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Letter from the Galapagos

George Seddon

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Essays

Letter from the Galapagos

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I. 'Drop everything and go to the Galapagos at once, before it is too late' is our advice to our friends. We're just back, from a trip that included Santiago and Valparaiso, Quito and the upper Amazon—for which it is already too late—and Easter Island on the way home. But the glittering highlight was the Galapagos. All of the trip was interesting to make once, perhaps mainly because of how much South America taught us about Australia, but as for the Galapagos, that taught us about far more interesting things, and we would both go back tomorrow.

We had a week there of quasi-mystical experiences and highly packaged tourism, an improbable and perhaps implausible combination. There can be no doubt about the packaging: there were nineteen Australians in our boat, which was approved by the Galapagos National Park, with a guide certified by the GNP (appropriate initials, as tourism from these islands plays a major part in the economy of Ecuador). Our itinerary had been dictated by the GNP, a prescribed selection from the fifty odd sites to which tourism is restricted, and where our movements were also regulated by marked trails and by a watchful guide who would lose his license if his charges were seen to transgress.

In short, we were highly regimented. Yet it didn't feel like it. One reason is that the islands are scattered over an area of 70,000km² (which is more than twice the size of Ireland, for example). Genovesa, the first on our itinerary, is 80km from the airport at San Cristobal, whence we began. Some of the islands are also pretty big: Isabela is 75km long. The time-tabling was very skilful. We more often than not had the site to ourselves for the half day of our visit, with another boat and a replacement package of eager tourists heaving to as we left. We saw other boats in plenty, some of them much more stylish than our stubby little cruiser; elegant pseudo-yachts with long lines and two or three masts which, however, were essentially no more than decor items. There is no doubt that the place was swarming with tourists, but we saw them only occasionally.

So the stage management was good, much enhanced in our case by an outstanding guide. His name was Harry ('erry) Jimenez, and he was a true Galapagueño as was his father before him, born on the islands and worthy of an operatic name of origin that makes him sound like a supernumerary from *The Marriage of Figaro*. His English was good. He was thoroughly trained by the National Parks Authority and knew his stuff, but at the same time had an open and curious mind, ready to learn and discuss ideas with our group. Above all he was a delightful human being, enjoying our fun (or seeming to) and full of enthusiasm for sharing his island with us in a way that is impossible to feign. He made it all fresh. We went through the day's program before we set out for the shore in our rubber dinghy, knowing if it was to be a wet or dry landing, the former being fairly tricky at times as we were decanted from a bucking dinghy into the surf zone. But he also gave us a vivid account of what we were likely to see and why it was worth seeing. In short he made it all an adventure. We might have been the first people ever to step out on these uninhabited shores.

Three things made it an adventure: the first was our guide; the second was the rest of the dramatis personae—the sea lions, the iguanas, the boobies and penguins and albatrosses and turtles, all but the last supplied in superabundance. The third was the Galapagos Mystique, the penumbra of ideas and stories that shrouds the islands, and not just about Darwin and a compelling natural history. They have also had a bizarre human history. One of the islands' several names is Las Islas Encantadas, the enchanted isles. The 'enchantment' originally implied that an evil spell had been cast over them. This is the sense of Herman Melville's bleak story *The Encantadas* (in *Billy Budd and Other Stories*, Penguin Books). The official name, rarely heard, is the Arcipelago di Colón after Christopher Columbus, an Italian who got no closer than the Caribbean, but at least did his exploring for the Spanish monarchy. So when the islands were claimed as part of Ecuador in 1832, they were renamed with the names of his ships or those associated with the Spanish court (hence *Santa Cruz*, *Isabella* and *Española*, replacing *Indefatigable*, *Albemarle* and *Hood*, names that had to that point reminded the world that even these remote islands were still well within the reach of British naval power, the islands marked as a dog marks a lamp post). But the Galapagos is the best name, for the turtles with a carapace that reminded someone of a Latin American saddle, which must have been very uncomfortable. That name brings us back from the mystique to the wildlife.

II. *The natural history of these islands is eminently curious, and well deserves attention.*

Charles Darwin
Voyage of the Beagle

The wildlife are all too literal. Littoral, too, for the most part, since all but the tortoises, land iguanas and a few small birds feed in the sea and sit or lie around on the shore to sun themselves or rest. The marine iguanas are the most striking. They graze on sea-weed, but being reptiles and cold-blooded, they can't keep it up for long, so they crawl out on the shore and line up on the black lava or sand with their heads raised, propped up on their forelegs, facing the sun. They are getting a recharge of solar heating, perhaps twenty or thirty of them, all precisely aligned. They don't, however, look much like dinosaurs, a frequent comment in the literature. They are rarely as long as a metre. The photographs we all have seen so often are almost invariably close-ups with no indication of scale. Close-ups are easy, with the iguanas and everything else. You can step over them, and in fact you have to be careful not to walk on the wildlife. I nearly trod on a sea-lion who was feeding a pup. They lie around on the sand like dogs in the sun, on their sides, their bellies, on their backs, stretching, snoozing, snuggling; and totally oblivious of our presence.

This is the magic of the Galapagos. There are no predators on land, so there is nothing to fear. In the literature of exploration there are similar accounts of other islands. We are given a glimpse of a 'naive land'—one that had never seen either humans or top predators—through the eyes of the great French navigator La Pérouse, who made landfall on Lord Howe Island in 1788, followed by two vessels of the First Fleet. All of the birds were so tame, they could be approached on the beach and simply knocked down. One observer writes that 'when I was in the woods amongst the birds I could not help picturing to myself the Golden Age as described by Ovid'. The birds never made the least attempt to fly away. 'The pigeons were also so tame as those already described and would sit upon the branches of trees till you might go and take them off into your hand'. So that is what they did: 'many hundreds of all the sorts mentioned above, together with many parrots, parroquettes, magpies and other birds were caught and carried on board our ship' (Flannery, 1994, p. 177). And so the Golden Age was brought to an end as soon as it was recorded on Lord Howe, where the birds seem to have learnt fear after a few

visits. Why the Golden Age has persisted on the Galapagos, and the wildlife have proved to be slow learners is not clear. It may relate to such a long history of total isolation.

On the Galapagos there were not only no predators on land. There were no land mammals either, other than two bat and one rat species—until three hundred years ago. Now there are cats, dogs, black rats, feral goats, donkeys, pigs and our own species, all of which are destructive. The tortoises especially have had a hard time. The whalers used to load up with them because they were a substitute for refrigeration, staying alive without food or water in the hold of the ship for months until they were butchered as needed for fresh meat. Everyone did it. Darwin did it: the H.M.S. *Beagle* left with thirty tortoises in the hold, along with the dead bodies of countless birds, reptiles and other animals. The *Beagle* was a floating mortuary by the time it got home. As late as 1959 the wife of a pair of German romantics who settled in Floreana in 1932 is able to describe how they had secured 'a giant tortoise—one of the galapagos with its tasty meat' (Wittner 1961, p14) with no awareness that the unique tortoises of Floreana Island were near extinction.

It is all too easy to fall into attitudinising about the short-sightedness of such behaviour, but in fact the non-human animal world has always been used. Darwin and his men used the turtles for food. Tourists like us use them to gratify their thirst for diversion and a 'rich experience' on vacation. The Ecuadorian government has found a use that pays better than eating them, bringing in the golden eggs of foreign currency and it is therefore at pains not to kill the goose---. The rest is largely rhetoric.

Three of the fourteen turtle subspecies are now no more, and most of the survivors are in two reserves or in the Darwin Research Centre in Santa Cruz. We saw them there, including Lonesome George, who is estimated to be perhaps two hundred years old and the last loveless survivor of the subspecies from Pinta Island. Tortoises are still fairly common 'in the wild' around Alcedo Volcano on Isabela Island, but that is out of bounds to tourists. We did see two 'en nature' (they are hardly wild) on Santa Cruz. Tortoises are not notably demonstrative or interactive, so about all you can do is walk round them and try vainly to count the growth rings on the scutes. The only feature that surprised me was that the place we were taken to is near the centre of the island, fairly high, wet and heavily vegetated. They are primarily vegetarian, of

course, so it makes sense that they be with the vegetation, and they are land tortoises, not marine ones, so they would be out of place lumbering around on the beach like their relatives. Anyway the beaches are already fully booked by the sea lions, swallow tailed gulls and all their confreres and consoeures.

Many of us have seen the wildlife in the photographs of Tui de Roy Moore (1980) and the magnificent ABC television series so there is little that can usefully be said. We were just tourists, not investigating scientists. Yet the reality is so vivid and intense. The little penguins are there in plenty, virtually sitting on the equator, but keeping to the shade of rocky cliffs on land, while the upwelling waters of the nutrient rich Humboldt Current are cool, so there is plenty to eat. The red-footed boobies, yes, have red feet, and the blue-footed boobies, blue. Big ones like ducks' feet (they are related to the pelicans) and they are a bright pastel blue as if painted, shown to great advantage when they sit on white guano encrusted lava.

The frigate birds really are something, on at least two counts. They are kleptomaniacs (more properly, cleptoparasites) in that they steal their dinner. The boobies do all the work, diving and catching the fish, but there is often no booby prize. The frigate birds hassle them in mid air until they yield up their catch. There are always a few to be seen hovering out at sea high over the water, buoyed by their immense wing span, often over 2.5m. They must have been at their thieving ways for a long time, moreover, as they can no longer waterproof their feathers from oil glands, like the cormorants but unlike most sea-birds. They no longer need to, as they no longer need to get wet to catch fish—yet another compelling example of the Darwinian theory of adaptive evolution. Even more striking is the courting behaviour of the males. They inflate great red pouches beneath their beaks to attract females. This too I have seen in photographs, but once again, they hardly prepare you for the reality. The red is so bright and the pouches are so tight, like a big red balloon; and during the mating season on Genovesa, where we saw them, there are so many of them, only a metre or so apart, all puffed up and saying 'Pick ME; pick ME' to the females, who seem bored with the whole show.

The other bird watching experience which drives me to superlatives is that of the nesting albatrosses on Española. This is the waved albatross, which ranges the South Pacific for most of the year, nesting for a few months only on this one island of the Galapagos, and on Cocos island to the north (not

our Cocos Island; this one is in the Pacific). Albatrosses mate for life, and when one dies, the partner dies soon after: 'dies from loneliness and grief', said our guide Harry. Once again, photographs did not prepare us for the reality: they are such big, powerful birds (weighing up to 4kg), and there are so many of them, all sitting on their meagre nests a few metres apart. You can walk right up to them and they pay not the least attention, although their large round eyes are glassily impressive, and their strong beaks look as if they could break a finger with ease. They have been coming back to Española for a long time. The guide showed us what he called the albatross runway, and that is what it is, clean of vegetation, even of weeds, the ground cemented with guano and beaten hard by the feet of countless heavy birds as they thud along the tarmac to take off from a low cliff at the end of the runway, rather like the old airport at Hong Kong.

The finches, Darwin's famous thirteen species of them, are, superficially, the least interesting birds on the islands, small, drab in colour, and not very good at sitting still when you do spot one, so it is a tribute to Darwin's tenacity as a field naturalist to have learnt so much and made so much good use of them. You barely have time to see that they have beaks at all, let alone that they differ from one to the next. But then you remember that the taxonomic work was done with dead little finches; he had a shooter in his party to collect specimens.

III. Much, but by no means all, of the writing about the Galapagos is about Darwin, and the best of it is *by* Darwin. *The Voyage of the Beagle* is one of the best books of the nineteenth century; it never seems to appear on literature courses in Australia, although it does in North America. Among recent writing about the islands, Darwin and his theories is a book by Steve Jones *Almost like a Whale: the Origin of Species Updated* (Anchor, 1999). Jones is a geneticist and a lively communicator. He has followed the structure of *The Origin of Species* closely, because the structure articulates the case so clearly and systematically, so the book is a tribute to Darwin. It also legitimately updates him by showing the relevance of much new information from genetics, which challenges some of the details of Darwin's theory. This book has had enthusiastic reviews, and rightly so. What also struck me, however, is that Jones is not a natural historian, unlike Darwin, who was a very good one.

We are constantly being told that knowledge now increase exponentially. We gain knowledge daily, no doubt. We also lose it. My favourite error, one of many in this book by an eminent scientist, is the following (inevitably dear to a Western Australian): 'South Australia was once covered with a spiny scrub called the jarrah. It had to cope with drought and with the giant kangaroos that browsed upon its leaves' (p. 85). Jarrah is a tall hardwood, one of the world's great hardwood, used among other things to pave the streets of London, where it is still to be found at times under the bitumen. It is unique to the comparatively well-watered south west of Western Australia. It is not spiny, either. I suppose he means 'mallee', which is not spiny either, and never covered South Australia, being largely restricted to the south east. It is a multi-trunked tree rather than scrub, and its leaves are unpalatable, the koala being the only marsupial specifically adapted to cope with the sclerophyll leaves of *Eucalyptus* species. Darwin never made mistakes like this—nor for that matter like the following: the Pacific is 'an ocean increasing in width by two yards a decade' we are told on page 335; but five pages later it is going the other way: 'If the continents continue to move at their present rate, in fifty million years America will be closer to Asia as the Atlantic broadens and the Pacific gets narrower' (p. 340).

Darwin was a meticulous observer in the field, and as a rule, kept careful notes; but *The Beagle* was in the Galapagos only for five weeks, and Darwin visited only four of the islands and those the least pristine (he was at Floreana, Santiago, San Cristobal and Isabela, but not at Pinta, Genovesa, Fernandina or Española, the highlights of our trip). Back in England he pooled his own collection with those of his shipmates. Most specimens had been carefully labelled with location where and time when collected amongst the data, and it was these field notes that enabled John Gould, who examined the birds, to announce to Darwin in 1837 that his finch specimens, which he admitted to have found confusing, were all new species and more significantly, that they varied from island to island.

Darwin had a lot of help, but his genius was to know how to use it and to work out its implications. Richard Owen, the most eminent palaeontologist cum zoologist of his day, studied his fossils from South America. Darwin's notebooks suggest what he began to make of this information: 'In July opened first book on "transmutation of species" - Had been greatly struck from about one month of previous March - On character of South American fossils and species of Galapagos Archipelago -

these facts (especially latter) origin of all my views' (in Sir Francis Darwin, 1961, p. 64). Eureka!

The islands are only some four million years old, basaltic shields of lava rising one after the other from the deep sea floor as the Nazca Plate moves slowly to the south east over a stationary 'hot spot' that generates outpourings of black basaltic lava. In time successive flows mound above the sea surface and a new island is begun. Thus one island was born after another, the oldest to the south east (Española, San Cristobal) and the youngest to the north west; Fernandina is still active and still growing. We got to Punta Espiñosa on Fernandina, an addition of pahoehoe or ropy lava, above water only since the eruption of 1975. I had learnt about pahoehoe as a student geologist years ago, but had never before seen such fresh examples, twisting snakes of black juicy basalt like giant spaghetti.

So the islands are all young, but because they differ in age they also differ as habitat, the youngest of bare rock, the oldest with mature and fertile soil and abundant vegetation; diverse also in height above sea level and thus moving from arid to humid, making for vertical zoning as well as horizontal: **in short, the perfect natural laboratory for the study of speciation through adaptation to differences in habitat.**

The plants are as interesting as the animals. Although they have not had as good a press, they were as carefully studied on Darwin's return, in this case by Joseph Hooker, like Gould and Lyell the most eminent scientist in his field. He confirmed eight years after the *Beagle's* return that the geographic distribution of the plants showed a pattern similar to that of the animals. There are two parts to this story. The first is the lottery of arrival, the second is subsequent speciation. Arrival of plant material on islands 1,000km from the South American mainland is a matter of pure chance; bird droppings, seed that was wind-blown or floated or rafted. El Niño doubtless played a part; El Niño years are characterised by torrential rains on the otherwise arid coasts of Peru and southern Ecuador. Rivers from the foothills of the Cordillera become raging torrents discharging great rafts of matted vegetation far out to sea. This is also the only way in which the giant land tortoises could have reached the islands. They cannot swim, but can survive for weeks without food or water, ideal candidates for distance rafting. (One fertile female ready to lay her eggs would be enough, and I find it much easier to visualise that 1,000 km journey than I do the subsequent history; what seems to me

more remarkable is that they also arrived at every significant island in this well dispersed archipelago.)

Seed that made the crossing would as a rule have failed to germinate, but some did: the plant might then have grown, flowered—and failed to set seed, because there was no fertilising opportunity, a plight like that of Lonesome George from Pinta. None of the common pollinating agents reached the Galapagos; there is only one bee, the Carpenter Bee, which does not pollinate. There are two bat species, but otherwise the choice is limited; the plants that can reproduce are nearly all anemophilous (wind pollinated) or self-fertile, and this has a curious consequence. The range of flower colour is limited. Colours that attract bees, butterflies, moths, butterflies and pollinating birds like the humming birds have little function, so they are rare. By far the most common flower colour is yellow. This comes especially from the genus *Scalesia*, which belongs to the Compositae and is fairly closely related to the sunflowers. *Scalesia* has diversified far more than the finches, and its variation is both lateral and vertical. In lowland areas it appears in species that are small herbs or shrubs, but in the humid highlands there are tree species that can reach 10m in height. These '*Scalesia* forests' constitute the fourth of seven vegetation zones going up slope, beginning with the littoral zone, which includes mangroves, then the arid zone with *Opuntia* (prickly pear) and *Brachycereus* growing out of fissures in bare lava. Next comes a transition zone, then the *Scalesia* zone, which we sampled on Santa Cruz; dense, tall, dripping trees and ground vegetation, impenetrable off the track, which needed constant maintenance, and all this only fifteen minutes drive up from the arid coastal zone. We did not get to the remaining zones which are restricted to the highest and wettest parts of the oldest islands; the brown zone is marked by brown liverworts, the *Miconia* zone by a shrub of that name, and the pampa, the highest, is a perhumid microenvironment of mosses and ferns. All mountains show a vertical zonation, but few areas show such variety in such a small area; *multum in parvo*.

IV. The arrival of our own species on the island has been as much a lottery as that of the other animals and the plants, and the ensuing social history as diverse as the natural history. The first record of Europeans on the islands dates from an unintentional visit by the Archbishop of Panama in 1535. Fray Tomás de Berlanga was blown off course on a voyage to Lima, arriving in much the same way as the land turtles and iguanas must have done a few million years before him. There is also

some evidence—by way of shards of pottery found on several islands—that pre-Incan Indians had been driven there in their balsa wood rafts before the Archbishop. Berlanga noted the docility of the land animals and described the big tortoises, so when the islands first appeared on Spanish charts 35 years later, they were called the 'Galapagos'.

William Dampier was there a century or so later (probably in 1679), his visit recorded in *A New Voyage Around the World* (1697). The book is still good reading, and it impressed his contemporaries. The diarist John Evelyn, for example, noted in his diary that 'I dined with Mr Pepys, where was Captain Dampier, who had been a famous buccaneer ---'. The *New Voyage* was read by Swift and Defoe and was part stimulus for *Gulliver's Travels* and *Robinson Crusoe*. However, his reports on the Galapagos were brief:

They are a good height, most of them flat and even on top. Four or five of the easternmost are rocky, barren and hilly, producing neither Tree, Herb nor Grass except a few Dildo-trees by the seaside (p. 39).

Dildo-trees? Surely not *Brachycereus*, a columnar spiny cactus, but there is no other obvious candidate. He reports that:

The land turtles are 'here so numerous that 5 or 600 Men might subsist on them alone for several Months without any other Provision. They are extraordinarily large and fat, and so sweet that no Pullet eats more pleasantly (p. 59).

So they loaded up with tortoises. The birds were also good eating and as tame as the ones the French later encountered on Lord Howe Island.

There are a great plenty of Turtle-Doves so tame that a Man my kill 5 or 6 dozen a Forenoon with a Stick. They are somewhat less than a Pigeon and are very good Meat and uncommonly fat (p. 60).

Dampier had three captive trading vessels to manage, so his visit was circumscribed, but it encapsulates the history of the next two hundred years. The subtitle of the *New Voyage* is *The Journal of an English Buccaneer*, and although he was much more than that, the Galapagos visit was indeed that of a buccaneer reprovisioning. Captain Davis, one of his convoy, made from the 'land-turtle', 'sixty Jars of Oil. This Oil served instead of Butter, to eat with the Doughboys'. He also found springs of 'good Fresh-water and Firewood enough' (p.61). A

long succession of pirates followed in Dampier's wake, and the concealed Buccaneer Cove on Isla Santiago was a favoured resort both for reprovisioning and as a base for surprise attack.

The pirates were followed by whalers, mostly American, who made similar use of the islands, calling for 'refreshments', meaning tortoises and water from the springs, and checking for mail at Post Office Bay on Floreana, where a box was set up on the beach. Herman Melville was there on the *Acushnet* not long after the *Beagle*, but lacking Darwin's powers of observation, found nothing of interest: 'Little but reptile life is here found: the chief sound of life is a hiss'.

Permanent settlement followed in fits and starts. In 1830, General José Villamil founded the first large plantation on Charles Island (Floreana) with eighty soldiers whom he had saved from execution on the mainland. He called his settlement *Asilo di Paz*, but the peace did not hold; his work force revolted and the settlement broke up. A semi-penal settlement began in 1859 on Chatham (San Cristobal) under Manuel Cobos, but his prisoners also revolted and killed him. Much the same scene was re-enacted on Charles in 1870. In the 1920's there was a further sorry tale from Charles, where one hundred and twenty four Norwegians from Narvik were persuaded to emigrate from the pole to the equator, to what they had been led to believe was an Earthly Paradise. They were soon disabused of this view, but they did their best for a time, building huts, damming the meagre streams and setting up a small fish-canning factory. But that failed, as did an attempt to set up a small sugar refinery: the boiler blew up. By 1929 there were only three Norwegians left in the islands.

There have also been several forays by German romantics after the Simple Life, of whom the most successful were Margaret and Heinz Wittmer and his son Harry. They found it, stayed and succeeded (see below); while the most colourful were the solitary Berlin dentist Friedrich Ritter, and the Baronin de Wagner-Wehrborn and her two lovers, all lured by their own private Dreamtime. Dr Eibl-Eibenfeldt, a fellow German from the Max Planck Institute who was later sponsored by the United Nations and the International Union for the Conservation of Nature to establish the first permanent wild-life sanctuary in the Galapagos, has given a good account of his fellow countrymen and their brief years on Floreana.

Ritter and Frau Dora Koerwin settled on Charles Island in 1929. He became famous by having all his teeth pulled out before he left Berlin and replacing them with a very strong steel denture. Near the Ritters' 'Eden', a little later on a 'Paradise' was to be set up. It was in 1932 that Eloïse Bosquet de Wagner-Wehrborn, the 'Baroness' came with two admirers to Charles. Though they settled down near the Ritters the two families could not get on at all. Ritter felt that his fame as a hermit had been impaired and he also was anxious about the preserved food and other presents which rich American tourists gave him every so often. The newcomers, indeed, had plans for building hotels and creating summer-resorts and they were clever in exciting the attention of the world's press. For a short time the wildest reports enlivened the newspapers—such as that the woman had proclaimed herself 'Queen of Floreana' and with the help of a number of stout fellows was waging war on Ecuador. The only truth in these stories was that the *Baronin* did maintain a jealous and tyrannical rule over the island. She chased away unacceptable visitors. She shot at one Dane and pushed out again to sea a shipwrecked Ecuadorian couple in a fragile craft. Even in her own *ménage à trois* things were not entirely peaceful. The more powerful of the admirers, a man named Phillipson, bullied the weaker, Lorenz who often had to seek refuge with the Wittmer family who had arrived in the meantime. One day the *Baronin* and Phillipson mysteriously disappeared and Lorenz who was found alone, wild and dishevelled in the disorder of their hut, declared that the pair had sailed off in a yacht—but no one had ever noticed such a yacht nor were the couple seen again. Had Lorenz at last made away with his tormentors? In any case he wanted to leave the island and finally a Norwegian, Nuggeröd, took Lorenz off in the little vessel *Dinamita*. On July 13th, 1934, the two men were seen for the last time as they sailed out from Academy Bay. There were many reports that the boat had been noticed drifting about aimlessly between the islands—then it also vanished. On November 17th, 1934, the American tunny-fishing boat *Santa Amaro* anchored off Marchena and when the crew spotted an improvised signal pole on the shore a boat was at once put off. The men found both Nuggeröd and Lorenz. One lay half in the shade of a

small, upturned boat and his comrade was a few yards away his hands clutching the burning sand. The sun had reduced both bodies to mummies. A dead sea-lion and the remains of an iguana showed what had been their last meal. Of the *Dinamita* and of the native Ecuadorian handyman who had been on board, there was no trace. Had he put them both ashore? Had some story of buried treasure haunted their imaginations? We are no more likely to learn the truth about the *Dinamita* than we are to pierce the mystery of the *Baronin's* disappearance and that of Phillipson. However, Ritter evidently knew something about these matters, since shortly after the events, he wrote to Captain Allan Hancock asking him to come as there was something to tell him which could not be entrusted to a letter. But Hancock arrived too late. The day before he got to 'Eden' Ritter died from food poisoning (Eibl-Eibesfeldt, 1960, pp. 172-4).

The Wittmer story is much more sympathetic; they found the simple life, but it was indeed simple. Nevertheless, they accepted it cheerfully. Their account is given at length for two reasons. The first is that it represents life on the island for most of its settlers until the sudden wealth of the last decade, brought by tourism. The second is that the book has been forgotten after a few months of celebrity: in its own way, it is a work of substance, a real-life Robinson Crusoe story, simply but well told.

By the time I got up, at half past five, Harry would have put on the water for coffee, and he and Heinz would be in the bush to load their backs with firewood, take it home and chop it up. Then we all had coffee before starting on the daily round. My first job was to see to the chickens. Although from January to May was the best time for rearing pullets, they needed a lot of attention then, for the hens were always pecking at each other's chicks, and would kill them off if you didn't stop them. The cocks fought among themselves too, of course, and their combs were generally covered with blood. After that I went to the pigsty, where I was greeted with great squealing, as soon as the pigs heard the clatter of their bucket. Their food was usually green bananas, yucca or otoi tubers which had been boiled with some bones and a little salt the afternoon before in a big old petrol can on a special stone hearth.

Heinz was meanwhile making a morning round of the 'estate' with the dogs, seeing if the wild cattle, which still troubled us as much as ever, had broken in the fence overnight and done any damage to the plantation, in which case repairs must be done during the day.

Then it was time for a proper breakfast. Our bread was 'home-baked,' the flour being made from either wheat flour or corn meal. Wheat grew on the island, but the sparrows usually picked off most of it, despite the efforts of Puchito Ladrón, before we had started gathering it in; so our wheat had to be bought from ships coming from the mainland. When there wasn't a ship for months and we ran out of flour, I sometimes fried green bananas instead of baking bread. You cut them in slices, fried them in fat until brown, and sprinkled salt over them as soon as they were done; they were very nourishing and tasted excellent. Other days there was hot corn bread, fried in the pan like small pancakes. For spreading on our bread we had pork dripping (when there was no gift butter), jam (which I made from guavas or papaws with bananas and pineapple), also sausage and cold beef.

It had taken a great deal of work before cow, calf or pig meat was ready for the table. Heinz had to go into the bush on a hunting expedition, and he couldn't afford a day off every week for that. When he had shot his animal, it had to be skinned, gutted, taken home and cut up. Then most of it had to be put in salt and afterwards smoked, all in twenty-four hours at most; for in our climate (without a refrigerator) meat would not keep longer than that.

Again, to preserve the meat needed a terrific amount of salt, and getting that was also a considerable operation. Our predecessors on Floreana, the Norwegians who had come in 1927, intended to start a fishing and canning business. They soon gave up, but we inherited from them the salt holes which had been made in a big salt lake about five hours away from us. These holes had to be cleaned out after the rainy season, and the saline in them dried up during the next months under the blazing sun, to form a crust of salt. This was 'ready for harvest' at the end of November or beginning of December, but you couldn't take more than fifty pounds on your back at a time, so Heinz and Harry had to make the ten-hour trek, on a miserable stony track, several times over—five

hours there, and five hours back, loaded with salt. Still, when that was done, we had our store of salt for the next months, both for cooking and for salting the meat.

We grew our own coffee, of course, but we drank it much faster than we grew it. It was five years after the little trees were planted before the first coffee beans could be harvested; and here again we had to do most of the work by hand. When the fruit turned scarlet, we knew they were ripe for picking, after which we dried them in the sun, turning them over several times a day. Then we pressed them through rollers to break the dried pulp of the fruit so that the actual beans came out. Then the whole mixture was exposed to the wind so that the pulp got blown away. After this the beans could at last be roasted.

Sugar-cane was one of our best crops, the plants themselves grew very quickly. Every four weeks the leaves had to be pruned when they began to turn brown, so that the sugar ripened faster. When it was ripe, the canes had to be cut close to the ground with a *machete* and taken to our home-made sugar-press. The juicy canes were very heavy, and you couldn't carry more than ten or fifteen at a time.

When it came to the pressing, we used our donkeys as substitute for a motor. They were tied to the press, and had to turn round and round like horses for grandfather's threshing machine. The juice extracted was caught and then boiled in a large container, till the liquid sugar had turned to a thick syrup. The whole process meant a heap of work, and also took an enormous amount of firewood. Harry would push the cane in, Rolf was already trained to drive the donkey, and I stood at the big boiler watching that the sugar should not boil over, or worse still, burn. This happened if you left it boiling a second too long, when all your work was completely wasted. At just the right moment you had to tear the burning log out of the fire hole, then pour the stiff syrup into another big, cold copper and keep on beating it with a wooden shovel till the whole mass became firm sugar. While still hot, it was turned out into wooden moulds, rinsed beforehand with cold water. Then when the sugar was cold, you wrapped the hard brown sugar 'bricks,' each weighing about three pounds, in dry banana leaves, protecting them from damp so that they would keep a long time.

Meat, coffee, sugar, salt, everything that went on to the table, was obtained and prepared only by our own labours. I sometimes reflected how much everything is taken for granted in civilisation, how little people think about the mass of work and worry and effort, of mistakes and setbacks, that go into the food they buy in shops and put on the breakfast table.

After breakfast, between about eight and nine, the 'menfolk'—usually including Rolf—would go off to work, often clearing new land, chopping trees and bushes, digging up the roots and trunks, and working over the cleared ground. It was a laborious business, with hands often replacing tools, and they were all nice and hungry at midday when they returned for dinner after a bathe in the cool spring water. During the morning I had been doing my housework and cooking, like any ordinary housewife, except that I had fewer 'gadgets' to lighten my work.

After the meal the children rested—Harry also needed a rest, although he was very much better—and then there was more work in the plantation, trimming maize, potatoes, sugar-cane and pineapple, and struggling to keep down the weeds, which grew with a profusion and speed far exceeding the worst experiences of suburban gardeners. I worked most of the afternoon in my vegetable garden and with the poultry, which never left me unemployed either!

The sun goes down quickly near the Equator, and it was already dark about six when we were having supper. After supper there would still be beans, peas and maize to shell, and some sewing and darning for me—because clothes were always getting torn in the bush. Rolf would have a story read to him before he went to bed, and then Heinz would go on reading out loud to Harry and me, either from one of our books or from some periodical we had been sent—perhaps months or even years old. Outside there was silence except for the occasional bray of a donkey or the lowing of cattle. The Asilo de la Paz was wrapped in a deep evening peace. The day was over, so much like the day of a family of small farmers anywhere in the world, and yet different because of its long weeks of complete isolation when no ship came. We did not mind this isolation and solitude. It was the life we had chosen ourselves, and on the whole we were well content (Wittmer, 1961, pp. 146-9).

Today there are discos in Puerto Ayora and Puerto Baquerizo Moreno, good restaurants, gift shops in plenty, artisans and artists and multi-million dollar yachts lying in the harbour. Most of the money goes into the pockets of the tour operators, mostly foreign owned, but some of its goes into conservation works, management and research. Feral animals, especially the goats, are slowly being brought under control, and the most vulnerable species, the tortoises and the land iguanas, are being bred up and released. So there is steady improvement and much dedication. But the future remains very uncertain, the essence of the problem being that a complex ecology that developed in exceptional isolation is now bound tightly into a global economy. The recent oil spill was less destructive than was feared at the time, but there will be more. With the visitors there inevitably come weeds and seeds: even in the time of the Wittmers in the 1920s, the highlands of Floreana were overrun with introductions gone wild: citrus, bananas, guavas, welcome to subsistence farmers but in competition with the indigeneous life support systems. The birds will disperse the seeds, and the constant stream of visitors cannot be adequately quarantined. They will bring more, and insects and pathogens. The pathogens will be the least welcome tourists. They don't get back on the luxury yachts.

V. To the well-fed tourist venturing ashore from the comfort and security of a motor launch, the Galapagos present many worlds. They make many bells ring, some concordant bells, some discordant. They suggest primal innocence, where we wonder at a world new born, like Miranda on Prospero's Enchanted Isle. This is the Earthly Paradise or the Dreamtime. Stories of an innocent world now lost lie deep in the consciousness of most cultures, their sources a matter of debate for sociologists, anthropologists and psychologists. Perhaps a projection from memories of the womb—but it is hard to accommodate marine iguanas in that milieu. Some anthropologists are more literal, that it is a memory of 'primitive affluence', societies with low densities and a superabundance of game. It has been claimed, for example, that in the 18th and early 19th centuries, most Aborigines in Australia had a more varied and nutritious diet gained with much less expenditure of effort than most people in Europe at the same time.

Maybe so, but flour for damper quickly became popular with the Aborigines whenever they could get it, much preferred to

collecting and grinding the meagre sporocarps of the water fern, nardoo. Perhaps the Dreamtime was related to more favourable climates of the past with more abundant and accessible game, which has been available everywhere, although at different times in different places: the Moa in New Zealand, the buffalo for the Plains Indians in North America, giant wombats for the Sunday roast in Australia.

Even so, the lion never lay down with the lamb (unless he had just killed it). It is the apparent harmony and tranquillity of life on the Galapagos that is so moving, but of course it is largely illusory: no predators on land, but the marine world is alive with them. There are sharks and rays, dolphins and predatory fish; the sea-lions, so innocent on the strand, are fierce predators in their own element, as, of course, are all the sea-birds, with crabs in plenty to clean up the left-overs. This is no Earthly Paradise: it seethes with primal energy, more William Blake than William Wordsworth. If this is the Garden of Eden, we are soon driven to the Tree of Knowledge and go for the apple. Science may begin in wonder, but it doesn't linger.

There is another sense in which the apparent tranquillity of the sites we visited is profoundly misleading: the physical environment is subject to violent and at times near catastrophic swings. One source is the tectonically active state of the islands, Fernandina, the most pristine, being also the most at risk. But the Galapagos, like Australia, are also very much at the mercy of El Niño. There was a huge disruption in 1982, when the upwellings of cold, nutrient rich waters on which the teeming life of the seas depends were replaced at depths to 100m with water that was 12 ° C warmer. El Niño does not induce drought in the deserts of coastal Peru and the Galapagos, but the reverse. In 1982, Santa Cruz had 3,225mm in seven months, compared with an annual average of 400mm. Some land animals flourished: the finches bred prolifically, as did the land iguanas, but others were not so lucky. The albatrosses had a terrible time nesting on low-lying Española, much of which was permanently flooded. A scientist working with the GNP authority reported some albatrosses swimming hopelessly above their submerged nests, but most were abandoned. Some vegetation suffered, too; ancient *Opuntia* rotted and collapsed.

The effect on marine life was disastrous. The whole food chain collapsed. Sharks, whales and dolphins migrated south. The breeding season of the fur seals was a total failure; the nursing mothers were too starved to give milk and the pups

died in their hundreds. The penguin population declined by 75%, cormorant numbers were halved. The water was too warm for the red and green algae on which the marine iguanas feed. Over two thirds of them starved to death (see Couper-Johnson, 2000). El Niño strikes around twice in a decade, and about one in every four or five is likely to be extreme. Nature itself is red in tooth and claw on the Galapagos—unless you visit them from a well provisioned boat at the optimal time of the year in an uneventful season ---

So the Galapagos can be a journey back into the history of human experience, back into the self, deep into the world of natural history and the non-self, forward into science, fast-forward into the future of the globe. Anyway, get there if you can ---. Before it is too late.

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