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Report on a visit to the Chesterfield Islands, September 1957

by

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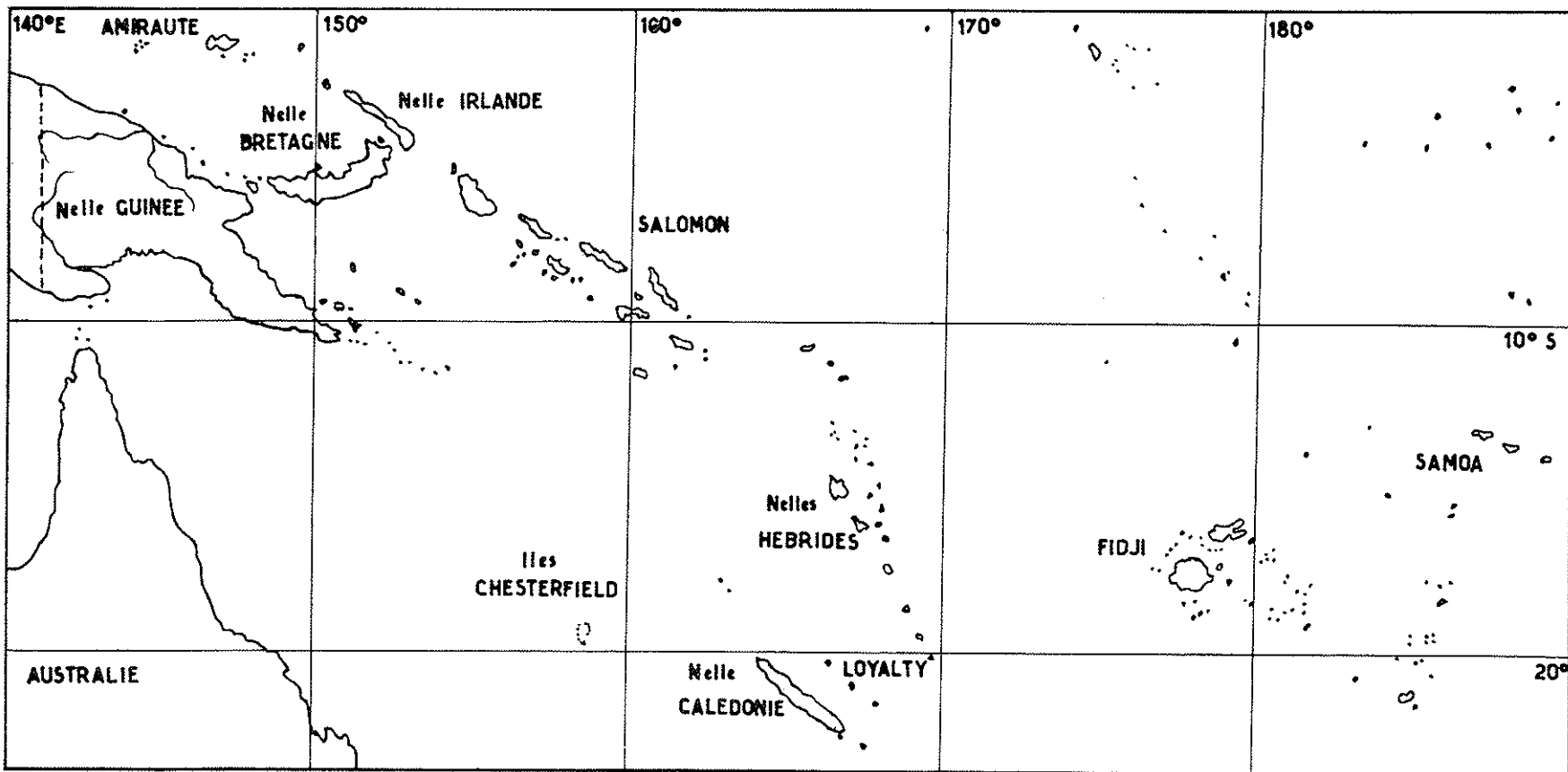
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Southwest Pacific area showing
Chesterfield Islands

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Introduction

The most westerly French possessions in the South Pacific, the Chesterfield Islands, are of interest to zoo- and phyto-geography. They are at the junction of several biogeographic regions, Australian, New Caledonian and New-Hebridean. There was a complete lack of information on these islands, so it was obvious that a visit would be fruitful. The visit, unfortunately very brief, only 4 hours, was made possible by the invaluable cooperation of the French Navy. We wish to express our gratitude for the opportunity to the authorities in charge, particularly to Admiral de Toulouse-Lautrec, and to thank the officers and crew of the sloop Francis Garnier, who were very helpful to us.

Location and history

The Chesterfield group is located about 500 km. north-west of New Caledonia, in the middle of the Coral Sea, and stretches between 158 and 159 degrees of Longitude East, and 19 and 20 degrees Latitude South. They include 11 islets, the main ones being the Chesterfield islets, Longue Island, and Avon, Renard and Bompton islets. Their total area is less than 1000 hectares. This coral group, halfway between Australia and New Caledonia, is completely uninhabited and isolated from shipping routes, and avoided as a danger to navigation.

The Chesterfield Islands have been a French possession since 1876, and have only been rarely visited by whalers and warships. The last French vessel was the Dumont d'Urville which surveyed the island and prepared a map in 1939.

Longue Island

This is the principal islet on the V-shaped coral reef, and was the only one visited. It is a narrow tongue of sand, approximately 1800 m. long and 130 m. wide, and only 7 or 8 m. above sea level.

It seems to be formed of a slightly raised platform, which has later been subject to wind erosion. The various borings made down to about 3.5 m. have revealed a regular stratification of darker guano-bearing sand

^{1/}This report is an abstract translation by M.-H. Sachet of a French paper, issued here by permission of the author. The original, entitled Rapport sur une mission effectuée aux Iles Chesterfield en Septembre 1957, 20 pp., Oct. 1957, was issued by the Institut Français d'Océanie, Noumea, New Caledonia, where the author is an entomologist.

layers alternating with lighter layers apparently free of guano, which seems to indicate that the surface has been repeatedly buried under new deposits probably by typhoons. No boulders or large size coral debris were observed. Along the shore can be seen some slabs of sandstone^{1/} similar to those seen in the Loyalty Islands, a fact which may support the idea that the island is raised. From the point of view of pedology, the soil is made up of calcareous sands of a rather coarse texture, with a thin brownish humus-bearing layer, often buried under sand. The island has no fresh water.

Vegetation

Several plant associations can be recognized:

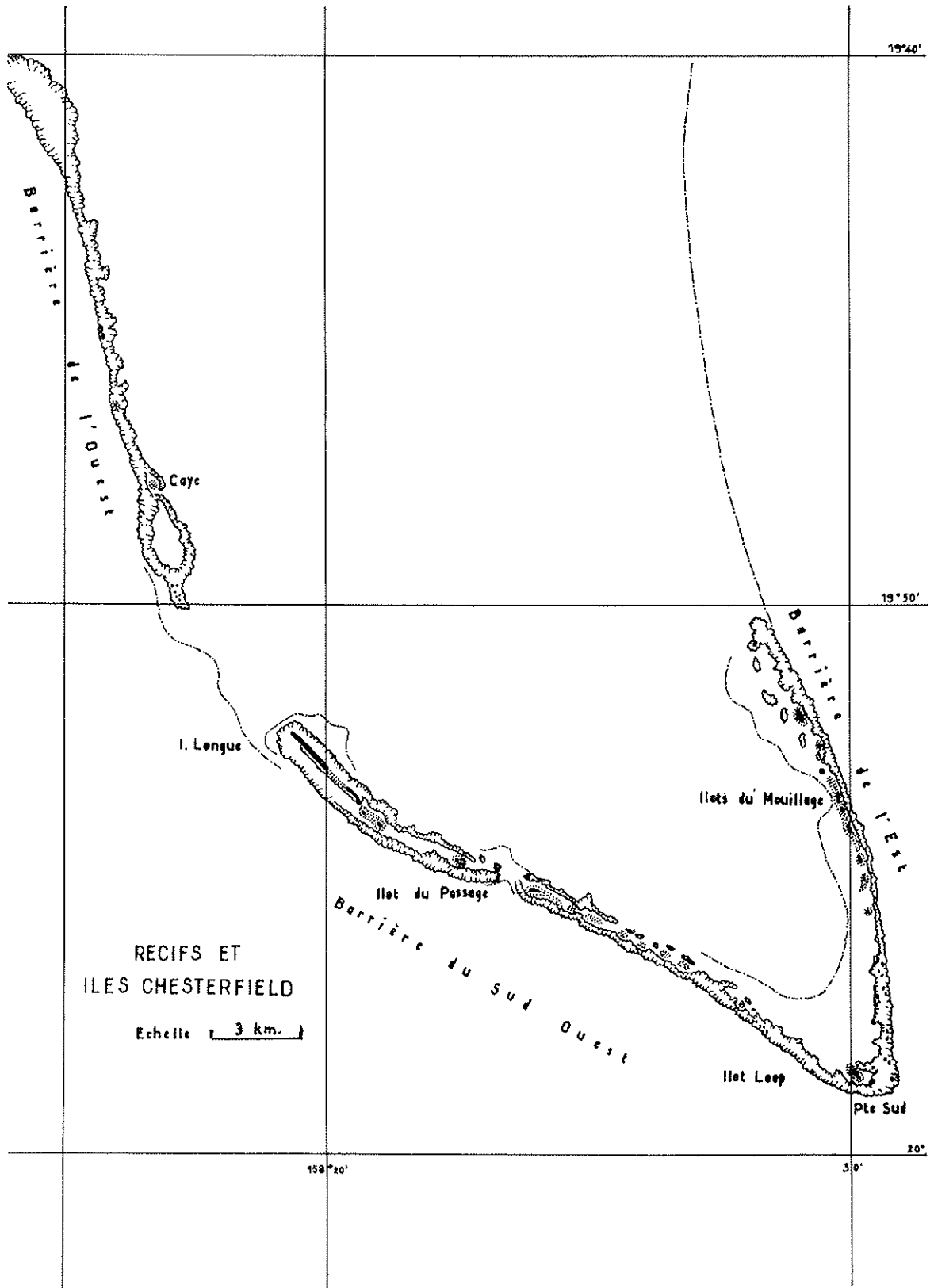
a.) On the sandy, very sunny east slope Triumfetta procumbens forms large patches. Often associated with it, and even mixed with it Boerhavia repens (= Boerhavia diffusa) forms similar patches. Other plants found in this vegetation type are rounded patches of Coronopus integrifolius, a few clumps of Portulaca lutea and many scattered plants of Didiscus sp. (Umbelliferae). Cassytha filiformis is also associated with this vegetation type, covering plants of Triumfetta and Boerhavia with its string-like stems.

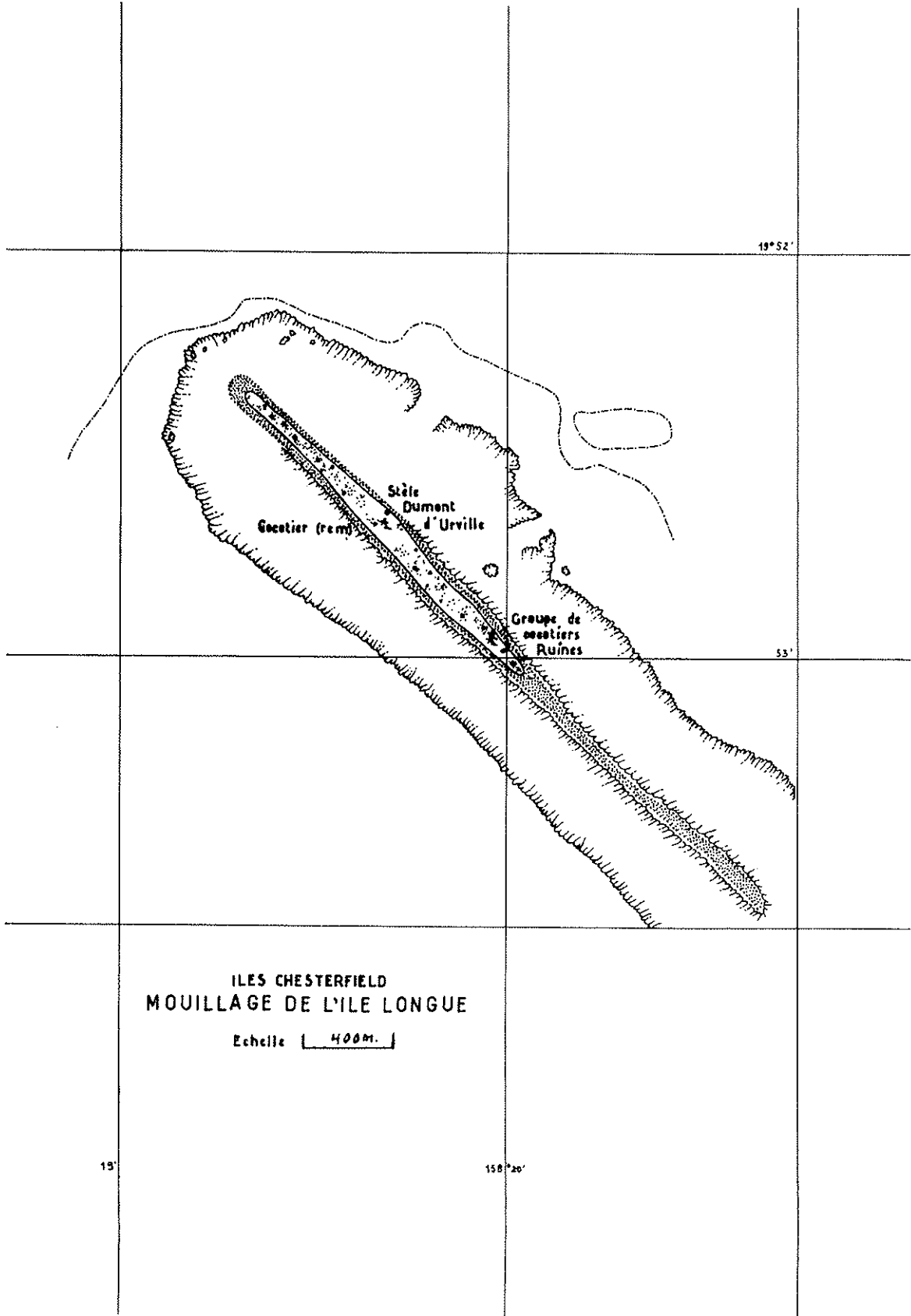
b.) On the east edge of the plateau the plants listed above are found again, but in smaller numbers. The low vegetation is made up mostly of grasses with Lepturus repens and Stenotaphrum sp. as dominants, forming a dense harsh turf, more or less continuous. There are only some clumps of woody plants, mostly in pure stands. The species are Sophora tomentosa, Scaevola sericea and Colubrina asiatica.

The shrubs, particularly Sophora and Scaevola, are the principal nesting sites of frigate birds and certain boobies and thus determine the areas where guano is deposited. This vegetation is mostly dead with skeleton-like branches carrying the few twigs forming each of the numerous nests. The accumulated droppings burn the leaves and branches and perhaps the excess of toxic salts in the soil disturbs the physiology of the plants which are slowly disappearing. By contrast some isolated clumps, or some shrubs too low for the gregarious birds to nest on are remarkably luxuriant.

c.) On the plateau, the vegetation is mostly made up of grasses of at least 5 species among which are Lepturus repens, Stenotaphrum sp., and Cynodon dactylon. The Lepturus cover is very hummocky in the central part, with deep hollows between the rounded clumps. Cynodon, or Bermuda grass, is very local and forms patches of very fine turf. Numerous clumps of Achyranthes aspera are scattered here and there, with occasional plants of a yellow-flowered Malvaceae, Abutilon molle, and of tobacco, Nicotiana tabacum. On the west part of the plateau, the beach morning-glory, Ipomoea pes-caprae, forms a few patches.

^{1/}The photographs kindly sent by the author show this sandstone is typical beach rock. Ed.





19° 52'

53'

ILES CHESTERFIELD
MOUILLAGE DE L'ILE LONGUE

Echelle [400m.]

19'

158° 20'

The island also carries a dozen coconut palms which are growing rather poorly because of the violent winds, but particularly because of the bird droppings, which burn the fronds, and perhaps because of an excess of phosphate and nitrates in the soil.

Flora

The flora of Longue Island is remarkably poor. All the species present are strand plants of wide Indo-Pacific distribution, which are also found on the coral islets around New Caledonia.

List of plants^{1/} of Longue Island

ANGIOSPERMAE

Monocotyledonae

Gramineae

- Cynodon dactylon (L.) Persoon
- Lepturus repens (Forst.) R. Br.
- Stenotaphrum sp.
- Spinifex littoreus
- Thuarea involuta (Forst.) R. Br.

Palmae

- Cocos nucifera L.

Dicotyledonae

Amaranthaceae

- Achyranthes aspera L.

Nyctaginaceae

- Boerhavia repens L.

Portulacaceae

- Portulaca lutea Forst.

Lauraceae

- Cassytha filiformis L.

Cruciferae

- Coronopus integrifolius Spreng.

Leguminosae

- Sophora tomentosa L.

Zygophyllaceae

- Tribulus cistoides L.

^{1/} Nomenclature and order adjusted somewhat from that in original French version. Ed.

Rhamnaceae

Colubrina asiatica (L.) Brongn.

Tiliaceae

Triumfetta procumbens Forst.

Malvaceae

Abutilon molle Sweet

Umbelliferae

Didiscus sp. (probably D. cussonii Montronzier)

Convolvulaceae

Ipomoea pes-caprae (L.) Roth

Solanaceae

Nicotiana tabacum L.

Goodeniaceae

Scaevola sericea Vahl

This flora of 20 species in 20 genera and 16 families is very poor. All the species are characteristic of coral strands; all are higher plants, no fern, moss or lichen were found. They are well adapted to the habitat and resistant to salt. Many have extensive root systems, and fleshy, or very hairy leaves. Most of them have fruits or seeds adapted to dissemination by ocean currents (corky fruits, long viability) or by sea birds (sticky or spiny fruits). Because of the extreme isolation of these islands, few species have been able to reach them and establish themselves.

During our short visit to Longue Island, a few plants were introduced by the Service d'Agriculture of New Caledonia. These were: coconuts, Araucaria columnaris (Forst.) Hook., Sesbania grandiflora Pers. and Leucaena glauca (L.) Benth.

Terrestrial fauna

The land fauna of Longue Island is very small. There are no mammals, amphibians or land reptiles. The few groups represented are birds, turtles - which come on land to lay eggs, sea snakes, a few Arachnida and insects.

A. AVES

The Chesterfield Islands, and particularly Longue Island, are an important roosting and nesting site for sea birds, which explains the formation of guano deposits. At the time of our visit the principal families represented were Sulidae and Fregatidae.

Sulidae

Sula sula rubripes Gould. The red-footed boobies nest mostly in the shrubby vegetation of Sophora tomentosa and Scaevola sericea. The nests contain only one egg, of a greenish white color and covered with a chalky deposit.

Sula dactylatra personata Gould. The blue-faced boobies nest directly on the ground, without any twigs or nesting material, among the clumps of Triumfetta, Boerhavia and Lepturus. The nests contain two eggs but usually only one young.

Sula leucogaster Boddaert. The brown boobies also nest on the ground but with a rudimentary nest of twigs usually protected from the sun. The females lay two or three eggs, but usually only one young grows up.

Fregatidae

Fregata ariel Gray. The lesser frigate bird characterized by the two white lateral markings of the male is the most abundant. The nest is usually perched on Sophora tomentosa shrubs and built of twigs more or less cemented by a hard substance. It contains only one chalky white egg.

Fregata minor palmerstoni. The great frigate bird appears to prefer Scaevola sericea bushes, but sometimes also nests on grass clumps in the open.

Other seabirds of the family Laridae (Larinae and Sterninae) were seen nesting on these low islands, but could not be identified.

B. CRUSTACEA

1. Isopoda-Oniscoidea

At least two species are present and especially abundant under coral boulders and plant debris.

2. Decapoda-Anomura

Coenobitidae

Coenobita perlata M.-E. This hermit crab is one of the most obvious elements of the fauna of the Chesterfield Islands. This species of the tropical Indo-Pacific area is adapted perfectly well to terrestrial life and practically never goes to the sea except for egg laying. These animals are of a beautiful red color, with little yellow tubercles bearing a black spine, and live on the part of the beaches above the reach of the highest tides, and also quite far in the interior, as we had already seen in Makatea.

In the Chesterfield Islands, the hermit crabs are exceedingly numerous and can be found during the day under coral boulders, under drift wood (pieces of canoes, bamboos, tree-ferns) and plant debris. The specimens observed were all of a large size and lived mostly in shells of Trochus and Turbo. They are mostly scavengers and clean the area of all sorts of material (fish, dead birds, etc.) but also eat the plants, as shown by their droppings which are full of plant cells and chlorophyll. However, while they are able to scale the coconut palms they do not appear to attack them and are not responsible for their poor condition.

C. ARACHNIDA

1. Acarina

a. Sarcoptiformes

Oribatei-Neoliodidae

A specimen, probably of the genus Neoliodes was captured in the sand under the nest of the red-footed booby.

Oribatei-Galumnidae

Eleven specimens of a species in this group, characterized by wing-like lateral appendages were collected in guano-bearing sand in a booby nest.

Acaridiae-Analgesidae

Sulanyssus caputmedusae Trouessart. This species was kindly identified by Dr. Jean Gaud of the Institut d'Hygiene du Maroc. Specimens were found in the feathers of Sula dactylatra and Sula sula. The females are viviparous, the males apparently are all heteromorphic.

b. Mesostigmata

Gamasina-Laelaptidae

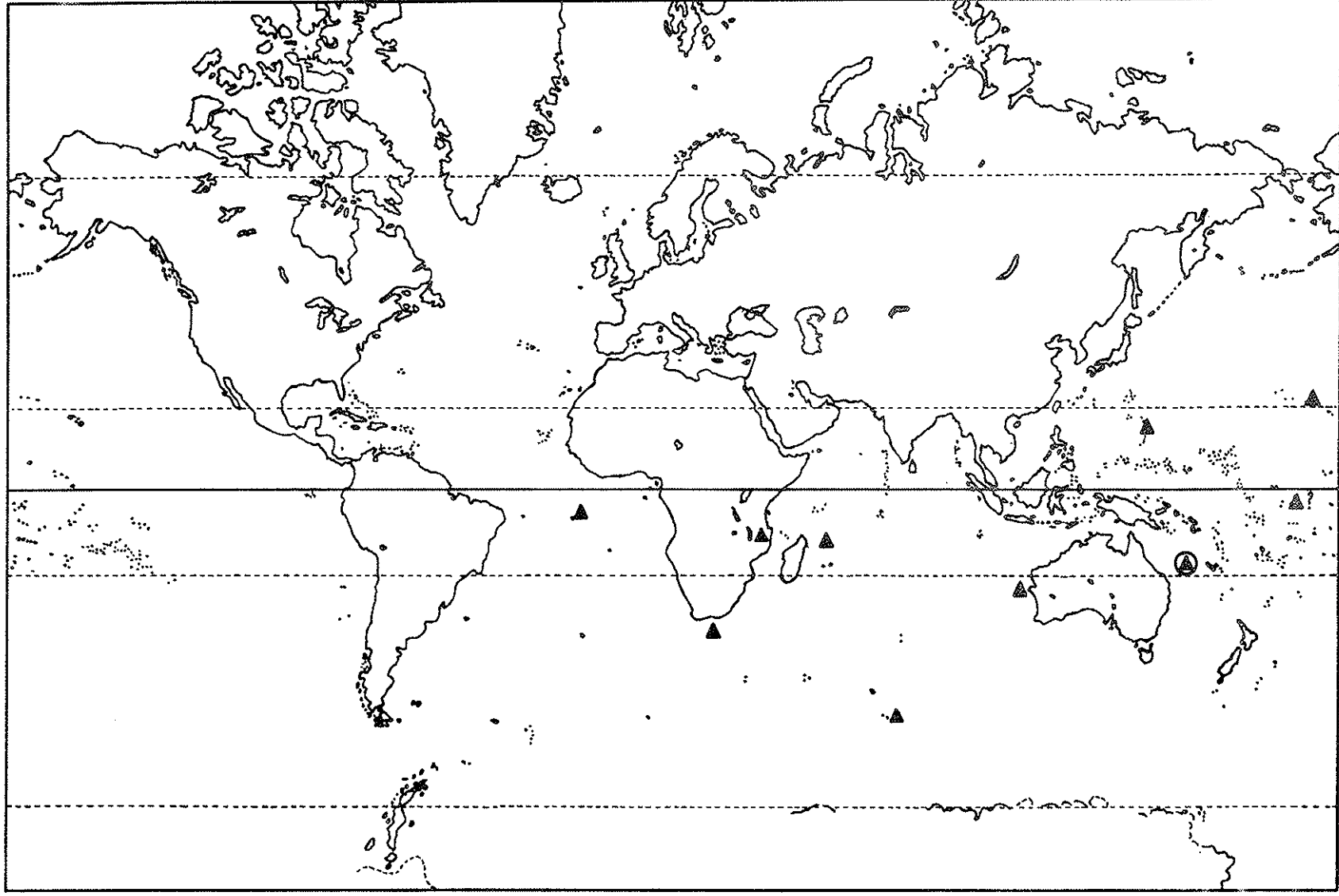
Many specimens were found in the litter of some frigates (Fregata ariel) brought back alive. This is a parasite of mammals, and as these are apparently completely lacking on Chesterfield, the acarians probably were due to accidental contamination aboard ship or in the animal raising laboratory.

c. Ixodides

Argasidae

Ornithodoros capensis Neumann. This species was kindly determined by Mr. J. Rageau, medical entomologist and veterinarian for the Institut Francais d'Oceanie. A specimen of this tick was captured on Sula dactylatra and several more found later. This species is reported from French Oceania and from this host, for the first time. To our knowledge it had been reported so far from Ascension I. in the Atlantic (Speiser 1909), from penguin nests (Spheniscus demersus) on the guano islands near the Cape (Neumann 1901), from St. Paul I. (New Amsterdam group, Nuttall 1908) and from the west coast of Australia on Eudyptula minor (Taylor and Murray 1946). In the Pacific, the species was known only from Micronesia (Guam, Kohls 1953) and the Hawaiian Islands (French Frigate Shoals, Joyce 1953). It is most likely that this species is very widely distributed and will be found in many islands where seabirds roost. Van Zwaluwenburg (1955) records an exuvium of Ornithodoros sp. from Canton Island; quite possibly it is the same species.

It may be noted that the bite of this tick is particularly painful for man.



▲ : AIRE DE DISTRIBUTION D'ORNITHODOROS CAPENSIS NEUM.

2. Chelonetida

Several specimens belonging in this group were collected from litter under Sula dactylatra.

3. Araneida

a. Sicaroidea

Oonopidae

Scytopes sp. probably S. marmorata L. Koch. Two females were collected. They feed on cicadellids and small orthoptera.

b. Aranoidea

Dionychae Thomisidae?

One specimen was collected on the beach.

Trionychae Agelenidae

One male and two females were found under a coral boulder.

In addition two species of Araneida could not be placed.

D. INSECTA

1. Blattaria

At least two species are present, from the egg cases found under dead wood.

2. Orthoptera

a. Grylloidea

Gryllidae Nemobiinae

One female, completely apterous was caught under a clump of Boerhavia.

b. Tettigonoidea

Tettigoniidae

One female was caught in a sweeping net.

c. Acridoidea

Acrididae

Ten or so specimens caught on Cynodon dactylon and Lepturus repens.

3. Embioptera

Oligotomidae

Oligotoma oceanica Ross. A female specimen found in seabird litter.

4. Mallophaga

1. Amblycera

Menoponidae Menoponinae

Colpocephalum spineum Kellog (det. Mr. J. Rageau) from Fregata ariel.

Myrsidea sp. from Sula dactylatra.

2. Ischnocera

Phlipteridae

Pectinopygus (Pectinopygus) sulae (Rudow) on Sula sula rubripes.

5. Homoptera

a. Fulgoroidea

Araeopidae (Delphacidae)

Many specimens were swept from grasses. Sexual dimorphism is strong, the males having the hind wings of an iridescent smokey black and the females transparent. These specimens bring to mind the genus Liburnia.

b. Cicadoidea

Cicadellidae Euscelinae

Orosius sp. Two specimens were caught on grasses.

Cicadellidae Typhlocybinae

About 60 specimens were caught on Boerhavia. The plant is literally infested with this small species and has many discolored yellowish spots.

Cicadellidae Jassinae

Eurinoscopus sp. One specimen.

6. Heteroptera

Gymnocerata

Miridae Capsinae

Four specimens caught by sweeping.

Miridae Cylapinae

Ten specimens caught by sweeping.

Miridae Phyllinae

Campylomma sp. Four specimens caught by sweeping.

Miridae Heterominae

Cyrtorhinus sp.? One specimen caught on Boerhavia. Very likely it is a parasite of the eggs of the Araeopidae.

Lygaeidae Lygaeinae Orsillini

Nysius sp. Numerous specimens caught on Boerhavia.

7. Coleoptera

Only four species were collected.

Histeridae

Four specimens found in the droppings of Coenobita perlata.

Tenebrionidae

Gonocephalum sp. Found under coral boulders and dead wood.

Undetermined Tenebrionidae. Three specimens found in same habitats.

Curculionidae

One specimen found by sweeping.

8. Lepidoptera

Pyralidae Pyraustinae

Hymenia recurvalis (Fabricius). One specimen was caught while flying. The caterpillars most likely live on Achyranthes aspera.

9. Diptera

Hippoboscidae

One specimen was seen flying but could not be caught. It was intensely black with a heavy and noisy flight, and at first sight would seem to belong in the genus Olfersia so common on frigate birds in the Pacific.

Chloropidae

Cadrema sp. About 100 specimens were caught on the guano around birds nests.

Calliphoridae

Lucilia sp. One specimen.

Dorilaidae (formerly Pipunculidae)

Four specimens; probably a parasite of larvae of Araeopidae and Cicadellidae.

Sarcophagidae

Sarcophaga sp. One specimen on a dead Sula sula.

Milichidae

Three specimens, much like Milichiella lacteipennis (Loew).

Lonchaeidae

10. Hymenoptera

Formicidae Formicinae

A few specimens found in guano-bearing sand, under a stone.

Formicidae Pseudomyrmicinae

Numerous colonies found in sand under dead wood and in the bases of palm fronds.

This faunal list does not pretend to be complete, our visit to the island being much too short. However, it is sufficient to show the complete absence of certain important groups, which we particularly searched for, such as Isoptera, Odonata, Culicidae, Tabanidae, Aphidae, Coccidae, Coccinellidae and Vespidae.

It is possible that during the wet season the arthropod fauna of the Chesterfield Islands is richer and more abundant than during our visit in a very dry period, but it probably is not very different from what we observed.

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^{1/}These references do not pertain to Chesterfield, but are cited in connection with the distribution of some of the animals listed.

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