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BOTANY.—*Mosses collected in Brazil and Argentina by J. N. Rose in 1915.*<sup>1</sup> R. S. WILLIAMS, New York Botanical Garden. (Communicated by WILLIAM R. MAXON)

The mosses reported upon in the present paper are part of a large botanical collection made in Brazil and Argentina in 1915, upon an expedition conducted by Dr. J. N. Rose under the auspices of the Carnegie Institution of Washington and the New York Botanical Garden, the principal object of the exploration having been to collect cacti. Dr. Rose was accompanied by Paul G. Russell, detailed by the U. S. National Museum as assistant. The mosses listed are in the U. S. National Herbarium and the herbarium of the New York Botanical Garden.

### SPHAGNUM MAGELLANICUM Brid.

Vicinity of Itatiaya, Brazil, July 26–30 (20486). This species, largely under the name of *S. medium*, is known from Alaska southward, also from Europe, Asia, and Africa.

### SPHAGNUM SUBSECUNDUM Nees

Locality and date of preceding (20508). Largely known as *S. platyphyllum*, and of about as wide distribution as the preceding. (I am indebted to Dr. A. LeRoy Andrews for the determination of these Sphagnums.)

### DITRICHUM RUFESCENS Hampe

Locality and date of preceding (20544). Not before credited to Brazil, I believe, but found on the west coast southward to Chile.

### CERATODON STENOCARPUS Br. & Sch.

Locality and date of preceding (20527, 20544). Common in tropical regions of the Old World also.

<sup>1</sup> Received September 3, 1930.



## AONGSTROEMIA VAGINATA (Hook.) C. M.

Locality and date of preceding (20449a). No. 60 of E. Ule's mosses of Brazil, called *A. julaceo-divaricata* C. M., does not seem to be distinct from this species.

## DICRANELLA EXIGUA (Schwaegr.) Mitt.

Itacurussa, State of Rio de Janeiro, Brazil, July 24 (20423, 20426).

## DICRANELLA GUILLEMINIANA (Mont.) Hampe

Vicinity of Itatiaya, Brazil, July 26-30 (20576).

## DICRANELLA HILARIANA (Mont.) Mitt.

Vicinity of Bahia, Brazil, May 29 (19689). Monte Serrat, vicinity of Itatiaya, Brazil, July 26-30 (20443, 20446). Near Milo Pecanna, State of Rio de Janeiro, Brazil, Aug. 9 (20734); very poor specimens but probably belonging here. This species occurs commonly from the southern United States to southern Brazil and has been described under a great variety of names.

## DICRANELLA PABSTIANA (C. M.) Mitt.

On Corcovado, Rio de Janeiro, Brazil, July 12; marked "h."

## DICRANELLA SUBSULCATA Hampe

Vicinity of Itatiaya, Brazil, July 26-30 (20578; 20450, immature but probably belonging here). Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20629).

## CAMPYLOPODIUM PUSILLUM (Schpr.) Williams

Vicinity of Itatiaya, Brazil, July 26-30 (20545a). Ule's no. 102 from this region, called *C. itatiyaiense*, does not seem to me distinct.

## HOLOMITRIUM ARBOREUM Mitt.

Vicinity of Toca de Onca, Brazil, June 27-29 (20122). Vicinity of Itatiaya, Brazil, July 26-30 (20548).

## HOLOMITRIUM CRISPULUM Mart.

Forests of Jabaquara, Brazil, Aug. 15 (20860, 20864).

## HOLOMITRIUM OLFERSIANUM Hsch.

Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22-24 (20391).

## CAMPYLOPUS ARCTOCARPUS (Hsch.) Mitt.

Vicinity of Itatiaya, Brazil, July 26-30 (20509).

## CAMPYLOPUS DETONSUS (Hampe) Par.

Vicinity of Bahia, Brazil, May 30 (19696). Sterile.

## CAMPYLOPUS INTROFLEXUS (Hedw.) Mitt.

Vicinity of Itatiaya, Brazil, July 26-30 (20474).



*CAMPYLOPUS PENICILLATUS* (Hsch.) Jaeg.

Locality and date of preceding (20434).

*CAMPYLOPUS SUBARCTOCARPUS* (Hampe) Jaeg.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20811). On Papagaya, Rio de Janeiro, Brazil, Aug. 1 (20698b).

*CAMPYLOPUS* SP.?

Near Santos, Brazil, Sept. 20 (21111). Sterile.

*CAMPYLOPUS* SP.

Vicinity of Itatiaya, Brazil, July 26-30 (20548a). Sterile.

*PILOPOGON SUBJULACEUS* Hampe

Vicinity of Itatiaya, Brazil, July 26-30 (20545, 20477a).

*LEUCOBRYUM ALBICANS* (Schwaegr.) Lindb.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20858).

*OCTOBLEPHARUM ALBIDUM* (L.) Hedw.

Vicinity of Bahia, Brazil, May 26 (19633, 19642). Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22-24 (20388).

*FISSIDENS OBTUSATUS* Hampe

Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22-24 (20389).

*FISSIDENS PSEUDOBRYOIDES* Schlph.

Vicinity of Bahia, Brazil, May 30 (19704) and June 3 (20139a). Sao Miguel, State of Bahia, Brazil, June 26 (20055). This determination as *F. pseudobryoides* appears to be correct, but on further study it would seem that the species is not sufficiently distinct from the older *F. Kegelianus*.

*CALYMPERES RICHARDI* C. M.

Vicinity of Bahia, Brazil, May 26 (19632).

*HYMENOSTOMUM MICACEUM* (Schlecht.) Hampe

Vicinity of Bom Finn, Bahia, Brazil, June 8, 9 (19830). Vicinity of Cabo Frio, Rio de Janeiro, Brazil, Aug. 8 (20730). This species is distinguished by having the costa quite papillose on the upper surface from near the apex about two-thirds of the way down, the back of the leaf and costa being smooth or slightly papillose, and the upper surface of leaf mostly mamilllose. Known only from Brazil until collected at Frederiksted, St. Croix, West Indies, by Rose, Fitch and Russell, in Feb. 1913, no. 4448.

*TIMMIELLA UMBROSA* (C. M.) Broth.

Near Cassaffousth, Córdoba, Argentina, Sept. 9 (21068).



## DIDYMODON SCHIMPERI (Mont.) Broth.

Portrerillos, Mendoza, Argentina, Sept. 2 (20998). Apparently not known previously outside of Chile.

## TORTELLA CAESPITOSA (Schwaegr.) Limpr.

Vicinity of Toca de Onca, Bahia, Brazil, June 27-29 (20118). Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22-24 (20386, 20387, 20392). Monte Serrat, vicinity of Itatiaya, Brazil, July 26-30 (20444). Near Iguaba Grande, Rio de Janeiro, Brazil, Aug. 7-9 (20715). Petropolis, Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20829). Near Cassaffouth, Córdoba, Argentina, Sept. 9 (21066). On Corcovado, Rio de Janeiro, Brazil, July 19, marked "a."

## HYOPHILA MICROCARPA (Besch.) Broth.

Salgada, State of Bahia, Brazil, June 1 (19712). Queimadas, Bahia, Brazil, June 9-17 (19861, 19882). Vicinity of Machado Portello, Bahia, Brazil, June 19-23 (19934, 19997).

## HYOPHILA TORTULA (Schwaegr.) Hampe

State of Bahia, Brazil, May 31 (19707). Alagoinhas, State of Bahia, Brazil, June 12 (19883).

## BARBULA UNCINICOMA C. M.

Near Cassaffouth, Córdoba, Argentina, Sept. 9 (21067).

## DESMATODON STOMATODONTUS (Card.) Williams

Vicinity of Bahia, Brazil, May 25 (19620), mixed with *Tortula agraria* Sw. Same locality, June 15 (19892).

## TORTULA AGRARIA Sw.

Vicinity of Bahia, Brazil, May 25 (19620a).

*Tortula perrufula* (C. M.) Williams, comb. nov.

*Barbula perrufula* C. M. Hedwigia 36: 103. 1897. This seems to belong rather to *Tortula*, inasmuch as there is no stereid band on the upper side of the costa. It has leaf margins of a double thickness of cells, 32 twisted teeth from a rather high basal membrane, and an annulus of 2 or 3 rows of cells.

## GLYPHOMITRIUM BALANSAE (Besch.) Broth.

Near Cassaffouth, Córdoba, Argentina, Sept. 9 (21064). Here must be referred *G. brevifolium* C. M., which apparently is not distinct in any way from *G. Balansae*.

## ZYGODON SUBDENTICULATUS Hampe

Vicinity of Itatiaya, Brazil, July 26-30 (20512). Not previously credited to Brazil.

## MACROMITRIUM FRAGILE Mitt.

On orchids in market, Bahia, Brazil, May 26 (19643).



MACROMITRIUM MUCRONIFOLIUM (Hook. & Grev.) Schwaegr.

Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22-24 (20380).  
Near Santos, Brazil, Sept. 20 (21115).

SCHLOTHEIMIA NITIDA Schwaegr.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20632).

SCHLOTHEIMIA RUGIFOLIA (Hook.) Brid.

Vicinity of Toca de Onca, Bahia, Brazil, June 27-29 (20122a). North  
of Caldeirao, State of Bahia, Brazil, June 30 (20134).

TETRAPLODON ITATIAIAE C. M.

Vicinity of Itatiaya, Brazil, July 26-30 (20475).

FUNARIA APIAHYENSIS (C. M.) Broth.

Vicinity of Itatiaya, Brazil, July 26-30 (20558, mixed with *Psilopilum*  
*Ulei*).

FUNARIA CALVESCENS Schwaegr.

Vicinity of Itatiaya, Brazil, July 26-30 (20451, 20466, 20467, 20468,  
20595).

FUNARIA HYGROMETRICA (L.) Sibth.

Vicinity of Buenos Aires, Argentina, Aug. 28 (20960).

FUNARIA SERRICOLA (C. M.) Broth.

Vicinity of Itatiaya, Brazil, July 26-30 (20465). Tijuca, vicinity of Rio de  
Janeiro, Brazil, Aug. 1 (20626).

MIELICHHOFERIA MANCA (C. M.) Broth.

Vicinity of Itatiaya, Brazil, July 26-30 (20539, 20546).

BRYUM ARGENTEUM L.

Aramary, State of Bahia, Brazil, May 31 (19708). Sao Miguel, State  
of Bahia, Brazil, June 26 (20054). Vicinity of Toca de Onca, Bahia, Brazil,  
June 27-29 (20121). Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil,  
July 22-24 (20355). Vicinity of Itatiaya, Brazil, July 26-30 (20547, mixed  
with a sterile *Campylopus*).

BRYUM CRUGERI Hampe; C. M.

Vicinity of Toca de Onca, Bahia, Brazil, June 27-29 (20119). Near  
Santos, Brazil, Sept. 20 (21112). Apparently not before reported for Brazil.

BRYUM DENSIFOLIUM Brid.

Near Santos, Brazil, Sept. 20 (21113). Vicinity of Toca de Onca, Bahia,  
Brazil, June 27-29 (20120). Alta Boa Vista, vicinity of Rio de Janeiro,  
Brazil, July 18 (20306).



## BRYUM GARDNERI Mitt.

Near Santos, Brazil, Sept. 20 (21114).

## RHODOBRYUM GRANDIFOLIUM (Tayl.) Par.

Vicinity of Itatiaya, Brazil, July 26-30 (20575).

## MNIUM LIGULATUM C. M.

Vicinity of Itatiaya, Brazil, July 26-30 (20577). Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20776, 20806).

## RHIZOGONIUM SPINIFORME (L.) Bruch

On Papagaya, Rio de Janeiro, Brazil, Aug. 1 (20647). Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20810, 20822).

## PHILONOTIS CURVATA (Hampe) Jaeg.

Nazareth, vicinity of Bahia, Brazil, June 30 (20139).

## PHILONOTIS UNCINATA (Schwaegr.) Brid.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20637).

## OLIGOTRICHUM RIEDELIANUM (Mont.) Mitt.

Vicinity of Itatiaya, Brazil, July 26-30 (20449, 20556a).

## PSILOPILUM ULEI Broth.

Vicinity of Itatiaya, Brazil, July 26-30 (20465a, 20555, 20558a).

## POLYTRICHADELPHUS UMBROSUS Mitt.

On Corcovado, Rio de Janeiro, Brazil, July 11, marked "f."

## POGONATUM ABBREVIATUM Mitt.

Monte Serrat, vicinity of Itatiaya, Brazil, July 26-30 (20447).

## POGONATUM GARDNERI (C. M.) Mitt.

Vicinity of Itatiaya, Brazil, July 26-30 (20556).

## POLYTRICHUM ANGUSTIFOLIUM Mitt.

Vicinity of Rio de Janeiro, Brazil, July 26-30 (20436).

## POLYTRICHUM ANTILLARUM Rich.

Vicinity of Rio de Janeiro, Brazil, July 26-30 (20436a). Vicinity of Itatiaya, Brazil, July 26-30 (20448, 20452, 20530, and "k"). Petropolis, Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20827).

## ERPODIUM CORONATUM (Hook. f. &amp; Wils.) Mitt.

Vicinity of Machado Portello, Bahia, Brazil, June 19-23 (19996).

## ERPODIUM GLAZIOVII Hampe

On Corcovado, Rio de Janeiro, Brazil, Aug. 17 (20875).



*RHACOCARPUS HUMBOLDTII* (Hook.) Lindb.

Vicinity of Itatiaya, Brazil, July 26-30 (20508a, 20521).

*ORTHOSTICHOPSIS TENUIS* (C. M.) Broth.

On Corcovado, Rio de Janeiro, Brazil, July 11, marked "j."

*SQUAMIDIUM NITIDUM* (Sull.) Broth.

North of Caldeirao, State of Bahia, Brazil, June 30 (20133a).

*LINDIGIA CAPILLACEA* (Hornsch.) Hampe

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20781b). No. 70 of E. Ule's Brazilian mosses, issued as *L. paupera* C. M., apparently an unpublished name, evidently belongs here.

*LINDIGIA TRICHOMITRIA* C. M.

Collected with the last preceding (20781a).

• *PHYLLOGONIUM IMMERSUM* Mitt.

On Papagaya, Rio de Janeiro, Brazil, Aug. 5 (20648).

*NECKERA ARGENTINICA* Lor.

Tucumán, vicinity of Buenos Aires, Argentina, Aug. 29 (without number).

*POROTRICHUM KORTHALSIANUM* (Dz. & Mb.) Mitt.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20821). Previously collected only in Venezuela and Surinam.

*POROTHAMNIUM STRIATUM* (Mitt.) Fleisch.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20772).

*STEREOPHYLLUM LEUCOSTEGUM* (Brid.) Mitt.

Rio Branco, State of Bahia, Brazil, June 12 (19877).

*FABRONIA LORENTZII* C. M.

Vicinity of Córdoba, Argentina, Sept. 8 (21039).

*FABRONIA POLYCARPA* Hook.

Bahia, Brazil, May 28 (19660). Vicinity of Bom Finn, Bahia, Brazil, June 8, 9 (19829, 19831). On Corcovado, Rio de Janeiro, Brazil, Aug. 17 (20875, 20876).

*HELICODONTIUM TENUIROSTRE* Schwaegr.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20631).

*HOOKERIOPSIS BEYRICHIANA* (Hampe) Broth.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20808a).

*HOOKERIOPSIS GLAZIOVII* (Hampe) Jaeg.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20633).



## LEPIDOPILUM SUBULATUM Mitt.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20781).

## HYPOPTERYGIUM MONOICUM Hampe

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20775).

## HELICOPHYLLUM TORQUATUM (Hook.) Brid.

Itumirim, State of Bahia, Brazil, June 5 (19815).

## HAPLOCLADIUM RIOGRANDENSE C. M.

Jardim Botânico, Rio de Janeiro, Brazil, Aug. 10 (20745).

## THUIDIUM DELICATULUM (L.) Mitt.

Vicinity of Itatiaya, Brazil, July 26–30 (20472a, 20557). *T. brasiliense* Mitt. is near this species, but has larger leaf cells and larger, higher papillae.

## THUIDIUM PSEUDORECOGNITUM (Hampe) Broth.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 20 (20772a). This species appears to come nearest to *T. Antillarum*, from which it is distinguished by the cells of the branch leaves having several papillae to each cell-surface instead of only one. The inner perichaetial leaves are long-ciliate. Small, often scarcely elongate cells extend almost to the leaf-base in both stem and branch leaves, and in the branch leaves the costa is very prominent and rough on the back.

## AMBLYSTEGIUM VARIUM (Hedw.) Lindb.

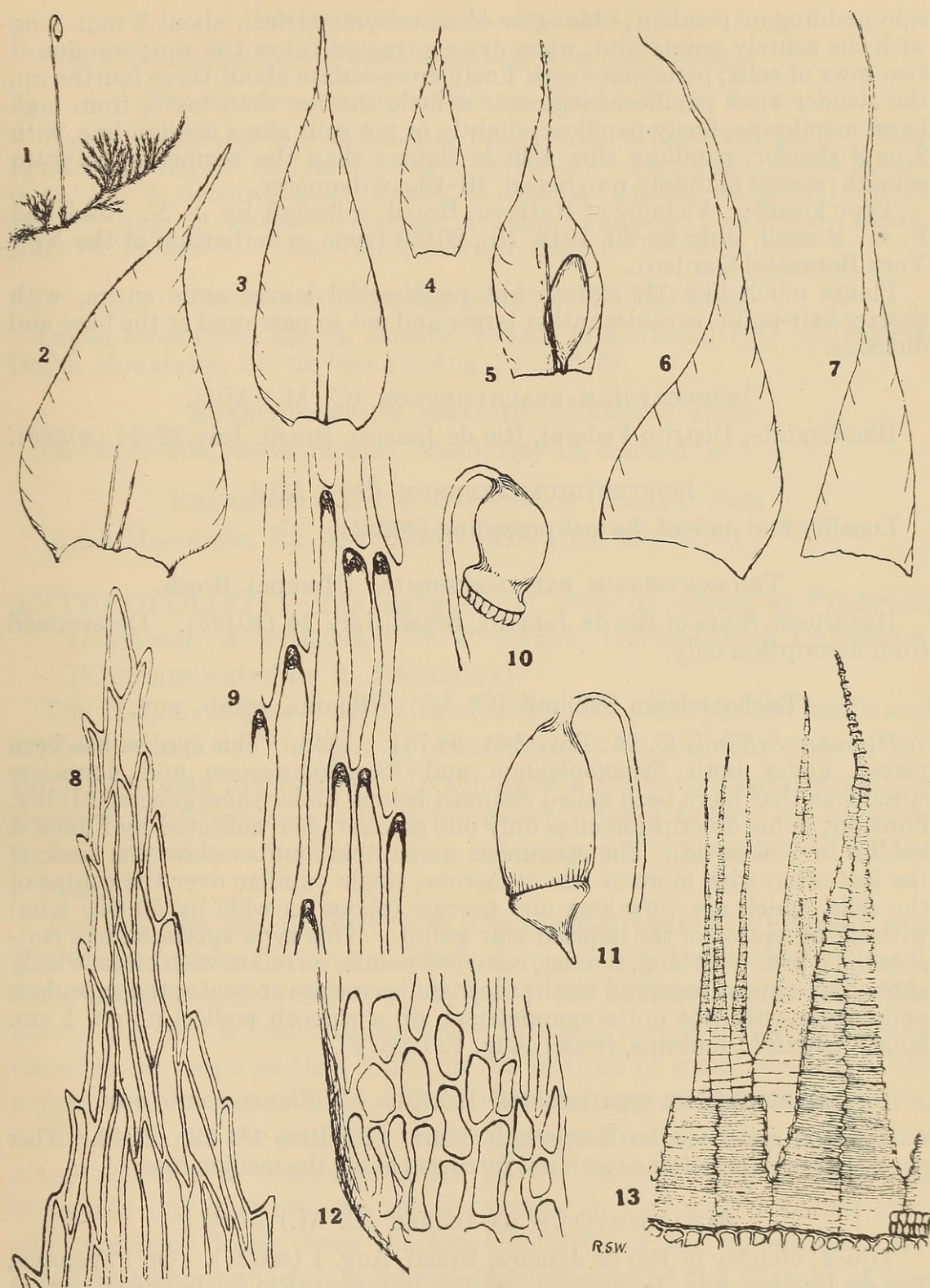
La Plata, Argentina, Sept. 14 (21106). E. Ule's no. 73, *A. pulchellum* C. M., apparently an unpublished name, seems to belong here.

**Microthamnium Russellii** R. S. Williams, sp. nov.

Figs. 1–13

Dioicous, ♂ flowers, about midway on the branches, rather narrowly ovate-acute, a little over 1 mm. high, the inner perigonal leaves with ovate base rather gradually narrowed to a lanceolate, serrulate point, enclosing 5–6 antheridia about .33 mm. long and a few slender paraphyses; plants growing in pale yellowish-brown mats with more or less trailing and branching stems mostly 3 or 4 cm. long, bearing scattered clusters of radicles and rather short, mostly .5–1 cm. long, often divided branches hardly complanate and tapering to apex; leaves not complanate, those of the upper stem shortly bicostate, about 1.5 mm. long, from a broadly ovate base gradually tapering to a very acute point, the borders more or less recurved and serrulate to near base; leaves of lower stem mostly shorter and broader than above and ecostate and entire; branch-leaves narrower and smaller than upper stem leaves, serrulate and bicostate except the much smaller apical leaves, these ecostate; cells of the branch-leaves mostly distinctly papillose on back at upper end, the median about 5μ wide by 35–50μ long, the alar cells sometimes forming a rather distinct group of wider, shorter cells; seta 2–2.5 cm. long; inner perichaetial leaves longer than stem-leaves, ecostate, from an ovate or lanceolate base gradually narrowed to a very slender, entire or nearly entire point; cap-





*Microthamnium Russellii*: 1. Plant about natural size. 2. Middle stem-leaf  $\times 35$ . 3. Middle branch-leaf  $\times 35$ . 4. Terminal branch-leaf  $\times 35$ . 5. Perigonial leaf, antheridium and paraphyses  $\times 35$ . 6 and 7. Inner perichaetial leaves  $\times 35$ . 8. Apex of branch leaf  $\times 210$ . 9. Median cells of leaf  $\times 210$ . 10. Dried deoperculate capsule  $\times 14$ . 11. Moistened capsule  $\times 14$ . 12. Group of alar cells from upper stem leaf  $\times 210$ . 13. Part of peristome and annulus  $\times 150$ .



sule nodding or pendant, oblong or often unsymmetrical, about 2 mm. long with the acutely pointed lid, when dry contracted below the rim; annulus of two rows of cells; peristome-teeth finely cross-striate about three fourths up, the slender apex papillose; segments a little shorter than teeth, from high basal membrane, finely papillose, slightly or not split along median line, with 2 or 3 slender, papillose cilia a little shorter than the segments; calyptra smooth; spores minutely roughened, 10–12 $\mu$  in diameter.

Type locality: Vicinity of Itatiaya, Brazil, collected by J. N. Rose and P. G. Russell, July 26–30, 1915, No. 20469 (type in herbarium of the New York Botanical Garden).

Plants much like *M. reptans* but perichaetial leaves more entire, with shorter hair-point, capsules rather larger and not so narrowed at the base and dioicous.

*ISOPTERYGIUM BRACHYNEURON* (C. M.) Mitt.

Ilha Grande, Distrito Federal, Rio de Janeiro, Brazil, July 22–24 (20382).

*ISOPTERYGIUM TENERUM* (Sw.) Mitt.

Locality and date of the last preceding (20384).

*TRICHOSTELEUM PAPILLOSISSIMUM* (Hampe) Broth.

Itacurussa, State of Rio de Janeiro, Brazil, July 24 (20425). Determined from description only.

*Trichosteleum Schlimii* (C. M.) Williams, comb. nov.

*Hypnum Schlimii* C. M. Bot. Zeit. 6: 781. 1848. This species has been placed under both *Sematophyllum* and *Rhaphidostegium* and doubtless specimens that have been called *Schlimii* belong under those genera; Müller, however, in his description cites only one number, 356, collected by Funck & Schlim in Venezuela. The specimens under this number show the back of the leaf often with more or less numerous, single papillae over the center of the cells, which are very long and narrow (about 4 $\mu$  wide by 50–60 $\mu$  long) with the exception of the inflated alar group. This type specimen has perichaetial leaves with long, slender, recurved points, serrulate with often widely spreading, almost recurved teeth; the stem leaves are ecostate; the capsule is nodding, mostly not quite symmetrical, on a smooth pedicel about 1 cm. long. Organ Mountains, Brazil, Aug. 12 (20812).

*Sematophyllum cyparissoides* (Hornsch.) Williams, comb. nov.

*Hypnum cyparissoides* Hornsch. in Mart. Fl. Bras 1<sup>2</sup>: 88. 1840. This species has the peristome teeth not furrowed along the median line.

*SEMATOPHYLLUM GALIPENSE* (C. M.) Mitt.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20625). On Papagaya, Rio de Janeiro, Aug. 1 (20650). Jardim Botânico, Rio de Janeiro, Aug. 11 (20836). On Corcovado, Rio de Janeiro, Aug. 19, marked "c." Garden of Museo Paulista, São Paulo, Brazil, Aug. 14, 15 (20842). Near Santos, Brazil, Sept. 20 (21110).



## SEMATOPHYLLUM MAILUSIAE C. M.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20780).

## SEMATOPHYLLUM SUBPINNATUM (Brid.) E. G. Britt.

Tijuca, vicinity of Rio de Janeiro, Brazil, Aug. 1 (20630 in part). Near Iguaba Grande, Rio de Janeiro, Aug. 7-9 (20749). Petropolis, Organ Mountains, Rio de Janeiro, Aug. 12 (20826, 20831). Jardim Botânico, Rio de Janeiro, Aug. 11 (20835). Garden of Museo Paulista, Sao Paulo, Brazil, Aug. 14, 15 (20869). Near Santos, Brazil, Sept. 20 (20899).

## RHYNCHOSTEGIUM BESKEANUM (C. M.) Jaeg.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20777). Petropolis, Organ Mountains, Rio de Janeiro, Aug. 12 (20828).

## RHYNCHOSTEGIUM SELLOWII (Hornsch.) Jaeg.

On Corcovado, Rio de Janeiro, Brazil, July 14, marked "d."

## RHYNCHOSTEGIUM SUBROTUNDUM (Hampe) Jaeg.

Organ Mountains, Rio de Janeiro, Brazil, Aug. 12 (20778).

ANTHROPOLOGY.—*The antiquity of man as shown at Frederick, Oklahoma: A criticism.*<sup>1</sup> O. F. EVANS, University of Oklahoma. (Communicated by A. HRDLÍČKA)

The Holloman gravel pit at Frederick, Okla., has yielded fossils and artifacts which are thought by some persons to indicate a great antiquity for man in America. In the light of my rather extensive experience in that region, I wish to point out what I believe to be some serious mistakes which have been made in the interpretation of the evidence.

The deposits rest on Red Beds which are probably of Permian age. The lower four or five feet consists of consolidated cross-bedded sand, clean pebbles, and boulders up to five or six inches in diameter. The coarse material is found in the lower part and except for being consolidated is the same as that found in the bottom of most streams in the region at the present time. These streams have the coarser material at the bottom of the sand and boulder beds, not only because the streams come nearer and nearer to grade as the material in the bottom is deposited but also because rapid changes in velocity, resulting from the numerous floods, keep the loose material of the stream beds agitated and hence the larger materials work toward the bottom as in a miner's pan.

<sup>1</sup> Received September 25, 1930.





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