

## Chapter VII

## Santa Cruz

*As noted in an earlier chapter,*

No other islands of the Galapagos group present the foreboding aspect of Fernandina. This island volcano has erupted more frequently and with greater violence during the few centuries of human presence than any of its neighbors. It stands scared and devastated by the outpourings from its remote summit. ~~[Flows of lava and fields of ash have isolated Fernandina's crater from the casual visitor so that only the most determined explorers have seen its fabled interior.]~~ Eruptions have indeed occurred within historical times on other islands, most recently on Isabela, <sup>from</sup> the side of the Sierra Negra, which is still smoking from ~~an~~ <sup>the</sup> event of two years ago. ~~[Lava from this eruption split into two streams as it reached Perry Isthmus, one turning east into Cartago Bay where it burned through the mangrove belt, and the other west to Elizabeth Bay. (A less contemporary eruption on Volcan Alcedo has left on its rim as a reminder a row of hot springs and geysers.)]~~ Perhaps not more than one hundred years ago, judging by the appearance of iridescent freshness of some of the flows around Sullivan Bay, lava poured from the flanks of Isla Santiago (James Island) blackening its slopes and coast lines on three sides but leaving the peaks green with life. Awesome as this event, or series of events, must have been it did not leave the island with the same atmosphere of impending doom that one senses on Fernandina.

Volcanism on all the other major islands appears to have been associated with a more <sup>remote</sup> ~~remote~~ past. They are clothed in vegetation, sparse and xerophilous on those of low profile but lush and tropical on the peaks and higher altitudes of the ancient, quiescent volcanoes. Above two thousand feet the vegetation is watered by the

moisture from clouds, occasional thunderstorms, and drizzly rains during the summer "Garua" or foggy season. Under this continual application of small quantities of water, combined with the mineral richness of volcanic soil, the various plants have developed a jungle density of giant forms. Some like the <sup>ls.</sup> Scalesia or tree sunflowers are endemic types that evolved on the Galapagos Islands, whereas others of hardwood varieties colloquially referred to as matazarna and guayavillo, the endemic Galapagos Guava, are counterparts of mainland species. These forests grow on the south side of Santa Cruz at medium altitudes and higher on the north facing slopes, but the peaks themselves and much of the highlands surrounding them are covered with grasses and bracken. The latter in favorable locations grows head high. The factors determining this distribution of vegetation ~~are~~ <sup>are</sup> not fully understood but are not necessarily related to available ~~under~~ <sup>ground</sup> water. The green mountain tops of Santiago, which have escaped the lava flows, appear to be covered with this ~~same~~ kind of forest. The islands of San Cristobal and Floreana at one time also supported a dense ~~vegetation~~ <sup>so</sup> cover, but it has been <sup>so</sup> greatly modified by human occupation and farming as well as by the introduction of exotic species that its original character is obscured. Much of the largest <sup>island</sup>, ~~of~~ Isabela, is still in its primordial state. All of its seven volcanoes, where volcanism in the past several centuries has not <sup>a</sup> ~~sered~~ or ~~buried~~ it, are clad with vegetation to their ~~limb~~ <sup>crater</sup> rims. On this island even the introduced burrows have produced little effect.

only? - According to geologists the whole Galapagos area is volcanically unstable and so far as they can predict eruptions and uplifts could take place anywhere within it, even though the most recent disturbances have occurred along its western boundary. And so the islands which appear the most stable, <sup>quiescent</sup>, and mature may be the



next to explode into eruption. One of them could become the awesome Fernandina of the future, while Fernandina mellowing in temporary old age clothes herself with a mantle of green to await some ~~future~~ far future fiery rejuvenation.

Why the vegetative associations differ so much from mountain top to mountain top, except where human intervention has been a factor, remains a mystery. When accumulated knowledge finds the answer <sup>to</sup> the mystery, a measure of our ignorance, will vanish, facts of the for the solution is contained within the/situation, and, for those with the acumen to interpret them, is as clear <sup>to</sup> see as <sup>are</sup> ~~is~~ the ~~existence of~~ the objects that compose it. Nothing in the natural world is truly mysterious: everything that happens and exists is the consequence of a perfect logic - the logic of nature.

The most recent botanical studies list 41% of Galapageian species endemic. Shortly after Darwin's visit the percentage of endemic species was considered higher but has been reduced by the discovery of Galapagos species on the coasts of Ecuador and Peru. Nevertheless the number of plants found only in the Archipelago remains impressively large. After the giant opuntias, the tree cacti of the arid coastal zone, the most impressive endemic genus is <sup>LC</sup> Scalesia of the composite family. Of the eighteen species fourteen occur on Santa Cruz and four on Santiago whereas other islands on which the genus is found have only one species each. This distribution is explained by the assumption that the original colonization took place on Santa Cruz followed by divergent evolution and secondary migration to other islands. But there are several other possibilities including multiple introductions of related species from the mainland, colonization of new habitats by the parental stock combined with isolation and subsequent evolutionary change, and finally hybridization between species

developed on different islands.

Because Santa Cruz contains such rich representation of Galapagos flora, not only in the many species of <sup>sc.</sup> Scalesia but in a great variety of other plants, several varieties of finches, and a protected ~~solitary~~ population of Galapagos tortoises, its interior higher altitudes should be visited by anyone hoping to gain even the most rudimentary understanding of Galapagos life.

Behind the <sup>desert</sup> coastal plain on the south side of Santa Cruz, which extends back from the shore around the settlement at Academy Bay and is covered by a tangled thorny forest of croton bushes, bursera, and tree cactus, the land rises steadily to a second sloping plateau at one thousand feet. The intermediate zone between the coast and the plateau is broken by several sharp escarpments formed by ancient flows of lava. As one ascends croton, bursera, and cactus are left behind to be replaced gradually by other kinds of trees. The temperature drops but the humidity increases until the atmosphere feels almost stifling. The first new types of tree-like plants to appear are spindly Scalesias. They are readily recognized by their lack of sturdy lower branches and by the way the foliage grows in a tuft-like masses at the top of the stem. As they increase in number to become dominant one feels as though he had <sup>been</sup> <sup>by</sup> shrunk ~~through the~~ <sup>(an)</sup> "Alice in Wonderland" magic and were walking through a field of weeds. Near the beginning of the plateau/further change in the vegetation takes place. Tropical hardwoods, matazarna and light-barked guayavillo, make their appearance along with the tree sunflowers. The forest becomes ~~dense~~, the bushy undergrowth ~~thickens~~ thickens, grasses grow wherever an opening occurs, and the taller trees are festooned with lichens and epiphytes.

This semi-plateau region in the Scalesia zone is the most fertile part of the island and has come under limited cultivation.



Above the farm lands the forest continues into a brown zone named ~~fox~~ after the color of the epiphytes, in particular for a variety of liverwort, that encrust the trees. Beyond the forest a band of Miconia bushes and ferns forms a nearly impenetrable barrier blocking access to the upland grassland, where at the top of the island a moor-like ~~so~~ landscape is the last of the vegetation zones. Grasses and bracken cover the sides of the <sup>dead</sup> ~~old~~ volcanoes ~~so~~. The hollows between the peaks and the old filled-in craters hold ponds and reedy marshes, and on the surrounding slopes one is astonished to find patches of gray ~~rain~~deer lichens, a miniature tundra on the Equator.

The zonation of vegetation on the island does not follow everywhere this exact order. Here and there the guayavillos grow down into the cactus margins, and in other places desert types are found mixed with scalea zone trees at altitudes higher than usual. These non-conforming distributions seem to be the result of climatic conditions locally produced by wind and ocean currents which effect the moisture over the adjacent land. The Miconia belt, peculiar to a few of the larger islands, is also non-uniformly distributed even on Santa Cruz where it is abundant but not continuous around the whole perimeter of the central grassy highlands.

The greatest changes that have been wrought in the past few decades on the distribution of vegetation on Santa Cruz are man ~~so~~ produced. In the period between the two world wars people came from Europe to settle in the Galapagos Islands. Among them were seekers of fortune and adventurers and people misinformed about the islands who <sup>expected</sup> ~~hoped~~ to find the easy life of a South Seas island paradise. The disillusioned soon left, while others putting the best face on a ~~bad/sixteenth~~ disappointing situation tried to adapt to the grim austerity of the islands and to extract from them a living.



Many failed and departed in discouragement, but a small number of ~~hardworking~~ incorrigibly romantic or hardworking individuals, whose determination could not be beaten down, fell in love with the Galapagos - with its unrelenting, intractable qualities - and succeeded. They were the nucleus that attracted later immigrants from the American continents until today several score Ecuadoreans and North Americans have staked out homesteads and cleared land for farming. They settled in the forested zone between the high grasslands and the dry coastal plains.

This small group of settlers introduced to the islands many economically valuable plants and trees - exotics in the language of ecology. They brought sugarcane, coffee, taro, pineapples, papayas, sweet potatoes, and other common vegetables; and they - planted bananaa, avocado, and citrus trees. Much of the land of the <sup>LC</sup> ~~Scalesia~~ zone was <sup>P</sup> ~~pre~~mented for these crops. They also brought with them domestic animals - pigs and chickens, cows and goats. Goats introduced earlier by whalers on many of the islands, to serve as a store of food, ran wild destroying the endemic vegetation and upsetting the delicate ecological balance. Pigs soon escaped to establish a feral population of extreme predaceousness against which the native fauna is defenseless. They decimated the young ~~xxx~~ tortoises and the land iguanas, and rooted out the nests of the green sea turtles on the breeding beaches.

The cattle, at first brought in as dairy animals, are now raised for beef and are ~~grazed on the slopes around the~~ turned loose to graze in the central uplands where, to the despair of island conservationists, they alter the balance of the grassland associations. The farmers contribute to the damage to native plant species by setting fire to the belt of Miconia bushes and ferns that border the grasslands at two thousand feet. They do this to clear land and create more room for their cattle, but the fires



often get out of control, penetrating<sup>g</sup> the grass slopes, and burn out large areas which they were attempting to enlarge.

Agriculture is changing radically the original forest character of what is now the farm zone. Places formerly dominated by <sup>co-</sup>Scalesia and guava forests have become cane fields and banana<sup>a</sup> plantations interspersed with groves of papayas and fields of pineapples. In dark avocado groves the tropical luxuriance of rapid growth conceals all signs of newness<sup>y</sup> and man-made change, giving the impression of long establishment, of conditions that could have prevailed for endless time. One forgets momentarily that avocados are exotics in the Galapagos, and the jungle of coffee bushes in the deep shade do nothing to dispel this illusion.

West of the farm lands on the southwest side of Santa Cruz a reserve area for the preservation of wildlife has been set aside under the guidance of the Darwin Foundation and the authority of the Ecuadorean Government. The Reserve ~~extends from the coast to~~ includes a large stretch of land from the coast to the beginning of the grassy highlands. In the wooded part of this sanctuary at several locations small ponds and bogs have formed in the depressions where water persists throughout the year. During the rainless season the water gradually evaporates or soaks into the brown clay soil but is renewed by the winter rains in December and January. ~~Thiſſ/ſſ/ſſ~~ In this protected space the Galapagos tortoises on Santa Cruz are making their last stand. Here upwards to 1,500 have been counted and many unrecorded individuals may be present.

visitors,  
for the convenience of official

The Darwin Station maintains a casita in the reserve area on the fringe of the Scalesia-Guayavillo forest near one of the concentrations of tortoises. <sup>Scarcely more than a shed</sup> The "little house" is a simple rough shelter built of boards and poles, and roofed with corrugated iron. A fireplace on one side for cooking, a low table in the middle, and



a dirt floor complete the appointments of the single small room. Aside from giving protection in bad weather, the roof serves the more important function for water collecting, and is connected by gutters and a down-spout to a rain barrel at the corner of the building. A <sup>raised stage</sup> ~~platform~~ dirt ~~platform~~/~~platform~~ on one side of the casita provided a well-drained platform for a very ragged tent in which two people could sleep without ~~crowding~~. (When <sup>we</sup> I visited the place we brought our own tents and slept on the ground nearby.) ~~Next to the tent a rustic table and benches made of poles under a canopy of sticks~~ Next to the tent, under a canopy of sticks, rustic benches and a table made of poles were the eating facilities. ~~Several miles~~ <sup>northwest</sup> ~~west~~ a second group ~~Southwest of the Casita, several miles away, another group of ponds near a hill called El Chato is a gathering place for~~ an even larger gathering of tortoises. A good trail leads to ~~El Chato which can be reached from the casita in an hour.~~ <sup>can be reached from the casita in an hour.</sup> ~~walk from the casita.~~

From Bella Vista, the village center of the farming community nearest to and directly above Academy Bay, it is a ten mile walk west to the casita. The trail first passes a grove of balsa trees brought over <sup>as seedlings</sup> several years ago (from the mainland). They have already grown to considerable size with smooth gray trunks up to two feet in diameter, and ~~a~~ crowns of broad glossy green leaves fifty feet overhead. They ~~grow~~ look very solid and strong, but appearances in this case are deceptive. Some of the trees had been cut down and long pithy logs were lying around, one of which my son Steve picked up with ease ~~and~~ to pose for a photograph. After the balsa grove, farms alternated with uncleared forest. One comes on <sup>banana</sup> stands of sugar cane, fields of pineapples, and plantations. The ~~banana~~ trees, ~~are~~ crowded together, shedding their torn plumed leaves, which lie about their feet in a crackly litter, with profligate



carelessness. The rough trail, at present used only by foot, horse, and pack animal traffic, had been cleared to a width so generous as to imply a plan to accommodate more modern transportation at some not distant future time. It followed a more or less straight course up and down hill, <sup>like a</sup> ~~the way~~ power line right-of-way ~~side~~ slashed across the countryside, skirting the edge of the forested zone. ~~After~~ When I made the journey the day was hot and ~~humid~~ oppressive. We stopped at a farm ~~to~~ for refreshments and ~~supplies~~ additional supplies for ~~the following day~~. The hospitable, courteous farmer refused all pay for ~~the~~ papayas and sugar cane that we consumed on the spot or carried with us, but he accepted a few sucres for a bunch of bananas and a dozen eggs. The bananas were loaded on one of our over-<sup>burdened</sup> ~~loaded~~ burros and <sup>being</sup> ~~because they were~~ in prime condition ~~stood~~ <sup>the</sup> many did not survive the rest of the trip; the mashed ones were fed to the animals. The eggs presented quite a problem ~~of transportation~~; in the end they had to be carried by hand in an enamel pail.

After about eight miles the trail emerged onto a more open region where scattered clumps of trees were divided by strips of grassland and wide areas covered with a low vine-like plant called mora. It is a name <sup>Loaded with implications</sup> ~~suggestive~~ of disaster, and its properties ~~which we~~ soon discovered did nothing to dispel this impression. Resembling northern hemisphere smilax more closely than any other vegetation, though far more generously equipped with the features that make smilax one of the most unpleasant plants to encounter in a temperate forest, mora is a tangled mass of stems, <sup>along</sup> ~~on~~ their undersides with rows of long, ~~sharp~~ <sup>sharp</sup> hooked thorns. It grows to a depth of three feet, and forms the most impervious barrier of any known vegetation. One could not penetrate a field of mora a dozen steps without becoming hopelessly entangled, clothing shredded and body lacerated. My first and last experience with mora resulted, when I carelessly brushed

against a straggling branch, in a deeply scatched and bleeding arm. The only means by which mora can be ~~pen~~<sup>r</sup> traversed is by cautiously and laboriously, stem by stem, cutting a path. The trail to the casita had been cut through in this way to provide a wide clear passage.

The casita faces a grassy glade surrounded by guayavillo trees draped with lichens. A short-eared owl perched on a high branch stared impassively down//w on us as we explored the area. Not solely nocturnal in habits like the Galapagos Barn Owl, this bird hunts during the day and so is often seen. Two kinds of flycatchers are also common in the wooded regions and ~~are found~~ frequent such different habitats as the coastal desert zone and the le Scalesia forests of the central mountain chain on Santa Cruz. They occurred around the casita. One is a small species of the genus Myiarchus, related to the ash-throated ~~flycatcher~~ and crested flycatchers of Arizona, a pretty little bird with the yellowish underparts but lacking the strikingly rufous tail of its northern relatives. Like others of the Myiarchus group, and so many of the Galapagos birds, it is fearless, inquisitive, and easily approached. The other is the Vermilion Flycatcher, the male of which in full adult plumage sports a scarlet breast and crown. This bright feature, however, is not universal to the Galapagos race and is apparently disappearing in a genetic drift towards drabness, a trend observed in other isolated insular species. Thus, it has been suggested that the somber plumage of the Darwin Finches may be a consequence of a similar tendency. Vermilion Flycatchers <sup>are</sup> attracted by the aquatic insects that breed <sup>there</sup> in them, ~~are~~ <sup>are</sup> the most lively members of the marsh community near the casita. They dart over the overhanging surface from lookout points on the ~~bordering~~ trees to snap up the winged forms, but they use also the backs of ~~the~~ tortoises resting



in the water as closer stations from which to launch foraging flights. It is not unusual to see several tortoises at one time serving as lookouts for these flycatchers.

In a pond bordered with dense thickets of manzanillo trees, which we visited on the first day of our trip to the casita, a half dozen tortoises were resting in the shallow water. Drawn into their shells, the heads of several of them were completely concealed behind elephantine front feet. Intermittantly they would extend their ancient wrinkled necks to gaze about with reptilian inscrutability that communicated nothing to us. They jacked themselves along a few steps, cropped a mouthful or two of grass, and subsided once more into inactivity. Once, manifesting unusual purpose a tortoise marched straight out of the marsh into the woods pushing through the thickest undergrowth.

← Tortoises spent their days feeding with catholic <sup>duck</sup> indiscriminateness on ~~marsh~~ weeds in ~~the~~ shallow water or on any vegetation in the surrounding park lands

Slow motion is the way of life of these giant tortoises. They move with the deliberation of a sloth and the indeflectableness of a tank. One front foot at a time is extended, to the right and to the left, pressed down and ~~backward~~ backward with a sweeping oar-like motion that propels the creature forward in a jerky course. The hind feet, not so easily observed, do their share of pushing under the concealment of the ~~carapace~~ over-spreading carapace. In wet grass and boggy places the tortoises slide themselves over the well lubricated surface without attempting, in the absence of compelling motivation, to rise up on their four legs, which in other situations they are perfectly capable of doing. In fact the largest ~~males~~ females are famous for their ability to carry at once two grown men on their backs. Occasionally, when in pursuit of a

female or a rival, a tortoise is capable of what in terms of their usual unhurried behavior might be called a burst of speed, but ~~if~~ for physiological reasons it cannot be long sustained.

In the evening, according to authority on tortoises, they retreat to the ponds or to mud wallows which they have created by churning up the sâil in damp places into a soupy liquid, there to rest all night half submerged. The breathing process of tortoises is a prolonged cycle of slow intake of air culminating in a rapid hissing exhalation. They ~~are~~ probably are able to build up a considerable oxygen deficite during the exertions required for occasion~~al~~ excessive effort or even for the normal activity of grazing. At night, bouyed up by water, the pressure of ~~the/their~~ body weight on their plastrons is relieved and they can breath more freely to reduce the accumulated deficiency of oxy~~ge~~n. Thus the periods spent in water fulfill a need beyond that for the replenishment of body fluids.

therefore

What motivates a tortoise is/a matter not entirely of conjecture. To some extent observers have been able to fathom the working of the sluggish tortoise mind - or more scientifically I should say interpret their behavior. When one lumbers into a shallow slough for a dozen yards or more and settles down, except for ~~the~~ slow rhythmic breathing, into inanimate immobility, he may be replenishing his dehydrated tissues or on the other hand he could be restoring his oxygen balance. Whatever goes on in his primitive reptilian brain, if indeed anything at all approaching consciousness does go on, he is not dâstracted with ease from his fixed preoccupation with internal matters, for when during one of these introspective sessions the animal is disturbed he simply reaffirms his concentration by tightening his withdrawal under his armour. Sometimes they seem to seek deeper seclusion for their reveries by sinking themselves in mud



mallows. When they return eventually to the external world of tortoise senses to resume their methodical wandering they appear smeared with the clays and clods of their muddy retreat, a proof of their late retirement.

The Galapagos tortoise has evolved in a tortoise paradise free, except for the herbivorous land iguana from all but intra-specific competition. His food supply was plentiful and he multiplied, apparently unrestrained by biological adversity in his limited world, to attain a population which numbered in the hundreds of thousands of individuals. He had no enemies; no predatory animals large or small ever attacked him; danger and fear were to him unknown until several centuries ago man walked over his horizon. Then his troubles began and have continued to increase to the point of his extinction on many of the islands. Not only ruthlessly by men alive by was he ~~attacked by man who butchered him~~ and carried off thousands ~~Alive~~, his young were attacked by the domestic animals that men released into his domain - wild pigs, dogs, and cats - not to mention that most destructive of man's social parasites the rat, accidentally introduced from the ships of sailing ships. Races of the tortoise now survive in viable numbers only on two islands, Santa Cruz and Isabela, and on these islands in a handful of thousands where a ~~thousand~~ ten thousand times that number once were common. It is told that when men first came to the Galapagos Islands the tortoises in the upland grazing meadows were so plentiful that it was possible to walk on their backs, stepping from one to another, without once touching the ground. The tortoises on Santa Cruz are beginning to learn fear and to withdraw into their shells at the sight of people. But whether this learned response would in the end save them from extinction is today not a pertinent question because man, their greatest enemy, has decided that the unique Galapagos *Geochelones*



shall not be exterminated. He is taking measures at long last to assure their survival. Wisdom and conscience, the highest human attributes, have at last in this distant corner of the planet and in this particular relationship triumphed over the predaceous impulse.

Female tortoises do not lay eggs in the moist cool highlands where they live most of the year. They migrate down to the ~~hot~~ hot bushlands where the conditions for incubation are more favorable, and there in the sun-baked ashy soil of flat open places called "campos" by the local residents they dig nests and deposit their eggs. Volcanic soil washed down from higher slopes into these depressions becomes cement-like when dry. In order to dig her nest the female ~~tortoise~~ tortoise must soften the ground which she does by urinating on it. After laying her eggs she presses the damp soil back over the eggs with her plastron. As it dries out again the ground becomes exceedingly hard and dense and unless ~~again~~ resoftened by rain at the time of hatching the young tortoises are unable to dig their way out and perish. Many have been found in all stages of disintegration trapped in their subterranean nests because rain did not come at the right time. This, however, represents a natural loss to which the tortoises during their long evolution have accommodated and can survive, but add to it the hazard of ~~man~~ man and the predators he ~~has~~ has introduced into the environment - pigs that dig out the nest, and rats, feral cats, and dogs that prey on the few hatchlings and young produced - and the survival of the tortoises is in jeopardy.

The grasslands and moors on the top of the island above the Miconia zone are quite a different associations from the parklands of the tortoises. For one thing they are drier ~~on~~ the hillsides, where the volcanic foundation of lava, cinders, and ash is only thinly covered with soil. Nevertheless, nourished by fogs, the



ground is almost completely covered with low vegetation: a tundra-like mixture of short grass, impoverished bracken, small ferns, mosses, and lichens. As the dry season of April and May comes to an end, before the onset of the summer garua, the bracken and grass turn brown streaked with yellow, the mosses darken and shrivel, ~~the~~ and the reindeer lichens become crisp and brittle; life seems to be going out of everything. The general aspect is very like autumn in the northern United States but lacks the accents of red provided by flaming blueberry ~~leaves~~. Counterpart to the dryness of the slopes is the persistence in old craters and in the hollows and depressions between peaks of reed bordered ponds and sphagnum bogs where a measureless depth of muck makes one hesitate to wade. I probed one of these bogs with the longest pole I could cut and found no firm bottom.

To add authenticity to the temporary character of the grassy highlands of Santa Cruz, but simultaneously to subtract from the anachronistic autumnal ~~a~~ complexion, when I was there in April, migrating purple martins circled the ponds and darted low along the hillsides in a swift search for insects. Their presence was an ~~undeniable~~ undeniable sign of spring, but <sup>of</sup> spring many thousand miles away.

The cones and craters of Santa Cruz are mostly so old that they have been smoothed and rounded by the action of weather and plant growth. Old lava flows and rivulets of lava, the outlines of which are still visible, are crumbling under these influences; their sharpness and abrasive properties that contribute such ~~a~~ deterrence to the ~~new~~ fresher flows on ~~Fernandina~~ <sup>islands</sup> and other ~~Santiago~~ have been obliterated. It is possible to walk over them anywhere with relative ease. One exception, the latest crater, ~~is~~ a peak called El Pintudo, though ancient by historical measure, is a steep-sided cone that rises over two hundred feet from the



center of an even older crater to a small vent not one hundred feet across. Its rim is bare dark rock still, and on its sides the tracery of lava rivulets is plain today. One rivulet in particular, a tube four feet in diameter, extends in a long S curve to the base of ~~the~~ the cone.

On the north side of the central chain of peaks the grassland ends abruptly at a forest wall composed of the tallest species of <sup>Sc.</sup> Scalesia found in the Galapagos Islands. Fingers of this forest reach up the sides of some of the craters nearly to their summits. All the vegetation at this altitude on the north slope is more luxuriant than on the south side, a fact which must ~~be~~ be related to differential precipitation or cloud formation on the two sides. Marching along the sky-line of the peaks on an east-west axis a row of agaves <sup>follows an old</sup> ~~marks a~~ trail across the island from Whale Bay on the west shore to Cerro Colorado opposite the Plazas Islands on the ~~west~~ east. Agaves are not endemic Galapagos species and were planted, so the legend goes, by whalers or buccaneers who ~~had~~ <sup>to mark</sup> ~~established~~ <sup>across the island</sup> a land route ~~between these~~ ~~these~~ bases.