VAUGHAN Keep.

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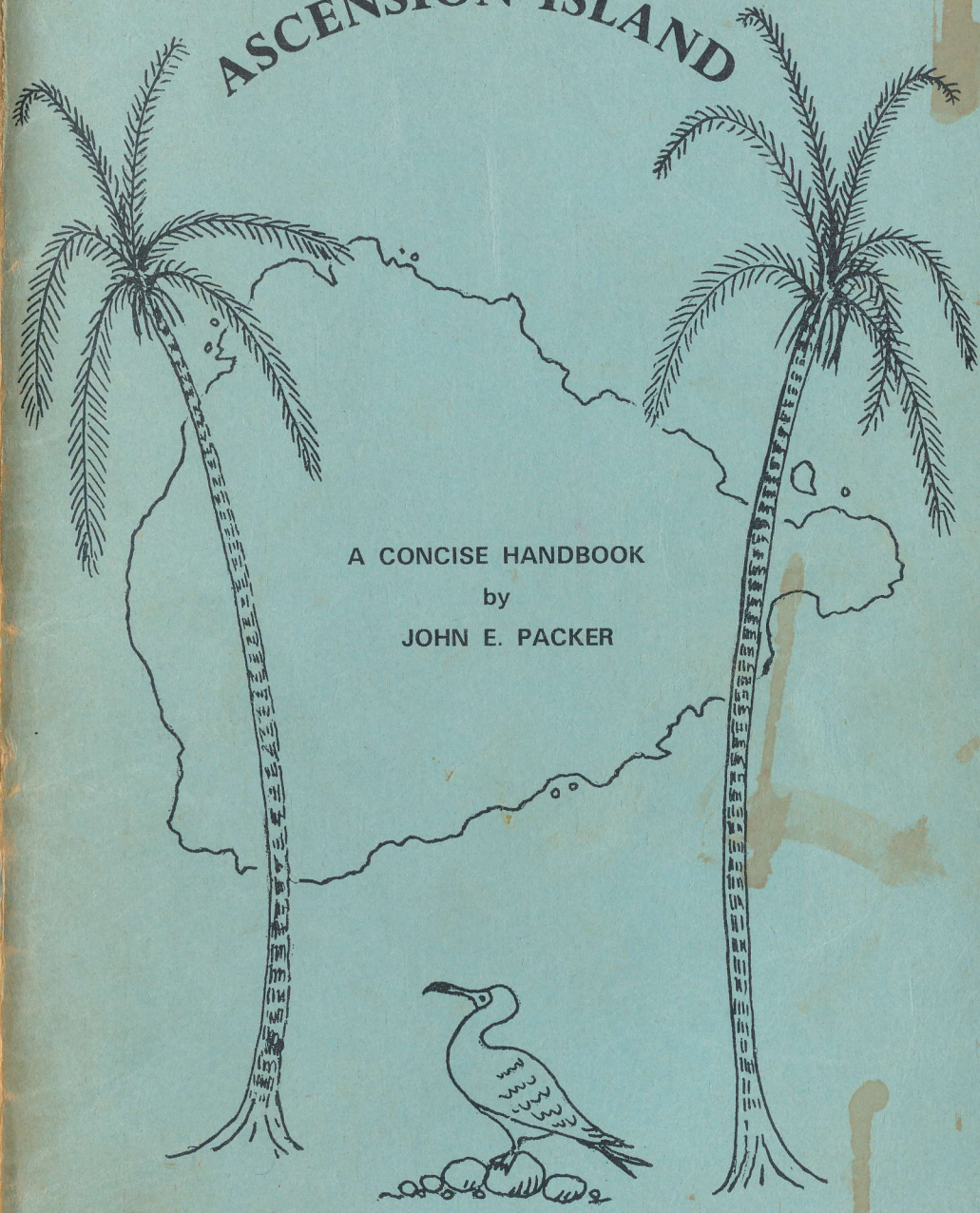
ASCENSION ISLAND



A CONCISE HANDBOOK

by

JOHN E. PACKER

THE ASCENSION HANDBOOK

A CONCISE GUIDE TO ASCENSION ISLAND

SOUTH ATLANTIC

J. E. PACKER

Georgetown, Ascension Island.
July, 1968.

INTRODUCTION

Little has been written about Ascension Island, and much of the published literature is either out of print or hidden in the esoteric papers of learned societies. This handbook is an attempt to bridge the considerable gap between the scientific paper on the micro-fauna of *Euphorbia origanoides*, or the chemical analyses of trachyte lavas, and the chatty and often inaccurate newspaper clippings which are all that most people manage to consult before visiting the island. My only qualifications are many days spent exploring both the island itself and the shelves of the relevant Museums and Libraries in Britain.

I am indebted to Dr. Bernard Stonehouse and all the members of the B.O.U. Expedition to Ascension for awakening an interest in the bird life, and for the opportunity to visit Bo'sun Bird Island on many occasions in the 'Ibis'; to Dr. Eric Duffey with whom I tramped the wilder parts of the island looking for rare plants; to F. B. Atkins, P. E. Baker, and J. D. Bell of the University Museum in Oxford for allowing me to sort through their maps and Ascension geological collections; to Professor A. Loveridge in St. Helena for information and hospitality; to J. P. Brenan of the Royal Botanic Gardens, Kew, for help in identifying many plants; to Peter Critchley of Green Mountain Farm for sharing his own considerable knowledge of the island; and many personal friends on the island who have kept company with me on long hikes over the clinker.

CONTENTS

PART 1. A 'POTTED' HISTORY OF THE ISLAND.

PART 2. A TOPOGRAPHICAL AND GENERAL DICTIONARY.

PART 3. THE FLORA OF ASCENSION.

PART 4. A LAYMAN'S GUIDE TO THE GEOLOGY.

PART 5. ORNITHOLOGY—THE ISLAND'S BIRD LIFE.

PART 6. MARINE LIFE INCLUDING FISH, TURTLES, SHELLS.

PART 7. ANIMALS AND INVERTEBRATES.

PART 8. MISCELLANEOUS.

PART 9. GENERAL BIBLIOGRAPHY AND REFERENCES.
EPILOGUE.

PROLOGUE

"It's volcanic, there's no fresh water, and there's supposed to be buried treasure."

This was all I knew about Ascension Island when I arrived there in 1956.

"Morning sir, we've arrived," said the face behind the tea tray, "You'll be able to go ashore after breakfast."

I peered out of the cabin porthole. A grey dawn light revealed low clouds and a choppy almost oily looking sea. In the distance shafts of a pinker light slanted obliquely from small gaps in the clouds, and a black man-of-war bird with curved beak swept momentarily across the edge of my field of vision. The customary thud of engines had ceased and I could hear quieter sounds; the faint whirr of some distant dynamo and the plop of water against the side of the anchored vessel. There was no sign of any island.

Later, having dressed and ascended to the boat deck I crossed to the opposite side of the vessel for a first sight of Ascension. The ship was anchored about half a mile offshore, and coming towards us from this shore was a motor boat towing an iron pontoon. I could see a long white beach onto which the waves thundered, and a small stone jetty at one end of the beach, whilst behind this the land rose in a series of barren looking conical hills towards high ground hidden in cloud. A boy fishing from the boat deck not far from where I was standing pulled a wriggling black fish aboard. I glanced down and saw that the sea was alive with hundreds of them, struggling to reach some piece of floating rubbish with such vigour that the fish in the centre of the moving mass were lifted partially out of the water by the press from all sides. Overhead the various sea birds circled and wheeled away beyond the superstructure of the ship. However desolate the island might look, the sea and sky at any rate were filled with life.

The launch towing the pontoon reached the vessel and the residents of Ascension, tanned and healthy, came aboard. I was met and welcomed and was soon in the launch travelling towards the little jetty, after a minor detour to retrieve a passenger's hat which had blown into the water and was drifting with remarkable speed towards Brazil. As we approached the jetty I could see a flight of stone steps with two ropes dangling from a wooden beam. The main requirement in landing on Ascension seemed to be a certain agility in stepping

from a rocking dinghy at just the right moment to avoid plunging waist deep into the swirling water. I was beginning to see the wisdom behind the announcement that had been made on board the liner that passengers would not be allowed ashore for such unneccesary purposes as sightseeing, and was later told that on a few occasions the sea had been too rough to allow any communication between ship and shore. Newcomers arriving at the island had once been forced to travel on to St. Helena, seven hundred miles further south, there to await a passage back to Ascension at a calmer date.

Once ashore I could see that the settlement of Georgetown, the only 'town' on the island with a population of perhaps 180, was built on a flat area between the jetty and Cross Hill, an extinct volcano rising in a great cone of reddish-brown ash 800ft. high.

I was given a running commentary on the buildings that we passed, many of them seemed to be old stone structures with open verandahs, a multitude of arches, and incongruous slate roofs. Meanwhile the supplies for the island were brought to the jetty on pontoons, and an antiquated steam crane puffed and blew as it lifted them ashore. The Rhodesia Castle drew away from the bay with a blast of its hooter and was soon lost on the southern horizon. The jetty was not a jetty I was informed, but was always called 'pierhead' and Georgetown was likewise 'Garrison'. I was beginning to learn, and was now, for better or for worse, an islander.

I had only been ashore for a few hours when someone invited me to go for a drive to see the local sights. I climbed into a dilapidated vehicle which looked as if it might have been made on the island and we jolted away along a potholed road which led from the settlement out into a kind of wilderness which my friend kept referring to as 'the clinker'.

"That's Gallows Hill," he said as we ground past a great mound of volcanic debris and across barren lava flows towards a distant hill of bright red ash. A little while later a semi-derelict wooden shed came into view, and beside it one or two tents huddled amongst the slag. I was told that this was the advance party of an American project to put a radar station on the island. "Miracle Mile," said my informant with a sweep of his hand as if indicating some fashionable residential area. It appeared that the name referred to the stretch of track along which we were travelling, the miracle was that it had once been tarred, the only stretch on the island. The furthest point in our tour was the airstrip, laid during the 1939-45 war and long since abandoned. More rotting and roofless wooden shacks lay scattered around its perimeter. It looked as if no more planes would ever land there, and I was told that it was a favourite place for learning to drive. The sun beat down on this derelict scene but the heat was tempered by a breeze which raised little clouds of red dust and blew them away in miniature whirlwinds. Beyond the long strip of cracked tarmac the land continued in a series of tortured flows of once molten rock, supporting scattered acacia bushes whose brown

seed-pods rattled dryly in the wind. On a distant skyline two donkeys moved in silhouette against the brilliant sky. The land rose gently towards the centre of the island, becoming greener with every increase in height, then the slopes became steeper, almost precipitous, culminating in high green peaks partly hidden in cloud. There was no sign of another vehicle, or another human being anywhere in our field of view.

"We must be getting back," said my guide, "I'm showing the film tonight and I want to show you the rest of Garrison first."

Returning to the settlement I was shown massive stone stores and crumbling forts, and enclosed pools near the beach called the 'turtle ponds'. I was curious to know the story behind these structures, and to know more of the odd monuments—"One's to do with pirates, the other's full of bodies"—which my friend indicated. At the first opportunity I began to learn something of the island's history.

PART 1

A POTTED HISTORY

1501—Island discovered by Juan da Nova and named 'Conception' but the discovery was never publicised.

1503—Island re-discovered by Alphonse D'Albuquerque who was not aware of da Nova's visit, and named Ascension.

1589—Van Linschoten, a Dutch traveller, called and recorded details of the bird life. He later published a book of his travels with a pictorial map which is the earliest known representation of Ascension—a rather inaccurate profile.

1659—A Cornish traveller, Peter Mundy, mentioned the 'numberless sea fowl' on the island and described a flightless rail-like bird of which no traces remain. Flightless birds exist on many remote oceanic islands (Tristan da Cunha, etc.) but it is possible that Mundy was actually describing flightless Wideawake chicks.

1673—Father Navarette visited and mentioned the 'ocean letterbox' where ships left messages for each other concealed in a crevice of the rocks. (See Part 2 under Letterbox.)

1698—James Cunninghame visited Ascension and made the first collection of shells and plants later described in a paper for the Royal Society.

1701—Wm. Dampier's vessel 'Roebuck' wrecked probably near S.W. Bay. (See part 2 Dampier's Drip.) Goats had already been introduced, probably by da Nova or D'Alburquerque.

1725—A Dutch sailor was castaway on the island for some crime and managed to survive for about five months on turtles and goats. He wrote a diary which shows that he was gradually going insane, the diary was later discovered near his bleached skeleton.

1754—Abbé de la Caille, a French priest and savant visited and described some of the few indigenous plants.

1775—Capt. James Cook put in to collect turtle meat.

1798—Wm. Davies, surgeon aboard the 'Atlantic' called and recorded the cross (navigation mark) on 'Crucifixion Hill' as being down. This is the earliest reference to Cross Hill. Davies was an ancestor of Mr. Ford Smith of Cable & Wireless Ltd., who was himself on Ascension in 1927-29 and possesses the surgeon's private log-book.

1800—H.M.S. Endymion picked up the crew of a brig wrecked some months previously.

1801—H.M.S. Cambrian passed close and fired 24 lb. shots into the hills as a signal to possible castaways to show themselves, in view of the Endymion incident of the previous year.

1815—The decisive year for the island. Napoleon Bonaparte was imprisoned on St. Helena and the first British garrison claimed Ascension in the name of King George III lest the French use it as a base from which to attempt to rescue the Emperor. From 1815 the island has been continuously inhabited. The garrison's immediate tasks were to search for fresh water and to build simple fortifications.

1816—The first stone buildings were erected in the Garrison around an area called 'Regent Square' near the present Georgetown swimming pool, many men still living in tents. A rough track made to Dampier's ravine and a detachment established there to collect fresh water which was sent to 'Regent Square' in barrels by donkey. The rough cave houses still visible at Dampier's were probably dug at this time.

1817—A track was extended up the side of Green Mountain and a stone house, almost certainly the present 'Garden Cottage' was built, and garden plots started nearby. A lookout post and alarm gun were mounted on the Weather Port Single (now Weather Post), a fort, probably Ft. Thornton, was begun in Georgetown, and a wall built to form a 'boat harbour' at the site of the present turtle ponds.

1819—First proper map of Ascension surveyed by Lt. Campbell.

1820—Mountain gardens extended, aloes and various shrubs planted, further stone buildings at 'Regent Square'.

1821—Napoleon died at St. Helena. Lookout removed from Weather Post, and the Ascension garrison passed from the Royal Navy to the Royal Marines.

1823—H.M.S. Bann brought a 'virulent fever' causing about 50 deaths, 26 officers and men being buried in a mass tomb just south of the present pierhead. Four water storage tanks completed.

1825—Guinea fowl introduced; these thrived for several years then died out.

1826—Six test boreholes for water made near Middleton's Ridge but with little success. Detachment at Dampier's still collecting water in casks for pack transport to Georgetown. The original 'Two Boats' shelters were erected at the foot of the mountain 'ramps' as a resting place for those ascending on horseback.

1827—English honey bees introduced and released on the mountain to assist in pollination at the gardens. Island commander asks for convicts to be sent out to cut stone.

1828—A British vessel was plundered by a pirate within sight of the island, the garrison was helpless due to the superior speed of the pirate vessel and lack of suitable island guns. H.M.S. Redpole of the St. Helena station, formerly at Ascension, lost off Cape Frio in action with another pirate.

1829—The settlement at 'Regent Square' renamed Georgetown after King George IV. Turtle pond built. Two vessels believed to be pirates hanging around, armed parties put in all the bays and a semaphore and lookout established on Cross Hill. More

bees from U.K. arrived dead. First large tank completed at Dampier's (Bate's Tank). The French scientific vessel 'Astrolabe' spent five days at Ascension. Lt. Brandreth arrived to advise about drilling for fresh water at Green Mountain.

1830—The famous ex-slaver 'Black Jake' arrived from West African duties with a fever stricken crew; after quarantine at Comfort Cove (later Comfortless) they recovered. Two small tanks built at 'Bullock Holes' and piping being laid from Dampier's tank to Georgetown. Fort Thornton enlarged; it was known as Fort Cockburn at this time.

1831—Capt. (formerly Lt.) Brandreth found water at a depth of 30 feet in Breakneck Ravine. Pipelines between farm area and Georgetown via Dampier's completed, during trials the water took one hour and 35 minutes to reach Georgetown from the farm. Heavy rains damaged Dampier's tank. One Marine killed another during a fight over a card game at the mountain. Commodore Hayes visited the island—later Ft. Hayes was named after him.

1832—The tunnel to carry waterpipes from Breakneck well to the farm area was completed, digging took place from both ends and when the adits met in the middle the difference in floor levels was only a few inches, a tribute to good surveying.

1833—Stone baracks built near the upper catchment which did not yet exist. North East Cottage built.

1832-1835—These years saw a great expansion in Georgetown, the present Hospital and Exiles Club (barracks) and many of the original small Officers' cottages between them were built at this time to replace dilapidated wood and canvas structures. The focus of Georgtown thus moved from the old 'Regent Square', near the turtle ponds and swimming pool (Narcissus tank), a part regarded as unhealthy, to the higher better ventilated plateau from which all boulders and loose debris had been cleared. An engraving dated 1834 shows the Exiles Club as a single storied stone building, the upper floor and clock tower were added later. Fort Hayes was an unfortified hill called Goat Hill, and it was proposed to level it and use the cinders for filling the depression now occupied by St. Helenian married quarters. Palmer's Cottage and associated small farm area were probably begun during these years.

1836—Charles Darwin visited the island as naturalist aboard H.M.S. Beagle, and wrote an account of the geology. (Darwin 1876.)

1838—Lt. Bedford of H.M.S. Raven re-surveyed the island and produced an improved chart. H.M.S. Bonetta brought yellow fever, her victims being buried near Comfortless Cove. Later in the year an influenza epidemic caused some deaths including that of Capt. Wm. Bate, island Commander for the previous ten years, who died at N.E. Cottage. Ships reported volcanic disturbances north of Ascension, with floating pumice and vapour clouds.

1839—Drought and scurvy. Thirty-seven donkeys running wild.

1843—Cornerstone of St. Mary's Church laid by Mrs. Dwyer, wife of the Commander. J. D. Hooker, director of the Royal Botanic Gardens, Kew, visited the island, and later sent many seeds and seedlings to improve the mountain gardens.

1844—More cowsheds built, cattle introduced.

1845—The Naval transport ship 'General Palmer' arrived from Buenos Aires with seedlings—perhaps this vessel gave its name to the small settlement at 'Palmer's' where some of the seedlings were planted.

1847—H.M.S. Tortoise nearly lost in the anchorage when her cargo of coal caught fire. Church completed.

1848—Cottage built at Green Mountain, later to be named after Mr. Bell, farm superintendent during the 1860's. Collier Brig 'Africa' wrecked at Comfortless. The Main Store in Georgetown (Her Majesty's Great Victualling Store) begun. Turtle ponds enlarged by 20ft.

1849—24-Pounders placed on Hayes (Goat) Hill and near Governor's Lodge on Cross Hill. Convalescent Hospital at the mountain completed (not the present 'San' building).

1851—*Francolin* (Red Legged Partridge) and probably waxbills (Estrelda astrild) introduced. A Scottish firm sent two brigs to collect guano at Boatswain Bird Island.

1852—Main Store completed. Walls built at N.E. Cottage to enclose a paddock. Starlings introduced. Men employed turning turtles issued with free boots for walking over the clinker.

1857—Drought, cattle dying in numbers.

1858—Cape Botanic Gardens sent over 200 species of plants.

1859—Great rains, 9 inches in a day with damage to roads and crops.

1861—Now about 200 starlings. Request for windmills to pump water at Breakneck and Georgetown. Work commenced on a steam driven 'factory' near Fort Thornton. Church consecrated.

1863—Union Castle liners begin to call at Ascension. Red Lion barracks built at the mountain. 12 h.p. steam engine for the 'factory'.

1865—Seven fever victims ex-H.M.S. Archer buried near Comfortless (2) and at Monkey Rock (5).

1867—Mountain Hospital ('San') completed.

1872—James Galloway, R.M.L.I., fell to his death from Black Rock on Rupert's path whilst going to N.E. Cottage in the night.

1875—Dewpond constructed at the peak of the mountain.

1876—The 'Challenger' oceanographic expedition called. A 'boat' shelter erected at the dewpond.

1877—Professor Gill and his wife Isabel camped at Mars Bay to make astronomical observations.

1879—Mynah birds (*Acridotheres tristis*) introduced from Mauritius. The 'Pillar Bay' tragedy in which five officers and men were drowned when their cruise round the island ended in shipwreck on a submerged rock. Very few sailors could swim in those days. St. Mary's Church restored and chancel built.

1881—Mountain catchment areas cemented to supplement the supplies from the Breakneck Wells and Dampiers.

1882—First Bermudan Cypress (*Juniperus bermudiana*) trees planted on summit of Weather Post.

1886—M'seur Faye of the French Academy of Science measured the local gravity which was found to be higher than the mean for the area.

1888—The island establishment was reduced as part of a British economy drive. Capt. Napier spent money supplied by a philanthropic society, to build a saltwater fountain (which never functioned well and was demolished in 1967) near the present Georgetown telegraph office.

1890—Canaries introduced.

1891—Needles water tank built.

1896—Unusual thunderstorm. The Captain's Japanese steward, who was talking to the Mountain on the telephone, was struck down to the verandah floor when the overhead line was hit. "A good brandy soon brought him round" (Cronk 1922).

1898—Conduit laid from peak dewpond to feed sheeptrough at N.E. Cottage.

1899—The Eastern Telegraph Company (later Cable & Wireless Ltd.) laid the first submarine telegraph cable into Ascension from the Cape via St. Helena. This was soon extended to the U.K. via the Cape Verde Islands and others were subsequently laid to West Africa and Central and S. America until the island sat like a spider in a telegraphic web.

1900—With the advent of direct cable communications with England, the Committee of Lloyds took over complete running of the Naval Semaphore Station on Cross Hill, sending back details of all ships passing the island. A further water catchment was built immediately above the Red Lion.

1901—First large scale survey of the island made by Capt. E. Y. Daniel. The carved wooden survey markers set in stone cairns still dot the less accessible parts of the island and a cairn above Coconut Bay has the letters E.Y.D. carved in the topmost stone.

1902—Georgetown stables (now Cable & Wireless Ltd. power house) built. A donkey driven treadmill worked a grist mill inside the building, the circular 'walk' and shaft trough can be seen north of the building.

1904—The 'Scotia' of the Scottish Antarctic Expedition called.

1908—H.M.S. Mutine geodetic team 'fixed' Ascension relative to the rest of the world with precision, the 'observation stone' lies immediately south of Bungalow No. 5 in Georgetown. Detailed marine surveys made of S.W., N.E. and Clarence Bay.

1912—St. Mary's Church roof repaired and an unsightly ventilating dome removed.

1913—Tin box (probably the first) placed at Letter Box (qv) by Messrs. H. Vincent and G. Dobson.

1914—First radio installation on Ascension erected by Admiralty at 'Wireless Plain' behind Cross Hill—a spark set for ship communication.

1916—Mountain 'ramps' improved, corners cut back and drains cut. Piping laid from a water tank on Middletons to feed the Bullock Ponds.

1921—Cronk's patch cut from Red Lion area to N.E. Cottage. Prof. R. A. Daly studied the geology, later a mineral new to science was discovered in specimens collected by him near Middleton's and named 'Dalyite'.

1922—Complete withdrawal of the British Naval establishment, the Eastern Telegraph Company (Cable & Wireless Ltd.) became the sole residents with the Manager appointed as Resident Magistrate. Shackleton-Rowett Expedition called. The first Ascension postage stamps were issued.

1923—The 'English Bay Company' erected buildings and processing plant and laid miles of light railway between English Bay and Porpoise Point, and started collecting 'guano'.

1925—Cleveland Museum expedition vessel 'Blossom' spent three weeks collecting bird specimens.

1926—The Union Castle liner 'Garth Castle' went aground near English Bay after mistaking the new Guano company's lights for those of Georgetown. (See 'Wrecks' Part 2.)

1934—Torrential rains, mountain road destroyed, floods in Georgetown.

1939—Ascension Volunteer Defence Force organised.

1941—The Manager of the E.T.C. (C. & W.) received coded instructions from the Governor of St. Helena to take soil samples and write a brief description of the surface at the 'Waterloo Plains' (S.W. Plains—now the airstrip). He may not have realised the military significance of the task.

1942—The U.S. Army Engineers built the airstrip, the first plane landed at Ascension. St. Helena Government representative appointed.

1943—About four thousand servicemen now stationed on the island, mostly American, but small detachments of Royal Artillery, R.A.F. and R.N.

1945—Large reduction in the island garrisons.

1947—Departure of the last servicemen, and island administration reverted to the Manager, Cable & Wireless Ltd., who once more became the sole occupants of Ascension. Population fell to about 170.

1949—Charles Darwin's great grandson (see 1836) visited the island and wrote an article for the American National Geographic Magazine.

1952—Prof. Coombs (Otago University) conducted a three week geological survey.

1953—H.M.S. Sparrow called and serviced the guns on Cross Hill. Live ammunition was removed from the associated storerooms.

1956—Advance survey parties arrived to survey the island for the present American Airforce Eastern Test Range facilities. U.S.S. Maury and Truckee assisted.

1957—The Duke of Edinburgh visited the island for one day. The Eastern Test Range opened. Installations erected on Cross Hill, and at the present domestic site near S.W. Bay, Red Hill. Road built to summit of South Gannet (Telemetry) Hill. Airstrip repaired. British Ornithologist's Union Centenary Expedition arrived and set up camp near Mars Bay. Pierhead at Georgetown extended.

1958—Further installations erected for the A.F.E.T.R. Airfield old wooden control tower burnt down. New mountain road via Command Hill and Hospital Hill tarred and opened to traffic. Mountain 'ramps' tarred for the first time. Survey made by firm interested in re-opening guano workings, but this proved to be uneconomic.

1959—British Ornithologist's Union Expedition left. Gradual expansion of the 'Base'.

1960—The 'Golfball' (T.T.R. Site) erected near Comfortless Cove and tarred road built to it from One Boat. A turtle tagging programme was initiated by Prof. A. Carr of Florida University, and H. Hirth visited the island to start the scheme. British Dept. of Scientific and Industrial Research commenced radio transmissions from a caravan on Long Beach in connection with ionospheric research.

1961—New submarine cable terminating house built at Comfortless. Advance party for the B.B.C. project arrived.

1962—Two lattice steel towers at Wireless Plain dismantled. The discoverer of the 'ceolocanth' (a fish long considered to be extinct) visited the island and collected bird specimens. H.M.S. Puma visited Ascension after a trip to the recently active volcano on Tristan da Cunha which neccessitated the evacuation of that island.

1963—Rough dirt road built from the N.E. Bay track, via N.E. Cottage spur, to the Devil's Ashpit. Further B.B.C. advance parties arrived. Old steam cranes on the pierhead at Georgetown dismantled. British judge arrived to try a murder/manslaughter case. A great rainstorm, which brought three years' rainfall in one day, caused extensive damage to roads, Deadman's Beach cemetery flooded to 3ft. deep, landslides occurred around Elliott's, etc. Transmitter in a caravan at English Bay (tests).

1964—The island administration passed from the Manager of Cable & Wireless Ltd. to an appointed Administrator—the first since the war years. Oxford University Geological Expedition visited the island. Building operations were begun at English Bay and Muriel Avenue near Two Boats for the B.B.C. project.

1965—The airstrip, which had stopped just short of Booby Hill, was considerably lengthened.

1966—A road from Command Hill, via Grazing Valley, to the Devil's Ashpit (N.A.S.A. Tracking Station) was completed in little over three months, and the N.A.S.A. facilities were installed. The boat at 'One Boat' was removed, for restoration.

1967—Cable & Wireless Ltd. Satellite Earth Station opened. South African Cable Company coaxial terminal building erected in Georgetown. The old Mountain road between One Boat and Two Boats was re-aligned and tarred for the first time. Transmitting site at English Bay completed and masts erected.

1968—Secor team visited the island to carry out intercontinental geodetic mapping by satellite observations. Simultaneously a BC4 camera team carried out a similar triangulation by optical means, photographing the satellite against a star background. S.A.C.C. coaxial cables laid, from Capetown, then northwards to the Cape Verde Islands. Road from Two Boats Village to B.B.C. Receiving Station near Butt Crater re-aligned and surfaced.

PART 2

A TOPOGRAPHICAL DICTIONARY

ARCHER CEMETERY: one of four small graveyards near Comfortless Cove (q.v.). The Words 'H.M.S. Archer' and an anchor are marked out in boulders on the sand of a tiny cove north of Pyramid Point, but there is doubt as to whether fever victims were buried there. Other largely indecipherable initials in the sand are more recent, some from World War II.

BANN MEMORIAL: a mass grave of 26 officers and men of H.M.S. Bann which brought a 'virulent fever' to the island in 1823, causing a total of 50 deaths. Sited on the beach south of the Pierhead.

BANANA BRIDGE: spans Banana Ravine on the path from Green Mountain Farm to N.E. Cottage (Cronk's Path). Allegedly unsafe! Dated 1922.

BATE'S COTTAGE: ROCK: TANK: etc. Wm. Bate, Capt. R.M.L.I., was island commander from 1828-1838 when he died at N.E. or Bate's Cottage. He brought many improvements to the island, and was sadly missed by the pioneering garrison of that time. By a curious error the tablet in St. Mary's Church refers to him as Capt. Edward Bates vice Wm. Bate.

BEAR'S BACK: a curious mass of highly magnetic basalt lava between Butt Crater and N.E. Bay, with no trace of a discrete vent, a geologist's puzzle.

BENIN CITY: the name given by West African labourers (Kroomen) to their encampment on the ash plain north of Cross Hill, after the real Benin City in Nigeria. Traces of kitchen foundations, drystone walls, etc. remain although the site was abandoned well before 1900. An Admiralty World War II direction finding

station lies derelict in the centre of the plain. Scattered clumps of *'Euphorbia origanoides'* a plant peculiar to Ascension, grow in the area.

BELL'S COTTAGE: erected in 1848 for farm superintendent Bell. On the edge of the track near the house a retaining wall has been built using hewn blocks from the first stone building ever erected on Ascension, the Commodore's Cottage which stood near the Georgetown turtle ponds.

BLOWHOLES: (See Part 4, Geology: Fumaroles and Caves.) Good examples occur at Catherine Pt., Pebbly Beach, Whale Pt., whilst between Pyramid Pt. and English Bay a sand blowhole has heaped a great cone of white shell sand at its mouth some yards inland.

BOMBS, VOLCANIC: (See Part 4, Geology).

BOATS, VARIOUS: The two halves of a naval gig were erected at Two Boats as a shelter for travellers ascending the Mountain, at a suitable place to let the horses cool off before beginning the steep climb up the ramps. This was in 1826 and the present 'boats' are probably second or third generation replacements. 'One Boat' is marked on the Admiralty Chart at a point on the old S.W. Bay track now occupied by the American base, it still remains propped up on its cairn of rocks and has been there since 1901 at the latest. The better known 'One Boat' on the direct Georgetown-Two Boats road is not marked on the same chart but appears in a photograph dated 1921. Another single boat shelter was erected on the peak of Green Mountain shortly before the visit of Gill in 1877, the 'Kroomen' labourers were given a 'holiday' on Ascension Day 1876 to drag it to its site. No trace remains.

BOOBY HILL: marked the extreme end of the wartime runway, one edge of the hill was trimmed during runway extensions in 1965. Seven or eight small fumaroles lie in a line to the north.

BREAKNECK RAVINE: until recent years the island's fresh water came entirely from the wells and catchments in this area. The main catchment area has a small rectangle left uncemented, this marks the outcrop of a thin clay seam which intercepts water further down the valley and allows two wells to operate. It was thought that if the outcrop were sealed over, the clay would dry and crack and the wells would dry up. From the main catchment water feeds via the 'tunnel' into the 'Mountain Main' tank, and thence to Georgetown. From the wells (one has now collapsed) water drains down Breakneck Ravine to the octagon tank from where it is pumped back up to the tunnel and 'Mountain Main' by windpump. As one emerges from the tunnel at the head of Breakneck, the first well is sheeted over, it is lined with stone and about 60 feet deep. The second collapsed well lies a few yards down the valley, it was formerly possible to enter an adit which led underground to the lower levels of these two wells but this is now blocked. A third still lower shaft surrounded by a wire fence was an abortive attempt to find water during World

War II. Near the windpump there is a sheeptrough lined with stone, formerly a drip or small spring emerged here, but this dried up when a small tunnel was driven into the hill behind it to try and intercept the water more effectively.

In the lower part of Dampier's Ravine, and again below Middleton's, deep shafts mark the sites of wartime drilling rigs in other vain attempts to find fresh water, whilst one of the new Two Boats bungalows is built over the site of a Naval shaft sunk in about 1898, also with little success.

A stand of Norfolk Island pines at the lower end of Breakneck was planted originally with a view to supplying wood suitable for the replacement of ships' masts.

BROKEN TOOTH CRATER: marked on maps at East Crater (after Capt. East, 1874). The rugged nature of the surrounding lava make it a difficult peak to reach, the jagged spire and other structures show that subsidence succeeded the last major eruption. The crater is breached on the eastern side and a thick flow has issued.

BOATSWAIN BIRD ISLAND: breeding site for most of Ascension's seabirds (see Part 5, Ornithology). The guano deposits were once worked by the English Bay Co. (q.v.) and rotting ropes used by the men to scale the cliffs still festoon the steep slopes over the tiny landing. Remains of a light railway, a shed, and winches litter the flat summit.

BULLOCK PONDS: two small tanks hidden in a eucalyptus grove between Middleton's and Grazing Valley. They are fed by run-off from clay slopes and also by overflowing from another tank sited higher up on the slopes of Middleton's. The pipes are dated J.B. 1915. Below the higher tank is a small hidden valley with a line of eight coconut palms and traces of a built-up zig-zag trackway.

BUDDLEA RAVINE: near the western end of Green Mountain. The buddlea is sometimes used as a cattle feed.

CASTLE HILL: with its nearby sheeptank and group of screwpines (Pandanus) lies between the Peak and Crystal Bay. The actual hill is a group of satellated crags to seaward of the sheep tank, a lookout was established there during World War I.

CANARY RAVINE: the lower part of Dampier's Ravine which trends towards N.E. Bay, one of the most likely places to see Ascension's few canaries which breed in aloe clumps in the bed of the gut.

CAVES: (see Part 4, Geology; Fumaroles and Caves).

CRYSTAL BAY: an isolated beach with curious olive green sand of tiny crystals of the gemstone peridote. Magnetic sand also occurs there. (See also Part 4, Geology).

COCONUT BAY: named when a small plantation of coconuts was established in the 1850's of which only one stunted specimen and the dead trunk of a second remain. The palms grew out of a sandy 'beach' actually a hundred feet or more above sea level and composed of felspar crystals weathered out of surrounding trachyte lavas. White Rock nearby supports breeding Boobies

and Noddies ,and old Noddy bracket nests occur on the mainland cliffs in a site probably abandoned when feral cats reached the area.

CORONATION PEAK: the peak above the farm area, crowned with a group of screwpines. Probably the Coronation of Queen Victoria.

COMMAND HILL: World War II command centre on a bluff overlooking the airstrip and American base areas. It is now used as a transit barracks. The red tiles came from Recife. Dug into the slopes between Command Hill and Dark Slope Crater are the remains of the island's wartime underground field-telephone exchange, with rusting wires still radiating from it. The summit of Command Hill shows traces of three contiguous vents, a common feature when volcanic action travels along a linear zone of weakness. A small white building near the summit is a 'bore-site' or optical and electrical reference point used to check the pointing accuracy of the Cable & Wireless satellite communications station on Donkey Plain.

COMFORTLESS COVE: the Bonetta Cemetery to the rear of the Cove dates from about 1838 when H.M.S. Bonetta brought cases of yellow fever to the island, these were quarantined at Comfortless and supplied with provisions from Georgetown. To avoid direct contact with the fever victims, the victualling party from Georgetown would leave the supplies near a conspicuous rock halfway between the end of Long Beach and the Cove. They would then fire a musket and return to the settlement; upon hearing the musket a party from the Cove would go to fetch the supplies, but would thus never actually meet Georgetown personnel. This is believed to be the first time that fever victims were buried there, but the Cove had been used as a quarantine station as early as 1830 when the famous ex-slaver 'Black Jake' arrived with a fever stricken crew. In 1865 H.M.S. Archer arrived with yellow fever victims, two were buried at Comfortless at the Bonetta Cemetery, and five others at Monkey Rock near 'San' (see Archer Cemetery). Later burials, probably all victims of various fevers, have added to the original Bonetta interments. The separate Trident Cemetery contains three graves inside a low clinker wall, and lies between Comfortless and Pyramid Point; two hand carved wooden boards are still just decipherable and read 'Trident Cemetery'—I was unable to find the date for this site but H.M.S. Trident was condemned and broken up at Ascension in 1857. In a lava gully near the sea between Comfortless and Pyramid Point there are five grave-shaped mounds of stone marked as 'un-named graves' on a map of 1901, I believe they date from before the arrival of the first settlers of 1815, a passing vessel might have buried fever victims and passed on its way without leaving any record. Comfortless was originally named Sydney Cove, then Comfort Cove, and this latter name was changed to Comfortless when the site's associations with the wretched victims of fever made the former name too ironic. Old bottle fragments and china in the area show that at one time a detachment of Royal Marines

camped there. On the beach old timbers mark the wreck of the 'Africa', a collier brig lost in 1848 (see 'Wrecks'). The submarine telegraph cables from S. America, S. Africa via St. Helena, West Africa, and the U.K. via the Cape Verde Islands land at Comfortless; the first cable was laid northwards from St. Helena in 1899 (see 'Mitchell Cove'). Connections with the telegraph office in Georgetown are made via landlines buried along Long Beach.

COAST RED NIPPLE: a small brick-red ash cone on the coast near Crystal Bay.

CRATER CLIFF: a curious half-crater near Crystal Bay, the ash cone has been neatly sectioned by the sea washing half of the original structure away.

CRICKET VALLEY: was probably formed partially by explosion and partly by subsidence. Much ash has fallen into it from later eruptions and it may once have contained a temporary lake. The name apparently refers to the insects.

CRONK'S PATH: one of the last paths to be constructed round the steep sides of Green Mountain, in about 1920 by Farm Superintendent Hedley Cronk (see Banana Bridge). Cronk's is the lowest of the three main tracks on the north slopes of the mountain, next being Rupert's, and uppermost Elliott's (q.v.).

CROSS HILL: was one of the first island features to be given a name, being called Crucifixion Hill in the 1700's because of the great wooden cross erected as a day mark for passing ships. A semaphore was erected on the hill to communicate both with ships and with Green Mountain, probably in about 1816 when another semaphore, the Weather Port Signal, was erected on the hill now corrupted to Weather Post (q.v.). In 1884 the Committee of Lloyds requested to be informed of all ships passing the island, and in 1900 with the introduction of direct cable communication with England they took over the entire running of the Signal Station from the Admiralty. The remains of the signal house and the actual semaphore were still on the summit until the erection of the present radar station in 1957. The derelict building on the lower slopes overlooking the anchorage was erected in the 1820's and has been variously known as Commodore's Cottage, Bate's Cottage (after Capt. Wm. Bate who lived there 1828-1838 q.v.), Governor's Lodge, and the Island Club. When the Navy abandoned the island in 1922 it became the residence of the Manager of the Eastern Telegraph Co. (Cable & Wireless Ltd.), the Governor of St. Helena staying there during his visits to the island. During World War II it was requisitioned by the military authorities, and after the war, during which time it had become very derelict, it was unoccupied. It would be pleasant if this historic building, one of the oldest on the island still standing, and occupying an excellent site, could be restored and put to some good use.

DALY'S CRAGS: Professor R. A. Daly visited Ascension in 1921 to study the geology. Daly's Crags are the whitish trachyte ramparts jutting strikingly from beds of black cinders north of Sister's Peak. They can be seen from the English Bay road. Specimens collected by Daly from Middleton's Ridge included a mineral new to science, called Dalyite (potassium-aluminium-zirconium-silicate).

DAMPIER'S DRIP: William Dampier, buccaneer, explorer and Admiralty hydrographer, was wrecked at Ascension in 1701 after a voyage of exploration to the far east. His leaky vessel 'Roebuck' put into the roads to repair, but the carpenter only managed to enlarge the hole and the ship settled in shallow water. Dampier and his crew were obliged to abandon the vessel and reached the shore with few provisions and negligible fresh water. It is said that the small drip or spring which saved their lives was discovered when they followed a goat to it, but Dampier's personal memoirs do not mention this, nor the so-called Dampier's Treasure which many generations of Ascensionites have kept an eye open for. The shallow stone cave which Dampier and his crew are supposed to have occupied can be seen below the 'San' cliffs. Dampier records finding a tree with an anchor and the date 1642 carved on it, and says that they lived on landcrabs, boobies and goats, before being rescued by passing East Indiamen some six weeks later. Shallow caves, some with crude wooden doors, are carved into beds of soft ash both below and level with the track into the ravine, they are the remains of dwellings occupied by the early Naval garrison. In the 1820's over 50 men, women and children were living at Dampier's, collecting water in casks for transport down to Georgetown by donkey, or beginning the farm plantations. In 1830 the cast iron piping was laid between Dampier's and Georgetown, and in 1831 the first trials were made for sending water down from the new wells in Breakneck, via Dampier's, to Georgetown, all by pipeline. This released men and pack animals for other farm work and the settlement at Dampier's dwindled as houses and barracks were completed at the present farm site. Two large stone tanks at Dampier's catch water run-off from surrounding stone slopes; further down the ravine lie two other smaller tanks almost completely overgrown, one has an associated small drip. During World War II a power station was erected on the track into the ravine; it supplied power to the radar station whose rusting tower still graces the ramps halfway up the road to the farm.

A second radar station at the eastern end of the mountain provided complementary coverage (see 'Elliotts').

DARK SLOPE CRATER: a prolific source of plutonic xenoliths. (See Part 4, Geology).

DEADMAN'S BEACH: immediately south of Georgetown, named because of the proximity of the main cemetery I assume. There is a story of a great storm breaching the cemetery walls and washing bones and skulls out onto the beach. Two graves lying outside the cemetery walls are those of Muslims. Between Fort Hayes Hill and the cemetery traces of late Royal Marine encampments can

be seen, and brass R.M.L.I. buttons picked up. Small inch-long black cylinders found on the beach near Catherine Pt. are charges of cordite. Wartime ammunition dumped in the sea off Deadman's Beach is obviously rusting through and scattering its contents to the waves. The base of a gun-mount (?) can be seen near the P.O.L. area.

DEVIL'S ASHPIT: a deep water-cut cleft in beds of soft ash to the S.E. of the N.A.S.A. tracking site; the cleft extends to the sea as a small but spectacular canyon.

DEVIL'S CAULDRON: an oval depression between Weather Post and the sea, formed by explosive evisceration and now walled with cliffs of white trachyte rock. A walk round the rim gives magnificent views of Boatswain Bird Island, Spire Beach, and the spectacular cliffs of Powers Peak.

DEVIL'S INKPOT: seen from the top of White Horse or the Razorback cliffs this curious formation looks exactly like a stream of black ink spilt carelessly over the sloping face of the S.E. head plateau. It is actually a thin stream of trachyandesite lava from a small fissure eruption.

DEVIL'S RIDING SCHOOL: a shallow crater-like lake filled with fine ash from later eruptions. The lake dried out and subsided in the centre, subsequent erosion has revealed the variously coloured ash layers as many vari-coloured concentric rings round the perimeter of the crater. The effect can be seen best from the hillock on the south rim. To the north the trachyte lava has been weathered into a fantastic assortment of pedestals and overhangs and convulutions, whilst underfoot there is the metallic tinkle of fragments so thin and fragile that the walker seems to stride over acres of broken porcelain. In the centre of the Riding School, where ashy beds have been cut by erosion gullies, curious eyeball shaped globes of white matter occur, half embedded in pink ash. They intrigued Charles Darwin when he visited the area in 1836 and are concretions of calcium minerals round a hard nucleus, formed when the Riding School was occupied by a shallow lake. A human skull was discovered here some 30 years ago, bearing mute witness to some forgotten tragedy of the past.

DEWPOND: at the summit of Green Mountain, built before the bamboos were planted. Goldfish were introduced to keep the water clean, and frogs which live in the area are possibly descendents of those brought to the island during the war for use in medical experiments. An anchor chain marks the island's highest point (2,817ft.); during the Naval occupation of the last century malefactors were obliged to spend hours at the Peak swinging a chain round their heads, although the present chain would appear to be too heavy for this. The chain swinging was not a refined form of torture, but was supposed to induce rain by 'changing the direction of the electricity' in the clouds so often enveloping the peak. Thick-stemmed crusty looking ferns growing on the windward slopes just below the Bamboo Grove are peculiar to the island and date from a time before the eruption of recent peaks such as the Sisters group.

DRIPS: the name for the many tiny trickles and dribbles which at one time were the island's only sources of fresh water. Dampier's Drip has been mentioned; others include Lady Hill Drip which once supported coconut palms but has since dried up, Flat Drip on the north mountain slopes, Mulberry Tree Drip below Dampier's, and others.

EAST CRATER: See Broken Tooth.

ELLIOT'S PATH: encircles the summit of the mountain at about 2,400ft. Cut in 1840, it provided a lookout route from which all parts of the horizon could be scanned when the Peak itself was obscured in cloud. The southern sector was widened during World War II to provide a jeep track to the radar station on the mountain's eastern ridge. A bulldozer employed on the work started a minor landslide and slipped a short way down a steep slope to hang poised over a precipitous drop. The engineering difficulties of recovering it without worsening the slide, and the urgent need to finish the track without delay caused it to be abandoned and the track completed over the top. The side of the ill-fated machine still sticks out from the hillside, half buried in earth and obscured by gingers.

ENGLISH BAY: The English Bay Company commenced guano collecting in 1925. Light railway lines were laid across the 'clinker', a small jetty was built at the south end of the bay, and a small boat called the 'Derby' made trips to Boatswain Bird Island where more guano diggings were established. St. Helenian employees camped on Boatswain Bird Island for a week or more at a time. A camp was also set up on Spire Beach and men would make the daily climb of 2,000ft. to the summit of Weather Post to collect fresh water from the tank. The Company was not successful, the 'Derby' and a launch were wrecked in a storm at English Bay (probably broke from their moorings in heavy rollers), bagged guano ready for export was washed into the sea in an unusual cloudburst which also wrecked the Spire Beach camp, and after only three years of operations the Company closed down. Much equipment was abandoned and later generations have used the railway lines for wartime bunker roofs, aerial feeder poles, even as railway lines—whilst half filled sacks and old implements can be found in the rocky lava wilderness near English Bay. Winches and rotting ropes and the guano workers' camp beds still litter Boatswain Bird Island. An investigation by a London firm in 1958 considering a similar project to exploit the phosphate deposits concluded that it would be economically unprofitable. The Union Castle passenger liner Garth Castle, unaware of the activities of the English Bay Company, mistook the lights at English Bay for those of Georgetown and ran aground there in 1926. The passengers were not allowed ashore and remained on board till taken off by another U.C. vessel after about a week. Divers and pumps were sent up from the Cape and the Garth Castle eventually was refloated. After this incident the present navigation lights were erected at Georgetown.

FORTS: one of the first activities of the 1815 garrison was to build fortifications. Fort Thornton, originally called Fort Cockburn, and a smaller emplacement just north of it were the first to be completed, in about 1817, but since that time Fort Thornton has been enlarged and altered several times; this is the structure close to the present Pierhead. The small emplacement which mounts two bulbous Victorian iron cannon near Governor's Lodge on Cross Hill was erected in the 1830's, although not with the present guns. The larger Fort Bedford nearby was built in the 1900's (?) and mounts two guns orginially from H.M.S. Hood. One of them shows the marks of hits received when the gun was afloat; no naval engagement has been fought off the island. Fort Hayes, near the Georgetown hospital, was built about 1860. The Ascension Historical Society Museum now occupies the premises. The hill in which it is dug was known as Goat Hill until the fort was built—in 1834 there was a scheme for levelling the hill and filling in the quarry area between it and the Main store. Gun positions were also constructed on the summit of Traveller's Hill, on Green Mountain near the farm, on S.W. Bay, Red Hill (one of the cannon at the entrance to the American base came from there) and elsewhere.

GALLOWS HILL: the Admiralty Chart No. 1691 shows the site of a gallows and the weatherbeaten post still standing may have been part of it. People have tended to assume that the gallows stood at the summit of the hill, but the chart sites it on the north west slope of the hill in the exact position of the present post. Photographs show that the post has been in position for many years and is nothing to do with recent installations, whilst a cement posthole on the actual summit of Gallows Hill was part of a World War II observation post.

GANNET BAY: lies to the east of Mars Bay. Glass and plastic fishing floats are often washed ashore there.

GARDEN COTTAGE: home of the Farm Manager, probably the first building erected on Green Mountain. It appears in an engraving dated 1834 and was probably built as early as 1817 (letters refer to a 'mountain house' at this time but this may have been only a temporary wooden structure on the site).

GHOSTS: in a magazine dated 1936 I found a startling article called 'Ascension Ghosts' in which the following paragraph appeared: "This much is certain, men and women walking alone on the island amidst the volcanic clinkers are liable to take sudden panic, running this way or that, or collapsing to the ground and remaining motionless with terror. Some have been known to disappear. This is why the British community arranges some social or sporting event for every day of the week to keep them from brooding about the mysterious atmosphere". This appeared in a Scottish newspaper (The Bulletin, February 15th, 1936) and greatly amused the E.T.C. (now Cable & Wireless Ltd.) staff who were the island's only residents. For an island only seven miles across, Ascension has a wonderful collection of odd tales. The West African

'Kroomen' were said to be able to communicate with their wives on the West Coast by means of telepathy. Surgeon-Commander Moxon-Browne and his son Kendall were passing through the Bonetta Cemetery in 1921 when the son said "Daddy, look at that Marine standing over there" and on being further questioned described a man in 19th century dress. The old 'Windmill Cottage' now demolished and replaced by the present Bungalow 57 in Georgetown was said to be haunted. There are fragmentary stories concerning a ghost ship at English Bay, and a man who drives a horse and cart from Georgetown to Needles Tank. (A plaque in St. Mary's recalled the memory of a sailor killed whilst driving the daily cart up the precipitous mountain ramps.)

GILL, PROFESSOR DAVID: visited Ascension in 1877 to observe the September opposition of Mars as part of measurements being made to determine the exact distance between the earth and the sun. His wife Isabel accompanied him and wrote 'Six Months in Ascension—An Unscientific Account of a Scientific Expedition', a book now out of print. The main instruments used were a transit telescope and a heliometer, and Gill's first observatory was erected close to the present Bungalow No. 10 in Georgetown. Cloud from Green Mountain hampered the work, and as a result of a night expedition across the lava by Isabel who found clearer skies over what is now called Mars Bay, the observatory was moved. Stores were carried round to the bay by sea whilst the delicate heliometer tube was carried overland, lashed to a spar, by the Kroomen. The site, just to the west of the bay, is still marked by the crumbling brick pillar of the telescope mount, and the neat pebble-edged paths laid by Isabel between instrument site and the kitchen and living tents. A pile of white shells on the site of the living tent were ones collected by Mrs. Gill and mentioned in her book.

GOAT-TRACK, THE: a narrow crumbling ledge around the side of White Horse on the route to Letter Box, which at first sight looks almost impassable. It leads to Powers Peak, a crag over a thousand feet above the beach, pierced by a small natural arch, and with good views of Boatswain Bird Island.

GOD-BE-THANKED TANK: a break tank on the old Mountain pipeline below Two Boats, with a sheep trough. Thirsty travellers walking or riding to the Mountain would stop for water at God-Be.

GUT: local name for a dry water course or stream bed—also in common usage on St. Helena and Tristan da Cunha.

GOVERNOR'S LODGE: see Cross Hill.

KROOMEN: the West African labourers working for the Admiralty until the Naval withdrawal in 1922. The first Kroomen were freed slaves who elected to remain on the island to work for the Navy rather than be repatriated to the West Coast.

LETTER BOX: at the extreme tip of S.E. Head in a rather inaccessible area. Navarette, writing in 1673, makes mention of an ocean letter box or cache where passing ships would leave notes and messages for each other, but this is more likely to have been near

Clarence or N.E. Bay rather than in this awkward and unlikely spot, far from any suitable anchorage. At one time a red Victorian pillar box stood near Bottle Point, having been carried there as a joke (or so I have been informed although this also seems unlikely; letter boxes weigh rather a lot). At present a green tin hidden in a stone cairn contains notes left by those reaching the spot. A check made in 1958 revealed notes dating from 1913, including one left by a former Governor of St. Helena, and more latterly notes left by Americans who cheated by arriving in a helicopter. I have been unable to discover who placed the first tin on S.E. Head, and when the practice of leaving notes there began.

LONG BEACH: the main breeding ground for the Green Turtles. A nursemaid and two children were swept into the sea and drowned during a period of heavy rollers in the latter part of the last century. At the north end of the beach lies Parker's Grave, a crumbling stone cross on the rocks over a sea chasm into which the unfortunate sailor fell and was killed. Tin sheds in the centre of the beach house the remains of pumping engines used to transfer aviation fuel from vessels anchored in the Bay, via floating hoses, to fuel tanks behind Cross Hill; used during the last war.

MARS BAY: see Gill.

MIDDLETON'S RIDGE: see Bullock Ponds and Daly's Crags.

MITCHELL COVE: the South Africa-Lisbon coaxial submarine cable comes ashore here. The shore ends were laid by C. S. John W. Mackay in March and April, 1968.

MIRACLE MILE: the name given to the present American Base near S.W. Bay Red Hill and dating from wartime days when the island's first tarmac was laid in the vicinity.

MOSQUE: a Mohammedan mosque in the form of a small plot of land enclosed within a low stone wall, with a plaque giving details, lies close to the Needles Tank to One-Boat Road at Wireless Plain. Built by W. African soldiers during World War II.

MURIEL AVENUE: the avenue of coconut palms now almost surrounded by Two Boats Village, named after one of the daughters of Capt. Morgan, R.M.L.I., island commander from 1905-1908, in whose time they were planted.

NAPIER'S FOUNTAIN: was a low mound of boulders surrounded by a circular wall immediately north of the Cable & Wireless telegraph office in Georgetown. Erected by Capt. R. Napier, island commander from 1886-1890, allegedly with money sent to the island by a philanthropic society for 'the benefit of the sailors'. It is not recorded whether the sailors appreciated a fountain, their interests probably lying elsewhere. It soon ceased to work properly and was demolished in 1967 to make room for an extension to the telegraph office. The loss to posterity was slight.

NATURAL ARCHES: occur along the coastline. The two best known are a massive arch over a sea inlet just north of Long Beach, and a delicate, far more graceful arch spanning another sea chasm north of Pyramid Point. Another occurs at Triscott Cove.

NEEDLES: two curious basalt spires behind Georgetown. The water tank nearby was built in 1891.

NORTH EAST BAY: one of the landing places often used by ships calling at Ascension in the days before the first settlement. An old path built by these early visitors can still be traced as it zig-zags from the bay up towards N.E. Cottage.

NULLAH: marked on the Admiralty chart to the north of Holland's Crater (Hollow Tooth). The name is Indian for a steep dry water course and perhaps suggests that the surveyors had previously been on the great survey of India.

ONE BOAT: see Boats, various.

PALMER'S: an abandoned small farm site established in the 1830's between the Norfolk Island Pines of Breakneck and Mountain Red Hill. The area is choked with prickly pear (*opuntia*) and various *acacias*, but detailed search will reveal the remains of two small cottages, low walled fields of *sanseviera*, a double water-tank and associated sheep trough. In the small ravines below the ruined cottages one can find Persian Lilac, Silver Oaks, Mangoes, Cape Yews, *Ficus* (rubber), Giant Aloes, Olives, Dragon Trees (*Dracaena*), Australian wattle, and other botanical relics of the undertaking.

PALM VALLEY: a shallow valley below the cliffs of 'San' with a row of about ten coconut palms.

PILLAR BAY: has two tall off-shore stacks rising to over a hundred feet, whitened by guano from roosting Boatswain Birds and Noddies. (See Potted History, 1879.)

POWERS PEAK: see Goat-track.

RAMPS: the Mountain road originally had 26 hairpin bends and associated 'ramps' between Two Boats and the Farm, road improvements in 1957/68 eliminted some of these, especially below the 'San' junction, leaving instead a much steeper gradient.

REDPOLE MONUMENT: on the lower slopes of Cross Hill, records the fate of H.M.S. Redpole, formerly of the St. Helena station, believed to have been sunk in action with a pirate vessel off Cape Frio (North of Buenos Aires) in 1828. According to a note in the Church archives the white gravestones nearby are for crew members who died when H.M.S. Redpole was at Ascension in 1820, yet I found that the only decipherable inscription read 'Richard Venner, Quartermaster of H.M.S. Heron. Died 1820, aged 35'.

RED LION: built for the Royal Marine farm workers in 1863 when it seems that the authorities agreed that the earlier structure by the main water catchment was too damp for human habitation (in a later age it was thought too damp for cows!).

RUPERT'S PATH: on the north side of the Mountain, below Elliot's and above Cronk's paths. At 'Black Rock' a white cross in the cinder

shows where J. Gallaway, R.M.L.I., fell to his death whilst walking at night in 1872. Lest modern walkers on today's broad track wonder what state Gallaway was in, let me add that an engraving dated 1834 shows a different scene, with a narrow ledge of crumbling cinder, and a frail looking rope ladder spanning part of the chasm. A ferny cave nearby with a plaster roof contains early dates and names (Capt. J. East, 1874, for example, in pencil) written or cut into the plaster amongst a welter of modern graffiti.

'SAN': the Naval hospital built in 1867 as a sanatorium for fever victims, mainly from the West Africa Squadron engaged in suppressing the slave-trade. A photograph taken in 1891 shows a much larger complex of buildings than at present, with the area now occupied by lawns almost entirely covered by outbuildings. Convalescing patients were allowed to exercise along the two paths called 'Invalids' and 'Convalescents' which run from 'San' to the Ramps.

SCANDAL TERRACE: the term, of Naval origin, for the row of Officers' Quarters between the Barracks (now Exiles Club) and Georgetown Hospital. See also 'Teapot Alley'.

SISTERS PEAK: (see Part 4, Geology). One of the more recently active volcanoes.

SOUTH WEST BAY: many of the turtles formerly exported from the island were caught here. (See Part 6, Turtles.) A curious lava tunnel occurs at the rear of Clarke's Beach. Old anchors lie off-shore. Dampier's 'Roebuck' may have foundered here.

SPIRE BEACH: access is by steep scree slope from the saddle between Weather Post and White Horse. From the beach a route leads along the strand at the foot of the cliffs to the Devil's Inkpot and S.E. Head. See also under 'English Bay Co.'.

SOUTH GANNET HILL: (Telemetry Hill) an ash cone with an associated basalt flow from a breached crater, large volcanic bombs occur on the south slopes.

SHELLY BEACH: lies east of Mars Bay and is reached by a rough track across the lava. This track was mentioned by Mrs. Gill, who found it in 1877 and wrote that no one on the island could remember who had made it or for what purpose. Small brown stains on rocks along the route are from square headed bootstuds torn from the soles of World War II lookouts(?) or Royal Marines from the last century? The studs can sometimes be found and on cursory inspection resemble handmade wrought iron nails found in some of Georgetown's early buildings. A similar path, almost invisible to the newcomer to 'clinger crawling' runs from English Bay to North East Bay via Porpoise Point; in parts it is only traceable by similar bootstud stains in little hollows of the rock. Saltwater pools about a hundred yards inland at Shelly Beach contain silvery-green globes up to 2in. diam. (a tropical seaweed?) and iridescent orange shrimp-like creatures amongst other fry. These pools have no visible connection with the sea but the

water is constantly circulating. Beyond Shelly Beach is a stretch of coast which accumulates much flotsam, fishing floats, spars and mast sections, pieces of tree trunk, etc. A collection of natural flotsam was made in 1958 to assist scientific study of ocean currents.

TABLE CRATER: tanks on the north slope supplied chemical solutions to hydrophonic troughs on the plain below, in a wartime attempt to grow 'soil-less' vegetables for forces stationed on the island. Troughs and pipes remain.

TEAPOT ALLEY: like 'Scandal Terrace' an old Naval name; given to the 'Other Ranks' married quarters lying between Georgetown Police Station and the Stables (Transmitter Hall).

TRAVELLER'S HILL: once mounted a gun at its summit. The survey of 1901 marks a lone grave on the eastern slope. The World War II Military Hospital was accommodated in wooden sheds nearby, giving the name to Hospital Hill. In 1957 a Geodetic Survey team erected telescopes at a temporary camp at the top of Hospital Hill to fix the island's precise position by means of star sights.

TANKS, WATER: the island has many old stone fresh-water tanks (George's, Benjamin's, Needles, Edward's, God-Be-Thanked, Bate's, Mountain-main, Narcissus, Evelyn, etc.). They show the care with which fresh water has always been collected and stored on the island. A complicated system of pipes drained water from every roof in Georgetown into some tank or other.

TURTLE-PONDS: these are located on the site of the original 'boat-harbour' of the first garrison, before the erection of the pierhead. Turtles were stored in them prior to shipment, the sea circulating via vents in the walls. An antique wooden windpump at the edge of one pool formerly supplied Georgetown houses with piped saltwater.

WATERS-EDGE-FAIR: the main Wideawake breeding site beyond Mars Bay. (See Part 5, Ornithology.)

WEATHER POST: a corruption of the name Weather Port Signal. A lookout was established on its summit in 1817 and linked to Georgetown by semaphore. It was dismantled on Napoleon's death in 1821, but replaced, together with a cannon in 1828 after a British vessel was plundered by a pirate within sight of the island. A fragment of drystone wall may mark the site—the grove of Bermudan junipers was not planted until about 1880. See also English Bay.

WRECKS: ships lost at Ascension include:

(a) The 'Africa', a collier brig which broke adrift from her moorings and ended up in Comfortless Cove, where parts of her timbers can still be seen, during heavy rollers in 1848.

(b) The 'Derby' a small motor vessel belonging to the English Bay Company which was lost at English Bay.

(c) A wreck close inshore between Comfortless and Pyramid Point may be the remains of a sugar trader from Mauritius to

London which is known to have been lost off the island.

(d) A wreck is marked on the Admiralty Chart of 1901 in about five fathoms just north of English Bay, but no details known.

(e) A small motor tug was wrecked at Crystal Bay in about 1943 when her propellor struck a submerged rock and snapped off, leaving her to drift helplessly onto the rocks. Only spars and the rusting engines remain.

(f) The 'Garth Castle' went aground at English Bay in 1926—see under English Bay.

(g) The site of Dampier's 'Roebuck' (see Dampier's Drip) has not been positively located but she probably foundered off S.W. Bay.

(h) Holman (1840) mentions that a brig was wrecked at Ascension in 1800 but no details given.

ZEBRA HILL: was the name once given to Sisters Peak due to the striped appearance of the ash on the southern slopes. The name was still in use in 1835.

PART 3

THE FLORA OF ASCENSION ISLAND

General

Little is known about the original flora of Ascension, the records of early travellers are brief and imprecise, and between the island's discovery in 1501 and the settlement of 1815 only a handful of flowering plants were recorded, whilst cryptogams received no attention until much later. However, none of the travellers who mention the flora in any detail ever ascended to the upper slopes of Green Mountain, although many recorded its verdant appearance.

The paucity of the indigenous plant life shows the island's comparative youth in the geological time-scale. In the last 100 years, as shown by early sketches, photographs, and farm reports, there has been a great spread of largely introduced vegetation into many areas not artificially irrigated, and it seems likely that the last 'sere' or natural process of plant colonisation had not reached its botanical climax when the process was upset by the establishment of the first garden plots on Green Mountain in 1816. Unfortunately at that time no detailed scientific account of the existing indigenous flora had been made, and as there has been a continuing, if limited, process of land reclamation and introduction of new species, etc., since that time until the present day, it is often impossible to fix with any certainty the provenance of many species now growing 'wild' on the island. However, most accidental introductions have been confined to the Green Mountain farm area initially, and have then spread to lower altitudes in a leeward direction until halted by soil infertility, lack of moisture, etc., on the barren volcanic ash slopes of the sun-baked lower altitudes.

In view of Ascension's geographical isolation, the arrival of any new species by natural means is of some interest, and any new plant

establishing itself initially on the eastern coastal areas or windward lower mountain slopes, away from farm areas, would possibly fall into this category. Certainly many wild herbaceous plants now found here are not mentioned in any of the few papers previously published on the island's flora. This process of continuing plant colonisation (or attempted colonisation) may be happening more frequently than one would suspect, the plant perhaps surviving a season in some isolated ravine until destroyed by drought, or lack of conditions neccessary to set seed.

No fossil plants have yet been discovered on Ascension, but the last major eruptions almost certainly occurred less than 2,000 years ago, at a time when some of the plants peculiar to the island (*Marattia purpurascens, Euphorbia origanoides,* etc.) must surely already have been established. (A recent Oxford University team suggested 500 years as a possible date for the last major eruption, in the Sisters area, whilst evidence suggests minor volcanic activity in the form of gas emissions, etc., during the last 150 years). The island is very small, few parts of it would remain entirely unaffected by a major eruption, and it is interesting to speculate whether a more complex flora might at one time have existed and been destroyed. Certainly the entire geological history of Ascension, from the earlier Green Mountain—White Horse—Weather Post complex to the much later Sisters area spans a million years or more.

This chapter attempts to summarise the early reports on the island's botany, and to supplement this with a checklist of plants now growing on the island. In particular it was felt important to list and record the approximate distribution of those rare species peculiar to Ascension. Some may be in danger of extinction, indeed *'Hedyotis adscensionis'* has apparently already disappeared, and other endemics may be removed by competition from introduced species.

The list does not claim to be complete, single specimens of plants growing only in cultivated areas have largely been ignored, as have certain common vegetable crops grown for local consumption, as the number and variety of these changes from year to year. It must be confessed that the choice of species to be listed has of necessity been rather arbitrary, but the majority of plants growing 'wild' even if introduced originally, and ruderals, have been included. Thanks are due to the staff of the Herbarium at the Royal Botanic Gardens, Kew, for assistance in identifying many tropical species.

GLOSSARY

CRYPTOGAMS—include the ferns, mosses, algae, lichens, etc.
ENDEMICS—plants peculiar to Ascension Island.
INDIGENOUS—plants found naturally (not introduced by man) but not peculiar to Ascension Island alone.
RUDERALS—plants introduced accidentally (seeds mixed up with animal foodstuffs, and other unintentional introductions).
SERE—the botanist's name for the natural progression of flora in any area, starting with the first species to colonize sterile ground, to the botanical climax limited by climatic and physiographic factors.
STATION—the particular site from which a species has been recorded.

Plants listed as rare, limited, local, common, etc., refer only to the distribution on Ascension; a plant listed as scarce for example may be

quite a common species elsewhere. The real rarities by any standard are those listed both as rare and endemic.

Previous Work

The first identification of any plant from the island was made in 1698 from a collection of four plants and some seashells made by J. Cunninghame. The plants were listed as:

Aristida adscensionis. A grass.
Hibiscus trionum.
Euphorbia origanoides.
Ipomoea pes-caprae.

Abbé de la Caille in 1754 listed:

Convolvulus (probably meaning *Ipomoea pes-caprae?*).
Grass (unspecified).
Purslane (almost certainly *Portulaca oleracaea* q.v.).
Tithymal or Spurge (almost certainly *Euphorbia origanoides*).

G. Forster, from a visit in 1775 mentions:

Panicum sanguineam (probably syn *Digitaria adscendens* q.v.).
Pteris dentata var *adscensionis.* A fern.
Purslane (*Portulaca oleracaea*).

The botanist of the Challenger Expedition made a collection in 1876. This was later worked out and the results published by W. B. Hemsley (1885)—the plants listed by Hemsley are detailed in the checklist.

The U.S. Eclipse Expedition visited Ascension in 1889; a Mr. Loomis made a small collection, adding nine vascular plants to Hemsley's list. The results were published by Sereno-Watson in 1891.

The Scottish National Antarctic Expedition visited the island in 1904; a collection made then was detailed by R. N. Rudmose-Brown in 1906.

The British Ornithologists' Union Expedition stayed on Ascension during 1957/59, and Dr. E. Duffey joined the expedition for three months to work on the terrestrial ecology. He made an extensive collection of plants which was detailed in a paper published in 1964.

Details of the various publications listed above are to be found in the bibliography towards the end of the handbook.

FLORA OF ASCENSION—CHECKLIST

The checklist has been divided into two sections; "Flowering plants" including trees, shrubs and herbs, and "Cryptogams" including ferns, mosses, lichens, etc. An alphabetical listing has been employed, rather than a more scientifically correct grouping by genera, in order to make the list more useful to the non-specialist.

FLOWERING PLANTS OF ASCENSION

Acacia albida (Del). First recorded in 1958 (Duffey 1964). Lower mountain slopes, localized.

Acacia longifolia. Port Jackson Wattle. Introduced in about 1861 (Baines 1867). Localised Green Mountain, San, Palmers, etc. Long dark green leaves. Also in St. Helena.

Agave americana(?). American aloe. Bell (1859) mentions A. americana var variegata growing near the farm. At present the un-variegated grey-green variety grows around the lower mountain slopes, believed to date from the 1890's.

Agave sisalana (Perr). Sisal hemp. Introduced possibly around 1830, an engraving of 1834 (Allen 1835) shows *agave* or *furcrea* (qv) growing near the farm. Plants of A. sisalana were sent from Kew in 1847. Common across lower mountain slopes, Traveller's Hill, Donkey Plain, etc.

Aloe hanburyana(?). A small variegated-leaved coral-red flowered agave grows near N.E. Cottage, Palmer's area, etc. Believed introduced about 1850.

Agave and *Aloe*-like plants. See under *'Furcrea* and *Sanseviera'*.

Alocasia indica?. Taro or false Yam. Aroids, probably *Alocasia* introduced from Madeira in 1847. Large saggitate leaves. Farm 'escapes' grow wild in Breakneck, etc. Also *Dioscorea.*

Alpinia speciosa (Wendl). Ginger. Bell (1859) refers to *A. nutans* which may be the same plant as the *A. speciosa* now common around Elliott's Path and elsewhere on the mountain. Fibrous leaves, pinkish flowers, ginger smell.

Amaranthus viridis (Linn). Recorded by Duffey (1964) in 1958, but introduced accidentally much earlier than this. Small ovate-leaved dry region weed common near Georgetown, etc.

Anagallis arvensis (Linn). Scarlet pimpernell. Recorded by Duffey (1964) in 1958, very localized on moister parts of mountain; ruderal.

Araucaria excelsa. Norfolk Island pine. Introduced in 1900 from Buenos Aires by H.M.S. Wye (Cronk in litt) as suitable for growing timber for ship's masts. Now local on Green Mountain (old tennis court), Breakneck, below Boobies, etc.

Argemone mexicana (Linn). Mexican poppy or thistle. Holman in 1828 (Holman 1840) refers to 'thistle' as common, probably referring to *A. mexicana* as the only other thistle-like plant *(Sonchus)* was unlikely to be common in 1828. If so, then *A. mexicana* must rank as one of the first ruderals to become well established, and may even be indigenous. Mrs. Gill (Gill 1878) mentions it as common in 1877. Bright yellow flower, variegated grey-green thistle-like leaves. Common in all dryer regions.

Aristida adscensionis (Linn). A rank grass first described from Ascension but later found to be common in tropics. First collected in 1698 (Cunninghame 1699), widespread in island but localized, dryer areas. Indigenous.

Aristida congesta (Roemer & Schultes). A grass collected by the writer near Georgetown in 1967 was identified by Kew as *A. congesta.* No previous record. Ruderal?

Azadirachta indica. Nim tree. Introduced dry region tree with dark thin leaves and small white flowers. Georgetown. Provenance unknown.

Bambusa sp. Hill bamboo. Seedlings from Kew in 1847, but the present plantation on the Peak was not established until after 1877 in which year Mrs. Gill mentions the open view from the Dewpond.

Banana. See *'Musa'.*

Begonia hirtella (Link). The writer saw these growing in rock crevices near the farm and Bell's Path in 1956. Duffey mentions unspecified *Begonia* in 1958. No previous record. Succulent pinkish-green stem, heart shaped leaves, small white flowers, prefers shaded cliffs and banks. Localized.

Bermuda cedar. See *'Juniperus'.*

Bermuda grass. See *'Cynodon'.*

Bidens pilosa (Linn). Tropical bur-marigold. First recorded by Sereno-Watson in 1889 (S.-Watson 1891). A ruderal which has never spread far from farm area. Small composite with serrate leaves, white petals round golden disk.

Bombax ?malabaricum. Red cotton tree. Cronk (in litt) refers to a specimen at Palmer's, planted about 1900.

Borreria verticillatum (Linn). Recorded by Duffey (1964) as present on mountain in 1958. Now common esp. on Coronation Peak, etc. Low woody plant with whitish clover-like flower.

Bougainvillea ?formosa and *?spectabilis. Bougainvillea* hybrids are common and identification of species difficult—but two main types on the island may be *B. formosa* (purple) and *B. spectabilis* (brick red). An orange variety also occurs. *Bougainvillea* sp sent from Kew in 1847. Localized in Georgetown, farm area, path to Peak, etc.

Breadfruit. See *'Monstera'.*

Briza minor (Linn). Lesser quaking grass. First recorded by Duffey (1964) in 1958. Very localized on upper parts of mountain. Ruderal.

Brugmansia. See *'Daturu'.*

Buddlea globosa. Introduced from Capetown Bot. Gdns. in 1858, grew rapidly in Peak area and threatened to become a nuisance until partially cleared in 1900 (Cronk in litt). Common on mountain, esp. in Buddlea Ravine. Purple flowers, pale green leaves.

Cape daisy. See *'Vinca'.*

Cape gooseberry. See *'Physalis'.*

Carica papaya. Pawpaw. Introduced 1900 and probably earlier. Confined to 'home gardens' on mountain, Georgetown, etc.

Cassia occidentalis (Linn). Introduced from Capetown Bot. Gdns. in 1858. Now very common in all dryer areas. A low woody yellow-flowered plant producing conspicuous seed pods.

Castor oil. See *'Ricinus'.*

Casuarina equisetifolia (Linn). She-oak. Beefwood. Present in 1859 (Bell) near the Peak. Further introductions planted at Two Boats about 1915 (Cronk). Now localized but common at Two Boats, Georgetown, N. lower mountain slopes, etc. Spreading naturally (as the specimens on Sisters Peak flank). A graceful weeping evergreen tree.

Catharanthus. See 'Vinca'.

Centella asiatica (Linn). Recorded by Duffey on Green Mountain in 1958 (Duffey 1964). A prostrate weed with kidney-shaped leaves. Breakneck Ravine, etc.

Cerastium vulgatum (syn *C. fontanum*: Baumg). Common mouse-ear. Recorded by Duffey (1964) in 1958. A small herb with five white petals, opposite lanceolate leaves, with a limited distribution on the upper parts of Green Mountain. Ruderal.

Ceratonia siliqua. Locust or Carob bean. Several introduced trees at Palmer's in 1859 (Bell in litt). Small spreading tree with pinnate leaves and long seed pods. Present distribution not investigated.

Chenopodium ambrosiodes (Linn). Goosefoot. Recorded by Duffey in 1958 and by the writer from a station halfway up the ramps. Widespread but limited at altitudes mainly above 500ft. A pungent weed with minute greenish flower clusters.

Chenopodium murale (Linn). Recorded by Duffey (1964) in 1958. Similar to *C. ambrosiodes,* but will withstand a drier habitat.

Clematis ?vitalba (Linn). Old Man's Beard. Recorded by Rudmose-Brown as present on Green Mountain in 1904 (Rudmose-Brown 1906).

Chloris virgata (Swartz). A tropical grass mentioned as present on Green Mountain only by Duffey (1964) in 1958.

Clerodendron fragrans (var *plentiflorum* Schauer). A farm report of 1859 mentions a hedge of this, so must have been introduced at least a year or so previously. Still present on Green Mountain. A shrub with broad dark green leaves and white flowers, scented.

Clidemia hirta (Linn). Kosters curse. Recorded in 1958 (Duffey 1964). A troublesome weed of the tropics, confined to upper parts of Green Mountain, quite common.

Cocos nucifera. Coconut palm. Introduced before 1859 when Bell (in litt) mentions group at Coconut Bay, now reduced to one stunted specimen. Others stations include Muriel Avenue at Two Boats, a valley near Monkey Rock, a group near Palmer's, seven or eight palms near Grazing Valley (towards the upper water tank), Cricket Valley, Goathole Ravine, Dampier's, etc., about 50 or more in total. Former sites included Lady Hill Drip, now dried up, near Command Hill (in 1928), near S.W. Bay (lone palm marked on Admiralty chart), Long Beach and elsewhere.

Commelina diffusa (Burm) syn *C. nudiflora* (auct). First recorded by Sereno-Watson (1891) from plants collected on Ascension in 1889. A ground creeping herb with small blue flowers found on Green Mountain, esp. near the farm, at Palmers tank, etc.

Commidendron rugosum (De Candolle). This was recorded as being present on Green Mountain in or about 1817 by Burchell who mentioned goats feeding on the plant. As this is a small white-flowered woody plant endemic to St. Helena, and as no other collectors have ever found it on Ascension, this is a doubtful record, perhaps the result of a mis-labelled specimen or faulty note-keeping.

Cupressus sp. See *'Juniperus'.*

Cynodon dactylon (Linn). Bermuda grass. Introduced in 1875 from Australia. A creeping tropical grass common in dryer areas but localized; on Green Mountain, at S.W. Bay beach where it is salt tolerant, etc.

Cyperus appendiculatus (Brong). Sedge. First recorded by Duffey (1964) in 1958. Common sedge tolerant of rather dry conditions, localized.

Cyperus brevifolius (Rottb). Sedge. Also collected by Duffey in 1958, this sedge is confined to a few damp locations on Green Mountain.

Cyperus cyperoides (Linn). Sedge. Similar distribution to C. brevifolius.

Cyperus haspan. Sedge. Recorded by Lesson in 1824 (Lesson 1826), not seen by any subsequent collector—possibly this is synonymous with one of the other Cyperus sp.

Cyperus polystachyos (Rottb). Sedge. First recorded by Duffey (1964) in 1958. Limited localized distribution on Green Mountain. Probably indigenous or ruderal.

Cyperus umbellatus. Sedge. First recorded by Hemsley as present in 1876 (Hemsley 1885) scattered thinly on lower Green Mountain slopes. Possibly indigenous.

Dactyloctenium aegyptium (Beauv). Grass. Identified by Kew from a specimen growing near Needles tank collected by the writer in 1967. No previous record. Present distribution not known but believed to be very limited.

Datura (Brugmansia) suaveolens. Introduced before 1859 when the species is mentioned in a farm report. A shrub with showy trumpet-shaped white flowers several inches long. Limited, Green Mountain, esp. below the piggeries. Poisonous.

Date palm. See 'Phoenix' sp.

Desmodium canum (Gmelin). Seen by the writer in 1956, collected by Duffey in 1958. No previous record. A prostrate creeping herb with small blue flowers found on open grassy slopes of Green Mountain. Persistent sticking seeds. Common. Introduced.

Dichanthium aristatum (Poir). Grass. Recorded by Duffey (1964) in 1958. Very localized on upper parts of Green Mountain.

Digitaria ?adscendens (Kunth). Grass. This was recorded by Duffey in 1958 (Duffey 1964) who mentions that Mr. W. D. Clayton of Kew believes this grass to be *Panicum sanguineum* collected by Forster in 1777. If this is so, the grass is certainly indigenous. Now quite common in areas above 500ft.

Dracaena. Occasional single specimens in mountain area, one at Palmer's. Bell (1859) mentions an unspecified *Dracaena* near the farm, perhaps the one still growing by Garden Cottage.

Eleusine indica (Linn). Grass. Recorded by Duffey in 1958 (Duffey 1964) on Green Mountain. Also found at Grazing Valley and other rather localized stations.

Enneapogon cenchroides (Roemer & Schultes). Grass. Recorded in 1917 by Stapf (1917) shortly after this grass first appeared on the island. Cronk (in litt) writes 'about 1915 a new grass appeared—it first appeared on the Wideawake Plain and looked as if the terns had brought it probably entangled in their feathers. On viewing it from the mountain the apex of the fresh crop started on the plain and the wind carried the seed across the flats to Garrison.' Now common on many of the island's low dry lava areas.

Eragrostis tenella (Roemer & Schultes). Grass. An introduced African slender spreading grass. Common.

Erigeron bonariensis (Linn). Recorded in 1958 by Duffey (1964). A small upright herb with white fluffy flowers confined to medium-altitude regions. Fairly common but localized.

Eriochloa procera (Hubbard). Grass. Recorded in 1958 by Duffey (1964). Widespread.

Erythrina arborea. Dadap. Madre-de-cacao. Introduced probably about 1850 from Kew. A small decorative tree confined to a few stations on Green Mountain.

Eucalyptus camaldulensis (Dehn). Gum tree. Introduced from Kew in 1847. Now common on upper Ramps, Middleton's Ridge, Bullock Ponds, Mountain Red Hill, Cricket Valley, N. lower slopes of mountain, etc.

Euphorbia hirta (Linn). Recorded by Duffey in 1958 (Duffey 1964). Common in low dry coastal regions, Georgetown, etc. Small semi-prostrate weed with reddish woody stems and opposite leaves. Ruderal.

Euphorbia origanoides (Linn). One of the world's rarest plants, peculiar to Ascension, and not common on the island. First recorded by Cunninghame (1698). Prostrate vermillion stems with a thick milky juice. small alternate oval slightly dentate leaves, greenish red flowerheads similar to English spurge. The milky juice is poisonous and can cause blindness if allowed in contact with the eyes. Rather small colonies grow near Letter Box, on the ash plain between Cross Hill and Sisters Peak, in the small valley immediately at the N.E. foot of Cross Hill, near Collyer Point, near Comfortless Flats, on seaward slopes of Devil's Cauldron.

Euphorbia peplus (Linn). Petty spurge. Recorded by Duffey (1964) on Green Mountain in 1958. A common British weed accidentally introduced with farm supplies.

Euphorbia prostrata (Aiton). Collected by the writer in 1956 but not then identified. Recorded by Duffey (1964) in 1958. A very small prostrate oval leaved weed of tropical regions, scattered over most of the island. Possibly indigenous although none of the early travellers record it.

Ficus elastica. Rubber tree. Introduced from India, via Kew, in 1847. Many at Palmer's in 1859 (Bell), have died but others planted in the farm area and near the Peak, some by Cronk in about 1900, have a few survivors.

Furcrea gigantea. Mauritius hemp. Green aloe. Introduced prior to 1859 (Bell), perhaps before 1834 when an engraving (Aleen 1835) shows *agave* or *furcrea* growing near the farm. Good specimens at Palmer's, bottom of Breakneck, below Middleton's, etc. Forms a rosette of bright green leaf spikes up to 5ft. long, producing a central flower stalk up to 25ft. high when mature.

Furze. See *'Ulex'*.

Ginger. See *'Alpinia'*.

Gum. See *'Eucalyptus'*.

Gnaphalium purpureum (Linn). First recorded by Duffey (1964) on higher parts of Green Mountain in 1958. Wild mignonette family, with thin pointed leaves and inconspicuous red-brown flowerheads. A ruderal weed.

Greasy grass. See *'Melinis'*.

Grevillea robusta. Silveroak. Introduced from Australia probably about 1860. A small tree with reddish flowers, bipinnate leaves with silvery undersides. Localized but quite common in the farm area, near Palmer's, etc.

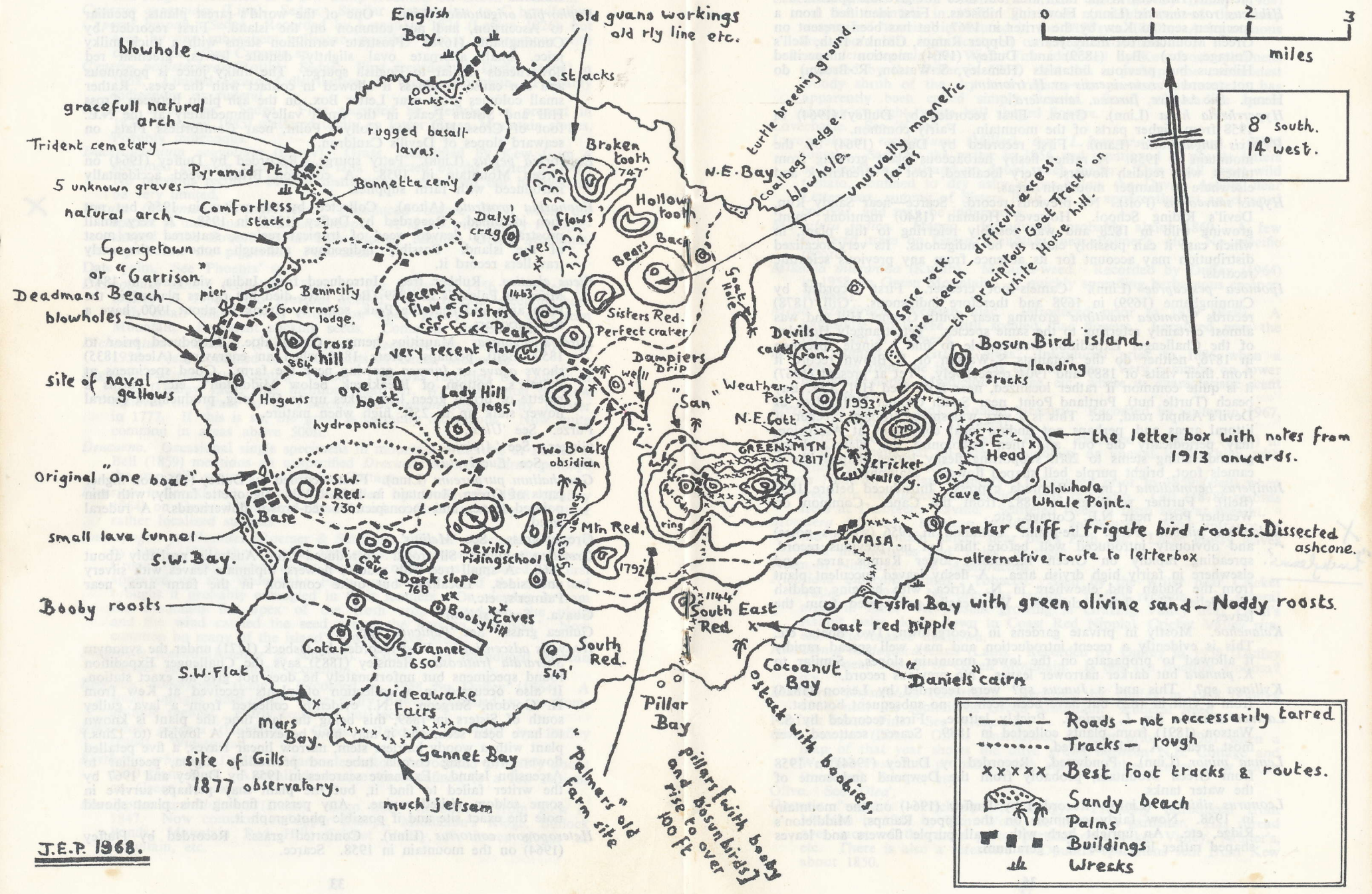
Guava. See *'Psidium'*.

Guinea grass. See *'Panicum'* spp.

Hedyotis adscensionis. First recorded by Osbeck (1771) under the synonym *Sherardia fruticosa.* Hemsley (1885) says the Challenger Expedition found specimens but unfortunately he does not give an exact station. It also occurred in a collection of plants received at Kew from H. Gordon, Surgeon, R.N., evidently collected from a lava gulley south of Sisters in 1889, this being the last time the plant is known to have been seen, and it may now be extinct. A lowish (to 12ins.) plant with a woody hairless stem, narrow linear leaves, a five petalled flower with long corolla tube and protruding stigma, peculiar to Ascension Island. Extensive searches in 1958 by Duffey and 1967 by the writer failed to find it, but the plant may perhaps survive in some seldom visited ravine. Any person finding this plant should note the exact site and if possible photograph it.

Heteropogon contortus (Linn). Contorted grass. Recorded by Duffey (1964) on the mountain in 1958. Scarce.

SKETCH MAP OF ASCENSION ISLAND



J.E.P. 1968.

Hibiscus trionum. First recorded by Cunninghame (1698) and therefore obviously indigenous. Unless this plant is synonymous with H. rosa-sinensis it has apparently died out on Ascension. Bell (1859) mentions Hibiscus in the farm area but does not give the species.

Hibiscus rosa-sinensis (Linn). Flowering hibiscus. First identified from a specimen sent to Kew by the writer in 1967, but has been present on Green Mountain for many years. (Upper Ramps, Cronk's Path, Bell's Cottage, etc.) Bell (1859) and Duffey (1964) mention unspecified Hibiscus but previous botanists (Hemsley, S.-Watson, R.-Brown) do not record *H. rosa-sinensis* or *H. trionum.*

Hemp. See *'Agave, furcrea, sanseviera'.*

Hyparrhenia hirta (Linn). Grass. First recorded by Duffey (1964) in 1958 from higher parts of the mountain. Fairly common.

Hypoxis angustifolia (Lam). First recorded by Duffey (1964) on the mountain in 1958. A rather fleshy herbaceous plant growing from tubers, with reddish flowers. Very localized, foot of Breakneck and elsewhere in damper mountain areas.

Hyptis suaveolens (Poit). No previous record. Scarce—near Sandy Run, Devil's Riding School. However Holman (1840) mentions 'mint' growing wild in 1828 and was possibly referring to this plant, in which case it can possibly claim to be indigenous. Its very localized distribution may account for its absence from any previous scientific records.

Ipomoea pes-caprae (Linn). Camels-foot creeper. First recorded by Cunninghame (1699) in 1698 and therefore indigenous. Gill (1878) records *'Ipomoea maritima'* growing near South Gannet Hill and was almost certainly referring to the same species. Yet strangely Hemsley of the Challenger Expedition was unable to find a single specimen in 1876, neither do the botanists S.-Watson or R.-Brown record it from their visits of 1889 and 1904 respectively. Yet at present (1967) it is quite common if rather localized, near S.W. Red Hill, S.W. Bay beach (Turtle hut), Portland Point, near South Gannet Hill, edges of Devil's Ashpit road, etc. This is a very widespread tropical creeper of littoral areas and, perhaps not finding ideal conditions at Ascension, may periodically die out and then re-colonize the island. Long ground-trailing stems to 20ft. supporting fleshy leaves shaped like a camels foot, bright purple bell shaped flowers. Halophytic.

Juniperus bermudiana (Linn). Bermuda cypress. Introduced before 1859 (Bell). Further seedlings in 1882 from the Cape. Common on Weather Post, near N.E. Cottage, etc.

Kalanchoe pinnata (Pers). Life-plant. Common in 1956 (writer's notes) and obviously introduced well before this but no previous record. spreading rapidly on Green Mountain, lower Ramps area, and elsewhere in fairly high dryish area. A fleshy leaved succulent plant from the Sudan and elsewhere in N. Africa. with hanging reddish 'chandelier like' flower clusters. Very easily propagated from the leaves.

Kalanchoe. Mostly in private gardens in Georgetown, Two Boats, etc. This is evidently a recent introduction and may well spread rapidly if allowed to propagate on the lower mountain slopes. Similar to *K. pinnata* but darker narrower leaves. No previous record.

Kyllinga sp? This and a *Juncus* sp? were recorded by Lesson (1826) from a visit in 1825 but have been seen by no subsequent botanist.

Lactuca scariola syn *L. serriola.* Prickly lettuce. First recorded by S.-Watson (1891) from plants collected in 1889. Scarce, scattered over most areas. A ruderal weed.

Lemna minor (Linn). Pondweed. Recorded by Duffey (1964) in 1958 from Green Mountain, probably from the Dewpond and some of the water tanks.

Leonurus sibiricus (Linn). Recorded by Duffey (1964) on the mountain in 1958. Now fairly common on the upper Ramps, Middleton's Ridge, etc. An upright herb with small purple flowers and leaves shaped rather like those of a geranium.

Lepidium ruderale (Linn). Pepperwort. Recorded by Duffey (1964) on the mountain in 1958. A common English weed introduced accidentally, scattered in farm area, etc.

Leucaena glauca (Linn). Horse-Tamarind. Recorded by Duffey (1964) on the mountain in 1958. This was no doubt one of the many unspecified 'acacias' introduced in the 1850's to 1860's. A leguminous tree about 18ft. high scattered on Green Mountain.

Leucaena leucocephala (De Wit). First identified by Kew from specimens collected by the writer in 1957. Yet this is perhaps the commonest woody shrub of the dry lava regions—in previous literature it has apparently been called simply 'acacia'. Small mimosa-like leaves closing at night, white ball shaped flowers.

Lovechaste. See *'Vitex'.*

Lycopersicum esculentum (Miller) syn *L. lycopersicon* (Linn). Wild tomato. Seen by the writer in 1956 and mentioned in private letters as present in 1950 and no doubt much earlier. This small sweet wild tomato, confined to dry ashy slopes below the Devil's Ashpit, near Letter Box, summit of Sisters Peak, etc., is apparently not an escaped cultivar, and may be indigenous.

Mangifera indica. Mango. Introduced, probably about 1860. A few scattered trees on Green Mountain, near Palmer's, etc. No specific record.

Mikania micrantha (Kunth). Mikania-weed. Recorded by Duffey (1964) in 1958 on Green Mountain. A quickly spreading herbaceous creeper. Ruderal.

Melia azerdirach. Persian lilac. Introduced prior to 1859 (Bell). A handsome small tree with scented lilac flowers. Localized near the farm, and at Palmer's.

Melinis minutiflora. Greasy grass. Introduced prior to 1886 when a specimen from the island was sent to Kew. Very common on lower mountain slopes, Middleton's Ridge, etc., where its characteristic scent fills the air.

Mercurialis annua (Linn). Annual mercury. Recorded by writer in 1967. No previous record. Ruderal.

Mirabilis jalapa (Linn). Marvel of Peru. Recorded by Duffey (1964) in 1958. Ornamental on Green Mountain, an annual to 2ft. high with white or pink flowers.

Morus ?indicus. Indian mulberry. Introduced prior to 1859 (Bell) when trees are mentioned (unspecified) near the farm. Gill (1878) records trees at Dampier's Ravine. Scattered trees in farm area at present.

Monstera deliciosa. Mexican breadfruit. Introduced. Near entrance to the long mountain tunnel, near Bell's Path, etc. Large glossy leaves with indentations and 'holes' in them.

Neem or Nim tree. See *'Azadirachta'.*

Nicotiana tabacum (Linn). Tobacco. Seen by the writer near Cricket Valley in 1956. No previous record. Duffey records it in several areas in 1958. At present growing in Grazing Valley near Devil's Ashpit (ashy slopes down to Coast Red Nipple). Cricket Valley rim, etc. Provenance unknown.

Nicodemia madagascariensis (Lam). Recorded by Duffey in 1958 (Duffey 1964) near summit of Green Mountain. Is this syn Buddlea globosa? q.v.

Nicandria physaloides (Gaertner). Recorded by Duffey in 1958 (Duffey 1964) near the summit of Green Mountain. Ruderal weed.

Norfolk Island Pine. See *'Araucaria'.*

Olea europea (Linn). Olive. Introduced at least prior to 1901 when a map of that year shows the olive grows between N.E. Cottage and Weather Post; and probably much earlier. Other groves grow above Breakneck Ravine, etc.

Olive. See *'Olea'.*

Opuntia ?vulgaris. Prickly-pear. Tungy. Probably introduced from Madeira in 1847 by Wm. Wren, the mountain gardener. Has spread over most of the drier parts, particularly Cricket Valley, Palmer's, etc. There is also a reference to Opuntia specimens sent from Kew about 1850.

Opuntia spp. A spineless *Opuntia* in appearance like *O. dillenii* was introduced to Georgetown gardens around 1952 and may spread. An unusual *Opuntia* with pads lighter green and more thickened and cylindrical than *O. vulgaris* occurs at one small area below Dampier's water tanks, I have seen it nowhere else on the island.

Oxalis corniculata (Linn). Yellow sorrel. First recorded by Hemsley (1885) in 1876. Common esp. on Green Mountain slopes, near Palmer's, etc. Ruderal.

Oxalis corymbosa (D.C.). Identified by Kew from specimen collected by the writer near the farm cowsheds in 1967. No previous record.

Oxalis martiana (Zucc). Recorded by Duffey (1964) from Green Mountain in 1958. Possibly syn *O. corymbosa?* (Note: Bell in 1859 mentions *O. rosea: grandiflora:* and *Boweii* in or near the farm area.)

Palms. See *'Cocos, Phoenix, Trachycarpus'*, etc.

Pandanus odorata. Screwpine. Introduced from Mauritius via Cape Botanic Gardens in 1858. Local on Coronation Peak, Elliotts, near Castles Tank, etc. A branching palm-like tree with aerial roots forming buttresses round the lower trunk. (Bell in 1859 mentions a fully grown *P. odorata* so specimens were introduced well before 1858.)

Pandorea jasminoides (Lindl). Recorded by Duffey (1964) from Green Mountain in 1958. A shrub.

Panicum laxum (Swartz). Grass. First recorded by Duffey (1964) in 1958. Scarce on upper parts of mountain. Probably a late ruderal.

Panicum maximum (Jacq). Guinea-grass. Introduced on several occasions, latterly in 1912 (Cronk). Quite common on the mountain.

Panicum molle syn *P. muticum.* Para or Buffalo grass. Introduced from Kew (Hooker) in 1849. Mountain area.

Panicum sanguineam. First recorded by Forster (1777) and probably referable to the present Digitaria adscendens q.v. Indigenous.

Para grass. See *'Panicum molle'*.

Paspalum commersonii (Lam). Grass. First recorded by Duffey (1964) on upper parts of the mountain in 1958. Scarce, probably ruderal.

Paspalum conjugatum (Bergius). Grass. First recorded by Duffey (1964) in 1958. Fairly widespread in all areas above the dry lava regions.

Paspalum dilatatum. Squat paspalum grass. Introduced about 1910 (Cronk) from Australia. Low spreading perennial. Possibly synonymous with one of the other Paspalums.

Paspalum polystachyos. Grass. Mentioned by Duffey (1964) p. 234 as present on the mountain in 1958 but curiously does not appear in his list of recorded species. Possibly a synonym.

Passiflora suberosa (Linn). Creeper. First seen by the writer in 1956, collected by Duffey in 1958, and now common on dry ash slopes and lava regions esp. near Castles Hill, Ragged Hill, etc. A straggling ground creeper with small blue flowers. Indigenous.

Passiflora quadrangularis. Granadilla. Introduced prior to 1859 (Bell) on Green Mountain, for the melon-like fruits. Present only as a cultivar.

Pawpaw. *See 'Carica'.*

Periwinkle. See *'Vinca'.*

Photinia japonica syn *Eriobotrya japonica.* Loquat. Medlar. Introduced prior to 1859 (Bell) when Loquats are recorded at the 'home gardens'. Now found in ravines on the north slopes of the mountain, not common.

Phyllanthus capillaris (Schum & Thonn). No previous record. Identified by Kew from a specimen collected by the writer on the upper Ramps in 1967. Small shrub with straggling branches, small feathery leaves.

Physallis peruviana (Linn). Cape-gooseberry. First mentioned by Holman (1840) as common on the mountain in 1828. Provenance unknown. Straggling perennial with red or yellow berries hidden in a green lantern-like calyx. Found in shaded parts of Cronk's, Rupert's, and other paths.

Pinus pinaster. Cluster-pine. Bell (1859) records this near Weather Garden.

Pinus spp and allies. Seed or seedlings of *Piuns pinaster: pinea; Araucaria cookii: Bidwilli: basiliana: excelsa: imbricata:* and *Agathis* spp have been sent to the island between 1840 and 1890 and single specimens of some of these may survive, but only *Araucaria excelsa* and *Podocarpus elongata* remain in numbers. An unusual *Pinus(?)* with buttressed trunk grows near Palmer's.

Pithecelobium dulce (Bentham). Madras thorn. No previous record. Very scarce. Two shrubs grow in Sandy Run near Donkey Plain, a dead specimen occurs in the Devil's Riding School, other scattered stations may exist.

Pittosporum undulatum. Spore-tree. Date of introduction unknown, but large spreading trees occur in a ravine near 'San', in Breakneck, etc.

Plagiochloa oblitera (Hemsley). Grass. Recorded by Duffey (1964) on Green Mountain in 1958. Scarce.

Plantago lanceolata (Linn). Plantain weed. Introduced in 1874 (unpublished letters) to the mountain. A common British weed which is rather scarce on the island.

Plantago major (Linn). Great plantain. No previous record. Scarce on Green Mountain, esp. near the farm area, a recently arrived ruderal.

Podocarpus elongata. Cape-yew. Introduced probably before 1859 when Bell mentions four unspecific Podocarpus near the farm. Now at Palmer's, Bell's Path, etc. Similar to the British yew in appearance.

Polycarpon tetraphyllum (Linn). Four-leaved allseed. First recorded by Hemsley (1885) as present in 1876, but very probably indigenous. Fleshy semi-prostrate weed with tiny white flowers. Scattered, mainly lower altitudes after rain.

Poa annua (Linn). Meadow grass. Recorded by Duffey (1964) on the mountain in 1958. A common British grass accidentally introduced in recent years. Limited.

Polypogon adscensionis (Trinuus). Grass. First recorded by Hemsley (1885) in 1876, but no subsequent records. Indigenous.

Polypogon strictus (Nees). Grass. First recorded by Hemsley (1885) in 1876. Scarce on Green Mountain. Duffey (1964) records P. tenuis which may be synonymous.

Portulaca oleracaea (Linn). Purslane. First recorded by De la Caille as a 'purslane' common in 1754. Again recorded by Forster in 1775, but Hemsley (1885) is the first to refer the Ascension 'purslane' to *P. oleracaea.* Widespread but scattered in dry regions. Fleshy succulent pale green leaves, tiny yellow flowers. Used as a salad plant by the Garrison in the 1830's. Indigenous.

Port Jackson Wattle. See *'Acacia longifolia'.*

Psidium guyava (Linn). Guava. Introduced prior to 1859 (Bell). Has spread rapidly over lower mountain slopes, attempts were made to destroy it about 1900 but with little success. Now one of the island's commonest small shrubs.

Phoenix dactylifera. Date palm. Introduced prior to 1859 (Bell) when several were growing near the farm. Rather scarce, specimens occur in Cricket Valley, in a small choked valley immediately S. of 'San', etc.

Ricinus communis (Linn). Castor oil. Introduced prior to 1859 (Bell) but may also be indigenous, esp. as the seeds remain viable after much time in sea water. Scattered, becoming plentiful after rain in lower altitude areas, otherwise rather scarce. Beautiful palmate leaves.

Romulea. Pink crocus. Duffey (1964) mentions an unspecified *Romulea* present on the mountain pastures in 1958.

Rubus nanus. Raspberry. First recorded by Sereno-Watson from a specimen collected in 1889 from near a tunnel on Elliotts Path—which he describes as 'a peculiar and distinct species not otherwise represented in the flora of the South Atlantic islands'. However there are over 400 species of Rubus in U.K. alone and *R. nanus* may be synonymous with one of the following Rubus species. Determinations of this genera are difficult.

Rubus pinnatus (Willdenow). Raspberry. Recorded by Seeman (1852) as common on the mountain in 1851.

Rubus rosifolius (J. E. Smith). Raspberry. Recorded by Duffey (1964) from the mountain in 1958.

Sanseviera tri-fasciata. Hemp. Introduced mid 19th century and established at Palmer's satelite farmstead where it still thrives. Variegated dark green leaf spikes, flowering (white) in January.

Sanseviera zeylanica. Hemp. Introduced prior to 1859 (Bell) when it is recorded as growing near the farm. This station has not survived and S. zeylanica, unless synonymous with S. tri-fasciata at Palmer's. may no longer be represented on the island.

Screwpine. See *'Pandanus'*.

Senebiera didyma syn *Coronopus didymus.* Swinecress. First recorded by Hemsley (1885) as present in 1876. Rather scattered and not common, on the mountain.

Senecio vulgaris (Linn). Groundsel. First recorded by Duffey (1964) on the mountain in 1958. A common British weed, present as a rather localized ruderal on the island. Probably a recent arrival.

Setaria verticillata (Linn). Grass. First recorded by Scottish Antarctic Expedition (Brown) in 1904, and the report suggested that the grass had been introduced by the Wideawake terns. Now widespread. See also note on *Enneapogon cenchroides* syn *E. mollis.*

Sherardia. See *'Hedyotis'*.

Sida cordifolia (Linn). Recorded by Duffey (1964) as scattered in most areas but limited, in 1958.

Solanum nigrum (Linn). Black nightshade. Mentioned by Balfour (1849) p. 548 who says 'the black berries of S. nigrum are used by the Garrison in the island of Ascension to make pies'. Scattered in all drier areas, Bear's Back, S.E. Crater, etc. Dark green leaves, small white flowers with 5 petals, black berries.

Solanum sodomaeum (Linn). Introduced, no doubt accidentally, before 1859 when Bell mentions it growing in Breakneck Ravine. Widespread but scarce, Breakneck, Traveller's Hill, etc. A sinister woody herb with prickly leaves, purple flowers with 5 petals, small 'sodom apple' fruit like unripe tomatoes. Poisonous.

Sonchus asper (Linn). Prickly sowthistle. Recorded by Duffey (1964)—a common British weed. Scattered in most moister areas. Ruderal. Yellow 'dandelion' flower.

Sonchus oleraceous (Linn). Common sowthistle. As for *S. asper.*

Sorrell. See *'Oxalis'*.

Sporobolus durus (Brong). Grass, peculiar to Ascension. First recorded by Hemsley (1885) amongst plants collected in 1876. Collected from Weather Post in 1889 by Gordon, and Duffey (1964) in 1958 on Green Mountain. A very rare endemic grass.

Sporobolus indicus (Linn). Grass. First recorded by Duffey (1964) in 1958. Widespread.

Stachys arvensis (Linn). Field woundwort. A common British weed accidentally introduced to the cultivated areas of the mountain. Tiny purple flowers.

Stenotaphrum secundatum (Walter). Grass. First recorded by Duffey (1964) on the mountain in 1958. Creeping leafy grass, rather scarce. one site occurs behind Rock Cottage, and elsewhere on the mountain.

Tecoma stans (Juss). Yellowboy. Introduced, probably by Cronk, about 1900. Very common on lower altitude lava regions esp. near Traveller's Hill. Shrub with bell shaped yellow flowers.

Tecoma ?velutina. Yellowboy. Introduced. Darker larger leaves and generally a bigger shrub than the far more common T. stans. Limited to a few areas in Dampier's Ravine and near Two Boats. Leaves less deeply divided.

Tamarind. See *'Leucaena glauca'*.

Terminalia ?catappa. Indian almond. Introduced. One established at 'San' for many years, others more recently introduced at Miracle Mile, Georgetown, etc. Large oval leathery leaves turning to red. A good shade tree.

Thistle-mexican. See *'Argemone'*.

Tobacco. See *'Nicotiana'*.

Trachycarpus (Chaemerops) ?fortunei. Hardy fan palm. *Chaemerops humilis* (Dwarf palm) introduced prior to 1859 (Bell) but the present fan palms growing near the farm are probably *Trachycarpus fortunei* introduced from the Far East via Kew.

Ulex europaeus (Linn). Gorse or Furze. Introduced in 1850 from U.K. Common but localized in parts of Green Mountain, esp. near Windy Ridge.

Urena lobata. Brazil aramina-fibre. Recorded by Hemsley (1885) as seen by the Challenger Expedition in 1876, but no station was cited. No subsequent record. An erect shrub with a stem yielding a jute-like fibre.

Veronica persica (Poiret). Persian speedwell. Both this and another undetermined *Veronica,* possibly *V. repens,* were collected by Duffey (1964) from Green Mountain in 1958. Both are British wild flowers accidentally introduced to the island.

Vinca major (Linn). Greater periwinkle. Recorded by Duffey (1964) on the mountain in 1958, probably a garden escape.

Vinca rosea syn *Catharanthus roseus* (G. Don). Madagascar periwinkle. Introduced from St. Helena about 1870 according to Cronk, spread rapidly and efforts to exterminate it were made in 1910. In 1922 Cronk says none could be seen. However, the plant survived and spread and at present is common in most higher altitude dry regions esp. near Two Boats, crater of Mountain Red Hill, near Sandy Run, etc. Pink flowers with 5 petals. Also called Cape daisy. A less common variety with white flowers is found—*Vinca rosea* var *alba.*

Vitex trifolia (Linn). Lovechaste. Introduced from the Cape in 1858. Used as a hedge plant around the S.E. and S.W. sides of the mountain to confine the stock and exclude the goats, and was formed in places of Agaves (q.v.); traces of it remain. Aromatic purple flowered shrub with light grey-green foliage.

Vulpia bromoides (Linn). Squirrel-tail fescue grass. Recorded by Duffey (1964). A British grass with oatlike heads. Probably ruderal, not common. Drier areas.

Wahlenbergia ?linifolia (D.C.). DeCandolle records W. linifolia from plants collected on Ascension (early 1800's?). No subsequent botanist records it, however, Duffey (1964) mentions seeing an unspecified Wahlenbergia on Green Mountain in 1958. Bell-shaped pale blue flowers with five petals united into a corolla tube.

CRYPTOGAMS

ASCENSION'S FERNS (FILICES)

NOTE:—Towards the end of the last century when many of the island's ferns were first recorded there was little agreement among botanists about the 'taxonomy' or scientific naming of them; one authority calling a fern a discrete species on the basis of some minor structural detail, another regarding the same plant as merely a variety of an already named species. Whilst this list gives 27 separate species recorded from Ascension at various times, it is likely that these are many synonyms and that the real number does not exceed about 16 species.

Adiantum capillus-veneris (Linn). Maidenhair fern. Seen by writer in 1956 when it was common on upper Ramps, Bell's Path, parts of Rupert's, etc. Duffey records it in 1958 but there is no previous record. Probably introduced later than 1876.

Adiantum raddianum (Presl). Maidenhair fern. First recorded by Kew from specimens collected by the writer in 1967 from the upper Ramps. Less common than *A. capillus-veneris.*

Anogramma ascensionis (Diels). Endemic. First recorded under the synonym Gymnogramme ascensionis by Hemsley (1885) in 1876 on wet rocks and banks on weather side of Green Mountain. A small rather scarce fern with fan and lobe shaped fronds, sori linear, naked.

Asplenium ascensionis (Watson). Endemic. First recorded by Lowe(?) from specimens collected in the 1880's. Fairly common in rock crevices along Bell's Path and in side ravines of Breakneck. Small dark green fern.

Asplenium dentatum. Listed by Bory (1804) but no later record. Probably taxonomic confusion.

Asplenium erectum. Mentioned in manuscript list dated 1876 in the Georgetown church records. Probably a synonym.

Asplenium lunulatum syn *A. reclinatum* (Lowe). First recorded by Hemsley (1885) on weather side of Green Mountain in 1876. Indigenous, dark green weeping fronds to 8ins., rising from upright fasciculate rhizome. Not common.

Blechnum australe syn *Lomaria australis.* Indigenous. 12ins. to 24ins. shining green fronds, sori linear and continuous, fertile fronds with thinner pinnules than on barren fronds. Breakneck Ravine. A native of the Cape.

Cyclosorus. See *'Thelypteris'.*

Gymnogramme. See *'Anogramma'.*

Histiopteris incisa (Thunb). Indigenous. First recorded by Duffey (1964) in 1958 but probably a synonym for one of the ferns collected by the 19th century collectors. Now quite common around Elliott's Path and elsewhere on Green Mountain. A curious irregular shaped fern.

Marattia fratinae. Mentioned in manuscript list dated 1876 in church records and almost certainly synonymous with *M. purpurascens.*

Marattia purpurascens (De Vriese). Recorded by Hemsley (1885) on weather side of the peak in 1876. Endemic. A rather scarce large brittle fern with broad fronds to 3ft., sori linear, confined to a few patches on the weather side of the mountain above Summerhouse Ravine. Also found amongst bamboos at the Peak, in a distinct form with thin stems and broader pinnules.

Nephrodium ascensionis syn *Lastrea ascensionis.* First recorded by Hemsley(?) (1885) in 1876. Endemic, rare on Green Mountain.

Nephrodium cognatum (Hook). Recorded by Kuhn in 'Falices Africana' p. 128, but no other record and probably a taxonomic error.

Nephrodium molle. Recorded by Watson (1891) from plants collected in 1889 by the U.S. Eclipse Expedition. No details.

Nephrodium viscidum. Allegedly seen but not positively identified by U.S. Eclipse Expedition in 1889. (Watson 1891.) Doubtful.

Nephrolepis axaltata (auct) syn *N. hirsutula?* Identified by Kew from specimens collected by the writer in 1967; the genus is under revision and this is almost certainly the plant recorded by Duffey (1964) under the name N. hirsutula. The commonest fern of Ascension's drier areas, especially between Mountain Red Hill and Ragged Hill, at Monkey Rock, Middleton's, etc., etc. Probably indigenous.

Nephrolepis exaltata (Sw) syn N. elegantissima? Identified by Kew from specimens collected by the writer in 1967 near Rock Cottage; also at 'San'. No previous record, no doubt introduced as a decorative pot plant. Feathery fronds.

Ophioglossum vulgatum. First recorded by Hemsley (1885) as quite common in 1876, but rare at present. A British fern probably ruderal on Ascension.

Platycerium alicorne. Elkhorn fern. On trees near the farm. No previous record but introduced before 1956.

Polypodium reptans. First recorded by Brown (1906) from Elliott's in 1904. No other records.

Polypodium trichomanoides. Indigenous. Recorded from specimens collected by Sir Joseph Hooker in 1843 but not seen since; probably another synonym. The station was given 'amongst moss at 2.800ft.'

Pteris cretica (Linn). First recorded by Duffey (1964) on the mountain in 1958.

Pteris dentata var *ascensionis* syn *Lonchitis ascensionis.* Recorded by Forster in 1771 but no subsequent record.

Pteris flabellata var *ascensionis* syn *P. palustris, P. arguta, P. lata.* An endemic variety of a widespread species. Listed by Hemsley (1885). Bright green fronds to 35ins., sori linear.

Pteris incisa syn *P. elegans, P. pallida, P. vespertiliones,* etc. Indigenous. First recorded by Hemsley (1885) on weather side of the mountain in 1876. Bracken-like habit, fronds glabrous, sori linear, not extending to apex of pinnules, fronds 2ft. to 3ft.

Thelypteris quadrangularis syn *Cyclosorus quadrangularis* (Schelpe). Indigenous(?). Identified by Kew from specimens collected by the writer in 1967, no previous record but Duffey (1964) gives *Cyclosorus ?dentatus* (Forssk) which must be synonymous. One of the commonest Green Mountain ferns, esp. Bell's Path.

OTHER CRYPTOGAMS

These have been listed briefly for the sake of completeness although the majority will only come to the notice of the specialist.

Agaricus sp? Mushroom. No previous record.

Barbula leucochlora. Brown (1906). Moss.

Bartramia subolescens. Brown (1906). Moss.

Campylopus helenicus. Hemsley (1885). Moss.

Campylopus pulvinatum. Hemsley (1885). Moss, esp. on damp wood.

Campylopus introflexus. Hemsley (1885). Moss.

Cladonia sp? Brown (1906). Lichen.

Dicranella ascensionica. Watson (1891). Lichen peculiar to Ascension.

Hygrolejeunia pterota. Brown (1906). Liverwort, also in St. Helena.

Lophocolea denta. Brown (1906). Liverwort.

Lycoperdon sp? Puffball. No previous record. Invalid's Path, etc.

Lycopodium cernuum. Hemsley (1885). A clubmoss looking rather like a miniature fir tree, common around Elliott's.

Lycopodium saururus. Hemsley (1885). Clubmoss.

Mastigophora leioclada. Brown 1906). Liverwort.

Parmelia saxatilis. Watson (1891).

Pellea hastata. Brown (1906).

Physica ascensionis. Brown (1906). A lichen first described from Ascension, later found in the Cape Verde Islands.

Plagiochasma limbatum. Brown (1906). Liverwort.

Psilotum nudum. Hemsley (1885) records P. triquetrum which is a syn. A stagmoss found in rocky clefts at Weather Post, near Palmer's, etc. I believe this is peculiar to the island. Branching green stalks with orange/brown tips.

Rhacopilum gracile. Hemsley (1885).

Targionia hypophylla. Brown (1906). Endemic. Liverwort.

Theloschistes crysophthalma. Watson (1891). Lichen.

Theloschistes flaviscans. Brown (1906). Lichen, poss. syn.

Trentopohlia polycarpa. Brown (1906). Algae.

PART 4

A LAYMAN'S GUIDE TO THE ISLAND'S GEOLOGY

It is a paradox that whereas many visitors to Ascension see only 'frowning mounds of slag' and a nightmare landscape from which a retreat to the cool confines of Green Mountain is a welcome relief; there are professors of geology who would cheerfully give a fortnight's salary to visit such an area and study with delight those same craters and lava flows. Let me try to explain something of their interest.

There is, of course, the purely aesthetic appeal of utter desolation. Some find this almost frightening and prefer the noisy babble of a

modern life which is often insulated from nature. But come instead to Pillar Bay perhaps, or Pumice Cove, at a time when the sea, white flecked and angry, seems to engage in an elemental fight with the jagged rocks of the coast. Rollers, spray crested and sweeping in from the distance with slow rhythm cause the beaches to vibrate, and all along the wild coastline the blowholes fume and roar. It is the rollers that will eventually destroy the island according to an old tale which compares the structure of Ascension to a giant mushroom rising on a slender stalk of solid rock from the ocean depths, and overhanging all around the coastline where the sea has undercut the ground. One day when the frequency of the incoming waves matches the natural period of vibration of this top-heavy mass, the slender stalk will snap and the island will disappear with a roar into the deep.

The geologist must pour cold water on such picturesque but scientifically untenable ideas, and yet in their place he will produce ideas that seem hardly less remarkable. Consider the possibility of the African and American continents actually moving apart, slowly but steadily, under the influence of forces only partially understood; and what about the possibility of another eruption, perhaps when men are still on the island? Such things have a very great bearing indeed on the island.

General

The earth's crust, far from being the immovable platform for physical life that many imagine, is in a constant state of flux. Land levels change, continents rise and fall, agents or erosion gradually destroy mountains whilst other forces raise new peaks to replace them, and geological cycles of great complexity slowly reach their fulfilment in a giant symphony that scientists are only beginning to comprehend. Movements of large land masses inevitably produce areas of stress and well defined lines or zones of weakness in the earth's crust form a pattern in many parts of the globe.

One such line extends from Iceland, through the North and South Atlantic oceans into Antarctic regions, its length studded with volcanoes, some of which rise high enough to form islands of which the Azores, Ascension and Tristan da Cunha, are but a few. (St. Helena lies to the east of the mid-Atlantic ridge, as this zone is termed, and significantly is much older than the majority of ridge islands.) Other volcanoes of lesser height form great submerged mountains occasionally betraying their presence by disturbed waters, floating pumice, and rising steam, like the submarine eruption reported north west of Ascension in 1838. If the observer could somehow drain the South Atlantic his labours would reveal a surface as jagged and irregular as any known to us above sea level, and Ascension would be seen as a cone over 18,000ft. high. As it is, the waters have drowned these great ranges so that only the last 2,800ft., the final tip, of the Ascension mountain rises above the sea.

Scholars still debate the reasons for this mid-Atlantic ridge and associated zone of volcanic activity; one school of thought which is gaining adherents maintains that the continents of Africa and America were once one mass, and that they drifted, and are still drifting apart,

floating on the denser plastic 'magma' of igneous rocks lying below the earth's visible surface. What is known with certainty is that the forces of change are not exhausted. The chain of islands stringing the weakened zone like pearls on a string contains many active vents, and whilst Ascension slumbers peacefully at present, this may not always remain so.

How old is Ascension?

Ascension is a young island, but its birth pangs were protracted and at times violent. I will not mention geological eras and time scales which mean little to the non-specialist, suffice to say that successive outbursts built a growing pile of debris which at last broke the monotony of the ocean's empty blue spaces, and a mountain of rock and ashes was raised towards the sky. At times great explosions occurred hurling shattered lava fragments and molten droplets far into the air and producing great cauldrons or 'calderas' which form a conspicuous part of the present landscape; at other times the molten rock welled more or less gently from fissures and vents, spreading out in widening carpets and flowing slowly to a steam-shrouded meeting with the sea. Over tens of thousands of years the action continued, with gaps when nothing happened, except that earlier structures were already beginning to erode and crumble, and perhaps life gained a foothold on barren rocks only to be obliterated by renewed activity. Gradually the island took shape, new flows obscured earlier ones, new vents built their piles of debris over the wrecks of others, the major phase of vulcanism died and the work of land sculpture passed into the hands of wind, rain and sea, in a relentless conspiracy of destruction aimed at reducing the new island to a flat wave-washed platform. This latter work has only just begun, and the more recent craters appear today very much as they did when first formed.

To be more specific, there have been at least three major phases. First an early period when Green Mountain, White Hill, and Weather Post were formed, together with the S.E. head and Boatswain Bird Island vents. Explosive activity and associated subsidence formed the cauldrons of Cricket Valley and the Devil's Cauldron, and the great cliffs near Spire Beach demonstrate how long sea erosion has been at work on this old part of the island. After a possible period of dormancy, the second phase began, and the hills like Spoon Crater, Traveller's and Mountain Red Hill were formed; considerable erosion has taken place from the soft surface deposits of these hills. Lastly, relatively recent eruptions formed the Sisters Peak complex, a small fissure eruption at S.E. Head, South Gannet Hill, etc. The last eruption of lava from the Sisters Peak area may have occurred within the last 500-700 years so there is a grain of truth in the story that Ascension was discovered just as soon as it was cool enough to land on! (See appendix to this chapter for notes on the evidences of recent activity.)

Will Ascension erupt again?

This is the sort of question on which a geologist prefers not to commit himself. However, the last eruptions were too recent, and the entire mid-Atlantic ridge too unstable for any man to declare Ascension as extinct. The island is 'dormant', but this was also the

state at Tristan da Cunha when the new vent appeared in October, 1961. Certainly any major eruption would be likely to give forewarning in the form of minor earth tremors.

How were the craters formed?

Volcanoes produce widely differing rock types, sometimes in sequence from the same vent, and their constructional forms are closely related to the chemical composition of the lavas. Volcanic rocks can be broadly classified into acid (trachyte, etc.) types rich in silica and quartz, and basic (basalt, etc.) types with less silica and quartz and more iron compounds. Acid vents often produce extruded 'domes' of viscous toffee-like lava, and may be associated with much explosive activity. Typical 'domes' of the characteristic whitish trachyte are Weather Post, White Hill, Wig Hill, etc. This type of volcano often produces pumice (really a rock froth) and obsidian (a volcanic glass rich in silica and typically black or olive green).

Basic vents are more likely to heap up cones of reddish ash, with successive outpourings of fairly mobile liquid lava of a dark colour (basalt). The ash is sometimes formed when much hot gas escapes through molten lava in the vent; steam is also emitted, and globs of molten rock flung high into the air may fall as solid droplets like a fossilised 'rain', peppering the ground with small 'bombs'. These can be picked up on the slopes of Lady Hill, Spoon Crater, etc. They vary in size from tiny spindle shaped pellets half an inch long to pasty masses several feet across. Sometimes when a basic vent has ejected ash and fragments to build up a fair sized cone, liquid lava will then rise in the central throat and overflow the rim at its lowest point which will always be the windward side of the rim (the major bulk of the ash having been blown to, and accumulated on the leeward side of the crater rim). The overflowing lava will often tear down great segments of the crater wall to give a 'breached cone'—this can be seen at Sisters Peak where the north east rim is missing and a great flow issues towards the coast near Porpoise Point. This cannot be seen from the Two Boats or Georgetown side, from which Sisters appears hardly to have a true crater at all. The fact that all the island's breached cones (Broken Tooth, Sisters, Sisters Red Hill, Hollow Tooth, less obviously Cross Hill, etc.) have been breached on approximately the same side, although they are of differing ages, shows the constancy of the present S.E. trade winds over past millennia.

A relatively recent 'fissure eruption' (a typically Icelandic type) has occurred on S.E. Head—the head is split by a fracture from which dark flows of a basic lava have spilled out to form the peculiar 'Devil's Inkpot'; in this case no central crater has been formed, but the fissure is marked by a line of small oval depressions caused by minor explosions.

Some of the island's volcanoes are complex, Bear's Back is obscure; the Devil's Riding School is an example of one vent producing both trachyte lava to form the curiously weathered area on the Green Mountain side of the School, and basalt, which forms the steep slope of great blocks facing the Mountain/Devil's Ashpit road junction. Green Mountain is again complex, highly weathered so that

it bears little resemblance to the original state, and composed in part of the loosely compacted black cinders visible around Elliot's Walk. Below Weather Gardens are cliffs of acid trachyte, probably from a separate vent. Even Cross Hill, mentioned above as an example of a breached cone, is a basalt cindercone built on the wreck of an earlier trachyte vent, and traces of this contrasting whitish rock can still be seen showing in small patches below the guns at Governor's Lodge, on the N.E. slopes of the hill, and halfway up the road to Needles Tank.

Is there anything of value to be found?

Whilst to the engineer or builder good building stone can be 'valuable' most people would rather hunt for gemstones. Their chances of success on Ascension are small. Volcanic rocks are made of small crystals of many different minerals, of which felspars and quartz are common. Only when a single crystal of an unusual mineral is sufficiently large and flawless is it classed as a gem. Large crystals require slow cooling of the molten rock to form, and are thus not usually found near the surface of recent volcanic areas, where the effusive lavas have cooled quickly in the open air. The gem 'peridot' is common as small green crystals in basalt, known to the geologist as 'augite', and the beach sand at Crystal Bay is composed largely of this mineral, but in worthless small grains. Quartz crystals, if flawless and unfractured, are valued as gems; they are common in the acid lavas and may be picked up in the gritty sands in the beds of some of the dry watercourses, but large crystals are rare. Felspars occur plentifully in the 'sand' at Coconut Bay. Magnetite occurs as minute squarish crystals in basalt, it forms part of the black sand found near Crystal Bay, and in places in Grazing Valley where it can be collected by trailing a magnet in the dust. Obsidian is a natural glass, mainly of fused silicates, which has a high lustre and splintery 'conchoidal' fracture. It will scratch window glass. Jet black, olive green, and rarer grey and beautifully banded varieties are found on the island (Obsidian Run, near Sharp Cliff, and below Middleton's Ridge). Ground flat on one side they make attractive paper weights but have no real value. Fragments can be tumble polished in a rotating tin with water and grit.

Plutonic Xenoliths

Sometimes fragments of the rock strata far below the surface are torn from the walls of the vent through which lava makes it way to the surface, and are brought up with the lava. These alien pieces, often altered by the intense heat which sometimes produces crystallisation of secondary minerals, can give geologists clues about the types of rock below the surface, inaccessible to direct study by other means. They thus possess special interest, and Ascension is rich in such fragments. In particular the S.E. slopes of Dark Slope Crater and the area between Middleton's Ridge and Grazing Valley will produce them. They look quite unlike the associated lavas, often being granular or granite-like, and containing small crystals of various minerals not found elsewhere on the island.

What else is there of geological interest?

A curious wall-like structure can be seen on the western slopes of Spoon Crater, technically known as an injected dyke. Molten lava has flowed into a vertical crack in the ground, probably caused by earth tremors associated with an eruption, has solidified in situ, and the surrounding ground, which in the case of Spoon Crater is soft ash, has subsequently been eroded away to leave the dyke standing up as a wall. Others occur below Middleton's, between N.E. Cottage and N.E. Bay, etc.

Beds of natural salt occur in places on the coastline, especially where blowholes or a low cliff cause sea spray to land on a rocky hollow, there to evaporate in the sun. I measured the depth of one such bed near Porpoise Point to be over a foot thick.

Beach-rock, a sort of natural sandstone, is being formed at low tide level at many of the shelly beaches. Sometimes fossil turtle eggs are found enclosed in fragments of this surprisingly hard stone.

Fumaroles and Caves

Small caves are fairly common and are formed in four ways.

(1) Lava tunnels are formed when the surface of a lava flow cools and solidifies, whilst beneath this solid crust the fluid lava continues to flow, draining away to leave a cavity. The roofs are often studded with tiny projecting 'stalactites' of rock called lavacicles. A good example occurs on the S.E. slope of Command Hill at about 390ft. a.s.l. The entrance leads down into a passage which runs up and down the hillside perhaps 20ft. below the surface for a distance of several hundred feet. I found a small tin with a note written by British sailors in 1916 (Messrs. F. J. Sweetland, F. Barraclough, F. Church and T. Adam), a piece of newspaper from 1921, and remains of crude flares made from oily rags wired to sticks. Other lava tunnels occur at the rear of Clarke's Beach and halfway along a direct line from Booby Hill to Spoon Crater where there is quite a complex small area of tunnels and curious structural features on a basalt flow.

(2) Erosion caves form when soft ash is eroded from beneath harder lava—a cave with a floor area of several hundred square feet but low roof occurs between N.E. Cottage and Goat Hole. Other similar small cavities of no great interest are quite common.

(3) Sea carved caves and blowholes; these are common round the low basalt coasts. Wave action penetrates planes of weakness and jointing in the lava, eventually a narrow cavern is formed, and enlargement of this cavern may result in partial collapse of the roof at a point a little way inland to form a 'pot' if the hole is large, or a 'blowhole' from which air and spray rushes, if the hole is small. Blowholes occur near Deadman's Beach, between Comfortless and English Bay, near Pebbly Beach, near Whale Point, etc. Larger sea caves occur near Comfortless, English Bay, Wig Hill, etc. 'Pots' occur particularly between Long Beach and Comfortless.

(4) Spatter cones or fumaroles. Hot gases and steam escaping to the surface of a lava flow will often form tiny cones with deep central chimneys leading to underground cavities formed by the pressure of the gases. A group occurs immediately to the north of

the main peak of Sisters; I stumbled across these in 1956 at which time they did not seem to be well known. An expedition was organised to descend the deep vertical shafts (this required ropes and hard hats) and subsequently a bottle was recovered containing a note written in 1840 by a sailor named Johnson. Bird bones recovered from one of the shafts were identified by the British Ornithologists Union Expedition as belonging to Boobies and Gannets which once bred in the area but are now confined to off-shore islets. The skull of a rail was also found. The largest shaft descends perhaps 50ft. vertically then gives access to a series of three or four small domed chambers. Other choked spatter cones occur N.E. of Booby Hill.

(5) Besides the natural caves, manmade caves occur at Dampier's, dug by Royal Marine and Naval parties in the 1820's (see Part 1, Potted History). There were 50 people, including women and children, living in these cave dwellings at one time. Other tiny caves and some quite lengthy tunnels occur on the paths nearer the top of the Mountain.

Darwin, who visited the island in 1836, writes "Amorphous masses of gypsum occur in caverns in the interior of the island". (Darwin, C. 1876).

Guano

Extensive guano deposits occur on Boatswain Bird Island, and more scattered deposits whiten the lava flows between Georgetown and English Bay, near Mars Bay, and near Pumice Cove. They demonstrate the large areas once occupied by breeding seabirds, now abandoned due to predation by feral cats, apart from the surviving Wideawake colonies which are the remnants of the vast concourses of birds of many species that frequented Ascension until the advent of man. An observer standing in the middle of the lava wilderness near Comfortless Cove and looking inland towards the Mountain sees a panorama of guano whitened rocks, yet glancing out to sea across similar flows reveals a black landscape with few guano stains visible. In other words the deposits lie to the leeward of each small rock hump, and were formed like this because the birds would roost facing into the prevailing trade winds to avoid ruffling their feathers, as the Wideawake's can be seen to do at present.

A Company formed in the 1920's to exploit the deposits had its headquarters at English Bay, and laid miles of light railway across the lava flows, as well as building a small jetty and another length of railway on Boatswain Bird Island. After only a few years of operation the English Bay Co. withdrew, equipment being largely abandoned where traces of it can still be seen. A mining engineer visited Ascension in 1958 to evaluate the guano deposits but his researches showed that exploitation was uneconomical as modern equipment was unsuitable for the purpose, a hundred men with teaspoons being more suited to extracting the scattered small pockets from the jagged rocks than two or three bulldozers.

APPENDIX TO PART 4

NOTES ON EVIDENCES OF RECENT VOLCANIC ACTIVITY ON ASCENSION

Introduction

Early reports about the island from the time of its discovery in 1501 to the establishment of the first permanent settlement in 1815 are few in number and lacking in detail, they do however suggest an absence of any volcanic activity on the island throughout that period. It has been generally accepted that the island has been in a dormant phase for possibly several thousand years; Gill (1878 says "not the slightest trace of volcanic action has been recorded during the years since its discovery" whilst Daly (1924) is of the opinion that "from the time of its discovery no sign of volcanic activity, not even a hot spring has been reported, though geologically the island is extremely young". The detailed report by Darwin (1845) says nothing of volcanic activity.

Ascension is however on a line of contemporary volcanic activity; in the last century there were reports of disturbances in the sea some few hundred miles north west of the island (Nautical Magazine, 1838), and recent eruptions have occurred at Capelinhos (Azores), Tristan da Cunha, etc. The writer believes that there are evidences to suggest that some form of fumarolic activity has occurred on Ascension within the last 150 years, unobserved by the residents of the time, although the evidences are not easily verified.

Possible recent fumaroles

Gill (1878) spent some six months on Ascension in 1877, and with reference to the shallow complex crater known as the 'Devil's Riding School' wrote "as we walked across it we found this saucer to be by no means level as we had supposed . . . dotted over many parts of the circus too, particularly on the north side, there were little cones of one and two feet in height, and on having their heads knocked off these displayed tiny central chimneys looking as if they were meant to represent Ascension in miniature". Study of Mrs. Gill's other writings reveal her to be a reliable and accurate if unscientific observer, and it seems clear that she was describing some type of fumarolic vent, her comparison of these vents with the major craters on the island with their steep cones and deep pits and calderas is particularly interesting. The Devil's Riding School is a complex focus of eruption where a shallow basaltic crater has been partially filled with trachytic lavas, later ashes have mantled the saucer to a depth of several metres as revealed by erosion gullies. Darwin (1876) and Daly (1924) give detailed descriptions. The craterlets seen by Mrs. Gill seem to have been on the surface of these ashy tuff beds.

A later visitor to the same area; Ellis (1885) writes about "numerous little mud-cones one or two feet in height which rise from the floor of the hollow and are like similar mud-cones which appear in the geysers of Iceland".

Thus two separate visitors, neither of them geologists, both noticed what were obviously significant and curious-looking structures within a few years of each other. No trace of anything fitting these descriptions exists today, and neither Darwin (1876) nor Daly (1924) make mention of them, although both describe the Devil's Riding School in detail. We must therefore assume that the structures were formed later than Darwin's visit in 1876, and had disappeared again by the time of Daly's visit in 1922, presumably by some brief display of gaseous activity. There was no road to the Devil's Riding School in the time of Gill's visit and thus the area was seldom visited by the inhabitants of the settlement at Georgetown.

Soft mud-walled tuff cones can disappear in a short time as can be shown from an interesting account of the Mexican volcano Jorullo given by Dr. Gadow. The volcano first erupted and appeared in 1759. Dr. Gadow states that by 1779 vulcanicity was in its dying phase, Antonio de Riano visited the crater and found numerous little mud and spatter cones exhaling steam and hot vapours. Humbolt in 1803 found many 'hornitos', Burkert in 1827 found that many of Humbolt's hornitos had disappeared, in part due to heavy rains. The traces of former fumaroles were visible as oval and circular depressions in the ground. Schlieden in 1846 found only a few hornitos still active, whilst Felix and Lenk in 1889 discovered and photographed 'the only preserved hornito'. Of hundreds of active mud and tuff-walled gas vents, only a single inactive specimen remained after about one hundred and thirty years. Apparently similar mud cones on Ascension have disappeared in an even shorter time, and could hardly have been formed prior to the island's discovery in 1501. A structure lasting in recognisable form for several hundred years would be unlikely to disappear without trace in the short period between 1880 and 1922. Slight fumarolic or gaseous emissions therefore have probably occurred in the Devil's Riding School between 1840 and 1870.

Recent eruptive centres

Whilst the Devil's Riding School may possibly be the most recent area of gaseous activity on the island, it is certainly not the most recent eruptive centre; the associated lava flows are well weathered and in parts buried under pyroclastic deposits from other vents. With the possible exception of localised fissure eruption on South East Head, the writer suggests that the Sisters Peak complex of vents was almost certainly the most recent lava producing area. Five or six discrete flows from the area can be distinguished. The upper ones, as expected in an area of waning vulcanism are much smaller than the earlier ones, and the absence of any ash on the jagged unweathered surfaces of these late flows also shows that they were formed later than any major eruption of proclastic material. A group of small spatter cones near the north foot of the Sisters main peak have open vertical throats unblocked by ashes, leading to subterranean cavities. These cones must therefore ante-date surrounding extensive ash beds and may be contemporaneous with the nearby recent flow which extends from the Sisters Peak crater (breached) towards the north

west coast, partially wrapping round and ante-dating such craters as Sisters Red Hill, Perfect Crater, Broken Tooth, etc.

An un-named crater forms the westernmost locus of eruption in the Sisters group, and appears to be considerably older than the other vents in the area. The cone is mainly composed of ash and scoriae but fragments of a thick stubbly flow of basaltic lava occur on its N.E. flank. The physical alignment of this flow suggests that a considerable thickness of pyroclastic material has been removed from the surface slopes of this crater. The lava may be the remnant of a thick flow formed in a gully on the original surface of the cone and left oustanding by removal of surrounding softer ash. Similar flow remnants are described on the hill Largo Law in Scotland by A. Geikie.

The upper flows of the Sisters complex contrast strikingly with many of the other lava flows on the island by reason of their black appearance, the almost complete absence of even the sparse vegetation which characterises older flows (partially a function of the lack of loose ash), and the razor sharp unweathered fractures of the surface matter. The fresh appearance of many of the other craters on the island is sometimes deceptive. Upstanding dykes near Middleton's Ridge, Spoon Crater, Goat Hole, etc., show that several metres of surface matter has been eroded in these areas, but such evidences of age are completely lacking at the main Sisters vent.

A possible order of eruption for the area is given below:

(1) Un-named eastern vent with the flow remnant detailed above.
(2) Sisters Red Hill.
(3) Broken Tooth and Hollow Tooth Craters. Flows associated.
(4) Perfect Crater—mainly ash and lapilli.
(5) Sisters main peak vent, giving rise to a flow which wraps round and partially covers the lower slopes of Perfect Crater, Sisters Red Hill, Broken Tooth crater.
(6) Parasitic vent on S. lower slopes of Sisters Peak—the flow ends in a steep front against the One Boat,Comfortless Road.
(7) Smaller parasitic vent just to the east (Two Boats side) of the parasitic vent No. 6. The tiny flow from this vent is probably the most recent lava stream on the island and may have occurred within the last 300 to 600 years.

Summary

Although it is generally accepted by writers that Ascension has been dormant since the time of its discovery, inconclusive evidence based upon the discovery and subsequent disappearance of mud cones in the Devil's Riding School suggests fumarolic activity within the last century. It is suggested that the Sisters group of vents includes some of the most recent flows on the island, and a possible chronology for the area is given.

With the possible exception of a small fissure eruption on S.E. Head, the most recent lava stream on Ascension is believed to originate at a small parasitic vent on the lower north slopes of Sisters Peak.

PART 5

ORNITHOLOGY—THE ISLAND'S BIRD LIFE

Sea Birds

Ascension was once the breeding ground for tens of thousands of sea birds; gannets, boobies, various terns, frigate birds, etc., which congregated over most of the lower parts of the island. Early visitors came to stare in amazement, or knocked the birds down with sticks for a tasty supper according to temperament, but the birds remained tame and thriving until 1815. In that year the first permanent settlement was established, rats were accidentally introduced, and cats to deal with the rats found that the birds were easier prey and soon ran wild amidst the breeding colonies. Fifty years later only the Wideawakes remained on the coastal plains and remnants of the other species survived only on cat-free stacks and cliffs, and on Boatswain Bird Island. The old breeding grounds are shown on early maps, and are traced today by the guano whitened acres near English Bay, Pumice Cove, etc. Booby and Gannet bones have been recovered from these now deserted areas. In reduced numbers 15 species still frequent the island.

ASCENSION FRIGATE BIRD (*Fregata aquila*)—large sinister looking black birds with forked tails, breeding only on Boatswain Bird Island. The males have conspicuous inflatable red pouches at their throats. Frigates feed by attacking other birds, mainly Boobies, and catching the fish dropped in fright by their prey; they also take Wideawake chicks. The species is peculiar to Ascension and limited to perhaps 1,500 to 2,000 individuals, thus qualifying as very rare, although the genus is widespread.

BOATSWAIN BIRDS. Red-Billed (*Phaethon aethereus*) and Yellow-Billed (*Phaethon lepturus*) breed on Boatswain Bird Island and in very small numbers on cliffs and stacks mainly between Pillar Bay and S.E. Head. The extremely long tail feathers and raucous screaming cry distinguish the genus. They can often be seen wheeling about the pillars in Pillar Bay.

BOOBIES. White Booby (*Sula dactylatra*) and Brown Booby (*Sula leucogaster*) are gannet-like birds common on Boatswain Bird Island, and they are also found on stacks at Pillar and Coconut Bays and on stacks and mainland cliff edges near Portland Point and between Clarence and English Bay. When the "fry" enter Clarence Bay the Boobies can be seen diving straight down into the water offshore. The rarer Red-Footed Booby (*Sula sula*) has been observed breeding on Boatswain Bird Island (Stonehouse, 1962).

NODDIES. Black Noddy (*Anous tenuirostris*) (syn *Anous minutus*) breeds on tiny ledges on Boatswain Bird Island and on cliffs between Pillar Bay and S.E. Head. They are small tern-like birds, completely black apart from a striking white cap on the head, and can be seen returning to their roosts, flying low along the coast near Mars and Gannet Bays in the late afternoon. Brown Noddy (*Anous stolidus*) is distinguished by the lack of the white cap, and breeds on many of the mainland cliffs and stacks, but is not present on Boatswain Bird Island.

PETREL. Madeiran Storm-Petrel (*Oceanodroma castro*) breeds only on Boatswain Bird Island and from its habit of flying low over the water, and its small size, is seldom seen by the casual observer.

WHITE OR FAIRY TERN (*Gygis alba*). These beautiful pure white terns with glassy black eyes and almost transparent wing feathers breed on Boatswain Bird Island and on stacks and mainland cliffs including inaccessible ledges below Weather Gardens. They are inquisitive birds and will often flutter above the walker who traverses the rim of the Devil's Cauldron or the White Horse goat track.

WIDEAWAKE OR SOOTY TERN (*Sterna fuscata*). Ascension's best known sea bird breeds every ten lunar months on the "fairs" between Mars Bay and Pillar Bay, and in very small numbers on Boatswain Bird Island. This less than annual breeding cycle characterises some of the other species but is particularly noticeable with the Wideawakes because of the relative accessibility of the breeding sites, and the complete absence from the island of the birds between seasons. It is this periodic absence from Ascension which has enabled the Wideawakes to survive the slaughter by wild cats which has largely removed the other resident species from the island's mainland. At present there is a balance being maintained between the birds and the cats. During the season the cats congregate in the area of the "fairs" and kill thousands of terns, but during the Wideawakes absence from Ascension the cats face semi-starvation which provides a check on their numbers. Any factor tending to increase the number of wild cats surviving this starvation period will threaten the birds, and no attempts should be made to feed, or allow cats other than genuine domestic pets to have access to dustbins or other food sources.

Furthermore visitors should avoid walking or driving through the centres of the Mars Bay and other "fairs" during the breeding season, particularly as the season progresses, as birds who abandon their eggs at this time will not re-lay. Adequate photographic coverage can be obtained from the edge of the "fairs", or early in the season before laying has commenced. These points possess greater significance with the increasing population on Ascension.

Chapin (1959) has suggested that the birds at the beginning of a new season begin to occupy the traditional breeding grounds on a night of full moon. "Only that period of full moonlight when the terns are gathered around the island, and again have the urge to settle on the traditional breeding grounds during the night, would seem really to act as 'regulator' ". If this is true there are other factors which support the case.

Wideawakes are heard over the coastal areas between English Bay and Mars Bay especially on nights of low cloud and drizzle; on clear nights they are seldom heard. This would suggest that the terns fly very low when visibility is poor, perhaps to maintain a visual contact with the white line of surf in order to navigate back to their chosen breeding sites. On clear nights they probably fly high and straight across the island to the "fairs". Also it has been noticed that Wideawakes are often entangled with the wires of radio aerials near the coast towards Mars Bay, but not on equally high aerials further inland, again suggesting low coast following flights. If such visual contacts with the island are required by the terns then it would seem reasonable to suppose that a visual sighting of the

guano whitened "fairs" on nights of full moon might trigger the birds into reoccupying the sites.

Land Birds

All the land birds have been introduced within the last 130 years. Unsuccessful attempts to introduce Barn Owls, Pheasants, and Starlings were also made.

CANARY (*Serinus flaviventris*). Yellow-green canaries frequent the lower parts of Green Mountain, especially Dampier's Ravine and ravines near N.E. Cottage. Limited to a few hundred. Introduced in 1860.

FRANCOLIN (*Pternistes afer*). These are scarce, and prefer the thickly vegetated areas near Palmer's, etc. Probably only a few dozen. Also known as Red-Legged Partridge.

MYNAH (*Acridotheres tristis*). The raucous brown, white and yellow birds common over most of the island especially around Georgetown. Probably more than 500. Introduced from Mauritius.

WAXBILL (*Estrilda astrild*). Small grey birds with colourful red bills and breasts; they often fly in groups of 30 or more, and prefer the lower parts of the island, usually where the yellowboy (*tecoma*) bushes are plentiful. Perhaps 400 or more. Introduced in 1860.

Accidentals and vagrants

Under this heading come the occasional migrant visitors, and birds not normally resident on the island.

HOUSE-MARTIN (*Delichon urbica*)—first recorded by Chapin (1954) from a specimen secured at the Pierhead in November, 1946. Others have been seen from time to time over Georgetown, as on May 1st, 1963.

CATTLE EGRET (*Bubulcus Ibis*) or Buff-Backed Heron. These birds have been visiting the island for at least 50 years, and Ascension may have been a stepping stone in the colonisation of the Americas from Africa by these birds. In recent years they have been seen among cattle on Green Mountain (1960, 1962, 1963). They have been recorded at Tristan da Cunha.

GODWITS, BAR-TAILED (*Liposa lapponica*). A pair were seen around the Turtle Ponds in December/January, 1961/62. No previous record.

RAILS (various). There are reports of Rail-like birds being seen on Green Mountain from time to time, and the British Ornithologists' Union Expedition discovered the skull of an unspecified Rail in a cave in 1957.

SANDPIPERS (various). A Sandpiper (unspecified) was seen on coastal rocks in November, 1963, and another one near Castle Hill in November, 1962.

SWALLOW (*Hirundo rustica*). Seen around Georgetown November, 1946, May, 1963, February, 1968, and probably on many other occasions. They never stay for more than a week or so.

TURNSTONE (*Arenaria interpres*)—two were seen among coastal rocks near Georgetown in November, 1962.

Being the only land within a radius of nearly 800 miles, and on the direct trade wind route from Africa to South America it is likely that many other species occasionally visit the island for short periods, remaining unobserved in the remoter parts.

PART 6

MARINE LIFE

There are no previous published accounts dealing specifically with the island's marine life, apart from a short note on Shells by Cunninghame—but written in 1699! These notes are offered merely as a rough guide to identification.

FISH AND PORPOISES

Ascension offers some of the world's finest "game" fishing and the list details a few of the common species. Each devotee of the sport has his own secrets concerning baits and lures, times of day and depth of water, and this part of the subject has been left well alone.

ALBACORE (*Germo* spp). Easily identified by the long pectoral fins, often from 35lb. to 80lb. weight. Allied to the "Tuna" family.

BARRACUDA (*Sphyraena barracuda*). Common near Ascension, usually six to eight feet long, these fish are inquisitive but unprovoked attacks on swimmers are very rare. Small barracudas have been recorded inside Comfortless Cave.

BLACKFISH (*Balistes* sp). The island's commonest shallow water fish, poor as bait, practically inedible, voracious when fed with offal yet harmless to swimmers and sufficiently bold that they can sometimes be taken by hand, or in a bucket, without hook or line. Stewards and old hands on the mailboats loved to describe the fate of anyone falling into a shoal and being torn to shreds within minutes, whilst passengers hooking them on bent pins would display them with pride, no doubt being considered fishermen of some skill. At some seasons the males(?) display a fine network of bluish lines on the forehead. Less numerous at night, when many fish tend to sink to deeper levels to sleep, remaining motionless in the sea by just sufficient fin movement to counteract any current.

BLUE SHARK (*Prionace glauca: Squalus glaucus*). The commonest pelagic shark which ranges over the entire Atlantic even to the English coast. They often swim just beneath the surface with the dorsal fin just showing, and are fast and voracious, sometimes taking hooked tuna and leaving only the severed head for the fisherman to reel in. Slender, blue green above and white beneath, snout long and pointed, mouth large, often 10ft. to 15ft. overall.

BONITO (*Katsuwonis* sp). A common Atlantic game fish, belly marked by darker stripes, about 3ft. long, related to the "tuna" family.

CREVALLE: CAVALLI: JACK (*Caranx hippos* and other spp). A common offshore fish, normally about 2ft., there are many similar species.

DOLPHIN (*Coryphaena hippuris*). Not to be confused with the mammal (q.v. Porpoise) this is a common tropical fish to 6ft. long with blunt forehead and forked tailfin.

FLYING FISH (*Exocoetas volitans*). Common round the island, the Brown Boobies feed largely on them. Other less common larger species are *Cypsilurus* and *Hirundichthyes* spp.

GAR FISH: NEEDLE FISH: PIPE FISH (*Scomberesox saurus*). A common surface fish, pale almost translucent grey-green, very long and thin, often seen at Comfortless and in shallow water near Pierhead.

GROUPER (*Mycteroperca bonaci* and others). A confusing genus with many similar looking species. Ugly speckled grey-brown, about 3ft. long, haunting shallow caves and recesses around the lava coastline. These fish quickly become very wary of spear fishermen, yet in unfished waters they are inquisitive and unafraid.

HAMMERHEAD SHARK (*Sphyrna* spp). Less dangerous than the Blue Shark, with the curious hammer shaped head; up to 15ft. long, not common at Ascension.

MORAY EEL (*Gymnothorax moringa*). Common brown speckled eel of the coastal rocks. Hooked Morays can inflict painful bites.

PORCUPINE FISH: PUFFER FISH: GLOBE FISH (*Diodon* and *Tetraodon* spp). A curious fish which inflates its spine covered body to football size as a defence mechanism when alarmed.

PORPOISES AND DOLPHINS. Although mammals, it is convenient to list them here. Generally Dolphins have longer sharper snouts but there are many allied genera and scientists make no precise distinction. The Porpoise (*Steno bredanensis*) is common about Boatswain Bird Island and Porpoise Point. The Dolphin (*Delphinus delphis*) is a shy Atlantic species, less likely to be seen. The Bottlenose Dolphin (*Tursiops truncatus*) is really a Porpoise from the shape of its snout, and is an inquisitive mammal growing to 9ft. The so-called Dolphin (*Coryphaena hippuris*) q.v. is not a mammal but a fish.

SAIL-FISH (*Istiophorus* spp). Remarkable sail-like dorsal fin. Up to 40lb.

SHARKS—See under BLUE AND HAMMERHEAD.

TUNA (*Thunnus* spp). The favourite game fish, often over 100lb. weight. The Yellow-Fin is a common local species, and makes excellent eating.

WAHOO (*Acabthocybium solandri*). Fast and solitary, with a long blue dorsal fin. About 35lb.

TURTLES

Turtles have been described as a link with the past, and have remained as a recognisable class of animals since the Triassic (200 million years ago). Green (*Chelonia mydas*) and rarer Hawksbill (*Eretmochelys imbricata*) turtles use the island's shell sand beaches as breeding places. During January/April female turtles leave the water to lay perhaps a hundred golf-ball sized eggs in a hole dug with the rear flippers. These are covered again, and in doing so the turtle tends to dig another hollow in front of the original one thus obscuring the actual site of the "nest". The local belief that this is a purposeful deceptive measure on the part of the turtle is probably false, as predators on turtle eggs at this stage are few. Greater danger is faced by the young turtles as they emerge from the sand some 60 or so days later, and face predation both by sea birds and larger fish. Perhaps because of this they normally emerge at night, but can sometimes be seen "erupting" from the sand at dusk as the movement of the first hatchlings triggers the whole "nest" to break out together.

Certain mysteries surround the life history of the turtle. In recent years Dr. Archie Carr of the University of Florida has organised a tagging programme which shows that Ascension turtles migrate to the coasts of Brazil between seasons, and return often to the same beaches to lay eggs again in ensuing seasons. It is not yet known how the turtles navigate over this distance, but Professor Carr has suggested that they may use sightings of stars coupled with a very delicate sensitivity to the "aura" of Ascension—the subtle nuances of taste and smell in the water around the island. The turtles do not remain in the vicinity of the island between laying seasons owing to the paucity of the marine grasses and algae upon which they feed.

Thousands of the island's Green Turtles were once captured and shipped away for food, often after a period of captivity in Georgegtown's two turtle ponds. A turtle turner's hut remains at S.W. Bay Beach. Sailors were detailed to turn turtles after they had completed laying, and would signal to Georgetown by means of a flagstaff on a bluff the number taken in a night. Boats were then sent round next day and the turtles, attached by their flippers to casks to prevent them sounding, were towed back to Georgetown for later shipment or Garrison use. The Green Turtle is now in some danger of extinction owing to over exploitation, and it is hoped that measures to protect it now in force at Ascension may be applied equally successfully at other breeding grounds. The turtle is of considerable scientific interest, as well as being a source of protein for an increasingly hungry world with proper "farming" and management.

Turtle watching parties will find Green Turtles at N.E. Bay, Long Beach, English Bay, Deadman's Beach, and S.W. Bay, during darkness hours in January to April. Females just emerging from the sea or still climbing the beach should be left alone or they will return to the sea. However once the turtle has begun to dig a hole it is less easily frightened, and when egg laying has commenced may be approached quite closely. Turtle's tears help to free the eyes from sand and dust, and the audible panting is a result of the exertion required to lift the weighty body (often over 400lb.) across soft sand.

SHELLS

Collectors will find few perfect specimens without diving or dredging, but a period of heavy rollers will often bring new material up on to the beach, which however, is soon ground into white shell sand. The following are some of the island's more common species. (There is no recent paper on the island's conchology. I am indebted to the East London Museum and to Mr. Steiner of San Francisco for help in identification.)

Univalves

Bursa corrugata (Perry). Rare in the Atlantic. To 1¼in.

Charonia variegata (Lam). Atlantic triton. One of the largest of the shells found washed up on the island's beaches. To 10in.

Cassis testiculus (Linn). A largish angular "helmet shell". To 6in.

Cheila ?equestris ( ). This species hardly looks like a shell at all. Not common. To 1in.

Cymatium martinianum (Orbigny). Hairy triton. Common. To 2in.

Cypraea cinerea (Gmel). Small brown cowrie with spots near the aperture. To 1in.

Cypraea lurida oceanica (Schilder). A widespread sub-species of a Mediterranean cowrie. I believe this has not been recorded from the S. Atlantic before. Easily identified by the two dark spots at each extremity of the shell. To 1in.

Cypraea spurca (Linn). Common speckled grey-brown cowrie. To ¾in.

Cypraea ?sp. A larger cowrie is occasionally found which I have not identified. To 2½in.

Echininus nodulosus (Pfeiffer). A common small shell.

Fissurella ?rosea (Gmel). Pinkish conical limpet. Common. To ½in.

Harpa nobilis (Bolt). A less common Ascension species, beautiful red and brown speckles on deeply ridged shell. To 1¼in.

Hipponix ?antiquatus ( ). A rather small shell sometimes found clinging to rocks or other shells. To ¼in.

Nerita fulgurans (Gmel). Identified from a worn specimen, and possibly mistaken for *N. scabricostata.*

Nerita scabricostata (Lam). A very common darkish ridged shell of roughly "winkle" shape. About ¾in.

Nodolittorina tuberculata (Menke). Common small shell. No details.

Pisania pusio (Linn). Common, rather pointed shell with deep to light brown speckles. To 1¼in.

Vermicularis ?sp ( ). A tube-like shell, not common.

Bivalves

Arca zebra (Swainson). A very widely distributed common bivalve. Whitish shell streaked light brown. To 1½in.

Chama ?sp ( ). Two valves of a large Chama in semi-fossil state were recovered from about 100ft. above sea level on Cross Hill. There was no fossil bed at the site.

Papyridea soleniformis (Brug). Smallish linear shell. Uncommon.

Pecten ?nodosus ( ). Large red "scallop" shaped shell with deep ridges. To 3½in.

Phacoides ?filosus (Stimpson). Small common "venus" shell. To 1in.

Trigoniocardia media (Linn). Angular "cockle". To 1in.

PART 7

ANIMALS AND INVERTEBRATES

CATS—Introduced in 1815-1820 to deal with ship's rats, but ran wild and decimated the sea bird population (see Part 5—Ornithology). Their elimination is desirable.

DONKEYS—Introduced for farm work and for carrying water barrels from Dampier's Drip to Georgetown in the early days of the Garrison. About 100 feral donkeys still roam the island.

GOATS—Introduced by early visitors probably in the 17th century or earlier to provide a source of fresh meat for passing ships. These animals are very destructive to plant life and their elimination in 1944 was a valuable step.

LAND CRABS—The yellow and purple land crabs (*Gecarcinus lagostoma*) were probably one of the very early colonizers of the new island. They return to the sea to breed, and lay eggs in sand or soft ash, and one of the puzzles about the Ascension land crabs is the infrequency with which this cycle is observed. In March, 1963, Georgetown was over-run with thousands of the minute young crabs going inland from the beaches, but residents of 12 years or more whom I questioned at the time could not remember seeing the phenomenon before, and I have heard of no subsequent observations. Yet all Gecarcinids that have been studied make annual migrations to the sea which are normally well known local phenomena, as for example on many of the West Indian islands.

LIZARDS, ETC.—A small lizard (*Liolaemus weigmanni*) is common in the dry regions. Pale geckos (*Hemidactylus mercatorius*) frequent buildings.

MICE—(*Mus musculus*) are common including in some of the very dry lava regions far from human habitation.

RABBITS—(*Oryctolagus cuniculus*) introduced in about 1820. They spread rapidly and became something of a nuisance until they were reduced by a disease which also attacked the rats in 1878, and from which the rabbits never fully recovered, being now quite scarce. The authorities in Australia wrote asking for details in the hopes of introducing the disease into that land, but the letter was received in Ascension in 1894 by which time scientific details of the epidemic were not available.

RATS—Dampier records '*Rattus rattus*' in 1701, introduced from some previous ship. The Brown Rat (*Rattus norvegicus*) was accidentally introduced with the first garrisons of the early 19th century, and is now widespread.

TOADS—The Clawed Toad (*Xenopus laevis*) was recorded by Tomlinson in 1944, and again from specimens collected at the Dew Pond by Farm Manager, Mr. Critchley, and identified by Loveridge (1959) in 1958. It is not known how they were introduced; Loveridge suggests that they were used for medical purposes during World War II.

Invertebrates

A long list of Invertebrates would be of no great interest to the general reader and thus only a few of the island's species are listed. The specialist is referred to Duffey (1964) and Wollaston (1861)—See Bibliography.

BUTTERFLIES—The small Blue Butterfly (*Lycaena boeticus*) which also occurs on St. Helena is common on Green Mountain. The world migrant "Painted Lady" (*Vanessa cardui*) reaches the island sometimes but does not breed; I last saw it in 1963. A black and white butterfly (*Hypolimnas misippus*) also occurs sporadically, and was seen in 1958 (Duffey) and by myself in 1963 and 1967, both times at seasons of unusually heavy rain.

CENTIPEDES— A largish centipede (*Scolopendra morsitans*) occurs under stones in the dry regions.

COCKROACHES—The common household pest is *Periplaneta americana.*

CRICKETS—Often heard is the common *Homorocoryphus nitidulus;* other species occur.

DRAGONFLIES—*Pantala flavescens* has been secured from Georgetown, and other species have occasionally been seen; they do not breed and arrive as wind blown vagrants.

SCORPIONS—The common Scorpion (*Isometrus maculatus*) occurs under stones in the dryer areas.

SPIDERS—The common "Black Widow" (*Latrodectus geometricus*) and at least 30 other species occur including three believed to be peculiar to Ascension, one of which occurs only on the endemic *Euphorbia origanoides* plant.

WASPS—The Social Wasp (*Polistes fuscatus*) builds small paper nests attached to walls and trees by very thin stalks, and is seen in Georgetown and the dryer regions.

N.B. *Pseudoscorpions.* small scorpion shaped insects, are of interest in that all three species recorded (two only from Boatswain Bird Island) are peculiar to Ascension.

PART 8

MISCELLANEOUS

(1) Cable & Wireless Ltd.

Cable & Wireless Ltd., formerly the Eastern Telegraph Co., are the oldest established of present residents. The first cable was laid from Capetown via St. Helena in 1899, and a telegraph office established in the building now called "Top and Bottom Flat", Georgetown. Cables were later laid north via the Cape Verde Islands to Britain, and to West Africa and South America, and a new office installed in an iron building on the site of the present S.A.C.C. Terminal. In 1922, with the withdrawal of the British Naval garrison the island passed entirely into the hands of the Company, the Manager being appointed as Resident Magistrate. Staff posted to the island often held two jobs, a technical one in connection with telegraphy, and an island one like Justice of the Peace, Clerk of the Court, Harbour Master, Post Mistress, etc. The population including St. Helenians hovered around the 200 mark. There was one rough track to the Mountain, another to English Bay, fresh water was rationed and came entirely from wells and catchments, and ships called infrequently. This tiny isolated community was a surprisingly happy one and many who served on the island then have retained a nostalgic interest in Ascension affairs until the present day.

World War II came as a rude interruption, and the Ascension Volunteer Force was organised amongst members of the cable company staff. They were soon augmented by detachments of British military personnel, and in 1942 the Americans built an 80-day wonder—Wideawake Field airstrip. Cable & Wireless Ltd. carried vital communications during both World Wars and assisted the Admiralty with radio transmitting and direction finding work. After the war the island reverted once again to its former isolated life with Cable & Wireless Ltd. as sole residents until the start of the tracking station projects in 1956. In 1964 growing developments made the appointment of an Administrator necessary.

The old iron telegraph office was replaced by the present C.T.O. in 1964, and the Company's satellite Earth Station which carries traffic for N.A.S.A. and other agencies was completed in 1966.

(2) American Installations

The Americans, who no doubt left the island after World War II with the thought that they had shaken off Ascension dust for ever, returned in 1956 to build the Air Force Eastern Test Range, Station No. 12, as part of the Atlantic missile test range. The U.S.S. Maury and U.S.S. Truckee delivered early stores and task force personnel, many of whom lived first in Georgetown, then under canvas at "Tent City" on the site of the present Base domestic area.

One of the first sites was completed in Cross Hill in 1957; two small radar dishes and a "Command Destruct" facility which was a

safety device to enable errant missiles, if any, to be destroyed in flight by ground command. Later one of the dishes and the "destruct" facility were removed. An up-dated FPS 16 radar for general tracking purposes was erected on Cat Hill, and a multiple target tracking radar on the specially levelled summit of Saddle Crater (Cotar Hill). This latter was subsequently dismantled and the area used for Infra Red telescopes, etc.

In 1958 a 60ft. telemetry aquisition dish was erected on South Gannet Hill and later joined by a second smaller telemetry dish. An optical telescope with associated high speed camera (Intercept Ground Optical Recorder) appeared in a caravan on Cat Hill; the operators claimed the ability to read the label on a beer can held up on Green Mountain. By 1961 the target tracking radar near Comfortless Cave, and comprehensive H.F. radio stations were completed; the H.F. transmitter station was just below Command Hill, and the receivers near Comfortless. Later the transmitters were moved to the Comfortless area, and a new receiving station was built south of the airstrip. These sites provided data and voice communications with the U.S.A. and with other tracking stations in S. Africa, the Indian Ocean, and on board tracking ships (Ocean Range Vessels) in the Atlantic as well as H.F. air to ground channels.

The National Aeronautics and Space Administration built a tracking station at the Devil's Ashpit in 1966, both as a support station for the Apollo manned space flights and for tracking deep space probes to the planets.

A site at S.W. Bay, linked to submerged microphones or "hydrophones", can detect and pinpoint the impact of nose-cones and other "space junk" falling into the ocean at this end of the test range, enabling their subsequent recovery when required.

(3) The British Broadcasting Corporation

In 1963 a small white caravan was towed over the rough track to English Bay and parked on the edge of the sand. Its lone occupant shared the cramped space with an experimental M.F. transmitter which was being monitored by stations in West Africa and S. America. At the same time portable receivers and field strength recorders were put in a shed near the Georgetown Hospital to monitor incoming M.F. and H.F. broadcasts. The tests confirmed the suitability of Ascension as a relay station for the B.B.C. World Service programmes and the following years saw the building of a transmitter site and power station near English Bay, receiving site at Butt Crater, and a new village at Muriel Avenue near Two Boats. The Butt Crater station receives broadcast transmissions from the U.K. in the H.F. band and sends them by landline or V.H.F. link to English Bay for re-transmission. Alternatively, pre-recorded material on tape can be transmitted. The four 250kW transmitters, Georgetown, Two Boats and Green Mountain are supplied by the English Bay power house (M.P.B.W.) and waste heat from the engines operates flash distillers to provide about 30,000 gallons fresh water per day.

PART 9

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EPILOGUE

I make no apology for including a chapter that some may consider to be out of place in a guide to Ascension. It is only out of place if Christianity is to be kept in a small compartment labelled 'Sunday', or regarded as an optional extra for those who are so inclined. If the claims of Christ are true then there is no department of life that they do not affect. My particular reason for this Epilogue is to try and suggest, however inadequately, reasons for giving those claims a second thought.

"What are you doing Tom?"

"Just looking at some small bits or rock from near Weather Post. Here, have a look."

(The questioner peers down the microscope which is focussed on some dull grey powder. Instead of an enlarged view of grey dust, he sees a riot of colour, with hexagons of iridescent green and purple set against a background of pale pink flecked with needles of bright blue.)

"It's beautiful, but what on earth is it?"

"Earth! Or at least crushed rock, but you are looking at it through filters which polarize the light. The colours are related to the atomic structure of the various minerals, so are the characteristic crystal shapes. It's possible to identify many minerals by their effect on polarized light, and by the crystal shape. Each mineral has its own particular character like a person's fingerprint, all part of the overall symmetry and harmony of the universe."

"Well it certainly makes a pile of dirt look like a stained glass window."

"The Creator is both a precise mathematician and an artist if one can say so without being irreverent."

"I suppose I shouldn't have mentioned stained glass. You don't believe all that stuff do you?"

"I don't know what you mean by 'stuff' but if it's what I think you mean, the answer is largely yes."

"But this is the twentieth century man. It no longer has any relevance."

"The twentieth century after what?"

"Well after . . . hmm, point taken. At least I admit the Christian faith stems from actual history. But sometimes I find it difficult to reconcile belief in God with modern science."

"I think the difficulty lies in the fact that science appears to have explained much that in previous ages was attributed to the supernatural. How can a man who knows all about electronics, or chemistry, believe in God. But you know science is largely concerned with the precise description of observable phenomena, and description isn't the same as explanation. If I tell someone that the chair they are sitting on is composed of atoms, with electrons orbiting round a nucleus like a miniature solar system, and that in the final analysis its appearance of solidity is largely illusory because it is composed more of energy patterns in space than actual 'matter', then I say something

which on the face of its quite astounding. Yet we accept it. We can't see it with our eyes but we know that the scientist has at least a glimpse of the truth, and his deductions are based on things that can be observed and experimentally verified. We have the nuclear bomb to show that our theories about the structure of matter are largely correct. Almost unbelievable until we get blasé about it, but correct. Now two things stem from this. Firstly, to describe the structure of matter does not explain it. No man can tell you why the electrons orbit the nucleus, or why in fact they exist at all. I am not trying to say that we have to invent a God to satisfy our demands for final answers, but I am saying that given other reasons for belief in God, scientific objections to His existance are largely untenable. Secondly, we have not got the universe neatly weighed up, its truer to say that we scratch at the surface of unfathomable mysteries, and that the more we discover, the more it points to a universe of design and harmony and incredible yet precise complexity."

"But from a human standpoint the world is in a mess isn't it? Christianity doesn't seem to have been the answer to man's problems, so I question the credentials of its founder."

"I think you have misunderstood the nature of the answer that Christ offers. Take that piece of rock. If I find a crystal with a certain angle between its faces and a certain effect on polarized light, then I can say with certainty that it is quartz for example. Its structure is governed by physical laws that are utterly reliable as far as can be experimentally verified. Why is it so difficult to believe that the Creator of these laws has also set equally reliable moral standards which we ignore at our peril?"

"I don't see what you're driving at."

"If I jump off a cliff in defiance of gravity and break my neck people would say I was insane. They would not question the reliability of the laws of gravity, or blame God for having made the world in that particular way. Yet mankind ignores moral laws and tends to blame God for the result. Yet the ensuing mess is surely the experimental verification that the laws exist. You know the world's anguish, misuse of natural resources, starvation, wars and rumours of wars, man's inhumanity to man and all the rest of it can hardly be blamed on the weather, and it is almost blasphemous to attribute it to the God who has given us a code for living in the Commandments, and a perfect example in the person of Jesus Christ."

"But man seems so incapable of extricating himself. Your Commandments don't seem to have succeeded in helping very much."

"They are God's commandments not mine, and it's not a question of succeeding. The laws of gravity don't succeed or fail. So God's moral law doesn't succeed or fail, it just IS. We fail."

"I suppose we do. Christ's example hardly seems to have been heeded."

"There's something else though. If men would admit the validity of God's moral standards, they would then discover the impossibility of following them properly, even assuming a willingness to do so. The

'best laid schemes of mice and men . . .', etc. The world's problems are only an extension of our own personal problems, and God deals with man on a personal level, not en masse. This is why I can't offer you a neat packaged answer to the state of the world. I can only point to the Commandments and say 'If only . . .' But when we reach the point where we begin to see the roots of evil in our own souls, then and only then can God speak to us through the person of His Son, the Saviour."

"Hold on a minute! What do you mean 'speak to us'?"

"The Christian's relationship with the Saviour is a personal thing. Christ died that we might be forgiven, individually and personally, by the One who claims our allegiance. Christ rose again, vindicating His claim to Deity, and thousands down the ages have attested to the fact that He is alive, and willing to grant His very real fellowship to those who will acknowledge Him as King. You see we can discuss God intellectually and at secondhand as it were, but only when we enter into that personal relationship with Him, by trusting in His Son, do we really begin to see the final answers that we may have sought so long. But we can't put the cart before the horse. It's no good wringing our hands at the state of the world in general when the roots of the world's problems lie unchecked in our own hearts. This is the problem that Christ can answer. Forgiveness and restoration for our own alienation from God, and guidance and help thereafter. Christ said 'Come unto Me, and I will give you rest' (a) and again 'I am the way, the truth, and the life: no man cometh unto the Father but by Me' (b). This is not to ignore the wider issues but rather to give our concern about them the proper perspective. The whole matter hinges on this, that the answer, God's answer, is not a set of rules, or a doctrine, or even a code of behaviour, but a living Person. When St. Paul said 'For me to live, is Christ' he was not framing some esoteric theological doctrine, but expressing the reality of his commitment to the Saviour. Despite the gropings of the 'God is dead' school, there can be no true Christianity without the living Christ at its centre. God doesn't await our condescension, He presents us with the claims of His Son, and upon our response to those claims, once we have understood them, hangs the whole tenor of our lives; 'ransomed, healed, restored, forgiven' as the hymnwriter puts it, or still lost in a wilderness of profitless philosophies."

"Well thanks for trying to explain. Perhaps you had better stop and let me think about it."

"Certainly. But read as well. If you think there is any ground for considering these things, then get a Bible or one of the new translations of the New Testament and look at the Gospels again, or read through the first few chapters of 'Acts' and you will find far better food for thought than anything I might say."

(a) St. Matthew, Chapter 11 v. 28.

(b) St. John, Chapter 14 v. 6.