

Chaptee VIII

Volcan Alcedo

Despite our defeat on Fernandina we were determined to climb one of the ~~several~~ ^{five major} volcanoes of Isabela. Which one was the difficult question to decide for each had ~~its~~ attractions, and none had ever been completely explored. Farthest to the west on the fat horizontal leg of Isabela rose Cerro Azul ^{or} highest of all unless Volcan Wolf, the most northern of ^{the} chain, exceeded it by a few score yards, and in all probability never climbed. Its crater ~~was~~ ^{is} over a mile. It is the steep ~~west~~ ^{flank} of the volcanoes and its mile high crater is the narrowest; its depth ~~is~~ ^{is} unknown. The south ~~slope~~ ^{lush} of Cerro Azul is covered right down to the shore with a/tropical forest of tree ferns in which tree ferns are ~~a common species.~~ This situation of tropical forest growing at sea level in unknown anywhere else in the archipelago and is the consequence of ~~local~~ ^{freaky} climatic conditions of Humboldt/origin. ^{current} south Pacific

The ~~east~~ ^{most of the time} is exposed swell piles in against the exposed coast making landing ~~impossible,~~ ^{impossible,} and an uncertain venture at best. On top of this hazard is ~~added~~ ^{added} the further one of re-embarkation ~~after the ascent,~~ which owing to changes in the state of the surf during the climb might well become ~~impossible~~ ^{impossible} leaving the climbers stranded for days ~~while they~~ ^{waited}.

The largest volcanic mass that forms the bulk of the southern section of Isabela is Sierra Negra. ~~It is~~ ^{its} On/northeastern slope ~~if~~ the most recent eruption occurred leaving smoking fissures and sulphurous fumeroles. The scene of this event ~~could~~ ^{which would be fascinating to visit} be reached from Cartago Bay but the condition of the lava ~~flows~~ ^{hot, creeping} not long since ~~flowing~~ flows could make the climb extremely difficult ~~if~~ not perilous.

Of the three volcanoes on the northern ~~branch~~ ^{arm} of Isabela, reading from north to south, Wolf, Darwin, and ALCEGO, the first ~~is~~ ^{is} the highest and ~~most~~ ^{least known} mysterious. ~~As~~ ^{Wolf as} high or higher than Cerro Azul ~~and~~ ^{over} five thousand feet, ~~and~~ ^{is} most like Fernandina ^{the most} of the Isabela volcanoes. ^{Streaked}

with ash and lava surround an enormous caldera several thousand feet deep and waterless according to the last air reconnaissance. Wolf might confront a climbing party with ~~present~~ ^{unimagined and probably unforeseen} even greater difficulties than Fernandina. Darwin, in the middle, not so massive as Wolf is probably the least interesting of the Isabela volcanoes. Such a judgement, however, should be made with caution since the Galapagos Islands are full of surprises and Darwin may well be concealing ~~an unanticipated~~ ^{one of its own}. The last of the three, Alcedo, just north of Perry Isthmus is also the lowest. At one point its rim is ~~no~~ ^{scarcely} more than three thousand ~~two hundred~~ feet high. ^{and} It is covered with grass and bushes to the top. ~~But~~ the floor of its huge crater is ~~now~~ a flat plain of lava over-grown with a forest of palo santa trees. On the west side of Alcedo's rim, and here ^{lies} its particular feature, a row of hot springs and geysers have persisted since the last eruption. They were described to us by Miguel Castro, ^{and} ~~the~~ inveterate ~~ex~~ ^{solitary} explorer of the islands ~~and~~ ^{the} a dedicated conservationist, who had visited them alone on foot ~~in~~ during a search for ~~the~~ tortoises ~~populations~~. We decided that Alcedo was out mountain because of its geysers and probable tortoise population ~~and that~~ ^{it} would climb it.

This time we were determined to leave as little to chance as possible. The expedition was planned carefully to assure ^{as a} ~~at the~~ minimum at least the attainment of some of our goals, which were ~~first~~ ^{if possible} to reach the summit, ~~second~~ to find tortoises, and ~~third~~ to cross the crater to the hot spring 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} ~~served~~ as a porter on the California Academy of Sciences' ^{ascent} of Fernandina a few years ~~ago~~ before. They had been gathering sand from the beaches near Academy Bay and transporting it in their dugout canoe for the

construction of ~~the~~ new port facilities and a hospital at Academy Bay. They ~~and~~ were physically tough and used to enduring long hours of hard labor. Next we selected our supplies and ~~equipment~~ photographic equipment reducing everything, ~~to~~ especially clothing and bedding to the barest meagre necessities. Since we had no information on the availability of water, except for the hot springs of doubtful potability planned to on the far side of the mountain, we ~~carried~~ 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 ~~was~~ from Urquina Bay was extremely difficult. rough terrain. Knowing what I do now, ~~and~~ 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 ^{reserve} a supply of food and water ~~to~~ for emergencies and for use after ~~we had returned from the interior while~~ we awaited the return of our chartered boats. to be picked up. sailed

^{our} The expedition ~~took off~~ from Academy Bay rather late ~~one~~ in the morning ^{on} May 2nd ^{owing} to difficulties with the Port Captain ^{about} clearance. We arrived a Jervis, ^{and dropped anchored} where ~~we~~ decided to anchor for the afternoon ^{set sail} the next day night, late in the day, planning to ~~start off~~ again before dawn for Isabela, having decided to get under way early the next morning before dawn for Isabela. As we approached Jervis we ran through a school of Manta Rays behaving in a peculiar ^{manner} way in the deep-water channel between Jervis and Santiago. They ^{that mantas} adults, rolling or summersaulting ^{turning back} ^{white} ^{then} summersaults, ventral side outermost, just below the surface. There were dozens of them and they ~~were~~ seemed completely undisturbed as we sailed among them. ^{formations} In ^{successful} schools with the large individuals, smaller, ~~rays~~ light brown rays darted about in formation, ruffling the surface, ^{like schools} and disappeared into the depth whenever we came close ^{of feeding fish.}

features referring to under the bow: Once a horse we actually struck the stern of it
referred with a conventional flip of the hand from right.

But When we approached them ~~they diamond shaped~~ they dove in formation, ^{fading} for the depth, ~~the brown diamond backs disappearing~~ rapidly into the depths the young forms of Whether they were a different species from the larger elasmobranchs or ~~they~~ were different species, we had no way of knowing.

On May 2nd our expedition sailed from Academy Bay ~~rather~~ late in the morning owing to difficulties with the Port Captain about that clearance. We arrived at Jervis ~~late in the~~ 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, the ~~moving~~ turning back somersaults, as it were, ^{the moving} white ventral sides outermost. ^{As they came to the surface, turning onto their backs their small mouths and nose} There were dozens of enormous size - ~~some~~ ¹⁰ fifteen feet ~~ft~~ or more of girth from fin tip to fin tip. From the leading edge of each ray on either side of the ~~mouth~~ ^{mid line} projected a stiff spatulate ~~limb~~ ^{limb} oriented at right angles to the plane of the animal's flat body. ^{These organs resembled} hands without fingers designed for gathering in food, or at least for steering it towards the mouth of the creature, but this is only speculation as to their ~~true~~ ^{actual} function. ~~When occasionally the back of the manta~~ ^{seen} The dorsal ~~or back~~ surface of the manta rays ~~observed~~ ^{two} on those that were not rolling were black or very dark and marked with white ~~loops~~ bands ~~also~~ extending back from the ~~leading~~ forward edge very like ~~a scarf~~ the carelessly ends of a scarf/ looped around the neck of a person and dangling down his back. They seemed completely undisturbed as we sailed among them, sometimes surfacing close under the bow. Once or twice we actually struck one causing it to ~~react~~ ^{a convulsive reaction} with a violent, convulsive flap of its wing-like fins and ^{to} dive from sight. ^{that went up and down} Although we sailed around among them for a long time, we could not determine what purpose the

feeding
rolling served - whether it was connected in some way with food-gathering
or ~~was~~ part of an elaborate ^{blow} ^{possibly connected with} pattern of sex display.

formations brown
In ~~schools~~ with the larger manta rays, small rays darted
about ruffling the surface like ~~schools of~~ frightened fish. But when
we approached ^{then} unlike their larger companions, they dove ^{for cover} in formation.
~~like~~ a flock of birds, ~~they~~ pale brown diamond-shaped backs
fading
~~as they~~ rapidly into the depths. Whether they were the 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~~ climb had at one time been buried in pumice, but ^{but} which had been washed
away by the sea exposing the underlying black lava and leaving vertical
crumbling bluffs very difficult to climb up. The Lava shore was
^{Isabela?} interrupted at many places by the ^{washed} establishment in ^{to} coves of white, shell
sand beaches. On one of these we went ashore and set up our base camp ^{at Antequera} 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. ^{as we left the coast the temperature became noticeably higher and drier.} We made good progress for mile or two on a gently upward sloping
packed pumice surface, ^{on which} ~~we~~ followed a trail, apparently made by ~~donkeys~~
donkeys, that went ~~straight~~ up the slope beside a deep gully ~~straight~~
toward the center of the volcano. Walking was easy on the pumice surface
on which very little vegetation grew, ^{not even many} hardly any grass and herbaceous
plants and only stunted bursera trees. As the slope steepened the bursera
trees became thicker and grasses and bushes began to make their
appearance. Spiders are said to be the first colonizers of volcanic
islands before insects or birds. The abundance of a species of
argiope on Isabela supports if anything this contention. Their large
^{spider} webs and guy lines were stretched between every branch and bush ~~and tree~~
on the medium slopes. The large ^{spider} ~~spiders~~ ^{themselves} floated in the spaces
^{the vegetation} between ^{net} plants on nearly invisible supports waiting for ^{insects} ~~some~~ insects to

~~FLX/LX~~ become entangled in their webs. We became entangled too, though not fatally, ^{with the spider} ~~with spider~~ ^{the clinging} ~~webbing sticking to our faces~~ to our great annoyance. so that we resorted to carrying sticks which we waved in front of us to clear a way. To avoid this unpleasantness in our hot sweaty condition, we resorted to the expedient of clearing a way ~~as we advanced~~ ^{before us with sticks} advanced by waving ~~sticks in front of us~~ as we advanced.

After about two hours ~~slow~~ ^{slow} steady climbing we decided to rest in the shade of a large Palo Santo tree. We ate ~~some~~ ^a lunch of and while the others were dozing I went ahead to reconnoitre a route around the ^{arroyo} ~~gully~~ we had been following. ^{arroyo} ~~The~~ gullies ^{on Alcedo's flanks} ~~in the pumice~~ are cut right down to the underlying rock and may be as ~~much~~ ^{many} as ten or twenty fifteen feet deep. They have verticle sides and are unclimable. Although ^{one could} ~~it would be possible to~~ descend into a ^{arroyo} ~~gully~~ it would not be possible to get out/because the verticle, crumbligg walls of pumice ~~ash~~ ^{the gully} afford no hand or / foothold. The only way to escape would be follow ~~it~~ down to the shore.

These gullies must have been produced by torrential flows of water on the rare occasions of heavy thunderstorms. ^{The condition} ~~There was~~ of the pumice surface provided convincing evidence that water had at one time flowed over it in sheets carrying with it a great mass of floating particles that ^{were} ~~it~~ deposits in ridges and winrows as/sinks ^{it} ~~rapidly~~ into the porous ^{more} ~~amount of~~ water. The ~~FLX~~ must have been prodigious to be able to flow even a short distance before being absorbed. ^{The block of ash} ~~Pumice~~ is probably formed by/explosive expansion of gasses in/silicious ash, ^{a very fluid rock} ~~producing~~ a very light ^{is released} ~~oftenblown~~ material with a density less than water. It ~~was~~ ^{is} thrown out during the early stages of an eruption, in enormous quantities as evidenced by the thickness ^{of the ash} ~~depth~~ of the deposits ^{around Alcedo} ~~the volcano~~.

^{formation initiated} ~~Gullies~~ must be eroded quite rapidly ^{fast} by water flowing over an edge to loosen the pumice and float ^{particles} ~~away~~ from the down hill side.

The deeper the hole and ^{groove} ~~channel~~ that is dug, the more rapidly the erosion continues. ^{fast} ~~All~~ material is washed out of the growing gully which by

Gully formation must have been initiated soon after the eruption that spread out the pumice and have developed quite fast - - -

confining the flow ~~of water~~ increases its force and erosive effect.

The channel is deepened ^{most} and widened quickly on the steep slopes and widened ^{where the slope is less} more rapidly on the gentle ones. The head of the gully develops into a circular, vertical-sided hole or miniature amphitheater a waterfall into which ~~water~~ pours in a waterfall, crumpling the edge and undermining the head wall is crumpled is ~~crumbled~~ constantly crumbled off by the 'in

The water flowing over it, and the head wall is undermined by splashing at the repeatedly caves in ^{advance} bottom, and thus the gully grows backward uphill.

The problem of the route was to find a way across the

Arroyo ~~gully~~ we had been following, which was turning away from the direction we wanted to go, and to avoid ^{also} a dead-end peninsula in ^{the} an anastomosing system of impassable channels, ^{which would have} necessitating retracing our route. A short distance above our resting place an elevation in the lava substratum ^{bottom to} had produced a wide, shallow ~~plateau~~ in the arroyo where a cascade must ^{been produced} have ~~been~~ during the run-off. The Bonkie trail crossed at this point and we followed over too. The higher we went the narrower and deeper became the gullies and the denser the vegetation. The palo santo trees ^a ~~variety of~~ began to be replaced by ^{by} scalesia of moderate ^{size} height and ^{above} around the arroyos ^{the properties} heads ^{of} una de gato or cat's claw ^{of} which we were to learn more ^{about}

later. All the vegetation was becoming denser; the grass grew deeper, ^{green} and more tangled; and around the ends of ^{the} gullies, where they began the growth of trees was so thick ^{that it} as to conceal them completely/adding from sight ^{As they became more numerous they called a treacherous obstacle to our progress} a hazard to any attempt to push through dense undergrowth. At one ^{gully head} of these arroyos ^{beginning} which we came upon unexpectedly we could look down dark sunless ^{covered} feathery thirty feet into a ~~gloomy~~ cavern ^{with} whose damp walls were ~~concealed~~ of all kinds with mosses and hanging ferns. Apparently ~~the~~ vegetation is stabilizing the ^{strata} deposits of pumice which are eroding less fast now than at the time of their deposition.

Before night fell we had climbed 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 meagre -
 tea with sugar, canned food and rice. It didn't take long to consume it.
 The fire was built up ^{using} all the wood we could find
 for a while we sat around the fire and talked nearby and we sat
 around it talking until it became dark. We ^{wanted} ~~hoped~~ the fire ^{to} ~~would~~/last until
 morning/, but lacking ~~any~~ large solid logs or hard wood this proved a
 vain hope. To conserve weight I had brought with me ~~besides~~ in addition to
 camera, ~~and~~ film, and tripod only a double ground-cloth, 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 progressed ~~the~~ ^{advanced} ~~the~~ ^{the} ~~the~~ ^{the}
 low clouds enveloped the mountain in a damp drizzly gray fog. I awoke
 around midnight and to keep warm spent interminable time
 thoroughly chilled, turning and turning to keep warm and looking for
~~the~~ 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 with dew or drizzle. After a breakfast of ~~coffee and~~
 we could not ~~get~~ ^{start} a fire going,
 grewl, we packed our few belongings and started off immediately for
 the last steep slope ~~for~~ ^{to} the rim. A zigzag path made by the donkeys and
 possibly by tortoises, for we saw many signs of their presence, ~~led~~ ^{climbed} ~~upward~~ ^{upward}
 led upward through a thick cover of ~~thick~~ low vegetation. It was not a
 hard climb ~~so~~ ^{the snow} so that we arrived at the top ⁱⁿ an hour and a half after break-
 fast. The rim was narrow ~~dropping~~ ^{steep} off, where we reached it, not more than
 fifty yards, dropping off ~~abruptly~~ ^{steeply} into the crater. The night clouds ~~on~~
 on our side of the mountain and we climbed the last few ~~in~~ ^(spilling) ~~in~~ ^{light} ~~had~~ ^{sun}
 had evaporated where we had climbed but were still ~~flooding~~ ^{over} the ~~the~~ ^{the}
 south side of the rim several miles away.

It happened that the ~~place~~ where we reached the top was a
 sort of saddle ~~on~~ the rim, which rose higher on either side. To the
 south the rim ~~became~~ was tree covered and became narrow 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, arranging to meet them the next day at this place. Almost immediately we discovered several large tortoises gazing 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 over it we climbed ^a ~~to~~ higher point which afforded a good view. Below and to the west a vast caldera spread out to the distant ~~lim~~ opposite side ^{near the big} ~~ten or twelve~~ miles away, how far no scale or measure gave a clue. The floor lay a thousand feet down and from it rose ^{abruptly} the steep walls of the ~~rim~~ ^{outer}, except directly in front of where we stood a ~~wide~~ ^{high} terrace, maybe a quarter to a half mile wide, ^{which fell off} five hundred feet down, interrupted the drop half way down to continue its for ^{the terrace separated the summit} at ~~the~~ ~~xxxxxx~~ edge/another equal distance. The south edge of the ~~colossal~~ ^{colossal} crater was still enveloped in clouds which spilled down the inner slope ~~to~~ in streamers ^{that} to dispersed before reaching the bottom. Everything before us was covered with vegetation: the terrace and south rim - as much as we could see - with dark green trees; the north rim with a lighter green ^{an} ~~were~~ grass-like growth, probably/associations of brachen abd scalesia; the lava plain of the floor ~~more~~ ^{an} (skimping) with what appeared, ~~to be~~ by the white trunks we could distinguish, to be a ~~forest~~ ^{forest} of palo santo trees. Much black lava showed between them. Brown and white streaks ~~on the~~ ^{on the} and a few large patches extending from the rim to the bottom of the crater ~~walk~~ ^{walk} ~~slopes~~ on the ~~xxx~~ west and southwest side suggested ~~hot springs and~~ travertine deposits. from hot springs. As we gazed intently at these formations we thought that we could detect ~~occasionally~~ ^{plumes} white points appear, ^{expand} grow and subside with erratic frequency. What ~~else~~ ^{could} they be but the ~~geyers~~ ^{geyers} of Alcedo ^{by what the text} ~~geysers~~.

As we studied the scene we ~~thought~~ ^{thought} considered ^{by what the text} ~~by what~~ routes we could ~~reach~~ ^{reach} these springs. Straight across the crater was the

Rebbed in evidence for the other manner college
if the air enter come with after the outer or
a colder

shortest ^{way} way, but ~~what~~ the lava plain looked oppressively hot in spite of the trees growing there, and to add to the ~~heat~~ discomfort of heat the surface might be treacherously rough. We were afraid that ~~by~~ this route we ^{might walk} ~~could become~~ endlessly diverted by fissures and pressure ridges - ^{route way} ~~spend~~ hours searching out a ~~way~~ through a maze of fissures and pressure ridges ~~and~~ with no clear land marks to guide us. We could also travel ~~around~~ the long way around by the rim, the north side offering perhaps the easier way ^{through} over grassy slopes and/low vegetation, 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 rim to the south could not be seen, ^{it} ~~but~~ was narrow - that much we guessed - ~~and~~ 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 correct in our surmise} ~~When we reached the~~ we would be able to reach a point on the rim above the hot spring area with little climbing and could descend from there directly into the crater. So we chose the south route.

On returning ~~when we returned~~ to pick up our packs we discovered that the tortoises had wandered among ~~them~~ those that had been left on the ground instead of hung in trees. They had climbed over one mashing ^{its} ~~the~~ contents flat and shattering ~~from~~ a plastic container but doing little damage otherwise. An orange nylon strap attached to ^{ast} ~~our~~ pack had disappeared and was not found though we searched the area. The inevitable conclusion was that it had been carried off by a tortoise - no burrows had been seen in the vicinity - and eaten. An interesting consideration in this connection is that tortoises may be more omnivorous than they are usually given credit for, and finding some strange objects ^{that their} ~~the most~~ natural reaction was to try to eat them. ^{Since} ~~A~~ nylon is not known for its digestibility, nor, judging by the amount of undigested vegetation in their droppings, ~~do~~ do tortoises possess a ^{a notable} particularly

inevitable
solvent digestive fluids, the conclusion is/that the orange strap ~~will~~
reappear ed some time later, unaltered except for possible mechanical
abrasion by the creatures 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 ^{narrow} a ridge, which ~~itself~~
in turn changed to a series of rocky ^{peaks} pinnacles and knife edges of crumbling
basalt all overgrown with vines and bushes. We pushed ^(on) climbing down
into one ravine of tangled vegetation
~~one cliff into another~~ after another and out again up
an ever steeper and higher pinnacle until finally a perpendicular
into a deep ~~slot~~ ^{canyon} drop confronted us across the rim, beyond which ^{still} an even higher ^{mountain} cliff
rose, confronted us. At this point we ^(one) (were) forced to change our tactics.
It was now obvious that the south rim route was not going to work out
and that our best bet ^(is) to descend into the crater and skirt its south
side. So we ^(went to) turned back down the last cliff we had climbed and turned ^(ed) west
at its base down a rbbly talus where the footing ~~was poor and the~~ would have been poor even
could ~~had~~ we have seen what we were walking on, but was made worse by an
visibility owing to the vines that ~~overspread it even less satisfactory.~~
overspread of vines that ^{recall the rubber} kept tripping us up. ^(H) finally We hoped ^(d) that
crossing the terrace half way ^{back} down ^{into} the crater ^(well) would be easier, but again
we ^(one) (were) disappointed. ^{down} The trees ^{growing} close together on the terrace
proved to be ^{the} dominantly una de gato that we had first experienced on the
climb up growing around the ends of ~~gullies~~ arroyos. They were hardly more
than ten feet high but grew so close together that ^{the} lower branches
^{interlaced} making a barrier which one could not push through without
becoming tangled on the thorns. We spent ^(d) a lot of time looking for ways ~~and~~
around the thickest places and even ^(try) (tried) crawling under the branches,
^{a procedure} which was immediately demonstrated to be entirely impractical. Anyone
who has attempted to crawl on his hands and knees through underbrush

with a pack on his back - especially with a ~~Kent~~ Kelti pack - will appreciate ^{our} the difficulty ~~we/had~~/. We finally resorted ^{to} the only possible expedient remaining, that of hacking a path with machetes, two of which we had fortunately brought along. ~~But~~ It ^{is} ~~(was)~~ a slow process for cat claw wood is tough and our machetes were not sharp.

When at last we ^{came} ~~(came)~~ to the edge of the terrace and looked precipitous down a ~~steep~~ slope more than five hundred feet to the crater floor, we ^{and our water} ~~(were)~~ tired and thirsty, and the day ^(was) ~~(was)~~ more than half gone. As we ~~sat~~ in the shade of the cat's claw debating our prospects, our attention ^{was} ~~is~~ drawn to a dark empty space some distance out from the base of the cliff on the crater floor. The surface ^{was} ~~is~~ different from the surrounding gray lava; no ^{come} ~~trees~~ grow close to it. Two objects ~~came out~~ ^{come} slowly out from the concealment in the trees. What could they be we wonder ^{of} burrows, but why would ~~they~~ ^{burrows} be down there on that barren plain. There ^{was} ~~is~~ no scale by which to judge their size ^{they are} ~~or~~ distance. They ^{move} ~~move~~ slowly out towards the center of the dark spot ^{with} the aimlessness of mechanical ~~beetles~~ ^{toys}. Suddenly the scene is transformed; a cloud shadow passes over the stage and in a flash the dark area shines like a mirror, reflecting the sky. ^{illuminated} In the same flash our comprehension is ~~focused~~ and we understand the nature of the event we have been witnessing: two large tortoises have just wandered into a muddy pool. So we know now that the tortoises descend ^{to the rim} the thousand foot walls of the crater to find water and return again ^a to graze after ~~the~~ rejuvenating soaking. That ~~they~~ can do it makes it all seem so easy, but they carry nothing with them and they ^{the} live off the land, whereas we are burdened with cameras and ~~are dependent~~ necessities of life on our supplies. Nature has not endowed us, ^{with} ~~with~~ as it has camels and tortoises, ^{reservoirs for} ~~with~~ (tanks from which to supply) ^{water} ~~our~~ needs during long 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 our minds

as we sat there. Could we expect to cross the crater floor with our meager supplies and return in time to keep our rendez-vous with Enrique and Vincente at the cache on the rim the next day. If we tried and found the hot springs ^{water} sulphurous and undrinkable we might be in serious difficulties with no one informed as to our whereabouts, and no relief possible. On the other hand should the water prove potable ^{for a day} so that we could explore the area/would we be able to keep our appointment with ~~our~~ ^{the} charter boats at our 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 we ~~de~~ ^{course of} decided that the/greater wisdom was to return together to the rim and explore the next day the north side of the crater. On the way back with very little water left in our canteens we thought of a source that botanist and entomologists have described, and found to our amazement a larger supply ^{ready} at hand than ~~we~~ ^{in view of}, without this information, we could have imagined was so readily available. ~~The cat's claw provided support for~~ ^{in view of} An epiphyte of the bromeliad family which grew in abundance on the ~~uma de gato~~ terrace trees. The axils of the upright stiff leaves of this plant each of which ^{protected for evaporation} form tight ^{microclimate} cups ^{which} hold a few cubic centimeters of water for long periods of time without evaporation. In these micro ^{ecosystems} various insects, and in particular certain interesting species of mosquitoes breed. Their interest to entomologists is centered, like most Galapagos specialized adaptation, biota, in the information they provide on genetic relationships, and evolution. We gathered the epiphytes, tipping out their liquid content in improvised ^{into} funnels into our empty canteens. The water was ~~black~~ ^{dark with} with a fine ^{dark brown} ~~black~~ sediment, and ^{chemicals} ~~(dissolved organic substances)~~ from the plants, and it contained a rich life of insect larvae. We drank off the supernatant fluid from our canteens caring little that we swallowed mosquito wrigglers or that the taste was bitter and astringent. It was water, ^{not} ~~that~~ all that counted.

That night on the edge of the crater the damp clouds reformed
 With ~~to mitigate the prospect of~~ bringing periodic drizzles/rain. / Another cold unpleasant night was in-
 prospect in prospect, we searched about for ways to mitigate ~~the~~ our/
 discomfort. Some of us gathered armfuls of bracken, which grew down the
 slope a few yards in thick stands, to use as a springy mattress and as
 insulation ~~too~~. I arranged a thick pad ^{of it in a sheltering} ~~of it/under the shelter of a~~
 grove of uña de gato, ^{on which I spread} ~~and heaped an~~ 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 ~~awak~~
 awakened by a great commotion and shouting in which the word "ticks"
 was most vociferously repeated. ^{Some one had} ~~Ticks had been~~ ticks
^{his bed} discovered/in the bracken
 and ~~those/who~~ was hurling/~~it~~ away in disgust. Others, in panic, followed
 suit
~~his example~~. I hadn't noticed any ticks and being warm and comfortable
^{were too strong}
 tried to go back to sleep, but the powers of suggestion/ ^{or perhaps the}
^{impervious}
 latent period for the ticks to reach my warm body between the sheets of
 layers of the ^{run out} ~~Whatever the cause~~
~~waterproofing~~ ground cloth had ~~expired~~, in any case I began to experience
 a crawling sensation, first here ~~and~~ then there, which I tried in vain
 to ignor. The force of concentration served only to aggravate the
 tickling ~~sensations~~, and rubbing each spot did no good either. I could
 find nothing with my ~~habds~~, so at last in desperation I threw back the
 waterproof cover and with my flashlight tried to find the offending
 creatures. Nothing was visible. I concluded that either I was imagining
^{that} ^{too} ^{unable to}
 it all, or/the ticks were ~~so~~ small ~~that/they~~ ~~as to be harmless~~ bite
 and therefore quite harmless. I lay down again having decided that
 I would rather suffer the crawling sensations than ~~be~~ shiver through another
 long night. I did sleep; and the next morning I did find the cause of
 all the excitement - minute seed ticks, scarcely visible even in ~~the~~
 daylight. I found no ticks burrowed into my skin although the others
 reported finding ^{some} ~~the~~ adults.

As we were finishing breakfast, this time more satisfying than on the previous morning, of canned fruit, hot oatmeal, and coffee, 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 been expecting them so early. They gave us an account of incredible 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 their loads of water and food. ^{Reaching first} ~~By dark they had reached our old camp site where they~~ ^{there} slept/that night, ~~starting off again~~ and before dawn began the last steep part of the climb, which they had completed in scarcely an hour.

On this third day we decided to split into two parties: those who had had their fill of uña de gato and bromeliad water elected to go down ^{the} ~~to the beach~~ and there await the return of ^{three Indian} ~~our~~ boats, ^{the rest}

^{myself} with the help of the Ecuadorians, stayed to explore the north rim of Alcedo for ^{as far as} ~~as far as~~ time and supplies would allow. We hoped to find ^{especially} ~~more~~ tortoises, ^{as evidence} ~~and evidence in~~ young individuals/of recent breeding, and in this we were not disappointed. Very soon the trees were left behind

as we climbed a series of grass-covered hills crenating the rim. We came across many tortoises, both males and females gazing on the grass ^{which} they had ^{reduced in pieces to the condition of a well trimmed lawn.} ~~reduced in pieces to the condition of a well trimmed lawn.~~ From large individuals weighing many hundred pounds we found all sized ^{some no more than} down to/ten inches long, but none smaller. They were not afraid of us as were the Santa Cruz animals, ignoring us ^{badly on the whole} ~~(almost completely)~~ when we came close to them.

The only manifestation of recognition we could elicit was that of possible curiosity when they would extend their necks and with wide open mouths let out hissing expirations. At moments like these rivalry may have ^{been} ~~superseded~~ ^{they had a} ~~their~~ sense of curiosity, but ^{most of} ~~most of~~ time they continued ^{sparing}

on whatever activities they were engaged, giving us apparently as little attention ^{as we had} ~~concern as~~ the burrows who shared their pastures. I came across ~~one~~ a

trying
 medium-sized tortoise ~~who was doing his best~~ to push a smaller one off
 the latter its into tall grass
 a hill-top, while the smaller tortoise was doing his best to escape,
~~banged rival~~
 During the pursuit the larger animal repeatedly ~~charged the smaller~~
^a
~~in the rear with/bulldozer persistence driving the other, who made for~~
~~the tall grass, ahead of him~~ With bulldozer persistence the larger
 animal repeatedly banged into the ~~rear of the~~ smaller one's rear (forcing
 it ahead.) With each shock the little tortoise ~~was knocked off its feet~~
 and was about to
 forward, and just as he seemed to be regaining his composure ~~to~~ continue
 on down hill, he was struck again. The battle or pursuit ended only when
 the small tortoise at last disappeared into a weedy thicket.

The view from the rim of Alcedo on that May morning was
 magnificent. To our right the land ~~spread~~ sloped away in a downward
 graceful sweep to the shore where our base camp had been established.
 The island below was very green and inviting, not at all desert-like;
^{luxurious}
 so green and ~~tropical~~ in places that it was hard to believe that springs
^{eastward}
 and running water were not hidden by the trees. Far ~~to the east~~ beyond
 a wide expanse of pale sea, the faint outline of Santiago, surprisingly
^{above the level of our vision, faded into}
 high as though suspended ~~in~~ the mists and fogs above the distant horizon,
^{with}
~~faded into the whiteness of the sky.~~ Nearer to the north in ~~the~~ line of our
 travel the dome of the next volcano, Darwin, rose beyond the intervening
 valley as green as Alcedo, but the mass of Volcan Wolf, ~~banded~~ striped
 with lava, still farther north was hidden from view. But the scene to
^{of Alcedo's Caldera vast}
 the left ~~dominated all else~~ dominated all else by its overwhelming
^{After} ^{our direction}
 coincidence. We had been walking for several hours ~~we still were~~ ^{still}
^{westward}
~~going north; and the curve of the rim to the~~ was scarcely noticeable.
^{crater}
 Far away still was the northern crest, and across that huge ~~plain~~ floor
~~of the crater~~ ^{many miles} the yellowish discolorations of the hot springs
 The revelation that the circumference
 deposits were as distant as ever. We were beginning to gain some
 of this enormous crater must exceed forty miles
~~concept of the enormous size of~~ was beginning to dawn
^{and with their revelation}
 upon us. The emotional force of the view ~~over the crater~~ was heightened

above the far rim
by the sight/of the dim ~~dark~~ 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 the ~~next~~ ^a dip. It had
the quality of a horn, and ~~that was~~ my first thought was a small 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 my mind immediately ^{to} and searched for
a reasonable substitute. The next explanation, though/less/to the pattern,
I concluded, ^{bearing resemblance to}
was more acceptable. It must be, ~~caused by~~ the braying of a donkey. ^{this}
In every way but in the quality of the sound it fitted the conditions,
~~fitted the~~ donkeys being abundant, but the quality was wrong; the sound
was too sustained; it continued without letup.

I wondered.

Although the pattern of the sound was wrong, could it be a donkey braying?
different
But the quality was ~~wrong~~ ^{more like a roar} too sustained, continuing
steadily without letup. Moreover, I saw no donkeys anywhere. So I
hurried on towards the source, when suddenly on the opposite slope I
perceived a short distance in front of me a large tortoise, and it was
from him that the ^{roar} ~~sound~~ issued. He was a strange sight: ~~his neck was extended~~ ^{his posterior with,}
~~he was propped up on/end and his neck was extended limply in front~~
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} ~~who was hardly~~ ⁱⁿ visible
beneath him, with his front feet planted on the front edge of her shell.
It was an awesome and unbelievable sight which immediately recalled to
my mind Ogden Nash's jingle. The voiceless tortoise, ~~who lives~~ 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 ~~an~~ equally improbable vocal demonstra-
tions.

Seeing that it would be impossible to reach the geysers in
less than another full day ~~even~~ ^{all we did not hope} with full provisions we returned ~~in~~ ^{along}

the rim in the afternoon to our starting point. In stead of spending another night with the ticks and drizz~~le~~ 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 ~~to~~ 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 ~~a very~~ not wasted for it gave us the opportunity to observe 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 hunters and were quite fearless. The young animals especially could be approached ~~quite~~ closely and reacted to our presence only with indifference, or at most, curiosity. We could stroke some of the baby seals ~~Some of the baby seals could be stroked~~ ^{are} in return for which they would sniff at our hands. Fur seals ~~represent~~ ^{are} one of the ~~curiosities~~ ^{phenomena} of the Galapagos Islands and like the penguins ~~do~~ represent an extention of southern ~~high~~ ^{high} temperate ~~latitudes~~ ^{latitudes} the range of a genus from ~~polar regions~~ to the Equator. ~~How the fur seals~~ got to the Galapagos Islands is less clear than in the case of the penguins that probably simply followed the northward flowing ^{Humbolt} ~~ocean~~ currents. ^{simple} ~~No similar current now exists in the north Pacific Ocean~~ ^{system} to account for ~~their~~ ^{the seal's} migration from Alaskan waters to the tropics. But somehow they managed it perhaps by following the coast of North ^{ride} ~~have ridden~~ America southward until they could ~~have ridden~~ the North Equatorial Current west to the Galapagos Islands. It is strange that ~~they~~ ^{is} if this ~~was~~ ^{took} ~~were~~ the route they followed no colonies ~~were~~ ^{were} remained on the mainland to mark their progress. Sealions on the contrary are found all along the continental coast

The ~~fur seals~~ southern fur seal got to the Galapagos Islands probably
 as
 by the same route ~~followed by~~ the Galapagos penguin by following the
 northward flowing Humbolt Current. The Galápagos fur seal ~~has recently~~
~~been accorded full specific status~~, and was, until ~~it/they~~ was brought
 near to extinction by commercial hunting, the largest colony of the
 hemisphere southern fur seal
 southern/genus Arctocephalus in the tropics. The only ~~other species~~
~~of Arctocephalus~~ found farther north is a small colony of a different
 species on Guadalupe Island off the coast of Baja California. The only
~~other~~ more northerly extension of the southern fur seal's range is a small
 colony of a different species found on Guadalupe Island off the coast
 of Baja California. The ~~Galapagos species~~ southern fur seal
 was probably able to
 colonize the Galapagos Islands because it found where the waters,
 compared with most Equatorial latitudes, are relatively cool, and ~~they could~~
 able to adapt to ~~the other more~~ ^{unfavorable} tropical conditions. ^(which they overcame) ~~It is noteworthy~~
 that they ^{always were} most abundant in the colder waters around the
 northern islands of, Santiago, Northern Isabela, Fernandina, and Tower,
 and were seldom found in the warm waters south of Santa Cruz. ~~Wherever~~
~~they did occur and are~~ The shores on which they ~~did occur~~ ^{left} when ~~here~~
^{exploited} numerous, and are still found today in smaller numbers are the rocky
 lava coasts ~~which provide many shelves~~ where many caves and sheltered ~~retrea~~
 retreats from the heat of the day are available. Thus they are able to
 live in a warmer climate than their ~~cousins~~ 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 occurred.