phrey, etc., from those herein termed "lobulate" types, as represented by *P. aphanidermatum, P. arrhenomanes* Drechsler, etc., he applies the name *Pythium,* not to those entirely filamentous forms on which the genus was founded, but to those with spherical sporangia. In the amended form, as proposed by Sideris, *Nematosporangium* groups together species having two different types of sporangia, *i.e.,* the entirely filamentous and the lobulate ones. *Nematosporangium,* in the sense of Fischer and Schröter, fits well those forms placed in *Aphragmium,* for, as has been pointed out, Aphragmium types are an impossibility. As the name *Pythium* already exists for these forms, and, in fact, was first applied to the very species placed by Schröter in his genus *Nematosporangium* (*P. monospermum*), the latter generic name is superfluous.

The situation might be somewhat clarified if the lobulate types were placed in the genus *Rheosporangium,* the first generic name proposed for these forms (Edson).[9] While some slight changes would have to be made in defining the genus, it seems better to adopt it than to continue, in a greatly amended condition, an untenable and confusing one. This action would leave Pythium in its original sense applying to those forms possessing entirely filamentous sporangia. As to the disposition of the subspherical and spherical sporangial forms, the writer does not feel so competent to express an opinion. Several courses, however, seem open: to raise the subgenus *Sphaerosporangium* to generic rank; to merge the group with *Phytophthora,* established by de Bary in 1876, or to revive one of the several generic names proposed in the past for various members of this group. If the genus *Pythium,* in the inclusive sense of Butler, is to be broken up into several genera, as seems entirely feasible, the name *Pythium* should apply only to those entirely filamentous sporangial types on which the genus was founded and not to those forms with spherical sporangia.

The salient features by which the three genera may be separated from each other are as follows.

Pythium: Zoosporangium identical with the filamentous vegetative hyphae, consisting of a hyphal segment delimited by cross walls; the content being discharged through a hyphal branch into a vesicle formed at the apex of this structure; not proliferating; the discharged protoplasm entirely delimited into zoospores within the vesicle.

Rheosporangium: Zoosporangium consisting of a subspherical portion or a series of more or less compacted, intercommunicating, lobulate elements cut off from the vegetative hyphae by septa, and a filamentous evacuation tube which arises from the basal portion and through which the content of the whole complex is discharged into the vesicle; not proliferating; the discharged protoplasm entirely delimited into zoospores within the vesicle.

Phytophthora or *Sphaerosporangium* n. gen.: Zoosporangium narrowly ovoid, spherical or citriform, clearly distinguishable from the vegetative hyphae from which it arises and is separated by a cross wall; renewed by proliferation or branching of various types; vesicle present or absent; zoospores sometimes clearly delimited within the sporangium and emerging fully formed.

F. K. SPARROW, JR.

DARTMOUTH COLLEGE

[9] H. A. Edson, "Rheosporangium Aphanidermatus, A New Genus and Species of Fungus Parasitic on Sugar Beets and Radishes," *Journ. Agr. Res.,* 4: 279–291, 1915.

TWO NEW DOMINICAN FORMATIONAL NAMES

THE MARINE PLIOCENE GATO FORMATION

THE later Señor Rodolfo Cambiarso, a resident of Santo Domingo City, presented me, in 1916, with a very fine fossil sea urchin that he had collected at Gato, Provincia del Seibo, on Rio Chavon, northeast of the port of La Romana, Dominican Republic. This town is shown upon the Santo Domingo-San Juan folio map of the American Geographical Society of New York. I gave the specimen to the U. S. National Museum, and Dr. R. T. Jackson identified it as *Clypeaster dalli* Twitchell,[1] and later described it in his "Fossil Echini of the West Indies,"[2] leaving the age indeterminate, Miocene or Pliocene.

This very handsome Dominican specimen is the only example of the species ever recorded except the type which Twitchell[3] described from near Fort Thompson, Caloosahatchee River, in the Caloosahatchee Pliocene of Florida.

In 1929, I referred my Gato beds to the marine Pliocene.[4] No other marine Pliocene has been differentiated in the Dominican Republic. I now propose for this interesting horizon, characterized by *Clypeaster dalli* Twitchell, the name Gato Formation.

The Gato formation of the Dominican Republic was laid down about the same time as the marine Pliocene beds described by Drs. Woodring and Brown[5]

[1] C. J. Maury, *Bull. American Paleontology,* No. 30, pp. 20–21, 1917.

[2] R. T. Jackson, Carnegie Inst. Washington, Publ. No. 306, p. 37, 1922.

[3] Clark and Twitchell, Monograph U. S. Geol. Surv., Vol. 54, p. 218, Pl. 99, Figs, 2a-b; Pl. 100, Figs, 8a-b, 1915.

[4] C. J. Maury, SCIENCE, p. 609, December, 1929.

[5] Woodring and Brown, "Geology of Haiti," pp. 241–242, 1924.

on Rivière Gauche, arrondissement of Jacmel, Republic of Haiti.

THE UPPER MIOCENE CAIMITO FORMATION

The lithological and faunal characters of the beds at Caimito, on Rio Cana, in the valley of Rio Yaque del Norte, Dominican Republic, were described by the writer[6] in 1917. The beds were found by the Maury Expedition, and the horizon was seen to be very intriguing, and an Upper Miocene age was suspected.

Later, from researches of the Vaughan Expedition, the Cerro de Sal formation, on the southern side of the Dominican Republic, in the Province of Barabona, near Las Salinas and Angostura, was described by Messrs. Condit and Ross[7] and referred to the Upper Miocene.

In 1929, I definitely referred the Caimito beds to the Upper Miocene,[8] and now propose for this horizon the name Caimito Formation.

CORRELATION OF UPPER MIOCENE ANTILLEAN HORIZONS

The following correlation of the Upper Miocene beds of the West Indies is now suggested. Those of Trinidad Island were discussed in detail by the writer in 1925.[9]

Upper Miocene: Younger or Caimitoan stage, Dominican Republic, north side, Caimito formation; south side, Cerro de Sal formation, apparently slightly younger than the Caimito. Trinidad, west central part of the island, Gomez Estate beds and Freeport to Todd's road outcrops. Tobago Island, Botanic Station beds. *Upper Miocene: Older or Springvalean stage,* Trinidad, Savanetta and Springvale beds near Couva, in the western part of the island; Pointe Noir beds on the eastern side of the island.

Climate of the Caimitoan Stage: Gypsum in the form of encrustations, plates and crystals is present in the Caimito formation. It is also abundant in the Cerro de Sal formation where it is followed by salt, which runs about 90 per cent. sodium chloride. This indicates aridity and excessive evaporation towards the close of the Upper Miocene. Conditions recall the gypsiferous strata of the Catahoula formation, regarded by the writer as equivalent to the Tampa formation of the Lower Miocene. The Cerro de Sal horizon is probably somewhat younger than the Caimito because the degree of evaporation exceeded that required for the precipitation of gypsum, and the beds of nearly pure salt were deposited.

Salt marsh and shallow lagoonary habitats are indicated for the faunas of the Caimitoan stage, concomitant with a rising coast-line and withdrawal of the sea off shore.

CARLOTTA J. MAURY

YONKERS, N. Y.

REPORTS

INVESTIGATIONS IN PANAMA DURING THE SUMMER OF 1930[1]

INTRODUCTION

AT the suggestion and on the invitation of Dr. Herbert C. Clark, director of the Gorgas Memorial Laboratory, Panama City, the writer undertook the investigation which is presented in this report. Facilities were extended so that Dr. William H. Martinez, a Tulane Medical School graduate, accompanied the writer, and later Mr. Alberto Prieto, a Tulane Medical School student resident in Panama, was enlisted as a technical assistant. In addition, non-professional personnel were secured locally in Panama City. The entire facilities of the Gorgas Memorial Laboratory and the connections which it enjoys in the Republic of Panama and the Canal Zone were placed at the writer's disposal for the work in view.

OBJECTS OF THE STUDY

The investigations were undertaken with the following objects in view.

(1) To study representative samplings of the population of Panama, in order to determine by present refined methods of examination the incidence of *Endamoeba histolytica,* both in its active and carrier states, and to discover, if possible, the public health importance of this infection in Panama at the present time.

(2) To study concurrently the incidence and significance of the following infections: giardiiasis, ascariasis, hookworm infection, trichocephaliasis and strongyloidiasis.

(3) To obtain autopsy confirmation of as many of these cases as was possible.

(4) To treat selected cases of *Endamoeba histo-*

[6] C. J. Maury, *Bull. American Paleontology,* No. 30, pp. 25–26, 1917.

[7] "Geol. Reconnaissance Dominican Republic," pp. 214–215, 1921.

[8] SCIENCE, p. 609, December, 1929.

[9] *Bull. American Paleontology,* No. 42, 1925.

[1] Contribution from the Gorgas Memorial Laboratory, Panama, and from the Department of Tropical Medicine, Tulane University.