Chapter VIII

Volcan Alcedo

Despite our defeat on Fernandina we were determined to climb one of the five major volcanoes of Isabela. Which one was the difficult question to decide for each had its attractions and none had ever been completely expolored. Farthest to the west on the wide horizontal leg of Isabela rose Cerro Azul, in all probability never climbed, and highest of all, unless Volcan Wolf, the most northern of the chain, exceeded it by a few score yards. It is the steepest of the volcanoes and its mile high crater ~~is the narrowest, it~~ of unknown depth is the narrowest. The south flank of Cerro Azul is covered right down to the shore with a lush tropical forest in which tree ferns of large size are common. This ~~situation~~ example of tropical forest growing at sea level, unknown anywhere else in the archipelago, is the consequence of freaky climatic conditions of Humbolt Current ~~origin~~ making. The South Pacific swell piles in against the exposed coast rendering a landing often impossible, and an uncertain venture at best. On top of this hazard is added the further one of re-embarkation, which owing to changes in the state of the surf during the climb might well become ~~dangerous~~ too dangerous to attempt, leaving the climbers stranded - perhaps for days. The largest volcanic mass which forms the bulk of the southern section of Isabela is Sierra Negra. On its northwestern slope the most recent eruption took place creating smoking fissures and sulfurous fumeroles which would be fascinating to visit. The scene of this event might be reached from Cartago Bay, but the condition of the lava not long since hot creeping flows could make the climb extremely difficult if not perilous.

Of the three volcanoes on the northern arm of Isabela,

reading from north to south, Wolf, Darwin, and Alcedo, the first is the highest and least known. Wolf, as high or higher than Cerro Azul, rising over five thousand feet, is the most like Fernandina of the Isabela volcanoes. Its sides streaked with rivers of lava surround an enormous caldera several thousand feet deep and waterless according to the last air reconnaisence. Wolf might confront a climbing party with even greater difficulties than Fernandina. Darwin, in the middle, not so massive as Wolf, is probably the least interesting of the three. Such a judgement, however, should be made with reservations since the Galapagos Islands are full of surprises and Darwin may well be concealing spectacular ones of its own. The last of the northern group, Alcedo, just north of Perry Isthmus is ~~also~~ the lowest. At one point its rim is scarcely more than three thousand feet high. It is covered with grass and bushes to the top. And the floor of its huge crater is a flat plain of lava over-grown with a forest of Palo Santo trees. On the west side of Alcedo's rim, and herein ~~here~~ lies its peculiar feature, a row of hot springs and geysers have persisted since the last eruption. They were described to us by Miguel Castro, the dedicated conservationist and inveterate explorer of the islands, who had visited them alone on foot during a search for tortoises. We decided that Alcedo was our mountain because of its geysers and probable tortoise population.

This time we were determined to leave as little to chance as possible. The expedition was planned carefully to assure as a minimum at least the attainment of some of our goals, which were to reach the summit, find tortoises, and if possible to cross the crater to the hot springs ~~area~~. The first thing we did was to hire two Ecuadorians to help carry our supplies. Recommended to us were Enrique and Vincente, father and son, one of whom had worked as a porter on the Univ. of California's ~~Academy of Science's~~ ascent of Fernandina

a few years before. They were at present employed gathering sand from the beaches near Academy Bay and transporting it in a dugout canoe for concrete ~~the~~ construction of new port facilities and ~~of~~ for a hospital. ~~at Academy Bay.~~ ~~They~~ Toughened by ~~hard work they could endure long hours~~ the severe demands of their occupation they could endure long hours of hard work. Next we selected our supplies and photographic equipment, reducing everthing, especially clothing and bedding to the barest of meagre necessities. Since we had no information on the availability of water, except for the hot springs of doubtful potability on the far side of the mountain, we planned to carry as much as we could with us and to send Enrique and Vincente back for more as soon as we reached the top. The ascent was planned from the east shore of Isabela because the volcano was less thickly wooded on that side, and also because everyone told us that the west side from Unvina Bay was extremely difficult, rough, terraine. Knowing what I do now, with the wisdom of hindsight, I would have advised making the assault from the west in spite of the longer voyage to get there. Our plan included setting up a base camp on the shore ~~where we would cache a reserve supply~~ as a reserve cache of food and water for emergencies and for use on our return while we waited to be picked up.

On May 2nd our expedition sailed from Academy Bay - late in the morning owing to difficulties with the Port Captain about clearance. We arrived at Jervis Island that afternoon and dropped anchor for the night having decided, instead of pressing on, to get underway for Isabela early the next morning before dawn. As we approached Jervis in the deep-water channel that separates it from Santiago we ran through a school of manta rays behaving, in what seemed to us, a peculiar manner. They were rolling over and over at the surface, turning back somersaults, as it were, the snowy white ventral sides outermost. When they came to the surface, turning

onto their backs, their tiny mouths and louvered gills were exposed to view. Dozens of enormous size - ten feet or more from fin tip to fin tip - were performing all around. From the leading edge of each manta on either side, ~~of the~~ symetrically arranged, ~~a~~ stiff ~~Spatulate~~ paddle-like limbs projected, oriented at right angles to the plane of the animal's flat body. These features resembled spatulas or hands without fingers, designed it seemed for gathering in food, or at least for steering it towards the mouth of the creature; but this is only speculation as to their function. The upper surface of the manta rays seen on those swimming normally was ~~very dark~~ black or very dark and marked with two white bands extending back from the leading edge very like the ends of a scarf carelessly looped ~~around the neck of a person~~ and left dangling. ~~down his back~~. The fish ~~seemed c~~ were undisturbed by the boat as we sailed among them, sometimes surfacing close under the bow. Once or twice we actually struck one. The reaction that ensued , the violent flap of its wing-like fins that sent spray on board, drove the manta into a swift dive from sight. Although we sailed around among them for a long time, we could not decide what purpose the rolling served - whether connected in some way with feeding or part of an elaborate ~~behavior~~ pattern ~~connected with~~ of sex display.

With the large manta rays, small brown rays darted about in formation ruffling the surface like frightened fish. But when we approached them, unlike their larger companions, they dove for cover all together, as do flocks of feeding birds on the approach of a hawk, pale diamond-shaped backs fading rapidly into the depths. Whether they were young forms of the large elasmobranchs, or were a different species, we had no way of knowing.

The shore of Isabela at the point where we landed ~~for our climb~~ had at one time been burried in pumice, which had been

washed away by the sea exposing the underlying black lava and leaving vertical crumbling bluffs very difficult to climb. The jagged lava coast line was interrupted at many places by white, shell-sand beaches washed into coves. On one of these beaches we went ashore and set up our base camp and cache of supplies on the pumice shelf above the beach. Because we had made a very early start from Jervis we were ready to strike out into the interior by eleven o'clock. The temperature became noticably higher and oppressive as we left the coast behind. We made good progress for a mile or two on a gently upward sloping, packed pumice surface. A trail we followed, apparently made by wild burrows, went straight up the slope beside a deep gully towards the center of the volcano. Walking was easy on the pumice surface on which very little vegetation ~~grew~~ widely spaced, dried herbaceous plants and stunted bursera trees, grew. With the steepening of the slope the bursera trees became thicker and grasses and bushes began to make their appearance. Spiders are reputed to be the first colonizers of volcanic islands - in advance of insects or birds. This contention is supported here if the abundance of a species of argiope on Isabela has any meaning at all. The large webs ~~and supporting~~ of these spiders hung from every support ~~were stretched between every branch and bush~~ on the medium slopes, and the banded spiders that had spun them floated in the ~~spaces~~ empty spaces between bushes and trees on nearly invisible nets waiting for unwary insects to become entangled. We became entangled too, though not fatally, in the sticky, persistent webbing that clung to our faces with annoying tenacity. To avoid such unpleasantness in our sweaty condition, we resorted to the expedient of clearing a way with sticks as we advanced.

After about two hours of slow steady climbing we rested in the shade of a large Palo Santo. We ate a lunch of canned meat and while the others were dozing I went ahead to reconnoitre the route

around the gully or arroyo on the left of the trail we had been following. The gullies on the east slope of Alcedo are cut right down into the pumice to the underlying rock and may be ~~as many as~~ ten or twenty feet deep. They have vertical sides and are unclimbable. Although one could descend into an arroyo it would not be possible to get out again because the vertical, crumbling walls of pumice afford no hand or foothold. The only way to escape would be to follow the gully ~~it~~ down to the shore. These gullies must have been produced by torrential flows of water on the rare occasions of heavy thunderstorms soon after the pumice had accumulated. The condition of the pumice surface provided convincing evidence that water had at one time flowed over it in sheets, washing down great quantities of floating particles that were deposited in ridges and windrows. ~~as it sank into the porous mass.~~ The amount of water must have been prodigious to ~~be able to~~ sustain a flow even a short distance before being absorbed by the porous mass. The Alcedo pumice, probably produced by the explosive expansion of gasses in a very fluid rock during the early stages of an eruption, is a solidified froth lighter than water. It was blown out by the volcano in ~~enormous~~ immense quantities all in a short span of time as evidenced by the lack of stratification.

Evidence too suggests that gully formation was initiated soon after the eruption which spewed out the pumice, and developed quite fast ~~by~~ under the action of water flowing over an irregularity ~~to give it~~ giving it sufficient force to loosen the pumice particles and float them away. The deeper the hole and groove that is dug below the irregularity, the more rapidly the erosion continues. All loose material washes out of the growing arroyo which by confining the flow increases its force and erosive effect. The channel deepens faster on the steep slopes, and widens where the slope is ~~less~~ more gradual. The head of the

gully develops into a circular, vertical-sided hole or miniature amphitheater into which a waterfall pours. The edge constantly crumbles off in the water flowing over it, and the head wall, undermined by splashing at the bottom, repeatedly caves in; and thus the gully advances backward uphill.

The problem of our route was to find a way across the arroyo we had been following, which was turning from the direction we wanted to go, ~~in~~, ~~and~~ but was also to avoid dead-end peninsulas in the anastomosing system of impassable channels, which would have necessitated retracing our steps. A short distance above our resting place an elevation in the lava substratum had produced a wide, shallow bottom to the arroyo where a cascade must have occured during the run-off. The burrow trail crossed at this point and we followed over too. The higher we climbed the narrower and deeper became the gullies and the denser the vegetation. The Palo Santo trees began to be replaced by a slender variety of scalesia of moderate height, and along the borders of the gullies by uña de gato or cat's claw, the properties of which we were to learn more about later. All the vegetation was becoming more profuse; the grass grew deeper, greener, and more luxuriant; and around the heads of many gullies the growth of trees was so thick it concealed them completely from sight. As the gullies became more numerous they added a treacherous obstacle to our progress. At one of the arroyo heads that we came upon unexpectedly we could look down thirty feet into a dark sunless cavern whose damp walls were feathery with overlapping ferns. Apparently vegetation of all kinds is stabalizing the pumice which is eroding less fast today than at the time of ~~its~~ deposition.

Before dark ~~night fell~~ we had climed onto a shoulder of the mountain above the gullied slopes, and here on level and nearly bare ground we stopped for the night. I cannot say that we pitched camp

for we had no tents and hardly any bedding, but what we had we spread out, and then set about building a fire and cooking supper. The meal was meager: tea with sugar, canned ~~fööö~~ tuna and rice. It did not take long to consume. After the cooking was done the fire was built up using all the wood we could find nearby and we sat around it talking until dark. ~~We wanted the fire to last until morning for warmth so ööö it was carefully banked, but~~ We banked the fire carefully to keep it burning through the night for warmth, but lacking large solid logs or hardwood the attempt proved vain.

To conserve weight I had brought with me, in addition to camera, film, and tripod, only a double ground-cloth, a half plastic air mattress, and a light jacket. I put on the jacket, took off my shoes, and crawled between the layers of the waterproof cloth. As the night advanced low clouds enveloped the mountain in a drizzly gray fog. I awoke, thoroughly chilled, around midnight and for what seemed like interminable time turned and turned to keep warm, always looking for the first sign of dawn. I probably slept fitfully more than I realized, for at last I was surprised when light began to show in the east. We all got up at the same time, thankful the night was over, to find everything soaked by the drizzle. After a cold breakfast of gruel - we could not start a fire - we packed our few belongings and set off immediately for the last steep slope to the rim. A zigzag path made by the donkies, or possibly by the tortoises, for we saw many signs of their presence, led upward through a thick cover of low vegetation and head-high bracken. The night clouds had evaporated on our side of the mountain and we climbed the last few hundred feet in bright warm sunshine. The climb was easy so that we arrived at the top of the narrow rim, which was not more than fifty yards wide, and ~~which~~ dropped off steeply into the crater, an hour and a half after breaking camp.

It happened that where we reached the top was a saddle from

which the rim rose higher on either side. To the south the rim was tree-covered becoming narrower and rocky; to the north it was broader, rounded, and grassy. We made a second cache of our stores in the shelter of some trees and dispatched Enrique and Vincente back to the shore for more food and water. We agreed to meet them the next day at this place. Almost immediately we discovered several large tortoises grazing on the short grass which had been cropped down to a lawn between the trees. The donkies may have contributed to the cropping too. Without the encumbrance of our packs we began to reconnoitre this part of the rim and make plans for the next phase of our exploration. The inner slope of the crater was here thickly wooded and in order to see out we climbed a higher point which afforded a good view. Below and to the scalelessly west a vast caldera spread out/to the distant opposite side more than six miles away. The floor lay a thousand feet down. From it rose abruptly the steep walls of the crater, except ~~that~~ where directly in front of ~~where~~ us ~~we stood~~ where a bench, maybe a quarter of a mile wide, interrupted the drop half way to the bottom. A massive collapse of the center of the volcano ~~crater's sides~~ occured during a past eruptive phase of which the bench is the last ~~remnant and defines the~~ and evidence of a once higher cone, and defines the caldera character of the crater. The south edge of the crater was still enveloped in clouds which spilled down the inner slope in streamers that dispersed before reaching the floor. Everything before us was covered with vegetation: the north rim - as much as we could see - with dark green trees; the north rim with a lighter green, grass-like growth, - probably an association of bracken and scalesia; the lava plain of the crater floor with what appeared to be, judging by the whitish trunks we could distinguish, a skimpy forest of Palo Santo trees. Much black lava showed between them. Brown and white streaks and a few large patches extending from the rim to the bottom of the crater walls far off on the west and southwest side suggested

travertine deposits from hot springs. As we gazed intently at these ~~formati~~ formations we thought we could make out white plumes that expanded and subsided with an erratic frequency. What could they be if not the eruption of the Alcedo geysers?

As we studied the scene we considered by what routes we could best reach those springs. Straight across the crater was the shortest way, but the lava field looked oppressively hot in spite of the trees growing there, and to add to the discomfort of heat the surface might be treacherously rough. Moreover, we feared that on this route we would waste hours searching out a way through a maze of fissures and pressure ridges with no clear landmarks to guide us. ~~An alternate choice would be~~ Another possibility was to take the long way around by the rim: the north side offering perhaps the easier of the alternatives over grass-covered terrain with only spotty areas of low vegetation to hamper us, but it would be twice as far - fifteen miles at least - as by the wooded south side. From where we stood the nearest part of the rim to the south could not be seen: it was narrow - that much we guessed correctly - but had donkey trails leading to it which we hoped would follow the top all the way around. It seemed like the best choice. If we were otherwise correct in our surmise we would be able to reach a point on the rim above the hotspring area with little climbing and could descend from there directly into the crater. So we chose the south route.

On returning to pick up our packs we discovered that the tortoises had been investigating those left lying on the ground. They had ~~ɛ~~ stamped over one mashing its contents flat and shattering a plastic container but doing little damage otherwise. An orange nylon strap attached to another pack had disappeared and was not found though we search the ~~area~~ high and low. The inevitable conclusion was that it had been carried off by a tortoise - no donkies had been seen in the vicinity - and eaten. An interesting consideration in this

connection is that tortoises may be more omniverous than usually given credit for, and finding some strange objects lying around, that their natural reaction would be to try to eat them. Since nylon is not known for its digestability, nor, judging by the amount of undigested vegetation in their droppings, do tortoises possess a notably solvent digestive fluid, the conclusion is inevitable that the orange strap reappeared some time later, unaltered except for possible mechanical abrasion by the creature's beak, neatly packaged with the woody discard from an assortment of Isabela's botany.

We set off without more delay along the rim to the south. The going at first ~~is~~ was easy. The burrow trails stayed clear of the densest thickets by following the open glades and crossing the bare high points. But rather soon the rim became a narrow ridge, which in turn changed to a series of rocky peaks and knife-edges of crumbling basalt all overgrown with vines and bushes. We pushed on, however, climbing down laboriously into one ravine of tangled vegetation after another and out again up a still steeper and higher pile of rocks, until finally a perpendicular drop into a deep slot ~~cutting~~ that bisected ~~across~~ the rim, beyond which an even higher peak rose, confronted us. At this point we ~~are~~ were forced to change our tactics. It was now obvious to us that the south rim route was not going to work out and that our best bet ~~is~~ was to descend into the crater and skirt its south side. So we went back down the last cliff and turned west at the bottom down a rubbly talus where the footing would have been poor even ~~could we have seen what we were walking on~~ at best, but was made much worse by an overspread of vines that concealed the rocks and kept tripping us up.

We hoped that crossing the slump bench half way into the the caldera would be easier, but again we were disappointed. The dominant trees on this terrace proved to be the uña de gato which we had first experienced on the ascent, growing around the ends of arroyos.

They grew hardly more than ten feet high but were so close together that the lower branches touched making a barrier which one could not push through without becoming ~~tangled~~ caught on the thorns. We spent a ~~lot of~~ long time looking for ways around the thickest places and even ~~tr~~ tried crawling under the branches, a procedure immediately demonstrated to be entirely impractical. Anyone who has attempted to crawl on hands and knees through underbrush with a pack on his back -especially with ~~with~~ a Kelti pack which is designed for open country hiking - will appreciate our difficulty. Finally resorting to the only expedient remaining, we hacked a path with machetes, two of which we had fortunately brought along. It was a slow business for cat's claw wood is tough and out machetes were not sharp.

When at last we came to the edge of the bench and looked down a precipitous slope more than five hundred feet to the crater floor, we were tired and thirsty and the day and our water was more than half gone. As we sat in the shade of the cat's claw debating our prospects, our attention was drawn to a dark empty space some distance out from the base of the cliff on the crater floor. The surface looked smoother than the surrounding gray lava and nothing grew close to it. As we watched two objects moved slowly out from concealment in the trees. Were they burrows - but why would burrows be down there on that barren plain? No scale existed by which to judge the size or distance of the objects. They were roundish without other distinguishable features and glided towards the center of the dark spot with the aimlessness of mechanical toys. Suddenly the scene was transformed; a cloud shadow passed over the stage and in a flash the dark area shone like a mirror, reflecting the sky. In the same flash our comprehension was illuminated and we understood the nature of the event we had been witnessing: two large tortoises had just wandered

into a muddy pool. So we knew now that tortoises seek water a thousand feet down in the crater, and make the descent of that rocky slope and the return to green pastures as often as their physiology requires. That they can do it makes it all seem so easy. But they carry no baggage and they live off the land, whereas we ~~are~~ were burdened with gear and the transportable necessities of life. Nature has not endowed us, as she has camels and tortoises, with reserves of water for our long term needs during periods of drought. We must improvise our tanks to provide the liquid that our uncooperative bodies evaporate as fast as we pour it in.

These considerations and many others went through my mind as we sat there. Could we expect to cross the crater floor with our ~~meager~~ scanty supplies and be able to return in time to keep our rendez-vous with Enrique and Vincente on the rim the next day. If we tried and found the hot springs sulfurous and undrinkable we might be in serious difficulties with no one informed of our whereabouts, and no relief possible. On the other hand should the water prove potable so that we could explore the area for a day would we be able to ~~kee~~ keep our appointment with the charter boats at out base camp on the shore. Another possibility was to split up, some returning to the rim to meet the Ecuadorians and others pressing on, but the latter group would still face the uncertainty of the water. Our problem after all was simply one of water. In the end, with the knowledge that ~~later~~ we would might later suffer ~~the~~ agonies of regret, we chose the course of greater wisdom: to return to the rim together, and as a second choice ~~so as to be able that the next day we could~~ explore the north side of the crater. the next day.

On the way back with very little water left in our canteens we thought of a source of this necessity described by botanists and entomologists, and found to our amazment a larger supply at hand than, in lieu of this

information, we could have imagined was so readily available. An epiphyte of the bromiliad family grew in abundance on the uña de gato. The axils of the upright stiff leaves of this plant form tight pockets, each of which holds, protected from evaporation for long periods of time, a few cubic centimeters of water. In these liquid micro-cosms various insects, in particular certain interesting species of mosquitoes, breed. The interest to entomologists of these insects is centered, like most Galapagos biota, in the information they provide on specialized adaptation, genetic relationships, and evolution. We gathered the epiphytes, tipping out their liquid content into our empty canteens. The water was dark with dissolved organic chemicals and contained a rich life of insect larvae mixed with a fine black sediment. We drank off the supernatent fluid from our canteens caring little that we swallowed mosquito wrigglers or that the taste was bitter and astringent. It was water, that was all that counted.

That evening on the edge of the crater the damp clouds reformed bringing ~~periodic~~ intermittant drizzly rain. With another cold unpleasant night in prospect, we searched about for ways to mitigate our anticipated discomfort. Some of us gathered armfulls of bracken, which grew down the slope a few yards in thick stands, to use as insulation. I arranged a thick springy layer of it in a sheltering grove of cat's claw, ~~and~~ On this foundation I spread my ground cloth and heaped another layer on top for warmth. It made a very cozy bed into which I crawled shortly after dark. I had not been asleep for long when I was awakened by a great commotion and shouting in which the word "ticks" was most vociferously repeated. Some one had discovered ticks in the bracken and was hurling his bed away in disgust. Others, in panic, followed suit. I hadn't noticed any ticks and being warm and comfortable ~~for once~~ at last tried to go back to sleep, but the powers of suggestion were too strong, or perhaps the latent period needed for

the ticks to reach my warm body between the impervious layers of the waterproof cloth had ~~expired~~ run out; whatever the cause, I began to experience a crawling sensation, first in one place then in another, which I tried in vain to ignore. The strength of concentration served only to aggravate the tickling, and to rub each tickle did no good either. I could find nothing with my hands, so finally in desperation I threw back the cloth and bracken and with my flashlight tried to find the offending creatures. Nothing was visible. Either I was imagining it all, or the ticks were too small to see and bite. I covered myself up again resigned to the ticks and their creeping irritations, prefering them to another long night of cold and shivering. I did sleep; and the next morning I did find the cause of all the excitement - minute seed ticks, scarcely visible even in daylight. But I found no ticks burrowed into my skin although the others reported finding some adults.

As we were finishing breakfast of canned fruit, hot oatmeal, and coffee - a more satisfying meal than the one we had enjoyed on the previous morning - we heard a shout and Enrique and Vincente came into camp with more provisions and, most welcome of all, five gallons of water. We had not expected them so early. They gave us an account of incredable energy. When we sent them off the day before they went all the way down to the beach without stopping, ate and rested for an hour, and started back up the mountain again in the afternoon with loads of water and food. Reaching our first camp site again by dark, they slept there that night, and before dawn, began the last steep part of the climb, which they completed in less than an hour.

On this third day we agreed to split into two parties: those who had had their fill of uña de gato and bromiliad water elected to ~~go down~~ return to the beach and there await the boats; three of us including myself, with the help of the Ecuadorians, stayed to

explore the north rim of Alcedo for a distance as far as time and supplies would allow. We hoped to find more tortoises, especially young individuals as evidence of recent breeding, and in this we were not to be disappointed. Not far from camp the trees were left behind as we began to traverse a series of grass-covered hills crenating the rim. We came across many tortoises, both males and females, grazing on the grass which they had cropped short in many places. From large individuals weighing many hundred pounds we found all sizes down to some no more than ten inches long, but none smaller. They were not afraid of us as were the Santa Cruz animals, ignoring us on the whole when we came close to them. The only sign of attention we could arouse was that of possible curiosity manifested by a hissing expiration from a wide-opened mouth with neck extended to its limit. At moments like these I suspected we were recognized more in the role of rivals than as objects of curiosity. Usually they continued on whatever activities they were engaged, sparing us apparently as little concern as they did the burrows who shared their pastures. Evidence that they do harbor an instinct of rivalry or terretoriality I discovered in a contest between two tortoises, during which a medium-sized tortoise was trying to push a smaller one off a hill-top, while the latter was doing its best to escape. With bulldozer tactics the larger animal repeatedly banged into the rear of the smaller one who was knocked forward with each blow. Just as he was regaining his equalibrium from the last shock and starting off down the hill he was struck again. The battle, or pursuit, ended only when the small tortoise at last disappeared into a thicket.

The view from the rim of Alcedo on that May morning was magnificent. To our right the land sloped away in a downward graceful sweep to the shore where our base camp was located. The island below was very green and inviting, not at all desert-like; so green,

in fact, and luxurious in places that it was ~~hard to~~ difficult to believe springs and running water were not hidden by the trees. Far eastward beyond a wide expanse of pale sea, the faint outline of Santiago, surprisingly high in the atmosphere as though suspended above the level of our vision, faded into the mists and fogs above the distant horizon. Nearer at hand to the north, in line with our direction of travel, the dome of the next volcano, Darwin, rose beyond the intervening valley, as green as Alcedo, but the mass of Volcan Wolf, striped with lava, still further north, was hidden from view. But the scene to our left of Alcedo's vast caldera dominated all else by its overwhelming coincidence. After we had been walking for several hours our direction was still northerly; the westward curve of the rim was scarcely noticable. Far away yet was the northern crest, and many miles across that huge crater floor the yellowish discolorations of the hot spring deposits were as distant as ever. ~~The revelation~~ That the circumference of this enormous crater must exceed thirty miles was beginning to dawn on us. And with this revelation the emotional force of the view was heightened by the sight, above the far rim, of the dim shape of Fernandina melting into the whiteness of the sky.

I was in the lead and as I came to the top of a hill I heard a strange sound coming from the opposite side of a dip in front of me. The quality was that of a horn, and my first thought was a small ~~boa~~ boat's fog horn, the kind one blows on, but the improbability of such a source was so great that I put it out of mind immediately to search for a reasonable substitute. Although the sound was sustained, continuing steadily without letup, could it be a donkey braying? But the quality was ~~was~~ different too, more like a roar. Moreover, I saw no donkies anywhere. So I hurried on towards the source, when there on the opposite slope I perceived a short distance from me a large tortoise, and it was from him that the roar issued. He was a strange

sight: propped up on his posterior, his head fully extended and dangling at the end of a thin withered neck, he roared away, oblivious of my approach. Suddenly it dawned on me what was going on. He was mounted on a female, almost invisible beneath him, with his front feet planted on the front edge of her shell. This awesome and unbelievable spectacle recalled immediately to my mind, with a Rabelaisian contradiction of its biological purity, Ogden Nash's jingle. The voiceless tortoise, whose anatomy it would seem raises an almost insuperable barrier to the procreative act, gives vent, during those moments of improbable consumation, to his satisfaction by equally improbable vocal demonstrations.

Seeing that it would be impossible to reach the geysers in less than another full day with full provisions, which we did not have, we returned along the rim in the afternoon to our starting point. Instead of spending another night with the ticks and dampness we chose to make a dash for the shore, knowing that if we did not make it before dark, at least we could sleep at a lower and warmer altitude. As it turned out we got back in time, not only for supper with those who had preceeded us in the morning, but for a much needed and refreshing evening swim.

Not having allowed enough time by several days to reach the hot spring area, we had in fact cut the expedition short by one whole day, but as fortune would have it the day on the shore was not wasted for it gave us the opportunity to observe and photograph a colony of fur seals, which was discovered not far from our camp. This group of seals had not, recently at least, been attacked by commercial hunters or scientific collectors, and were quite fearless. That collectors can be as ruthless as hunters is illustrated by the record of the Hopkins Stanford Galapagos Expedition of 1898-1899 which secured two hundred skins of the species, from Wenman, Narborough, (at a time when their numbers were depleted)

Galapagos

and Albemarle islands. Perhaps the fur seals are content ~~to have been called on to make~~ to have made this sacrifice, in the name of taxonomy, ~~for the reward~~ for the honor, however temporary, of ~~to escape the anonymity of racial status by the reward of~~ specific rank, with the bestowal of the name Arctocephalus galapagoensis. The next sacrifice, however, may well be rewarded by a return to the anonymity of subspecific status. The young animals especially could be approached closely and reacted to our presence only with indifference, or at most curiosity. We could stroke some of the baby seals in return for which they would sniff at out hands.

Fur seals are one of the phenomena of the Galapagos Islands ~~and~~ that like the penguins ~~represent~~ are an extention of the range of a genus from southern temporate latitudes to the Equator. The Southern Fur Seal got to the Galapagos Islands probably by the same route as the Galapagus penguin by following the northward flowing Humbolt Current. The Galapagos fur seal was, until brought near to extinction by commercial hunting, the largest colony of the southern hemisphere genus in the tropics. The only more northerly extension of the southern seal's range is a small colony of a different species found on Guadaloupe Island off the coast of Baja California. The southern fur seal was probably able to colonize the Galapagos Islands because here the waters, compared with most equitorial latitudes , are relatively cool, permitting them to adapt to the unfavorable tropical conditions which they also encountered. It is noteworthy that they were always most abundant in the cooler waters around the northern islands, Santiago, northern Isabela, Fernandina, and Tower, and were seldom found in the warm waters south of Santa Cruz. The shores ~~on which~~ they ~~occured~~ inhabited when first exploited, and on which they are still found today in smaller numbers, are the rocky lava coasts where many caves and sheltered retreats from the heat of the day are available. This they are able to live in a warmer climate than their southern relatives, adapting slowly to these new conditions which

ultimately, if they survive, should result in a much greater genetic change than has so far taken place.