dream. Their impressions were varied but they, and so many of us, have this in common — the Galápagos have unique qualities and the memories of them are etched so deeply in our minds that they must remain there as long as we live. It would be tragic if these wild places did

not survive to give to future generations the privilege which we have enjoyed.

EDITOR'S NOTE

G. T. Corley Smith created this book as an exercise of popular science and history, with the intention of making visible the fascinating reality he found in the Galapagos Islands during his time living and working there. Therefore, he did not include a bibliography to back his quotes or the sources he used for creating his narrative — since such elements were considered unnecessary for this kind of work.

The following notes, produced by the editor of this book, are intended to provide the interested reader with such information. Most of the sources used by Corley Smith to build his carefully-crafted text can be found in the "Historical Bibliography of Galapagos," part of the digital project *Galapagueana* developed by the Library, Archive & Museum area of the Charles Darwin Foundation.

Regardless of their origin and of their correctness, the quoted texts have been kept as the author originally wrote them.

At the beginning of chapter 1, the quote by H. R. H. The Prince Philip, Duke of Edinburgh, belongs to his book *Wildlife Crisis* (New York: Cowles, 1970), co-authored with British naturalist James Fisher. Corley Smith wrote a review of that book for *Oryx*.

In chapter 2, the quote by William Shakespeare belongs to *The Winter's Tale* (Act IV, Scene 4, 1623). The chapter extensively uses excerpts from Tomás de Berlanga's letter to King Charles I of Spain (1535). Titled *Carta a Su Magestad de Fray Tomás de Berlanga, describiendo su viaje desde Panamá á Puerto Viejo, e los trabajos que padeció en la navegación*, it was first published within a compilation of colonial texts prepared by Joaquín F. Pacheco and Francisco de Cárdenas (*Colección de documentos inéditos relativos al descubrimiento, conquista y colonización de las posesiones españolas en América y Oceanía*, Madrid, 1864-1884).

In chapter 3, the quote by William Shakespeare belongs to *The Tempest* (Act I, Scene 2, ca 1610). The Inkan legend about the islands in the Pacific Ocean was collected by Pedro Sarmiento de Gamboa in his *Historia Indica* (second part of his *Historia de los Incas*, 1572); by Miguel Cabello de Balboa in his *Miscelanea Antártica* (chapter XVII, 1586); and by Martín de Murúa in his *Historia General del Perú* (chapter XXV, 1616). Mentions of Clements Markham, as well as all the information about the possibility of inter-oceanic travel in pre-Hispanic *balsas*, were mainly taken from *Archaeological Evidences of Pre-Spanish Visits to the*

Galapagos, by Norwegian explorer Thor Heyerdahl and co-author Arne Skjølsvold (Salt Lake City: The Society for American Archaeology, 1956).

In chapter 4, the quote by John Keats belongs to *Ode to a Nightingale* (first published in *Annals of the Fine Arts*, 1819); it is abbreviated. Flemish cartographer Abrahamus Ortelius' work was titled *Theatrum Orbis Terrarum* (Antwerp: Gilles Coppens van Diest, 1570); the Galapagos appear there as "ye. de los galopegos". Mercator's map including the Galapagos was actually previous to Ortelius' (1569, *Nova et Aucta Orbis Terrae Descriptio ad Usum Navigantium Emendate Accommodata*). The one mentioned in the text is *Orbis Terrae Compendiosa Descriptio* (1587). Rivanedeira's adventures were narrated by Pedro Cieza de León in his *Tercero libro de las Guerras civiles del Perú el cual se llama La Guerra de Quito* (chapter CCVII), first published by Spanish historian Marcos Jiménez de la Espada (Madrid, 1877). Treasurer Pedro Castellanos and president of the Royal Audience of Lima, Pedro de la Gasca, also produced contemporary notes on that expedition. The history about Fernandes de Queirós' ship appears in *Historia del descubrimiento de las regiones australes hecho por el general Pedro Fernández de Quirós* (tome I), a compilation of Queirós' manuscripts prepared and published by Spanish historian Justo Zaragoza y Cucala (Madrid, 1876).

In chapter 5, the quote by Herman Melville belongs to *The Encantadas, or Enchanted Isles* (first published in *Putnam's Magazine* in 1854). Most of the geographical information provided in the chapter has to be understood in the book's chronological context (1970).

In chapter 6, the quote attributed to Edward Davis has an unknown origin; it probably belongs to the diaries of captains William A. Cowley or William Dampier. The quote by Richard Hawkins belongs to his diary *The observations of Sir Richard Hawkins Knight, in his voiage into the South Sea. Anno Domini 1593* (first published in 1622, reprinted in 1847). There are mentions to and quotes from pirates Woodes Rogers (*A Cruising Voyage Round the World*, 1712), Bartholomew Sharp (in *A Collection of original voyages*, 1699), William Ambrosia Cowley (*Journal of a voyage round the World, 1683-1686*, ca 1690), and William Dampier (*A New Voyage round the World*, 1697, and *A Discourse of Winds*, 1705). The author does not mention that the pirates that got sick in Guayaquil had allegedly assaulted local graveyards, taking jewels from the corpses.

In chapter 7, the quote by English poet William Cowper belongs to the poem *The Solitude of Alexander Selkirk* (number CLX in *The Golden Treasury*, 1875). There are several sources repeated from chapter 6. Patrick Watkins' story is taken from David Porter's *Journal of a Cruise Made to the Pacific Ocean by Captain David Porter*

in the United States Frigate Essex in the Years 1812, 1813, And 1814 (1815).

In chapter 8, the quote belongs to the Bible (Psalm 107, 23-31). The text includes fragments from James Colnett's *A Voyage to the South Atlantic and around Cape Horn into the Pacific Ocean for the purpose of extending the Spermacetic Whaling Fisheries and other objects of commerce* (1798) and from David Porter's *Journal of a Cruise...*, quoted above.

In chapter 9, the quote by Alfred, Lord Tennyson belongs to his poem *Ulysses* (first published in *Poems*, 1842). Charles Darwin's information and quotes were mainly taken from *The Voyage of the Beagle* (originally published as *Journals and Remarks*, 1839).

In chapter 10, the quote by Charles Darwin belongs to *The Voyage of the Beagle*. There are also quotes from James Colnett's *A Voyage to the South Atlantic...*, already quoted above. About Lawson, there is currently plenty of information; an example is Jacob P. Lundh's *Galapagos: A brief history* (2001).

In chapter 11, the quote by John Keats belongs to his poem *Endymion* (Book II, I, 211, first published in 1818). There are quotes from Charles Darwin's *The Voyage of the Beagle* and from his *Autobiography* (originally produced as *Recollections of the Development of my Mind and Character*, 1929), and from the works

of Woodes Rogers, James Colnett and David Porter already referenced above. The work by Malthus mentioned in the chapter was actually titled *An Essay on the Principle of Population*.

In chapter 12, the quote by American statesman Daniel Webster is actually taken from the introduction of Herman Melville's *Moby Dick, or, The Whale* (1851). Apparently, it comes from *Report of Daniel Webster's Speech in the U. S. Senate, on the application for the Erection of a Breakwater at Nantucket. 1828*, a text initially collected in a compilation of Webster's discourses titled *Speeches and Forensic Arguments* (1830). There are quotes by pirate Cowley and by captain Colnett, from sources already referenced above. There are several fragments from *Moby Dick* throughout the chapter. The text by Donald Mc Lennan (brig *Colonel Allen*, 1818) was probably taken from Charles H. Townsend's *The Galapagos tortoises in their relation to the whaling industry: a study of old logbooks* (published in *Zoologica*, 4 (3), 1925). Townsend, an American naturalist, was known for his "research done on the log-books," as Corley Smith himself remarks, which included ships like the *Potomac* and the *Herald*. Raveneau de Lusan (not "Lussan") was not a traveler, but a French pirate; in his famous *Journal du voyage fait à la mer du Sud, avec les flibustiers de l'Amérique en 1684 et années suivantes*, it is made clear that he was never in the Galapagos. Finally, the source for the report of the schooner *Kamaile* is unknown.

In chapter 13, the quote by Herman Melville belongs to *The Encantadas*. Actually, most of the chapter relies on that work. The mention of American photographer Eliot Porter refers to his work in the two volumes of *Galapagos: The Flow of Wilderness* (San Francisco: Sierra Club, 1968).

In chapter 14, the quote by Herman Melville belongs to *The Encantadas*. The name *Santa María de la Aguada* (actually, "Sta. Maria de l'Aguada") appears for the first time in print on the map *A New & Exact map of the Coast, Countries and Islands within ye Limits of ye South Sea Company* (1720), by Herman Moll, based on the travel of British pirate John Clipperton. The chapter includes mentions of Captain Alonso (not "Alonzo") María de Torres y Guerra (whose pilot, Lorenzo Vacaro, produced a poor map of the Galapagos titled *Carta Esferica Que Comprehende unaparte del Archipelago delos Galapagos*); quotes from Charles Darwin's *The Voyage of the Beagle*; and the history of Briones, the pirate of the Guayas. The latter was originally collected by Swedish scientist Nils Johann Andersson, member of the first Swedish circumnavigation expedition on board the *Eugenie* (1852), and published in 1854 (*Optegnelser paa en Reise rundt Jorden med den svenske fregat "Eugenie" i Aarene 1851-1853*). Finally, it presents the visit of Alessandro Malaspina to the Galapagos, which so far has not been proven. A narrative of the Galapagoan colonization period can be found in *El hombre en las islas Encantadas* (Quito, 1999) by

Ecuadorean historian Octavio Latorre, who has produced several works on the archipelago.

In chapter 15, the quote by Alfred, Lord Tennyson belongs to his poem *In Memoriam A.H.H.* (originally published in 1850). There are mentions of Joseph Dalton Hooker's work on flora ("Enumeration of the plants in the Galapagos Islands", *Proceedings of the Linnean Society of London*, 1, 1846, pp. 276-279), John Gould's contributions on birds, and T. Bell's on reptiles ("On a new genus of Iguanidae", *Zoological Journal*, 2, 1825, pp. 204-208), alongside Robert FitzRoy's geographical work (chart *Galapagos Islands*, 1836). There are fragments from the diary of Louis Henri, comte de Gueydon, the French captain of *Le Génie*, who visited the islands in 1846, and from Joseph R. Slevin's *The Galápagos Islands: a history of their exploration* (San Francisco: California Academy of Sciences, 1959). The text also mentions Austrian ornithologist Simeon Habel (whose travel diary, produced in 1868, was included in Osbert Salvin's *On the Avifauna of the Galapagos Islands*, 1876); German naturalist Theodor Wolf (who published *Ein Besuch der Galápagos-Inseln*, 1879); the visit of Swiss-American biologist Jean Louis Rodolphe Agassiz on the *U.S. Hassler* in 1872 (not in 1873), narrated by Agassiz's wife Elizabeth Cabot ("A cruise through the Galapagos", *The Atlantic Monthly*, 1873); the expeditions to Galapagos led by Rollo H. Beck on behalf of Lord Walter Rothschild (1897, 1901); and the famous "Academy Expedition" (the California Academy of Sciences Expedition, aboard the

Academy, organized by Beck, and described in a number of academic papers) in 1905-6.

In chapter 16, the quote from Samuel T. Coleridge belongs to *The Rime of the Ancient Mariner* (first published in *Lyrical Ballads*, 1798), which is subsequently quoted in the text twice. The chapter presents references and information taken from Alf Harbitz's *Mandskapet fra bark "Alexandra" - oplevelser paa Galapagosøerne* (1915), the main source on the adventures of the *Alexandra* and its tripulation. The testimony quoted literally was taken from William Beebe's *Galapagos: World's End* (chapter XIV, "The ship-wrecked taxi-driver"). The quote by famous British Army officer F. Spencer Chapman is the title of one of his books, *The jungle is neutral* (1948).

In chapter 17, the quote by William Beebe belongs to *Galapagos: World's End* (New York: Putnam's Sons, 1924). The chapter includes a good number of fragments extracted from that book. There are also mentions of several ships, such as the *Academy*, the *Stela Polaris*, Hancock's *Oaxaca* and *Velero III*, Valderbilt's *Ara* and *Alva*, Mellon's *Vagabondia*, and Astor's *Nourmahal*, as well as some famous visitors, like Gifford Pinchot, Theodor Roosevelt, Alain Gerbault, and Wiliam A. Robinson. All of them have academic articles and diaries-turn-into-books published, describing their time in Galapagos; Robinson's (*10,000 leagues over the sea*, 1932) is quoted in the chapter.

In chapter 18, the quote by Herman Melville belongs to *The Encantadas*. Coleridge's quote belongs to *The Rime of the Ancient Mariner*, and Beebe's, to *Galapagos: World's End*. The history of the Norwegians in Galapagos has been collected in works such as S. Hoff's *Drømmen om Galápagos* (Oslo: Grøndal, 1985). *Galápagos, verdens ende* was a book by Harry Randall, F. Støren, P. Bang and A. F. Christensen (Oslo: Tønsbergs Forlag, 1926). The name "Kolonisation Paa Galápagos Oerne" referenced in the chapter may be wrong. The quote by Victor Wolfgang von Hagen belongs to his work *Ecuador and the Galapagos Islands* (Oklahoma: University Press, 1949). The work by French traveler Paulette E. Kieffer de Rendón was titled *Galápagos, las últimas islas encantadas* (Quito: Casa de la Cultura Ecuatoriana, 1946) and was the first book written entirely by a woman about the islands.

In chapter 19, the quote by British writer Edward FitzGerald belongs to the poem 698 of his translation *Rubáiyát of Omar Khayyám* (1859). The chapter includes fragments taken from *Satan came to Eden*, by Dore Strauch (New York: Harper, 1936) and *Floreana*, by Margrett Wittmer (1960, originally called *Postlagernd Floreana*, Frankfurt: Scheffler, 1959), as well as several mentions of Dr. Frederick Ritter's articles, mostly published in *The Atlantic Monthly*. Finally, there is a quote from Shakespeare's *King Lear* (Act 5, Scene 3, 1608).

In chapter 20, the quote by Venezuelan Simon Bolívar belongs to his famous *Carta de Jamaica* ("Letter from Jamaica", 1815). There are mentions to Carlos Manuel Llara's *El Archipiélago de Colón (Galápagos): Descubrimiento, exploraciones científicas y bibliografía de las islas* (Quito: Casa de la Cultura Ecuatoriana, 1958). An account of the Galapagoan history during WWII and the US base in Baltra/South Seymour Island can be found in Hugo Idrovo's *Baltra, base Beta* (Quito. MCE, 2013). The attempts by several nations (especially the USA) to seize control of the archipelago during the first half of the 20th century has been documented by Octavio Latorre (e.g., in *Historia humana de Galápagos*, Quito, 2014).

In chapter 21, the quote by British ecologist and conservationist Frank Fraser Darling belongs to the lecture "The forward look in conservation", fifth of the series "Wilderness and plenty" (Reith Lectures, 1969). Most of the information on CDF history presented in the chapter was compiled by the author himself and presented in the paper "Looking back on twenty years of the CDF" (*Noticias de Galápagos*, 30, 1979, pp. 5-13). There are new mentions of Lord Rothschild, Victor Von Hagen, and Paulette de Rendón, whose bibliography was already included above. The expedition to Galapagos organized by *Life* Magazine produced a famous, fully-illustrated article (September 8, 1958). The first conservation officer at the Charles Darwin Research Station mentioned in the chapter was Ecuadorean Miguel Castro.

Chapters 22 to 25 present biological and conservation-related information about Galapagos up to the book's date of writing (1970). Even if, by today's standards, it could be outdated, it includes most of the knowledge collected at the Charles Darwin Research Station (CDRS) during its first decade of existence.

In chapter 22, Miguel Castro is mentioned again; he produced a number of interesting manuscripts with notes on tortoises, currently kept at the CDF's Library, Archive & Museum. There is a quote taken from Charles Darwin's *The Voyage of the Beagle*, and one from Melville's *The Encantadas* as well. Roger Perry was the fourth director of the CDRS (1964-1970).

In chapter 23 there are fragments taken from Charles Darwin's *The Voyage of the Beagle*, and there is a quote from David Porter's *Journal of a Cruise...*, already referenced above.

In chapter 24, there is a mention of Alan Root, a British filmmaker who, alongside his wife Joan, produced a documentary on Galapagos, *The Enchanted Isles*, for Anglia TV's *Survival* series (1967). Woodes Rogers' fragment belongs to *A Cruising Voyage Round the World*, already referenced above. British ornithologist Bryan Nelson's quotes belong to *Galapagos: Islands of Birds* (New York: William Morrow, 1968). The visit of the Duke of Edinburgh mentioned in the chapter happened in 1967; Karl Angermeyer, one of the early German colonists of Puerto Ayora, Santa Cruz Island,

used to work as a local guide for that kind of visit. *Julia Whaler's* mention was taken from Townsend's *The Galapagos tortoises in their relation to the whaling industry*, already mentioned above; Townsend's work on the "Academy Expedition" (1930) is also included.

In chapter 25, American ornithologist Harry S. Swarth's work mentioned in the text is *Avifauna of the Galapagos Islands* (San Francisco: California Academy of Science, 1931), while Nelson's one is *Galapagos: Islands of Birds*, already referenced above. The work by English ornithologist David Snow is "The breeding cycle of the Swallow-tailed Gull (*Creagrus furcatus*)" (*Ibis*, 109 (1), 1967, pp. 14-24). Theodor Wolf's quoted book is *Ein Besuch der Galápagos-Inseln*, already mentioned. Michael Harris produced, among other texts, *A Field Guide to the Birds of the Galapagos* (New York: Collins, 1982). American ornithologist Robert Cushnam Murphy's quote belongs to *Oceanic Birds of South America* (New York: The American Museum of Natural History, 1936). British ornithologist David Lack was the one to coin the expression "Darwin's finches" in his classic homonymous book (Cambridge: University Press, 1947), while Robert I. Bowman produced a number of texts on that species (e.g. *Morphological Differentiation and Adaptation in the Galapagos Finches*, Los Angeles: University of California Press, 1961). There are also fragments taken from Charles Darwin's *The Voyage of the Beagle*. The extension and detail of this chapter clearly demonstrates the interest of the author in birds.

Finally, in chapter 26, the quote by British meteorologist Henry Charnock has an unknown origin. The chapter presents information about Galapagos up to the book's date of writing (1970). The quote by Frank Fraser Darling belongs, again, to the lecture "The forward look in conservation," while the source of James Fisher's fragment could not be located. The texts by English pirate William Funnell (not "Funnel") come from his *A Voyage Round the World*, where he commented on fellow pirate William Dampier's travel in 1703 and 1704. There are also fragments taken from Charles Darwin's *The Voyage of the Beagle*.

As stated before, this text was written in 1970. In many senses, it can be considered to be outdated. However, it expresses the concerns and struggles of the conservationists in the Galapagos at that point in time. Concerns and struggles that were the basis for the many changes that happened in the archipelago in the last five decades. Much of what Corley Smith expressed as wishes in his book turned into reality: from naturalist guides and a strong National Park Service, to the eradication of invasive species and the recovery of many endangered native ones, included the beloved tortoises.

Fortunately, the British writer could see it all during his lifetime.

