

14. GEOGRAPHY AND ECOLOGY OF DESROCHES

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Introduction

Desroches is a sand island on the windward rim of a slightly submerged atoll located 16 km east of the main Amirante Ridge. The atoll is 19-21 km in diameter; its rim has depths of 2-9 m on the north, east and south sides, and of 15-18 m on the west side. The lagoon is 18-31 m deep. There is a sounding of 1598 m between the atoll and the Amirante Ridge. Desroches island, which has been described by Baker (1963, 60-63), is elongate, 5.25 km long and 0.4-1.1 km wide, with an approximate area of 324 ha. Figure 7 is based on aerial photographs flown in 1960; there is no detailed land survey. Nothing is known of the condition of the peripheral reef of the atoll rim, and whether coral is active on it. Gardiner (1936, 435) drew attention to the absence of patch reefs and knolls within the lagoon.

The island is formed mainly of sand, and has a main elevation of 2-3 m. There is very little surface relief. The south coast especially is irregular, with deep bays surrounded by steep beaches of sand with cobbles (Plate 37 and 38). Beachrock outcrops patchily on the south coast (Plate 39). Beach erosion is taking place at the east and especially the western points; at the latter there is a small peninsula formed by layers of massive beachrock (Plate 40). No elevated reef-rock was seen. Piggott (1968) maps most of the island as Shioya Sand and Loamy Sand, with scattered patches of Jemo Series soils. The latter occur as rounded lumps of phosphate-cemented sand scattered over the surface.

Table 15 lists previous scientific work on Desroches. Coppinger (1883) contributed an important descriptive account following the visit of the Alert; Gardiner spent two days there during the Percy Sladen Expedition (Gardiner and Cooper 1907); but otherwise the most important systematic accounts are the recent ones by Baker (1963) and Piggott (1961, 43-47; 1968, 56).

Vegetation

By the time of Coppinger's visit in 1882, the vegetation was dominated by "several large groves of tall Casuarina trees, many...one hundred and eleven feet [34 m] in height". Coconuts had been planted

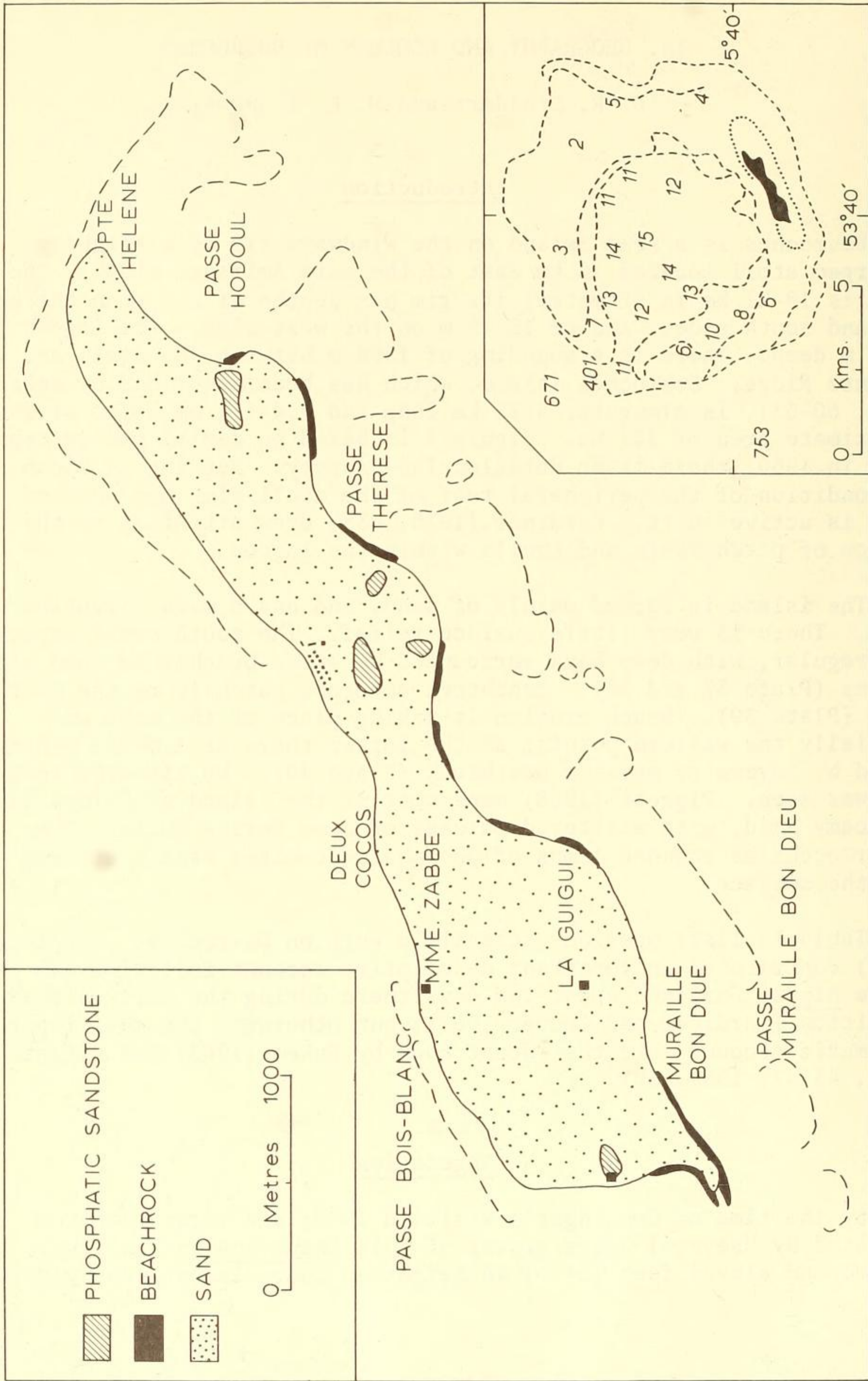


Fig. 7. Desroches

Table 15. Scientific studies at Desroches

<u>Date</u>	<u>Study</u>	<u>Reference</u>
1770	M. du Roslan: first recorded visit	Findlay (1882)
c. 1837	H. Dufo: mollusca	Dufo (1840)
1882 March 25-29	H.M.S. <u>Alert</u> , Dr R. Coppinger: Collections of birds and marine fauna. Hydrographic survey by Capt. J. P. Maclear	Coppinger (1883); Coppinger et al. (1884); Admiralty Chart 724
1892 Aug. 26	W. L. Abbott: birds	Ridgway (1895)
1905 Oct. 14-15	H.M.S. <u>Sealark</u> : J. S. Gardiner and Percy Sladen Expedition party	Gardiner and Cooper (1907), Gardiner (1936)
1960 Nov. 2-4	B. H. Baker, C. J. Piggott: geology, soils	Piggott (1961, 43-47; 1968, 56) Baker (1963)
1965 March 5	W.H.T. Tams and I.W.B. Nye: insects	
1967 Sept. 24	M. D. Gwynne, D. Wood, I. S. C. Parker: plants, birds	Parker (1970); Gwynne and Wood (1969)
1968 Sept. 21	M. E. D. Poore, D. R. Stoddart: General observations; collection of plants	This report; Fosberg and Renvoize (1970)

extensively, though few were old enough to bear, and at the time of this visit vanilla was being planted round the bases of the Casuarina trees. Coppinger noted that the flora was "more extensive than that of the other islands"; he recorded Scaevola taccada, a Ficus (possibly introduced), the only fern he saw in the Amirantes (Nephrolepis), and "herbaceous plants of the families Malvaceae, Solanaceae, Cinchonaceae, and Convolvulaceae" (Coppinger 1883, 223).

Gardiner and Cooper (1907, 155) state that the Casuarina was planted about 1835, and though the island was abandoned the tree rapidly spread over it. A new settlement was established about 1880, when coconuts were planted. At the time of the Percy Sladen visit in 1905 the Casuarina was being cut and coconuts were being encouraged. At that time there was an enormous clump of Casuarina at the west end, more along the south side to the village, and clumps at the east end. Gardiner commented on the lack of ground vegetation beneath these trees.

Thus the vegetation of Desroches, which has been continuously managed since 1905, has a long history of human interference. It is now actively managed as a copra island, with labourers clearing undergrowth and preventing the establishment of shrubs, as well as planting coconuts. With the exception of littoral Scaevola, Piggott (1961, 45) found "no evidence of the original vegetation. In other ways the flora is very

poor; the number of species is extremely limited and is diminishing under the existing system of nearly clean cultivation". This is somewhat exaggerated, for though vegetation growth is controlled there is a fairly complete ground cover, and our collections in 1968 totalled some 60 species (Fosberg and Renvoize 1970). There are no rainfall records for Desroches, but data for Darros and Alphonse in the Amirantes suggest an annual total of about 1500 mm, substantially more than occurs on the islands immediately north of Madagascar.

Undisturbed vegetation is now limited to nearshore areas. On the south coast Scaevola taccada is dominant, forming a tall hedge, with occasional Suriana maritima and Tournefortia argentea (Plates 37 and 38). Guettarda speciosa is commonly found fringing the Scaevola hedge on its landward side. On the north coast Scaevola is again dominant (Plate 41), forming taller and more open shrubs, with scattered tall trees of Ochrosia oppositifolia, Guettarda speciosa, Pipturus argenteus and Cordia subcordata. These species are presumably indicative of the original tree flora of the island. Elsewhere the vegetation is completely dominated by tall Casuarina equisetifolia and planted coconuts (Plate 42). A few other trees are occasionally found in the centre of the island, especially at the southwest end (Guettarda speciosa, Morinda citrifolia, large Ficus, Terminalia catappa), but otherwise the only trees on the island are huge specimens of Hernandia sonora forming an avenue at the settlement. Gardiner and Cooper (1907, 155) recorded these, together with Barringtonia asiatica. We did not see the latter, but did record Calophyllum inophyllum, also at the settlement. Decorative trees such as Delonix regia and Tamarindus indicus and economic trees such as Carica papaya are found at the main settlement and at smaller settlements around the island. A single bryophyte, Calymperes sanctae-mariae Besch. (det. C. C. Townsend), was taken on a rotten Casuarina trunk; this species has also been collected at Aldabra and Diego Garcia.

A shrub or tall herb layer is almost absent under the coconuts, apart from some Gossypium hirsutum and tall Alocasia near the main settlement. The tallest plants of the ground layer are Kalanchoe pinnata, Stachytarpheta jamaicensis and Turnera ulmifolia, but especially near the settlement the vegetation is kept closely cropped and these plants are not important. Grasses collected include species of Eragrostis, Stenotaphrum micranthum, Cynodon dactylon, Dactyloctenium aegyptium, Eleusine indica, and taller Digitaria horizontalis and Enteropogon sechellensis; the sedges Cyperus dubius, Cyperus ligularis and Fimbristylis cymosa are all common. The fern Nephrolepis biserrata is widespread, especially towards the northeast end of the island. The remaining species of the ground layer form a diverse assemblage of flowering plants, comprising:

Bidens pilosa
Euphorbia hirta
Euphorbia prostrata
Gynandropsis gynandra
Lippia nodiflora
Passiflora suberosa

Phyllanthus amarus
Phyllanthus maderaspatensis
Sida parvifolia
Striga asiatica
Tridax procumbens
Vernonia cinerea

Cassytha filiformis is very widespread, especially on open ground between the seaward Scaevola hedge and the coconut woodland. Ipomoea is very uncommon: I. pes-caprae was only found in one place on the lagoon beach crest. A single specimen of Euphorbia cyathophora was found at the settlement cemetery.

The settlement itself (Plates 43 and 44) has the usual assemblage of decorative and economic plants, apart from the trees already mentioned. The decoratives include species of Gaillardia, Catharanthus roseus, Tagetes patula, Pedilanthus tithymaloides and Mirabilis jalapa; the economic plants Moringa oleifera, Ricinus communis, Agave, Musa, and maize. Caesalpinia sp. is also present.

The combination of Casuarina and Cocos forms a most attractive woodland, and Piggott (1961, 44) noted that "palm yields tend to be much higher when next to a large Casuarina and their leaves are rich dark green". Nevertheless he later (1968, 56) stated that Casuarina "is notorious for the way it reduces fertility. Nothing grows underneath. Some still remain and, other than those necessary as windbreaks, should be cut down as soon as possible". We feel that more consideration should be given to this question before the trees are cut.

Fauna other than Birds

Apart from the birds very little indeed is known of the fauna of Desroches. Small collections of marine fauna were made by the Alert expedition: they include 8 species of marine Mollusca (Smith 1884), one echinoderm (Bell 1884), and either 4 or 8 species (locations are doubtful) of Crustacea (Miers 1884). The Percy Sladen party apparently completely neglected the marine fauna and flora during their visit.

Of the terrestrial fauna, a single reptile Hemidactylus brookii was recorded by Boulenger (1909), two spiders by Hirst (1911), and three species of terrestrial isopods by Budde-Lund (1912). About forty species of insects were collected by the Percy Sladen party, and the references to the determinations are given in Table 16.

Birds

Land birds

The following are recorded from Desroches:

Streptopelia sp.

According to Coppinger: "I saw only once. But one of the Creoles living on the island told me that it was an indigenous species, and was quite distinct from the domestic pigeons which roost about and restrict their range to the houses and trees about the settlement" (1884, 225). There is no later record of either; Benson (1970) discusses Streptopelia in the Amirantes.

Table 16. Insects recorded from Desroches
by the Percy Sladen Expedition

<u>Group</u>	<u>Number of species</u>	<u>Reference</u>
Orthoptera	10	Bolivar (1912, 1924)
Dermaptera	1	Burr (1910)
Hemiptera	4	Green (1907), Distant (1909)
Lepidoptera	9	Fletcher (1910)
Coleoptera	7	Champion (1914), Scott (1912, 1926), Arrow (1922)
Hymenoptera	6	Cameron (1907), Forel (1907, 1912), Meade-Waldo (1912)
Diptera	1	Theobald (1912)

Passer domesticus

Reported (as P. indicus) by Abbott in Ridgway (1895), and included by Watson et al. (1963). Common at the Settlement in 1968.

Foudia madagascariensis

Collected by Abbott on 26 August 1892 (Ridgway 1895), and "with great difficulty" by Coppinger (1884, 224) "in the large Casuarina grove, near the western end of the island"; "the females were nesting". Fairly common at the settlement in 1968 but only infrequently seen elsewhere. Status unknown according to Watson et al. (1963).

Francolinus pondicerianus

Coppinger (1884, 224) noted a "red-legged partridge", Abbott in Ridgway (1895) a partridge, and Gardiner and Cooper (1907, 156) a wild partridge. Seen in 1968 on the seaward side near the cemetery.

Estrilda astrild

Coppinger (1884, 224) noted "a very small bird which was to be seen every now and then flitting in large flocks among the maize plants and low bushes". He thought it a waxbill and it may have been this species. There is no later record.

Serinus mozambicus

Collected by Coppinger, recorded as Crithagra chrysopyga in Sharpe (1884). Coppinger states: "The yellow-breasted finch is gregarious, and mostly frequents the tops of the cocoa-nut trees and the upper branches of the tall Casuarinas" (1884, 224). One specimen collected on 26 August 1892 by Abbott (Ridgway 1895, as Serinus icterus). Introduced, according to Gardiner and Cooper (1907, 106).

In addition to these records, Coppinger also noted a brown finch "not abundant", which "seemed to confine its range to the plantations of young coconuts, where it was continually shifting its perch" (1884, 224).

Shore birds

Bubulcus ibis

Recorded as Bubulcus bubulcus by Abbott in Ridgway (1895) and in Watson et al. (1963). Not seen in 1968.

Butorides striatus

Recorded as Butorides atricapilla by Abbott in Ridgway (1895) and in Watson et al. (1963). Seen inland in 1968.

Migrants

Numenius phaeopus

Recorded by Abbott in Ridgway (1895). Quite common and vocal in woodland in 1968.

Actitis hypoleucos

Sight record, September 1968.

Arenaria interpres

Listed generally by Parker (1970) after his visit in 1967.

Sea birds

Puffinus pacificus

Seen at sea between Desroches and Mahé by Parker (1970).

Puffinus l'herminieri

Seen at sea between Desroches and Mahé by Parker (1970).

Sterna fuscata

Seen by Parker in September 1967 and by Poore and Stoddart in September 1968.

Anous stolidus

Seen by Parker in September 1967 and by Poore and Stoddart in September 1968.

Gygis alba

"Very common" according to Parker in 1967, but not seen by Poore and Stoddart in September 1968.

Other species of shore birds, migrants and sea birds are likely to occur on Desroches in view of the list for the Amirantes in Watson et al. (1963, 179-182).

History and Settlement

Desroches was discovered by Europeans later than most of the islands immediately north of Madagascar. The island is said to be identical with the "Ile du Berger" discovered by Du Roslan in 1770, when "good water" was found. But Du Roslan described the Ile du Berger as consisting of two separate islands with a channel passable at low water between them (Findlay 1882, 128). Such a description would fit Poivre rather than Desroches, but Du Roslan's navigation then becomes difficult to follow. Ile du Berger was named after his ship Heure du Berger, and Desroches after the Chevalier Desroches, Governor General of the Ile de France and Bourbon.

Casuarina trees were planted during a brief settlement in 1835. A new settlement was established in 1875-1880, and coconut planting was begun. Since that time the island has been continuously inhabited, and Casuarinas have been cut and coconuts planted at intervals. The manager's house, offices and plantation works were laid out between 1910 and 1920 (Plates 43 and 44). By 1882 there were already pigs and poultry on the island, and fruit and vegetables were grown (Coppinger 1884, 223). Cats and rabbits were noted in 1905 (Gardiner and Cooper 1907, 156), but there is no further reference to rabbits and the reference may be mistaken. There are now pigs and poultry on Desroches, together with about seventy semi-feral donkeys formerly used in the coconut mills. The manager has a lorry and there is a network of motorable roads. In 1967 copra production was 179 tons.

Desroches has clearly changed so much in the last hundred years that little evidence of its original biota remains. The vegetation is dominated by a man-induced woodland, with a characteristic assemblage of wide-ranging species beneath the coconuts and Casuarina. There are no certain references to breeding land birds, and the only common species in 1968 (the house sparrow and the Madagascar Fody) are both introduced. The extent of human disturbance may likewise account for the paucity of records of shore birds and sea birds: it is unlikely that any of the species noted now nests on Desroches. No collections of the terrestrial invertebrates have been made since Gardiner's in 1905, but it is probable, that like the plants, many of the species now there represent deliberate or accidental introductions.

Desroches was administered as a dependency of Seychelles between 1903 and 1965, when it was incorporated in the British Indian Ocean Territory.

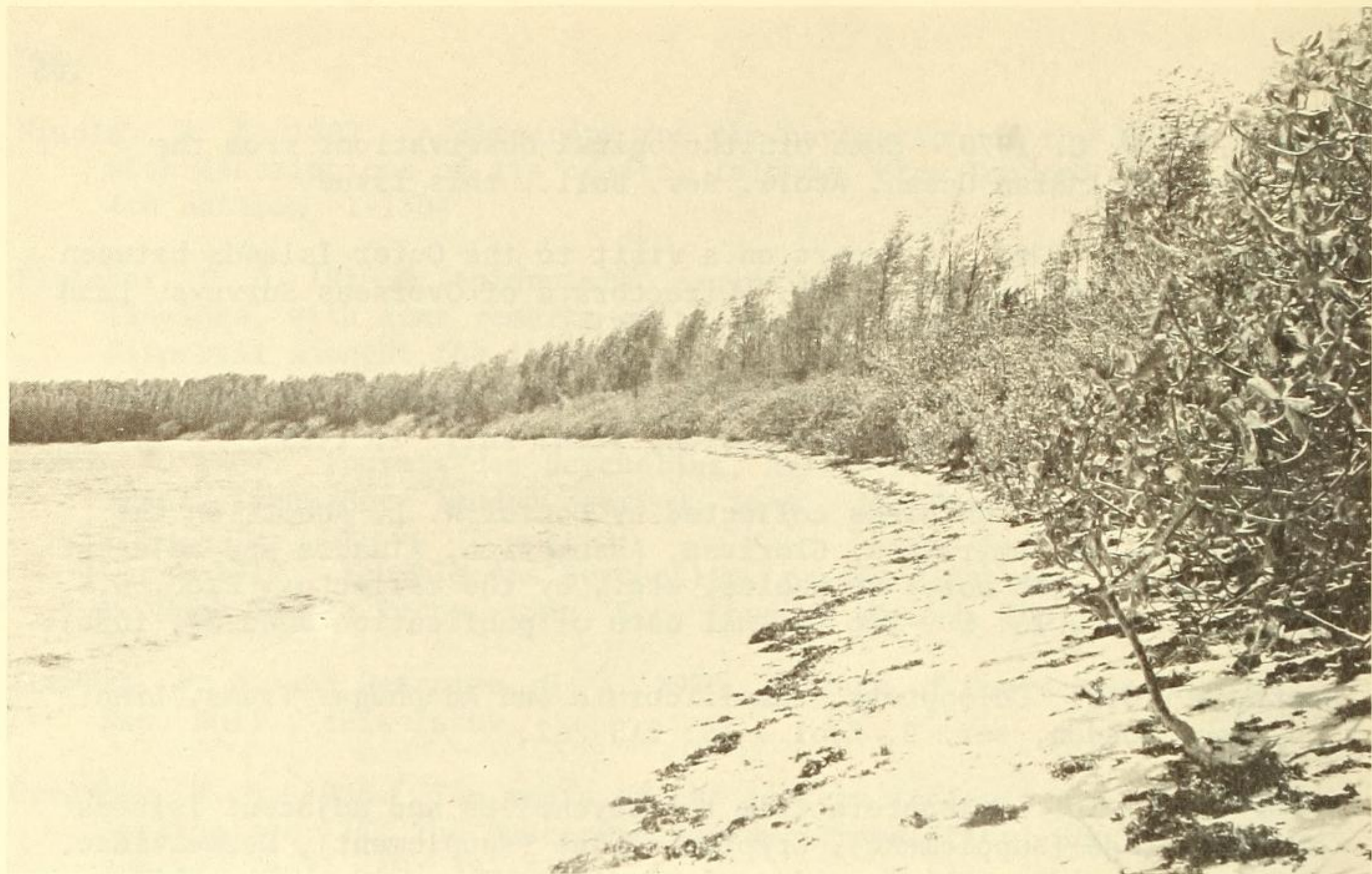
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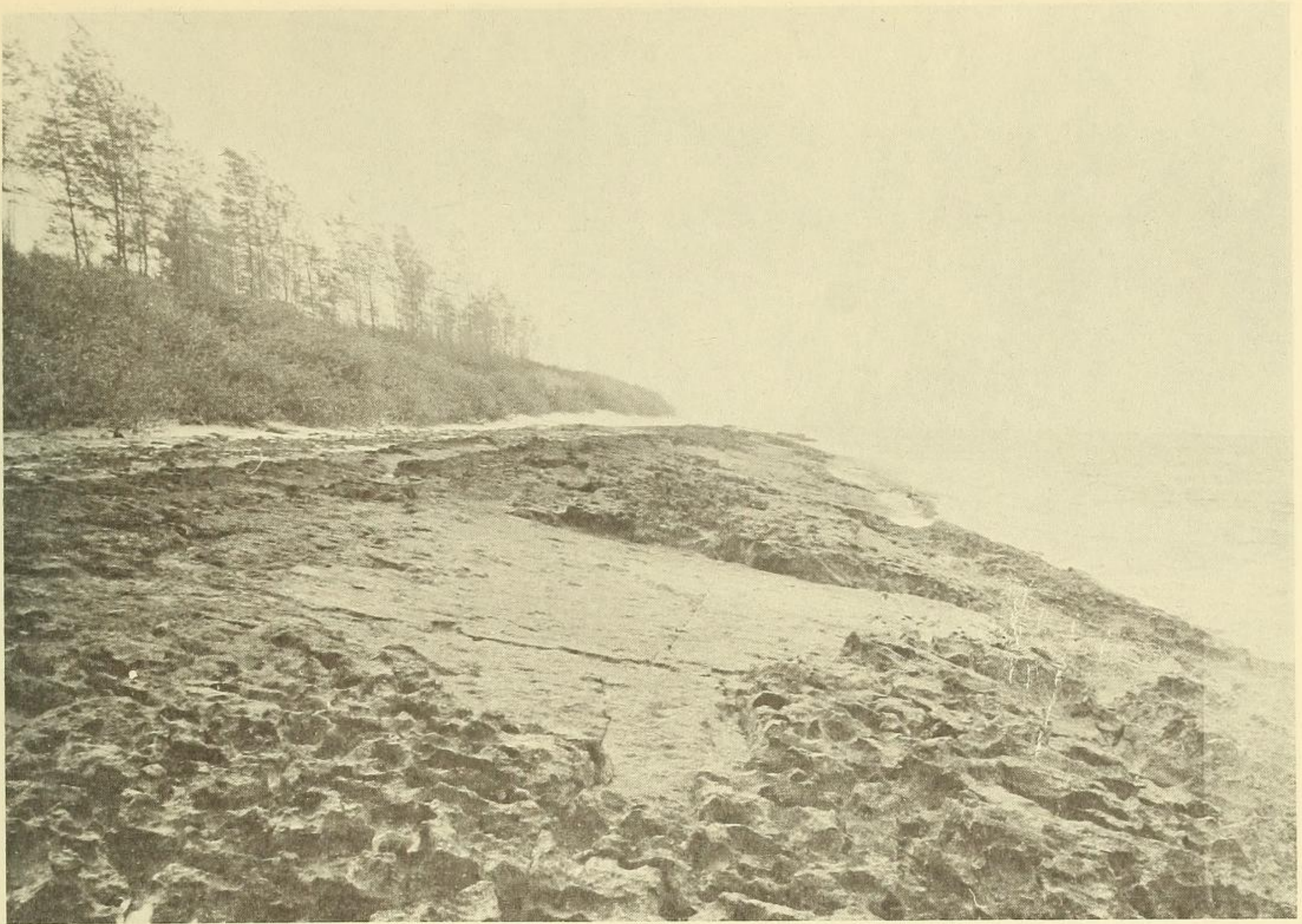
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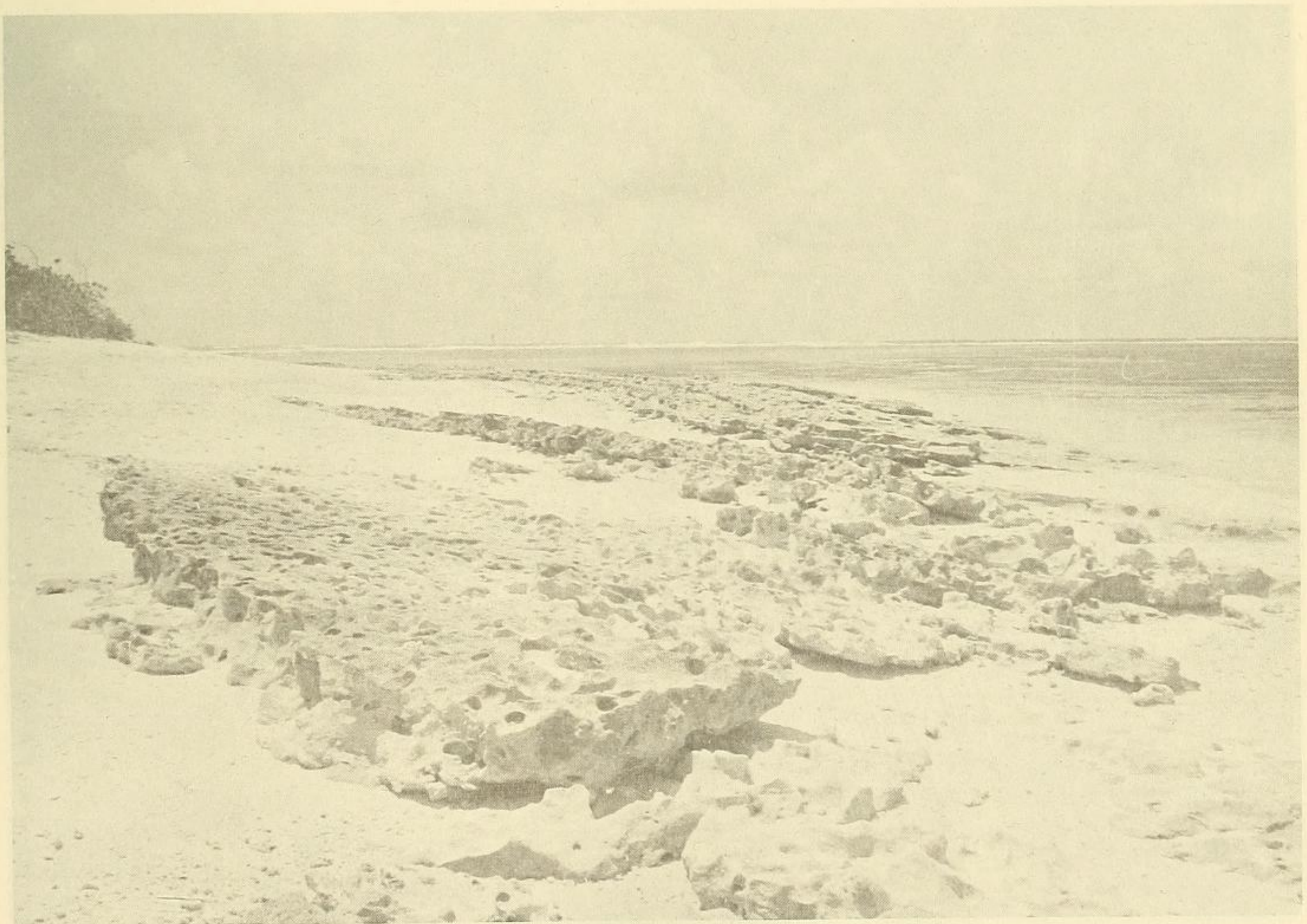
36. Scaevola and Casuarina on the south coast near Pointe Helene



37. Suriana on the south coast near Muraille Bon Dieu



38. Massive beachrock near the centre of the south coast



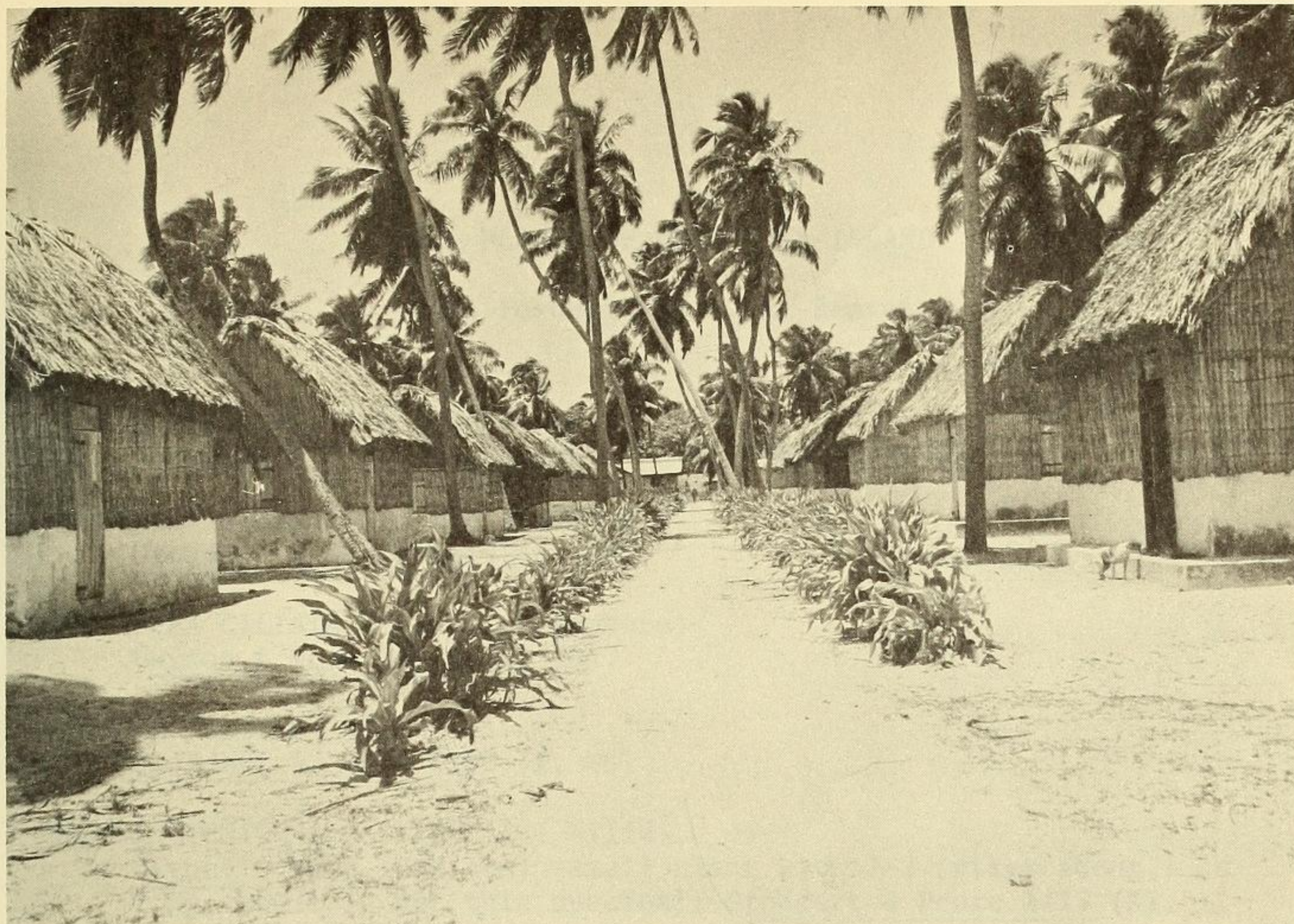
39. Massive beachrock at the southwest point



40. Scaevola and Cocos on the lagoon shore at Settlement



41. Mixed Cocos and Casuarina woodland near La Guigui



42. Labourers' quarters at Settlement, the path flanked by Cocos and Hymenocallis



43. Labourer's quarters at Settlement