MUELLERIA

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MUELLERIA

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STANDARD ABBREVIATIONS FOR HERBARIA.

MEL	National Herbarium of Victoria, Melbourne.
NSW	National Herbarium of New South Wales, Sydney.
BRI	Queensland Herbarium [Botanic Museum and Herbarium], Brisbane.
PERTH	State Herbarium of Western Australia. Perth.
AD	Tate Herbarium, University of Adelaide [S. Aust.].
HO	Herbarium of Tasmanian Museum, Hobart [at Botany Dept., University].
CANB	Herbarium. Division of Plant Industry, C.S.&I.R.O., Canberra.
K	Herbarium, Royal Botanic Gardens, Kew, England.
BM	British Museum of Natural History [Dept. Botany], London.

FOREWORD

The Maud Gibson Gardens Trust

Miss Maud Gibson, formerly of Melbourne, a lover of gardens, under a Deed of Settlement dated 1945, set up a Trust with assets valued at approximately £20,000. The income from this sum of money was to be applied to the maintenance, development, replacement and improvement of the flora of the Melbourne Botanic Gardens, and also for "the promotion of botanical research and the publication of papers of a scientific or educational nature dealing with botanical subjects". Her object was to commemorate her father, the late William Gibson, founder of the firm of Foy & Gibson Limited, Melbourne.

Melbourne is the fortunate possessor of a magnificent botanic garden, which is world famous. Included in its administration is the National Herbarium, housed in a fine building donated to the State by the late Sir MacPherson Robertson in 1934 The Trustees of the Gibson Gardens Trust have, for many years, realised the importance of this Herbarium. It is probably the largest and the most valuable south of the Equator, and it owes its importance largely to the pioneer work of Baron Sir Ferdinand von Mueller. The Trustees have also recognised that, on present-day standards abroad and in Australia, the National Herbarium in Victoria is under-staffed, and can only undertake essential research work on the innumerable problems presented by the flora of such a vast area as Australia when the day to day needs of identification are satisfied. A herbarium is much more than a mere collection of dried plants and an office where numerous school-teachers and amateur botanists can get plants identified. It is primarily a research institution, as is fully recognised in such centres as Kew and the Arnold Arboretum. Pending greater support from the public and the Government along these lines, the Gibson Trust has assisted the Herbarium in several ways — with equipment and by providing salaries of part-time additional staff to enable the full-time staff to spend more time on the preparation of a new hand-book to the flora of this State. In the year 1951 the Trust brought out from Kew, Dr. Melville, who is in charge of the Australian plant collection there. He visited every State and State Herbarium in Australia, collected widely, both for the Melbourne and Kew Herbaria, and did much to stimulate research into our rich native flora.

The Trust now takes another step in this direction, by financing a new Herbarium journal *"Muelleria"*. The proposal for the establishment of this journal came from the Director of the Gardens and State Botanist, Mr. A. W. Jessep. A great deal of modern research in agriculture, horticulture and forestry by State departments, the C.S.I.R.O. and universities rests on the sure foundation of the systematic description and naming of the plants investigated. Although the scientific journals of the world welcome full-scale articles on these subjects, facilities for the publication of shorter records and descriptions of more local interest are lacking.

The Trustees are convinced that the initiation of this new journal will encourage research in a most important field of science.

J. S. Turner,
Professor of Botany
(University of Melbourne),
Chairman of the Committee advising the
Trustees of the Maud Gibson Gardens Trust.

ALEXANDER WILLIAM JESSEP, M.Agr.Sc., B.Sc., Dip.Ed.

(Director and Government Botanist at Melbourne Botanic Gardens and National Herbarium since 1941)

DIRECTOR'S PREFACE

The National Herbarium of Victoria is the oldest, largest and the most important repository of dried plant material in Australasia, containing, as it does, approximately one and a half million numbers of botanical specimens. By common consent, the adjacent Melbourne Botanic Gardens is also without equal among the scientific and scenic plantations in the Commonwealth and New Zealand. Types of all the 2,000 species described by Baron Sir Ferdinand von Mueller during his 44 years as Colonial Botanist are housed therein; many duplicate types of Robert Brown's, F. Sieber's, A. Cunningham's, T. Mitchell's and other important historical collectors enhance the value of the herbarium, which is rich, too, in cryptogamic collections — mosses, hepatics, algæ, lichens and fungi.

Yet, in the 98 years of its existence, the institution has never had a journal of its own (if Mueller's 12 volumes in Latin of the *Fragmenta Phytographiæ, Australiæ,* 1858-1882, be excepted), and much special work done upon this vast accumulation of world material has never been printed for the benefit of other workers at home and abroad. Members of the staff have been obliged to publish their researches through the various Royal Societies in Australia or, more often, in the acceptable but restrictive space of the *Victorian Naturalist.*

In view of its growing importance to agriculturists, foresters, nurserymen, school teachers, ecologists and the community at large—up to 15,000 specimens are identified for the public every year—the Melbourne Botanic Gardens and National Herbarium now regards some official organ as a *sine qua non.* Without any medium of literary exchange, it becomes increasingly difficult to build up the library—rich in older monographs and botanical periodicals, but deficient in many modern and highly desirable publications.

MUELLERIA

On 26th January ("Australia Day") 1953, it was exactly a century since the appointment of Victoria's first Government Botanist, the then Doctor F. J. H. Mueller, who added such lustre and world renown to his office. As this auspicious occasion passed, it was felt that no more worthy memorial to such a distinguished man of science could be conceived than a journal, bearing his name and emanating from the very institution he had founded. Very generously, the trustees of the Maud M. Gibson Botanic Gardens Trust have agreed to defray the initial expenses and cost of the first number of such a Herbarium journal. So, with due acknowledgment of the Trust's munificent gesture, it is a great pleasure to present the first number of this commemorative periodical, and to express the hope that its pages will ever do honour to Baron von Mueller's name.

Intended primarily as a vehicle for the publication of botanical monongraphs, descriptions of new species, horticultural papers, systematic and historical notes by officers of the Melbourne Herbarium, it will yet be wide enough in scope to embrace items of interest by members of other herbaria and by amateur botanists both within and outside Victoria.

Muelleria will be issued from time to time, as occasion demands; it will not observe any fixed periodicity. Intending contributors may obtain reprints *gratis*, and are requested to adhere carefully to the adopted format, arranging their typescripts (with double spacing) in accordance; papers typed on both sides of a sheet are not acceptable.

For the present, Mr. J. H. Willis has consented to act as editor.

National Herbarium,
The Domain,
SOUTH YARRA, S.E.1., VIC.,
1955.

A. W. JESSEP,
Director and Government Botanist.

NEW SPECIES AND VARIETIES OF STYLIDIUM FROM WESTERN AUSTRALIA

by

RICA ERICKSON* and J. H. WILLIS†.

Since C. A. Gardner described two large West Australian *Stylidium* species in 1942 (*J. Roy. Soc. W. Aust.* 27:198), no additions to this genus appear to have been published; but it is evident that a considerable number of the smaller representatives remain unknown and still await definition. The following descriptions of nine new species and two new varieties are a step toward the complete revision of *Stylidium* in Australia, which one of us (R.E.) contemplates publishing as a separate monograph, and we have followed the arrangement of J. Mildbraed in *Stylidiaceæ* [*Das Pflanzenreich IV, 278*, Heft. *35* (1908)]. Seven of the new species are in the Section *Despectæ*, constituting a remarkable enlargement of this small group; one is in the Section *Saxifragoideæ*, while the ninth additional species belongs to the *Repentes* Section—although closely resembling *S. repens* in habit of growth and foliage, it has flowers that differ markedly in their column structure. The new varieties of *S. repens* and *S. adpressum* are local forms of rather variable plants. Except for *S. zeicolor* and *S. repens*, the only collections at present known of all these novelties are those made by one of us (R.E.) since 1951, and the type material has been shared between the National Herbarium of Victoria (at South Yarra), State Herbarium of Western Australia (at Perth), and Herbarium of the Royal Botanic Gardens at Kew (England)—the abbreviations used for these institutions are MEL, PERTH and K respectively.

We are indebted to Mr. Tarlton Rayment of Sandringham, Vic., for the identities of all insects captured from flowers of sundry *Stylidia*.

1. S. BOLGARTENSE Erickson & Willis, *species nova*. [Tab. I, 1-7].

Annua circiter 8 cm. alta; folia radicalia rosulataque, pauca, spathulata, circ. 7 mm. longa; flores 1—3, pedicellati, comparate magni (corolla usque ad 15 mm. lata, dilutissime carnea); faucis appendiculæ variabiles, sed semper 2 magnæ dentiformes adsunt; labellum anguste lanceolatum, circ. 2 mm. longum.

Species *S. petiolari* Sond. in Lehm. (Sectionis *Despectæ*, basi bulbosa et petalis inæqualiter biseriatis) proxima, sed ab hac et aliis speciebus cognatis differt; petalis 2 erectis parvissimis, petalis 2 inferioribus magnis latissime dilatatis atque corollæ tubo longiore.

Small glabrous plant, about 8 cm. tall (or more), with a bulb-like stock. *Leaves* basally rosetted, few, dark-green, glabrous and rather fleshy, almost orbicular, with long slender petioles. *Scape* dark-coloured, flowers 1–3 on pedicels two or three times longer than the calyces; floral bracts green, fleshy and blunt, bracteoles smaller, often paired. *Calyx* green, twisted, turbinate, glabrous, about 8 mm. in length including lobes; lobes

* "Fairlea," Bolgart, Western Australia. † National Herbarium, South Yarra, Victoria.

free, blunt, a little shorter than the calyx tube. *Corolla* whitish; tube longer than calyx lobes; petals very unequal, the upright pair almost minute, oblong, sometimes with a tooth on the outer edge, the extended petals about four times as long, broadly rounded at the extremities and narrow at the base; throat appendages variable, usually 2, prominent and dentiform, located at the bases of the larger petals and appearing half as large as the smaller petals, sometimes with two similar additional appendages; labellum about 2 mm., narrow and pointed, without appendages. *Column* short, dark and strong, somewhat taller than the small upright petals; stigma developing into a rolled hairy lip.

Pollination by the fly *Comptosia carculum* Newm. (Family *Bombyliidæ*, Subfamily *Lomatiinæ*).

Epithet in allusion to the locality of collection.

Vernacular name: "Pinafore Trigger-plant".

Habitat: In a pocket of sodden, washed soil, near the bottom of a small gully, in open Wandoo (*Eucalyptus wandoo* Blakely) forest, in compact colonies.

Representative locality: WESTERN AUSTRALIA — Bolgart, in Colin Haynes's "poison paddock" (HOLOTYPE and PARATYPES in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 11 Sept. 1951).

The new species is in the *S. petiolare* group of the *Despectæ* Section (bulbous stock and unequal petals) differing in its exceedingly small upright petals (pointed and almost as long as the extended petals in *S. petiolare*), very broadly dilated extended petals, and 2 prominent dentiform throat appendages (6 in *S. petiolare*).

2. S. ASTEROIDEUM Erickson & Willis, *species nova*. [Tab. I, 8–13].

Annua pusilla, gracilis, usque ad 8 cm. alta; folia rosulata, pauca, anguste linearia, circ. 6 mm. longa, "stellulas" formantia; flores 1 vel 2, pedicellati, comparate magni (corolla usque ad 10 mm. lata, pallide carnea); labellum anguste ovatum, 1.5–2 mm. longum, apice longo calycis lobos subaequante.

Species ex affinitate *S. petiolaris* Sond. in Lehm., sed differt: caulibus gracilioribus, foliis linearibus, calycis lobis obtusis, corollæ faucis appendiculis 2 gibbosis (6 in *S. petiolari*).

Small, slender, glabrous plant up to 8 cm. tall, with a bulb-like stock. *Leaves* basally rosetted, few, narrow-linear, about 6 mm. long. *Scape* dark-coloured, very fine, 1- or 2-flowered; pedicels much longer than calyces, with a few glandular hairs; floral bracts and paired proleaves blunt, minute, a bract lower on scape, scarcely larger. *Calyx* greenish, twisted, turbinate, glabrous, about 4 mm. in length including the lobes; lobes free, blunt, almost as long as the tube. *Corolla* pale pink, fading quickly to whitish, tube about as long as calyx lobes; petals unequal, upright pair small, narrow and curved but not pointed, the extended pair about twice as long and broad, dilated at the extremities; throat appendages 2, forming prominent humps at the bases of the larger petals; labellum narrowly oval, fleshy, with a long point. *Column* pale, short, about equal to the smaller petals.

Epithet in allusion to the star-like rosette of leaves.

Vernacular name: "Star Trigger-plant"

Habitat: Amongst sodden moss over rock, on a hillslope above the creek at Toodyay Road.

Representative locality: WESTERN AUSTRALIA — Clackline (HOLOTYPE in MEL—*Rica Erickson*, 14 Sept. 1952).

The new species is near to *S. petiolare* but is more slender and differs in the shape of leaves, throat appendages and calyx lobes. (In *S. petiolare* leaves are ovate, throat appendages 6 and dentiform, calyx lobes pointed).

3. S. RUBRICALYX Erickson & Willis, *species nova*. [Tab. I, 14-21].

Annua circiter 8 cm. alta; folia rosulata, pauca, oblanceolata, circ. 10 mm. longa; flores 1 vel 2, longe pedicellati, comparate magni (corolla circ. 10 mm. lata, albida, contra calycem rubram valde eminens); labellum anguste lanceolatum, circ. 2 mm. longum.

Species *S. petiolari* Sond. in Lehm. proxima, sed differt: bracteis verticillatis infra inflorescentiam, calycis lobis obtusis, et præcipue corollæ faucis appendiculis quarum 2 minutæ quum 2 prominente gibbosæ bifidæque sunt (cf. 6 appendiculæ æquales in *S. petiolari*). *S. emarginatum* Sond. in Lehm. etiam bracteas verticillatas habet, sed corolla albido-flavescenti rubro-striata et faucis appendiculis 6 æqualibus distinguitur.

Small glabrous plant about 8 cm. tall, with a bulb-like stock. *Leaves* basally rosetted, few, oblanceolate, green, glabrous, somewhat fleshy, about 10 mm. in length. *Scape* 1- or 2-flowered, dark reddish, glabrous, with a few red, blunt, verticillate bracts below the flower or inflorescence; pedicels longer than the calyces, sparsely glandular-hairy at the bases, with or without bracteoles. *Calyx* bright reddish, twisted, turbinate, the blunt lobes almost equal in length to the tube, connate to above half their length, bilabiate. *Corolla* whitish; tube longer than calyx lobes; petals very unequal, the upright pair about half the length and very narrow, the extended pair widening at the extremities; throat appendages consisting of 2 prominent bifid humps (appearing as 4) at the bases of the larger petals, and 2 minute teeth at the bases of the smaller petals; labellum narrowly lanceolate, about 2 mm. long. *Column* dark, strong, somewhat longer than the smaller petals, stigma developing into a rolled hairy lip.

Pollination by a small native bee (unidentified), also visited by a fly of the genus *Lomatia* (Subfamily *Lomatiinæ*).

Epithet in allusion to the red calyx.

Vernacular name: "Apron Trigger-plant".

Habitat: On a reedy creek flat in association with *S. rhipidium*.

Representative locality: WESTERN AUSTRALIA — Approximately half mile south of 120 mile post, Albany Highway, south of Williams (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 30 October 1952).

This species is in the *S. petiolare* group, near *S. bolgartense*, but differs in the partly connate lobes of the calyx, the presence of verticillate bracts below the inflorescence, and in the throat appendages (6 equal in *S. petiolare*, 2 in *S. bolgartense*). *S. emarginatum*, the only other bulb-like species with verticillate bracts, has 6 equal throat appendages and flowers yellow with red stripes on the outside, also the petals are more equal in length, with lobes and notches in the apical half.

4. S. PERISCELIANTHUM Erickson & Willis, *species nova*. [Tab. II, 1-8].

Annua gracilis, 6–15 cm. alta; folia rosulata, circiter 8, spathulata, circ. 10 mm. longa; flores racemosi, circ. 10, pedicellis brevibus, parvi (corolla circ. 5 mm. lata, rosea); calyces lineares, faucis appendiculæ 6, ad apices sanguineæ; labellum minutum, oblongum, valde apiculatum.

Species valde affinis *S. pulchello* Sond. in Lehm. (quod, ob flores plures parvos corymbosos, in sectione *Despectæ* unicum fuerat), sed differt: calyce longiore angustioreque, petalis coloratis parvioribus subæqualibus, et faucis appendiculis 6 (*cf.* 2 in *S. pulchello*).

Small slender plant 6–15 cm. tall, with a bulb-like stock. *Leaves* basally rosetted, about 8, glabrous, spathulate, on long petioles, about 10 mm. long. *Scape* racemose, bearing 10 or more flowers, slender, dark-reddish, usually with one or two small blunt bracts below the slightly glandular inflorescence, pedicels shorter than the calyces, glandular, floral bracts pointed and narrow, smooth, reaching as far as the minute, pointed, paired bracteoles near the bases of the calyces. *Calyx* greenish-red, linear, glabrous except at the base; lobes free, pointed, much shorter than the tube, the margins minutely serrate. *Corolla* small, about 5 mm. wide, bright pink with white throat, tube about equal to the calyx lobes; petals very unequal, the small upright pair narrow, a little curved, rather blunt, about half as long as the broad extended petals; throat appendages 6, toothed, with crimson tips; labellum minute, fleshy, almost oblong, with a long point. *Column* dark and strong, about as long as the small petals.

Pollination by the fly *Comptosia cuneata* Ed. (Family *Bombyliidæ*, Subfamily *Lomatiinæ*).

Epithet in allusion to the resemblance of the corolla to a figure in long baggy "pants".

Vernacular name: "Pantaloon Trigger-plant".

Habitat: Along wet flats by creeks or swamps, in compact colonies.

Representative localities: WESTERN AUSTRALIA—Cranbrook (Oct.); Youngs Siding (Oct.); Bolgart (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, Sept. 1952).

A very constant species over a wide area. The bulb-like stock and the form of the corolla apparently places it in the *S. petiolare* group; but the new species differs markedly in its spike-like raceme and long narrow calyx, marking its closer affinity to *S. pulchellum* which has paniculate scape and linear-oblong calyx. This latter species, however, has small white flowers on long pedicels, petals almost equal, and 2 throat appendages.

5. S. RHIPIDIUM Erickson & Willis, *species nova.* [Tab. II, 9-16].

Annua pusilla, gracilis, circiter 5 cm. alta; folia rosulata, pauca, minuta, suboblonga; flores 1 vel 2, pedicellati, comparate magni (corolla circ. 7 mm. lata, alba, flabellata); faucis appendiculæ 6, valde capitatæ; labellum minutum, ovatum, carnosum.

Species prope *S. utricularioidem* Benth. (Sect. *Despectæ*) quod præcipue petalis roseis subæqaulibus et faucis appendiculis 4 linearibus, *haud* capitatis, recedit.

Small, slender, slightly glandular-hairy annual about 5 cm. tall. *Leaves* few, basally rosetted, about 2–4 mm. long, smooth, reddish, almost oblong, the blade slightly thickened. *Scape* 1- or 2-flowered, dark-coloured, very slender, sparsely glandular-hairy throughout; bracts 2 or more, lanceolate, glabrous, green, one of them halfway along the scape. *Calyx* greenish-red, oblong and twisted, slightly glandular, lobes shorter than the tube, two of them connate almost to the apex, total length under 5 mm. *Corolla* white, fan-shaped, the larger petals 5–6 mm. long, narrow at the base and gradually widening, the lesser petals rounded, about 2 mm. long and flanking the larger; throat appendages 6, plainly capitate; labellum minute, ovate, fleshy, shortly pointed, without appendages. *Column* pale, short and slender, with black anthers.

Epithet in allusion to the form of the corolla.

Vernacular name: "Fan Trigger-plant".

Habitat: On a reedy creek flat in association with *S. rubicalyx.*

Representative locality: WESTERN AUSTRALIA — Approximately half mile south of 120 mile post, Albany Highway, south of Williams (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson* 30 October 1952).

The new species differs from the *S. petiolare* group of *Despectæ* in the absence of a bulbous root-stock, and is distinct from the *S. despectum* group in its fan-shaped corolla and 6 *capitate* throat appendages.

6. S. EXOGLOSSUM Erickson & Willis, *species nova.* [Tab. II, 17-23].

Annua gracilis, 3–15 cm alta, simplex aut ramulis paucis; folia rosulata, pauca, minuta, ovato-lanceolata, ante anthesin marcescentia; flores 1–16, subsessiles, in cymis laxe dispositi (nisi solitarii); corolla circiter 7 mm. lata, carnea aut alba, ad faucem rubri-maculata; faucis appendiculæ 2, parvissimæ, rubræ (appendiculæ duæ aliæ minutæ interdum adsunt); labellum in tubo corollæ extrinsecus affixum, conspicuum, circ. 1.5 mm. longum, obtusum, ad basin carnosum, ad apicem roseo-petaloideum.

Species prope *S. despectum,* sed ab hac et aliis speciebus in Sectione *Despectæ* ob positum exteriorem labelli certe differt. (Hic character, quanquam in speciebus meridionalibus unicus est, etiam in formis paucis e regionibus calidis adest.).

Small glabrous annual from 3–15 cm. tall, green and reddish-coloured, either simple-stemmed or branching a little, roots small and few. *Leaves* basally rosetted, few, withering early in the flowering stage, glabrous, ovate to bluntly lanceolate, 2–5 mm. long; stem bracts about 3, scattered, small and blunt, upper bracts larger (2 mm.), more pointed at the junction of the branches to the main stem, floral bracts 1 mm.

long, blunt, opposite the flowers. *Scape* cymose, or simple, or single-flowered, the branches springing from both sides of the terminal flower and bearing up to 16 blooms, which are loosely spaced, alternating, and almost sessile. *Calyx* narrowly oblong or broadly linear, with very few glandular-hairs; lobes free and narrow, a little shorter than the tube, total length about 5 mm. *Corolla* about 7 mm. wide, pink or whitish, with red spots at the throat; petals almost oblong, paired sideways, the larger petal in each pair about 3.5 mm., the smaller petal less than 3 mm.; throat appendages usually 2 at bases of large petals, red, very small, toothed, sometimes also with 2 minute appendages at the bases of the smaller petals; labellum oblong, about 1 mm. or more, inserted on the outside wall of the corolla tube, fleshy at the base but petal-like and pink at the apex, blunt and fairly conspicuous. *Column* short. *Capsule* linear, 7 mm. long, valves recurved. *Seeds* minute, numerous.

Epithet in allusion to the position of the labellum.

Vernacular name: "Tongue Trigger-plant".

Habitat: In a drying black swamp with Pitcher-plants, also in sandy seepage on low heath (by the side of Marine Drive, Albany).

Representative localities: WESTERN AUSTRALIA — Swamps about 2 miles west of Albany aerodrome (HOLOTYPE and PARATYPES in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 13 January 1953; Albany, by Marine Drive (*Rica Erickson*, December 1952).

The new species in its inflorescence resembles some tropical species, especially in the fruiting stage, but is even more remarkable for the labellum being placed on the outside wall of the corolla tube—a feature of several tropical forms, but unique among temperate species. In other details it is close to *S. despectum*.

7. S. XANTHOPIS Erickson & Willis, *species nova*. [Tab. III, 12-20].

Annua gracilis, 4–10 cm. alta, sæpe paulum ramosa, per totum parce glandulo-pilosa, (præter foliorum glabrorum); caudex parvus, brevis, albus et carnosus; folia 3–5 mm. longa, rosulata, congesta, crassa, ± linearia, obtusa; flores usque ad 10, irregulariter laxe corymbosi; calyx linearis, circiter 8 mm. longus, lobis obtusis quam tubus multo brevioribus; corolla expansa circ. 1 cm. lata, vivide rosea sed fauce conspicua flava; petala subrotunda, unguibus latis brevibus, 3–4 mm. longa, eorum 2 notis sanguineis et 2 vittis albis prope bases; faucis appendiculæ 6 minutæ, breves, obtusæ verruciformes; labellum perminutum, longe-deltoideum, non-appendiculatum.

Ab omnibus aliis speciebus Sectionis *Despectæ* hæc differt colore insigni corollæ atque petalis comparate magnis latisque; simulat *Levenhookiam leptantham* quacum concrescit.

Small plant, often branching, green and red, 4–10 cm. tall, sparingly glandular-hairy throughout (except for the glabrous leaves), with a small, fleshy, white (but not bulb-like) stock. *Leaves* rather densely crowded in a basal rosette, glabrous, fleshy, ± linear and blunt, 3—5 mm. in length. *Scape* firm, usually with comparatively long branches bearing up to 10 pedicellate flowers in an irregular corymb, with floral bracts at

the junction of the branches and pedicels, and often with a single lanceolate bract lower on the scape. *Calyx* linear, about 8 mm. in length; the lobes much shorter than the tube, blunt, two of them connate for more than half their length. *Corolla* about 1 cm. wide, bright pink, with a conspicuous yellow throat, the tube shorter than the calyx lobes; petals rounded, on short broad claws, spreading, with dark red marks near the bases of two and with white bands at the bases of the remaining two; throat appendages 6, blunt and short, wart-like; labellum very small, long-triangular, without appendages. *Column*, slender, longer than the petals; pollen bright cobalt-blue; stigma rounded and cushion-like.

Epithet in allusion to the yellow "eye" of the flower.

Vernacular name: "Yellow-eyed Trigger-plant".

Habitat: In pockets of soil near the base of a large outcrop of rock.

Representative locality: WESTERN AUSTRALIA — Pinnacle Rock near Pindewa Station, about 25 miles north of Morawa (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 8 Sept. 1953).

The new species is in the *S. despectum* group, but differs strikingly from all others in its remarkable corolla shape and colour, bearing a strong likeness to *Levenhookia leptantha*, with which it was found (also in the company of *L. pusilla*, *S. petiolare* and *S. calcaratum*).

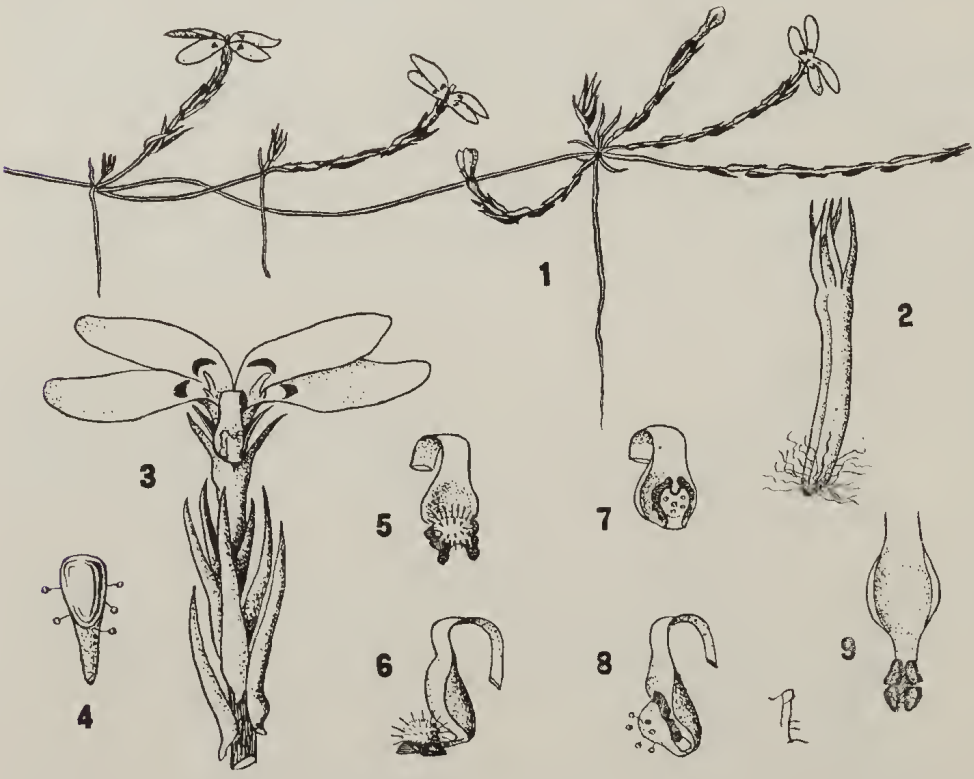
8. S. SACCULATUM Erickson & Willis, *species nova*. [Text. fig. 1-9].

Perennis inconspicua, usque ad 5 cm. adscendens, stolonifera, innovationibus filiformibus valde elongatis; folia glabra, linearia, 5–6 mm. longa, imbricata, apicem versus conferta; flores solitarii, sessiles; petala circiter 5 mm. longa, pallide carnea, quodque ad basin macula rubra præditum; labellum minutum, subtriangulum, carnosum, pilis paucis glandulosis fimbriatum; faucis appendiculæ 4, parvissimæ, dentiformes.

In habitu facieque *S. repentem* R.Br. (quocum sæpe concrescit) valde simulat; sed floribus sessilibus, calycis lobis sublinearibus liberis, corollæ faucis appendiculis parvis aut imperfecte formatis, et præcipue columna sub apicem *manifeste sacculata* differt. *S. verticillatum*, *S. scandens* atque *S. trichopodum* (Queensland) etiam columnas sacculatas possident, sed in modis multis aliis facile distinguuntur. *S. breviscapum* flores sessiles, calycem sat similem et faucem nudam habet, sed differt: foliis multo longioribus obtusis atque floribus subverticillatis capitulum densum formantibus.

Stoloniferous and rather inconspicuous matted perennial, the innovations borne on dark rigid wiry roots (to 8 cm. long). *Stems* ascending 3–12 cm. long, very slender and wiry, grey, glabrous, leafless in the older parts; new roots and stems arising from loose rosettes of the previous season. *Leaves* scattered along the stems, but becoming congested toward the apices where they form dense terminal clusters (about 10 together), 5–6 mm. long, erect, appressed, lanceolate with fine mucro, rather fleshy with scarious incurved margins and a basal spur (as in *S. repens* R.Br.); terminal leaves slightly longer and less tightly appressed than stem leaves which are shed late in the season. *Flowers* solitary and sessile within the terminal leaf clusters. *Calyx* reddish, almost linear, curved, about 10 mm.

long, slightly glandular-hairy above and woolly at the base with long, white, silky, glandless hairs; lobes free, linear acuminate, about 3 mm. long (much shorter than tube), finely ciliate on the margins. *Corolla* whitish or pale pink, with a red spot at the base of each petal; tube scarcely as long as the calyx lobes; petals almost equal, about 5 mm. long, rounded oblong and paired sideways; labellum minute, almost triangular, with a long apex, fleshy, fringed with a few glandular hairs; throat appendages 4 (at bases of the larger petals), small and rudimentary, dentiform. *Column* short and stout, dilated below the apex, with the margins curved inward to form a pouch into which the anthers are folded by an elastic hinge; stigma rotund and prominently cushioned.



Figs. 1—9, *Stylidium sacculatum*: 1, Habit; 2, Calyx; 3, Terminal rosette of leaves and flower; 4, Labellum; 5, Front view of column with mature stigma; 6, Side view of column with stigma; 7, Front view of column showing anthers folded into pouch; 8, Side view of column and anthers; 9, View of pouched column with anthers held open.

Pollination by the flies *Comptosia cuneata* Ed. and *C. carculum* Newm. (Family *Bombyliidæ*, Subfamily *Lomatiinæ*), also visited by an ant of the genus *Iridomyrmex*.

Epithet in allusion to the pouched column extremity.

Vernacular name: "Locket Trigger-plant".

Habitat: In open Wandoo (*Eucalyptus wandoo* Blakely) forests and the adjacent sand-plains, forming extensive mats often in association with *S. repens.*

Representative localities: WESTERN AUSTRALIA — Bolgart Yericoin; Piawaning (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 7 October 1952).

The new species closely resembles *S. repens* in general appearance, but differs markedly in having sessile flowers, linear calyx (turbinate in *S. repens*) with free lobes, narrow pointed glandular labellum and 4 rudimentary throat appendages (conspicuous and varying from 2–8 in *S. repens*). The calyx is nearer to that of *S. breviscapum* except in the lobes which are blunt in the latter species. The most notable character, however, is the pouched column — a rare modification found also in *S. verticillatum* and *S. scandens* of W.A., as well as in *S. trichopodum* of Queensland.

9. S. REPENS R.Br. *var.* DIPLECTROGLOSSUM Erickson & Willis, *varietas nova.*

A forma speciei usitata differt: calyce minore glanduloso-pubescenti, lobis longioribus angustioribusque (tubum æquantibus) semper liberis, et præcipue labello quod ad basin calcaria duo filiformia fert.

Differing from the typical and usual form of the species in having longer, narrower, leaf-like, free (*not* connate) calyx lobes and especially in the possession of two long, fine, divergent appendages at the base of the labellum. TYPE from the plains between Kendenup and Mondurup Peak in the Stirling Range (HOLOTYPE in MEL, ISOTYPE in PERTH—*C. Morris*, November, 1953).

10. S. ZEICOLOR Erickson & Willis, *species nova.* [Tab. III, 1-11].

Perennis caespitosa, usque ad 35 cm. alta, interdum pluriscaposa; caudex brevis, ligneus, in radicibus pluribus nigrantibus portatus; folia usque ad 5 cm. longa suberecta, graminiformia linearia et manifeste canaliculata acuta, superficiebus parce glandulo-pilosis; flores 15–40 in racemis latis, graciliter pedicellati; calyx linearis, circiter 8 mm. longus (tubo lobisque subæqualis), glaber; corolla siccans cremeo-flava (ut in granis *Zeæ mays* colorata), tubo quam lobi calycis multo breviore; petala subæqualia, circ. 6 mm. longa; rotundo-oblonga, lateraliter jugata; faucis appendiculæ 6, minutæ, dentiformes, interdum breviter pilosæ (earum 2 inter glandes tres aures siti sunt); labellum ovale, longe acuminatum, ad basin appendiculis duobus gracilibus instructum; semina minuta, 0.3–0.35 × 0.1–0.2 mm., ellipsoidea, nubilo-olivacea, subpapillosa.

Species affinis *S. lineato* Sond. in Lehm. (Sect. *Saxifragoideæ*) quod foliis rosulatis planis latis obtusisque certe recedit.

A tufted perennial, sometimes many-headed, with a short, woody stock borne on several dark, rigid roots. *Leaves* suberect, grassy, linear, plainly channelled, usually up to 5 cm. in length and less than 3 mm. in breadth, pointed at the apex, the margins set with hairs, the surfaces sparsely glandular-hairy. *Scape* racemose, glabrous, glaucous, usually about 20 cm. tall, the inflorescence occupying the upper half, the lower half set with several small, linear, inconspicuous scattered bracts; the pedicels about

as long as the calyces, very sparsely glandular-hairy; floral bracts linear-lanceolate; bracteoles similar, smaller. *Calyx*, oblong-linear, glabrous, 8 mm. in length including the lobes; lobes spreading, free, blunt, about equal to the tube in length. *Corolla* deep-cream, drying to maize-yellow, tube much shorter than the calyx lobes; petals almost equal, rounded oblong, paired laterally; throat appendages 6, minute and tusk-like, sometimes shortly hairy, two of them set between three shining golden glands on the margin of the throat; labellum oval, with a long point and two slender basal appendages, twisted across one of the calyx lobes. *Column* pale, very slender, longer than the petals; anthers black, pollen whitish; stigma oval, cushion-shaped. *Capsule* oblong-linear. *Seeds* olive-brown to blackish, rough, ovoid, minute (0.3–0.35 mm. long).

Pollination by the flies *Comptosia cuneata* Edw. and *Phthiria albocapitis* Roberts (Family *Bombyliidæ*).

Epithet in allusion to the maize-colored corolla (when dry).

Vernacular name: "Maize Trigger-plant".

Habitat: In low scrub of gravelly sand heath near Wandoo trees.

Representative localities: WESTERN AUSTRALIA — Bolgart (HOLOTYPE in MEL, ISOTYPES in K and PERTH—*Rica Erickson*, 29 Sept. 1953); on sand-plain 1 mile north of Wogarl (*E. T. Bailey*, No. 142, Sept. 1945—in PERTH); Belka turn-off on Bruce Rock Road (*E. T. Bailey*, No. 381, Sept. 1947—in PERTH); Newdegate (*Dr. W. Blackall*, Nov. 1931—in PERTH).

The scape of the new species, although glabrous at the base, closely resembles that of *S. lineatum*, despite minor differences in the length of the calyx and its lobes; but the tufts of suberect, linear channelled leaves are quite distinct from the flat rosettes of broad blunt leaves in the latter species. E. T. Bailey's two collections from the eastern wheat belt differ from the typical form in having quite glabrous leaves.

11. S. ADPRESSUM Benth., *var.* PATENS Erickson & Willis, *varietas nova.*

A forma speciei usitata foliis patentibus solum recedit.

Differing from the usual form of the species in its spreading leaves. TYPE from sandy heath and Banksia country, a mile or so north of Yanchep, Western Australia (HOLOTYPE in MEL, ISOTYPE in PERTH—*Rica Erickson*, 4 Oct. 1954).

KEY TO ILLUSTRATIONS

PLATE I.

Figs. 1—7, *Stylidium bolgartense*: 1, Habit; 2, Longitudinal section of calyx; 3, Anthers of young flower; 4, Stigma and empty anthers of mature flower; 5, Two views of labellum; 6, Toothed upright petal; 7, Side view of flower. Figs. 8—13, *S. asteroideum*: 8, Habit; 9, Throat appendages; 10, Side view of flower; 11, Labellum; 12, Anthers of young flower; 13, Stigma and empty anthers of mature flower. Figs. 14—21, *S. rubricalyx*: 14, Habit; 15, Side view of flower; 16, Throat appendages; 17, Lobes of calyx; 18, Longitudinal section of calyx; 19, Two views of labellum; 20, Side view of mature stigma and empty anthers; 21, Front view or stigma and anthers.

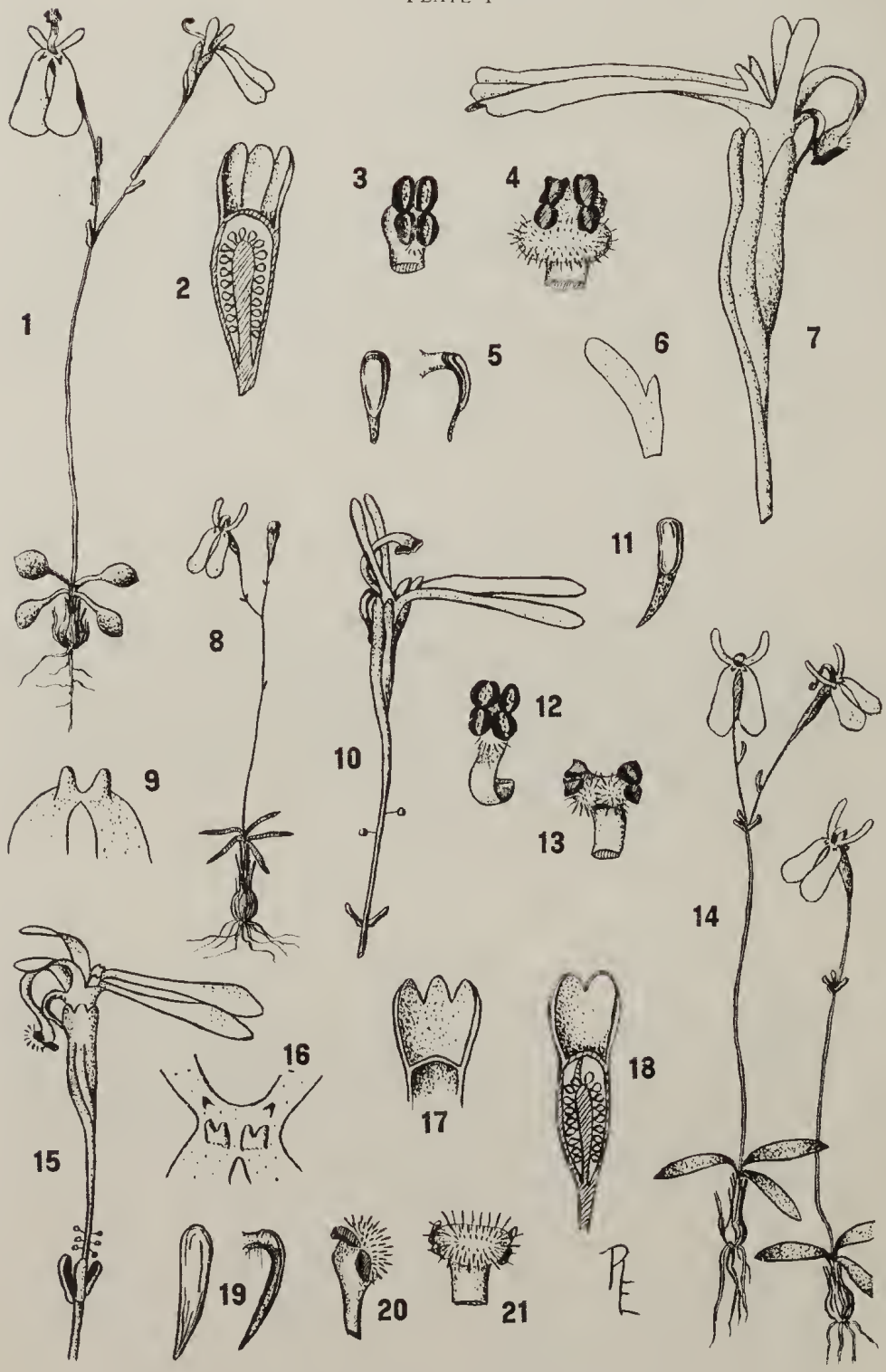
PLATE II.

Figs. 1—8, *Stylidium periscelianthum*: 1, Habit; 2, Longitudinal section of calyx; 3, Corolla; 4, Side view of flower; 5, Labellum; 6, Anthers of young flower; 7, Stigma and empty anthers of mature flower; 8, Throat appendages. Figs. 9—16, *S. rhipidium*: 9, Habit; 10, Leaves and lower stem; 11, Corolla; 12, Throat appendages; 13, Labellum; 14, Calyx; 15, Anthers; 16, Stigma of mature flower. Figs. 17—23, *S. exoglossum*: 17, Habit; 18, Corolla; 19, Calyx; 20, Leaves and lower stem; 21, Anthers; 22, Stigma and empty anthers of mature flower; 23, Side view of corolla showing labellum on outside wall of corolla tube.

PLATE III.

Figs. 1—11, *S. zeicolor*: 1, Habit; 2, Anthers; 3, Stigma and empty anthers; 4, Labellum; 5, Transverse section of leaf; 6, Flower with pedicel and bracteoles; 7, Throat of flower, showing six tusk-like appendages and three shining glands; 8, Leaf; 9, Portion of scape; 10, Longitudinal section of calyx; 11, Transverse section of calyx. Figs. 12—20, *S. xanthopis*: 12, Habit; 13, Two views of labellum; 14, Corolla showing throat appendages; 15, Calyx and floral bracts; 16, Leaf rosette and root stock; 17, Anthers; 18, Stigma; 19, Portion of scape with bract; 20, Bract.

PLATE I

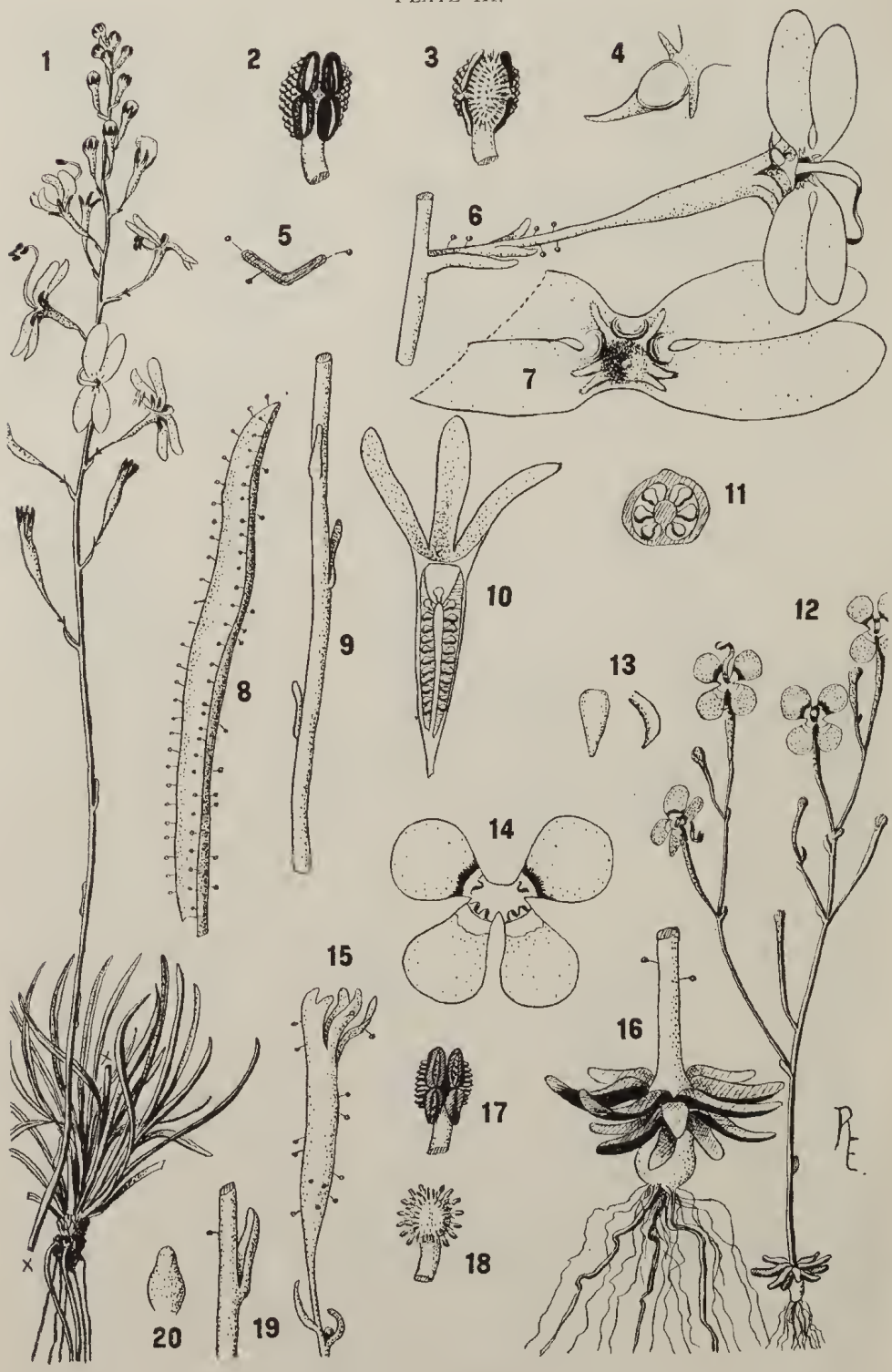


For explanation see page 17.

PLATE II.

For explanation see page 17.

PLATE III.



For explanation see page 17.

A NEW SPECIES OF ERIA (ORCHIDACEÆ)

by

TREVOR E. HUNT, Brisbane, Queeensland.

ERIA JOHNSONII T. E. Hunt, *species nova.*

Pseudo-bulbi ovoidei, circiter 1 cm. alti et 8.5 mm. lati, virides. *Folia* 2, lineari-lancelota, circ. 7 cm. longa, petiolata, coriacea, apice emarginata. Inflorescentia dense multiflora, circ. 6 mm. longa. *Flos* cum ovario circ. 4 mm. longus lutei-albus, pellucidus, pilosus. *Sepala* lanceolata, obtusa, concava, circ. 2 mm. longa, extus pilosa. *Petala* lineari-lanceolata, circ. 1.5 mm. longa concava, glabra. *Labellum* circ. 1 mm. longum et 1 mm. latum, acutum, glabrum, ad apicem callis minutis instructum. *Columna* brevis lataque.

Pseudo-bulbs ovoid, about 1 cm. long and 8.5 mm. wide (in the type plant), light-green, covered with the scarious remains of the sheathing scales. Leaves two from the apex of the pseudo-bulb, linear-lanceolate, emarginate, petiolate, coriaceous, light-green. Raceme many-flowered, very short and stout, about 6 mm. long. Flowers crowded together, yellowish-white, minute; bracts scarious, about 2 mm. long, broad acute. Flower including ovary and pedicil about 4 mm. long, not widely expanding, beset with woolly hairs, all segments transparent and incurved. Dorsal sepal lanceolate, about 2 mm. long; lateral sepals as long but slightly broader. Petals linear-lanceolate about 1.5 mm. long. Labellum about 1 mm. long and 1 mm. wide, tapering quickly to a short acute tip which bears a quantity of very minute calli. Column very short and broad. Pollen masses hard, easily detached from the surrounding dry membrane.

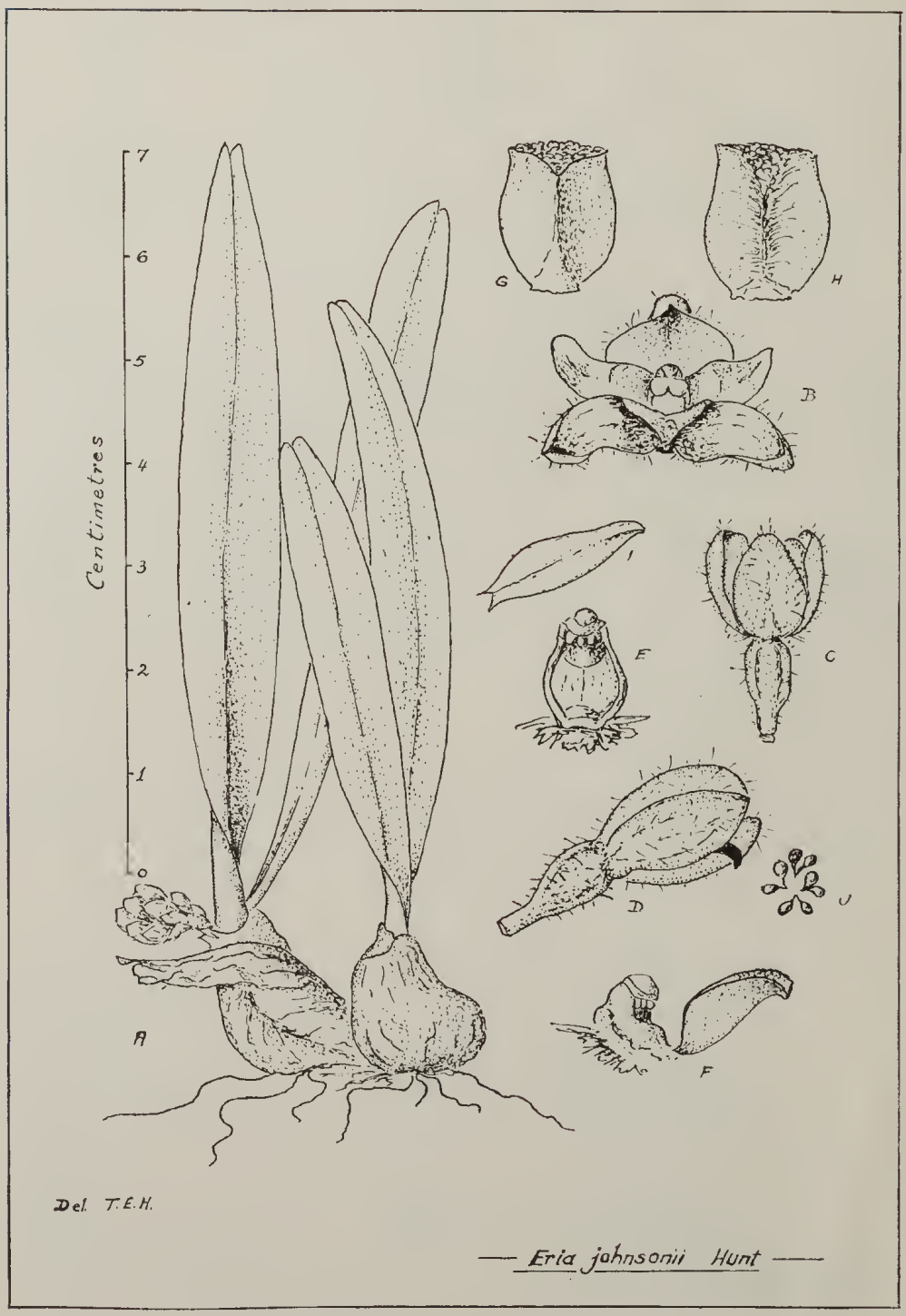
QUEENSLAND—Cook District: Mt. Islay, at 3,000 feet (*Arnold Johnson*, 7 May 1950—TYPE in BRI: part of type plant growing in the author's collection).

Eria johnsonii is easily distinguished from the other six Australian *Eria* species by the diminutive stature of the plant and the correspondingly small racemes and flowers, as the following key will show:

AN ARTIFICIAL KEY TO THE GENUS *ERIA* IN AUSTRALIA

1. Pseudo-bulbs more than 2 cm. high
    2. Pseudo-bulbs 5–20 cm. high, very stout, racemes to 30 cm. long, flowers white or yellow
        3. Labellum ornamented with lines of calli
            4. Labellum with 3 lines of calli .. *E. fitzalanii* F. Muell.
            4.* Labellum with 2 lines of calli .. *E. linariiflora* Rupp
        3.* Labellum not ornamented with lines of calli
            5. Sinus between mid-lobe and lateral lobes a deep incision, lateral lobes triangular *E. inornata* Hunt
            5.* Sinus a broad undulation, lateral lobes almost orbicular .. .. *E. liparoides* Hunt
    2.* Pseudo-bulbs 4–10 cm. high, slender (almost terete), racemes to 8 cm. long, flowers roseate ..
        6. Flowers purplish, labellum 3-lobed .. .. *E. erioides* (Bail.) Rolfe
        6.* Flowers dingy-pink, labellum entire .. .. *E. queenslandica* Hunt
1.* Pseudo-bulbs less than 2 cm. high, racemes less than 1 cm., flowers minute .. .. *E. johnsonii* Hunt

PLATE IV.



For explanation see page 23.

When this plant flowered in the author's glasshouse, some months after its arrival, it was forwarded immediately to the late W. H. Nicholls in order that he could prepare a plate of it for his monumental work *Orchids of Australia.* As the species was unknown and had been disturbed during the growing season, the duration of life of the flowers could not be predicted; so the plant was not held long enough for the writer to prepare detailed drawings of the flower. Although sick at the time, Mr. Nicholls, with his usual courtesy and thoughtfulness, returned a delightful coloured sketch of the plant and the floral details, and it is from his sketch that figures B-J have been prepared. His plate of this species must have been one of the last, if not the last, that he painted.

KEY TO PLATE IV.

Eria johnsonii sp. nov.

A. Plant (to scale provided); B. Flower, from front; C. Flower from above; D. Flower, from side; E. Column, from front; F. Column and labellum; G. Labellum from below; H. Labellum from above; I. Petal; J. Pollen masses.

—Drawings after the late W. H. Nicholls.

(Nos. B–J. greatly enlarged).

[NOTE—While this paper was in press, S. T. St. Cloud published in *The North Queensland Naturalist* 23^3: 1-2 (May 1955) the description of *Eria irukandjiana* type material of which came from Nesbit Range, Trinity Bay. This new *Eria* was described as the "smallest yet recorded." I had recently provided Mr. St. Cloud with a manuscript copy of my diagnosis of *E. johnsonii* (prepared several years ago), but apparently he considered that the two plants were not conspecific—an opinion which I do not share. It is therefore most regrettable that the name *E. johnsonii* must at once fall into synonymy; but, at least, the present illustrations will serve to supplement the rather inadequate sketch provided by St. Cloud, and the key to our seven known Australian species may be useful].

SYSTEMATIC NOTES ON VICTORIAN COMPOSITÆ—1

by

J. H. WILLIS.

(National Herbarium of Victoria)

OLEARIA.

SUMMARY:

Limitations in the use of indumentum as a basis for classification are discussed; two new varietal combinations are made under *O. ramulosa* (Labill.) Benth. (*O. stricta* Benth. being reduced in rank); three varieties of *O. ramulosa* and one of *O. floribunda* (Hk.f.) Benth. are described as new; *O. exilifolia* (F. Muell.) Benth. is admitted as a species new to Victoria: the combination of *O. frostii* is made for the first time (based on *Aster Frostii* F. Muell.); *O. toppii* Ewart & White is reduced to a synonym of *O. passerinoides* (Turcz.) Benth. *O. quercifolia* Sieb. ex DC. is deleted from the Victorian flora (records were based upon mis-determinations) and two new varietal combinations are made under *O. phlogopappa* (Labill.) DC.—the legitimate name for the plant generally known as *O. gunniana*.

As in other large genera, where floral and fruiting structures are remarkably uniform, it has been found convenient to divide *Olearia* into sections delimited by the principal types of indumentum. G. Bentham [*Flora Australiensis 3*: 464-7 (1866)] defined five such sections which have been later recognized by F. M. Bailey (1900), J. M. Black (1929), C. A. Gardner (1930) and A. J. Ewart (1930), viz.:

> *Dicerotriche* (leaves silvery-shining or woolly beneath from the matted and centrifixed hairs), *Asterotriche* (leaf surface scurfy beneath with stellate hairs), *Eriotriche* (leaves with dense and intricate woolly hairs on the under-surfaces), *Adenotriche* (plants glabrous and usually glutinous; involucre rarely hemispherical, bracts rarely acute), and *Merismotriche* (plants various but hair, when present simple, rigid and septate: involucre hemispherical, bracts usually acute).

It will be noted that the first three sections depend entirely upon the vestiture on the under-surfaces of the leaves, and usually there is no trouble in deciding whether specimens belong to one or other of these groups; but difficulties are met in the remaining two sections which are mixed assemblages, depending upon *general* indumentum (or its absence) and involucral characters. For instance, several plants referred by Bentham to these last sections certainly have a few intricate woolly hairs on the under surfaces of the leaves and would thus qualify also for the section *Eriotriche*.

Olearia ramulosa (Labill.) Benth. has been a stumbling-block to botanists for more than a century, defying accurate definition and shattering all ideological concepts of a "species". Bentham placed it in the *Eriotriche* without comment, but the elements included by him under this name display the most astonishing diversities and blendings of indumentum.

Within the orbit of *O. ramulosa* (*sensu lato*) are three principal types of hair—*intricate-woolly*, *septate-bristly* (often short, stout and thorn-like setæ) and *glandular* (glands globular and either on long

irregularly septate bases or almost sessile). Each type may predominate (with the other two suppressed or absent) on a particular plant; two may be equally well developed (with the third suppressed) or these three types of hair may be conspicuous on a single specimen; but in *all* cases the under-surfaces of the leaves invariably bear some intricate woolly hairs. To complicate matters, one branchlet may show gradations between the long, slender, regularly and simply septate bristle to the shorter, stouter, irregularly septate kind (often with longitudinal septation as well) which may or may not bear a terminal gland. Coincident with these various admixtures of tomentum one finds every combination in size and roughness of leaves, size and distribution of heads along the branches, size, colour and number (5–15) of ligulate florets. The number of possible combinations between indumentum, leaves and flower-heads is almost without limit and would provide any "species splitter" with a fertile field for activity!

Older botanists (chiefly A. P. De Candolle) had segregated seven species from the material which Bentham later included under *O. ramulosa*. As far as Tasmania was concerned (the type area for both *Aster ramulosus* Labill. and *A. aculeatus* Labill.), J. D. Hooker recognized only one species in the complex, viz. *Eurybia ramulosa* (Labill.) DC.; but he described eight varieties [*Fl. Tas. 1*: 178 (1855)] and then made the extraordinary pronouncement:

> The varieties enumerated are not distinct forms, I fear, and some may very probably have been gathered from one individual.

Labillardiere's *Aster aculeatus* became the eighth variety (*aculeata*) and evoked the following comment:

> An original specimen of *E. aculeata* from Labillardiere's herbarium, communicated by Webb, has the upper surface of the leaf quite glabrous and smooth, though described and figured by Labillardiere himself as muricated.

In the *Flora Australiensis* [*3*: 477 (1866)], Bentham recognized only two varieties of *O. ramulosa*, i.e. var. *microphylla* (based on *Aster microphyllus* Vent.)—a slender plant with small obovate to spathulate and petiolate leaves, extending from Port Jackson north-west through the Blue Mountains to as far as the Dunedoo district, N.S.W.—and var. *communis* which embraced all other forms. He was puzzled by the latter complex and wrote on a covering sheet in the Melbourne Herbarium, "the species all run into one another so much, I can make very little of them". Ewart [*Flora Vict.* 1116 (1930)] admits only one variety for this State, viz. *microphylla*, but no Victorian specimens of this distinctive Port Jackson plant (perhaps worthy of specific rank?) exist in the Melbourne Herbarium and its occurrence so far south is extremely doubtful. Black [*Fl. S. Aust. 4*: 599 (1929)] has no varieties, but comments as follows:

> The ligules of South Australian specimens vary from slightly longer than the style branches to three times as long and both organs vary in size, even on the same plant.

Throughout coastal and southern Victoria (from the Genoa River to the Glenelg) are populations with 5–10 whitish ligules in the heads (usually small, numerous and racemosely arranged), with the leaves 2–10 mm. (even on one plant) and varying from smooth to finely aculeate all over, and an indumentum that variously combines short and scattered thorn-like bristles with appressed woolly-white hairs. These I would consider as mere forms of *Olearia ramulosa* (including *Aster aculeatus*) in the stricter sense. But the question arises, can one recognize in Victoria any other populations within the general circumscription of *O. ramulosa* which may be distinguished from the eight Tasmanian variants described (and immediately queried) by Hooker?

After examining considerable material in field and herbarium, I believe that at least five entities are recognizable and that is is desirable to define these extremes as varieties, while freely admitting the possibility of intergradation between them. All but one (var. *microcephala*) are very hairy shrubs inhabiting rocky terrain in mountainous country on and north of the Dividing Range; these will now be discussed briefly:

1. *O. RAMULOSA*. var. *MICROCEPHALA* (Benth.) J. H. Willis, *combinatio nova*.

O. hookeri (Sond.) Benth., var. ?*microcephala* Benth. in *Fl. Aust. 3*: 483 (1866).

The author of this varietal epithet, by his query, evinced uncertainty concerning its correct application under *O. hookeri*—a glabrous and exceedingly glutinous, apparently rare, Tasmanian shrub, having close, narrow, obtuse, rigidly erect, slightly recurved and shortly decurrent leaves. Type of the variety was collected by J. Dallachy on the "Murray River" (probably in N.S.W. near Mildura) and certainly bears little resemblance to the Tasmanian species with which Bentham allied it. The minute leaves (1–2 mm. long) are broad, widely spreading, non-decurrent, hairy beneath and with only rudimentary aculeations; these features, together with the branchlet indumentum (of woolly appressed hair and a few sessile viscid glands), point to close affinity with *O. ramulosa*, not *O. hookeri*. I have little doubt that Dallachy's type specimen, in Melbourne Herbarium, is an abnormally reduced (perhaps aberrant) condition of a small-leaved form of *O. ramulosa* which ranges along the Murray and lower Darling Rivers; the same extreme in leaf reduction is sometimes observed in such species as *Helichrysum semipapposum* from the north-west of the State—often as shoots on a plant with otherwise normal foliage. The varietal name is rather unfortunate, since mature heads of this inland shrub are no smaller than in the more typical coastal populations of *O. ramulosa*. *O. hookeri* must now be deleted from the Victorian flora; but Mrs. Enid Robertson (formerly of Waite Institute, Adelaide University) recently showed me a fragmentary specimen of the late J. M. Black's from "Murray Lands", S. Aust., which does conform in vegetative characters to the Tasmanian *O. hookeri*.

2. *O. RAMULOSA*, var. *STRICTA* (Benth.) J. H. Willis, *status novus et combinatio nova.*

O. stricta Benth. in *Fl. Aust. 3*: 485 (1866).

The original description of *O. stricta* was based on a single collection of F. Mueller's from Mt. Buffalo ("Mt. Aberdeen") and Bentham quotes the elevation as 4000 feet. There is no specimen in Melbourne Herbarium, bearing a label with this altitude: but the diagnosis perfectly fits a series of specimens with the following label in Mueller's handwriting:

"Frutex strictus 1–3′ altus. Radius lilacinus. Flor. fragrant. In montis Aberdeen summitatibus granitico-rupestribus tract. Buffaloi rangi. 26 Febr. 1853."

The rocky summit of "Mt. Aberdeen" (now The Horn) is 5646 feet, and despite the altitudinal discrepancy, I haven't the slightest doubt that the specimen Bentham saw was part of this collection in Melbourne. Bentham located the species in section *Merismotriche* (next to the longer leaved *O. tenuifolia* and *O. adenophora*) on account of its very glandular indumentum, but a little woolly hair and a few non-glandular setæ (especially on the leaves) are also present, and the affinities of *O. stricta* are far too close to *O. ramulosa* for specific separation. At best I consider that the Mt. Buffalo plant represents an extreme local development of the more hairy condition of *O. ramulosa*, in which nearly all the hairs have become glandular. Identical populations exist on Mt. Cobbler plateau to the south and along the sandstone-conglomerate portion of the Barry Mountains (Viking, Razor and Speculation peaks where I noted them in January 1945). In all these areas, there is a tendency to lobing in a few of the lower, less revolute leaves, while the numerous (10–15) ligulate florets are usually rich blue in colour.

Near the original shrubs of *O. stricta*, Mueller also collected at The Horn (5000 feet) samples which are more typically *O. ramulosa;* the latter, apparently not seen by Bentham, have an indumentum of much wool, stout setæ and a few almost sessile glands. In the Cudal district, west of Orange (N.S.W.), G. W. Althofer collected (1949) examples of otherwise typical *O. stricta* in which the glands were all practically sessile.

Near Elmhurst (north of Mt. Cole ranges) and on the Black Range south of Horsham, Vic., occurs a plant which can only be referred to *O. ramulosa*, var. *stricta* (comb. nov.): it has the same aspect (very scabrid) and numerous blue ligulate florets, but long setiferous hairs are developed equally with the shorter gland-tipped ones, and every gradation may be observed between the two kinds of hairs.

3. *O. RAMULOSA*, var. *LONGISETOSA* J. H. Willis, *varietas nova.*

Frutex diffusus laxus, ramis tenuibus, capitibus et sæpe foliis dispersis, ligulis 9–12 cæruleis; hæc varietas ab aliis formis speciei vestimento longisetoso (et porro involucri squamas involvente, sed sine pilis glanduliferis) distinguitur.

HOLOTYPUS (in MEL): *Victoria occidentali*, a Mt. Byron Trig. (Black Range, in Paroecia Daahl) circ. 3 km. [2 mil.] septentrionem versus—"in gully head, among standstone rocks." *J. H. Willis*, 5 Mar. 1948.

This variety has a hoary aspect from the very long (to 1.5 mm.) simply septate, setiform hairs which copiously beset the leaves and branches, standing out at right angles to their surfaces. A little appressed woolly hair is also present, but no glands occur, and the numerous ligules are bright blue. Gland-bearing (and with setæ also) shrubs referable to var. *stricta* occur in the same district; but the new variety seems to be confined to sandstone rocks of the Grampians system, e.g. the Black Range, at the southern end of the Victoria Range (*H. L. Tucker*, Oct. 1944), also on the Dundas Range near Cavendish and on Mt. Zero at the northern extremity of the Grampians (*J. H. Willis*, July 1950).

A collection in Melbourne Herbarium labelled "Grampians" (*J. W. Audas*, 1914) formed the basis of *O. ramulosa* var. *intermedia* A. J. Ewart, published as a *nomen nudum* in *Proc. Roy. Soc. Vict.* n.s. 27: 302 (March 1915). Ewart was mistaken in believing the plant to be intermediate in character between *O. ramulosa* and *O. ramulosa* var. *microphylla* (Vent.) Benth.; it is very close to the new variety *longisetosa*, having setiform hairs without glands and blue ligulate florets, but the flower-heads are rather smaller, with fewer ligules, and the setæ do not extend over the involucral bracts. At the Hall's Gap camping ground and on the banks of Fyan's Creek, Mr. T. E. George found (23.12.1953) a remarkable setose form of *O. ramulosa* with a strong curry-like odour, which is still apparent in the dried specimen (Herb. Melb.). This plant is similar to the Audas collection discussed above; but the 3–5 ligulate florets are white. Another approach to var. *longisetosa* is found in coastal specimens from near Robe, South Australia; these have bluish ligules and dense, longish setæ without glands, but the leaves are only moderately aculeate and there is an admixture of much more woolly hair on the branchlets.

4. *O. RAMULOSA*, var. *RIGIDA* J. H. Willis, *varietas nova.*

Frutex 1–2 m. altus, rigide multo ramosus, capitibus densis, ligulis 5–7 albis; ab aliis formis speciei ramulorum indumento præcipue setoso (sed etiam pilos paucos glandiliferos lanatosque ferente), foliis longis (usque 1.2 cm.) rigide expassis (sæpe deflexis) multo revolutis superne lævibus et minute aculeatis, capitibus confertis in racemis longis gracilibus terminalibus differt.

HOLOTYPUS (in MEL): Victoria boreali-orientali ad Lima East (a Benalla meridiem versus). *Mrs. Evans*, 27 Nov. 1917.

The long, stiffly spreading leaves and white flower-heads, densely massed in elongated racemes, give a very distinctive appearance to this scabrid variety which is known only from the vicinity of the Strathbogie

Ranges in the north-east of Victoria. A second collection at Melbourne Herbarium carrying the label "Rocky summits of granite mountains between Nine-mile Creek and Broken River" was obtained by F. Mueller on 10th February 1853.

5. *O. RAMULOSA*, var. *TOMENTOSA* J. H. Willis, *varietas nova*.

Ab omnibus formis speciei differt ramulorum foliorumque indumento copioso albido-tomentoso (pilos glanduliferos setiformesque obscurante); folia usque ad 1.2 cm. longa, breviter, sparseque aculeata, fere multo revoluta; capita sæpe magna axillaria; ligulæ 5–7. magna, lilacinæ.

HOLOTYPUS ♂ PARATYPI (in MEL): Victoria centrali. "Mt. McIvor, Nov.". *?F. Mueller.*

Noteworthy for its long leaves and extreme development of white woolly hair, this variety also exhibits a few setæ and sessile glands on the branchlets and foliage. It is apparently restricted to central-western Victoria in the vicinity of the Divide, two other old collections in Melbourne Herbarium being labelled "Loddon Ranges" and "Scrubby Places on the Campaspe River."

Olearia floribunda (Hk.f) Benth., var. *LANUGINOSA* J. H. Willis, *varietas nova*.

A planta typica tasmanica (etiam a forma alpina continenti) differt ramuli indumento dense tomentoso quod sæpe foliorum fasces breves involvit.

HOLOTYPUS (in MEL): Australia Meridionali, ad Murray Bridge. *J. H. Maiden*. Jan. 1907.

The type of *Olearia floribunda* was collected by R. C. Gunn in Tasmania on the "banks of rivers" (Derwent, etc.) and was described as differing from *O. lepidophylla* (Pers.) Benth.—also Tasmanian—in its furfuraceous, *not* tomentose branches, as well as in the larger and more distant leaves [see J. D. Hooker in *Lond. J. Bot. 6*: 109 (1847)]. *O. lepidophylla* has crowded subrotund, shining and bubble-like leaves which are often deflexed (lying close against the white-woolly branchlets) and typically about 1 mm. long; another significant difference is that it has larger heads and more numerous ligulate florets (6–10) than in *O. floribunda* (3–6). Both species tend to have the foliage disposed in small fascicles, which probably represent abbreviated lateral branches.

In Melbourne Herbarium are a number of specimens (from Tasmania, Victoria and South Australia) which F. Mueller and others had determined as "*O. lepidophylla*", doubtless because of their woolly indumentum; but the narrower, not noticeably deflexed leaves and fewer ligules in the heads (3–4) indicate a much closer relationship to *O. floribunda* with which they should be included. I have found that, throughout its range, *O. floribunda* varies considerably in the development of a hairy indumentum. The typical riverside form shows a little woolly hair mixed with much scurfy material (probably an exudation from glands along the branches), but exclusively scurfy and moderately woolly conditions are co-extensive in Tasmania.

In Victorian highland localities, we find less scurf and more wool, otherwise the plants are practically identical with Tasmanian riparian populations, while in Mallee areas of Victoria and South Australia (extending to Eyre Peninsula) are forms having an extremely woolly indumentum which invests the foliage and involucral bracts also—capitula may actually appear to be embedded in wool along the thickened branches, giving a curious *Lachnostachys*-like aspect to the little shrubs.

So distinctive is this very tomentose Mallee form of *O. floribunda* that I deem it worthy of recognition and have designated it as the variety *lanuginosa* (above).

O. floribunda occupies almost an intermediate position systematically between *O. lepidophylla* and *O. ramulosa*, and in eastern Victoria are populations which verge toward the latter species in their longer (but still fasciculate) leaves and rather more numerous ligules (5–7). It is remarkable that all three species discovered originally under the cool climatic conditions of southern Tasmania, should be represented by forms adapted to the Murray Mallee with long dry summers and a rainfall of only 10–15 inches.

Olearia exilifolia (F. Muell.) Benth. in *Fl. Aust. 3*: 476 (1866).

WESTERN AUSTRALIA—Great Australian Bight: "N.E. side white sand patch, 60 miles from the Bellingers (east), shrubs 4 feet", *G. Maxwell*, 1863 (LECTOTYPE in MEL); "Under the Bank, pts. 3 feet, limestone", *G. Maxwell* 1863 (PARATYPE in MEL).

VICTORIA—Grampians region: Daahl Parish, Black Range, 2 miles north of Mt. Byron, Trig. in heath formation over weathered sandstone, *J. H. Willis*, 5 Mar. 1948 (MEL).

The discovery of this little-known species in the Black Range, south of Horsham, constitutes the first recorded occurrence for eastern Australia, where its habitat is quite dissimilar from that obtaining in the Australian Bight. C. A. Gardner [*Enum. Pl. Aust. Occid.* 131 (1930)] synonymises both *O. exilifolia* and *O. revoluta* F. Muell. ex Benth. under *O. ramulosa* (Labill.) Benth., and J. M. Black [*Fl. S. Aust. 4*: 599 (1929)] in discussing *O. ramulosa* remarks that it "should probably include . . . *O. exilifolia*. F.v.M." I am unable to endorse these opinions and consider that *O. exilifolia* diverges sufficiently from all of the many *O. ramulosa* variations to be accorded specific rank. Attention has already been focused on the difficulties of drawing a line between one species and another in this complex; but to broaden the circumscription of *ramulosa*, enough to include *exilifolia*, would surely involve the coastal *O. axillaris*, and then why not also *O. tubuliflora*, *O. floribunda* and even *O. lepidophylla?*

It is doubtful whether *O. ramulosa* extends into Western Australia at all, but Bentham's *O. revoluta* is a puzzling plant of western coasts which seems intermediate between *ramulosa* and *axillaris*—the white rays are conspicuous, although not as long as in *ramulosa*, and Mueller labelled his specimens "*O. axillaris*, var. *radiatus*". *O. revoluta*, var.

minor Benth. (southern coast, W.A.) closely approaches *exilifolia* in its more diminutive leaves and heads and reduced number of florets (3–5), but again the rays are white and longer than in the latter. I am uncertain what to do with *O. revoluta*; it is neither *ramulosa* nor *axillaris* in the accepted sense, and is perhaps best maintained for the present as a convenient "half-way" species with very hazy margins.

O. exilifolia, as represented in Victoria, conforms very well to the West Australian type, although the leaves are longer. It is an erect trim shrub to 5 feet, with small nearly smooth leaves, small massed yellowish and sweetly scented capitula. The total number of florets per head is low (3–7), with only 1–3 pale yellow ligulate ones; each ligule is only about 2 mm. long and therefore quite inconspicuous. The branch indumentum consists almost entirely of appressed but rather coarse, intricate woolly hairs; a few glandular swellings (incipient setæ?) are also present.

Olearia frostii (F. Muell.) J. H. Willis, *combinatio nova.*

Aster frostii F. Muell. in *Victorian Naturalist 6*: 167 (Mar. 1890);
O. stellulata DC., var. *Frostii* Ewart in *Fl. Vict.* 1114 (1930).

VICTORIA—Summit of Mt. Hotham (6000 ft.), *C. French Jun.*, Jan. 1890 (LECTOTYPE & PARATYPES in MEL); various collections from the Bogong High Plains (MEL).

The name "*Olearia frostii*" has been used by several writers and attributed to F. Mueller; but I can find no evidence that Mueller ever made use of this combination, which seems never to have been validly published. *O. frostii* is a distinctive robust shrublet (up to 2 feet high) with rather large heads (2–3 cm. wide), borne singly on the branches or a few together. The mauve-coloured rays are numerous and conspicuous, while the whole plant (branches, foliage and involucre) is beset with a copious woolly indumentum. It is an abundant species between Mts. Hotham and Bogong, at elevations exceeding 5000 feet and would appear to be endemic in this region. This and such other large-flowered Victorian daisy-bushes as *O. pannosa* (white), *O. rudis* (blue) and *O. magniflora* (rich purple) are subjects worthy of garden culture.

Olearia passerinoides (Turcz.) Benth. in *Fl. Aust. 3*: 482 (1866).

Diplopappus passerinoides Turcz. in *Bull. Soc. Imp. Nat. Mosc. 24*, pt. 2: 63 (1851);
Eurybia glutescens Sonder in *Linnæa 25*: 462 (1852);
Aster vernicosus F. Muell. in *Fragmenta Phyt. Aust. 5*: 67 (Oct. 1865);
Olearia toppii Ewart & White in *Proc. Roy. Soc. Vict.* n.s. *21*: 543 (1908);
O. glutinosa sens. J. M. Black (1929), etiam Benth. p.p. (non *Eurybia glutinosa* Lindl., 1839).

As LECTOTYPE of *O. toppii* Ewart & White, I have chosen the specimen in Melbourne Herbarium labelled "Sandy tracts, Shire of Borung, *F. M. Reader*, 29.5.1904", and as PARATYPES the several specimens (MEL) labelled "Mallee scrub, Shire of Dimboola, *F. M. Reader*, 20/12/1892". Comparison of this Victorian type material with

that of the Western Australian species *O. passerinoides* Benth. (*J. Drummond*, No. 371) shows it to be identical in every respect, and I have no hesitation in relegating *O. toppii* to synonymy: Bentham had already done so with F. Mueller's *Aster vernicosus* (from Mts. Barren area, W.A.). The authors of *O. toppii* state where their plant differs from *O. decurrens* Benth. (to which it really bears little resemblance); but, strangely enough, they make no reference to the much more obvious affinities with *O. passerinoides*.

The leaves in *O. passerinoides* are erect, 5–15 mm. long, narrow-linear, strongly revolute and with somewhat recurved tips; the heads are infundibuliform, rather large, and usually solitary at the extremities of slender virgate branches, while the ligulate florets number 6–10; the few short hairs on stems and foliage are completely masked by a copious resinous exudation. The Tasmanian and coastal Victorian *O. glutinosa* (Lindl.) Benth. is very closely related, but differs consistently in its longer, more spreading leaves which are narrow-linear and *flat* (never revolute-terete). *Eurybia glutescens* Sond. (from South Australia), which Bentham merged with this species, is in my opinion referable to *O. passerinoides* and I have never seen a South Australian specimen of the typical flat-leaved *O. glutinosa*.

Olearia quercifolia Sieb. ex DC. in *Prodr. Syst. Nat.* 5: 272 (1836), non Auctt. var.

This species should be deleted from Victorian floras. It was described from Sieber's *Fl. Nov. Holl.* No. 340 which represents a plant endemic (apparently) in the Blue Mountains, N.S.W. The Victorian specimens assigned by Bentham, Mueller and Ewart to *O. quercifolia* are all referable to *O. stellulata* (Labill.) DC., var. *rugosa* (F. Muell.) Ewart, which differs in its more sharply dentate leaves (strongly reticulate and more finely stellate-hairy beneath), in the much smaller more numerous heads with tomentose (not glabrous) involucral bracts, and in the shorter, less boldly ribbed achenes.

Olearia phlogopappa (Labill.) DC. in *Prodr. Syst. Nat.* 5: 272 (1836).

Aster phlogopappus Labill. in *Nov. Holl. Pl. Specim.* 2: 49. T.195 (1806);
Eurybia gunniana DC. in *Prodr. Syst. Nat.* 5: 268 (1836);
Olearia gunniana (DC.) Hk. f. ex Hook. in *Bot. Mag.* T.4638 (1852).

var. *FLAVESCENS* (Hutch.) J. H. Willis, *combinatio nova*.

Olearia flavescens Hutchinson in *Gard. Chron.* 3rd. *ser.* *61*: 23 (1917).
O. gunniana, var. *flavescens* (Hutch.) Ewart in *Fl. Vict.* 1113 (1930).

var. *SUBREPANDA* (DC.), J. H. Willis, *combinatio nova*.

Eurybia subrepanda DC. in *Prodr. Syst. Nat.* 5: 268 (1836);
Olearia subrepanda (DC.) Hutch. in *Gard. Chron.* 3rd ser. *61*: 24 (1917);
O. gunniana, var. *flavescens* (Hutch.) Ewart in *Fl. Vict.* 1113 (1930).

The name *Olearia gunniana* has been applied for many years to a common and variable species in the mountain forests of Tasmania and Victoria. But 30 years before DeCandolle published his *Eurybia gunniana*, Labillardiere had described and figured *Aster phlogopappus* which is unquestionably the same plant. A century ago, J. D. Hooker wrote [*Fl. Tas. 1*: 176 (1855)]:

> An authentic specimen of Labillardiere's *Aster phlogopappa*, communicated from his herbarium by the late Mr. Webb, proves it to be the same as DeCandolle's *Eurybia gunniana*.

Hooker should have taken up the older epithet *phlogopappa* in the name of the species, and at the same time reduced *Eurybia gunniana* to synonymy. Instead, he made *phlogopappa* a variety of *E. gunniana*, and in this was followed later by Hutchinson (1917) and Ewart (1930) who put *phlogopappa* as a variety of *Olearia gunniana*. I agree with Ewart's reduction of *Olearia flavescens* Hutch. and *O. subrepanda* (DC.) Hutch. to varietal rank; but the two new combinations (as now made above) called for publication under the legitimate specific name of *O. phlogopappa*. The variety *flavescens*, of alpine country in eastern Victoria and New South Wales, departs from the typical form in its rather larger, thicker, subentire leaves (often drying yellowish beneath) and longer, stouter peduncles; Hutchinson's statement that the achenes are "quite glabrous" is not supported by an examination of duplicate type material in Melbourne Herbarium (*leg.* F. Mueller on Mt. Barkly, 1863) which shows decidedly hairy achenes. The variety *subrepanda*, also alpine, differs in having much smaller (½in. or less), somewhat obovate leaves, very short leafy peduncles and comparatively large, often solitary, flower-heads; but intergradations between both varieties and the typical form sometimes make recognition of these entities difficult. In the montane ash forests of Victoria (2000-4000 ft.) a rank-growing and very tomentose form of *O. phlogopappa* has an objectionable, almost fœtid odour when crushed. Beautiful blue-flowered forms occur sometimes, as with *O. ramulosa*.

O. stellulata (Labill.) DC. is very close to *O. phlogopappa*, and its only significant difference would seem to be in the leaf surface, which is rugose and more scaberulous above, more coarsely and loosely tomentose beneath.

THE EUCALYPTUS SPECIES OF CAVANILLES

by

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Antonio Joseph Cavanilles (1745-1804) was Spain's greatest botanist. He is best remembered for his work in six volumes *Icones et descriptiones plantarum quæ aut sponti in Hispania crescunt.* In this he described for the first time a number of Australian plants and founded the genera *Angophora* and *Bursaria.*

In Volume IV (1797) of that work he describes six species of *Eucalyptus*—three at some length, each with a figure, and three very briefly. While the identities of the first three are clear, and that of a fourth had been accepted without question, that of the other two has been doubtful and none of the suggestions put forward has received general acceptance. Because of the early date of this work, the true identity of all six species is important in working out the synonymy of this complicated genus.

In October 1950 I visited Madrid and inspected the available type specimens used by Cavanilles in describing his eucalypt species and since then have received further information from the Herbarium of the Botanical Gardens there which enables the identity of these species, except in one instance, to be definitely determined.

Little was known of the Australian flora in general, and of the eucalypts in particular, before 1800; so it is important to know the extent of published information on the genus at the time Cavanilles' work was published. Briefly this is as follows:

1788. L'Héritier de Brutelle—*Sertum Anglicum, seu plantæ rariores, quæ in hortis juxta Londinum imprimis in horto regio Kewensis excoluntur.* In this work L'Héritier founded the genus and named the first species *E. obliqua.*

1788. J. Gaertner—*De Fructibus et Seminibus Plantarum.* In this work Gaertner describes and illustrates the fruits of three species but, being unaware of L'Héritier's work, refers them to other genera. They are *Metrosideros gummifera* [= *E. gummifera* (Gaert.) Hochr.], *M. salicifolia,* an indeterminate eucalypt, and *Leptospermum umbellata* [= *E. tereticornis* Sm.].

1790. Dr. J. E. Smith in Surgeon White's book, *Journal of a Voyage to New South Wales,* described *E. resinifera* and *E. piperita.*

1793. Dr. J. E. Smith—*Specimen of the Botany of New Holland,* in which are described *E. capitellata, E. corymbosa* [= *E. gummifera* (Gaert.) Hochr.], *E. robusta* and *E. tereticornis.*

1797. Dr. J. E. Smith—in *Transactions of the Linnean Society,* Volume III, page 286 *et seq,* in which are described *E. botryoides, E. hæmastoma, E. paniculata, E. pilularis* and *E. saligna.* (Note that this work was published a few months earlier than Volume IV of Cavanilles' "*Icones . . . .*" and in the event of synonymy Smith's names take priority.)

L'Héritier's description was based on specimens collected in Tasmania by Nelson and Anderson on Cook's third voyage (1776-79), while Gaertner's are based on specimens collected by Banks and Solander on the famous first voyage.

Smith's descriptions are based on specimens and notes sent to him from Port Jackson after the first settlement of Australia in 1788.

Cavanilles' descriptions are based on specimens collected in the neighbourhood of Port Jackson by Luis Née, botanist on the Spanish expedition led by Malaspina which arrived in Port Jackson in March 1793, remaining there for some time.

It is clear that at the time of writing Volume IV of his *Icones*, Cavanilles was unaware of Smith's work although he had access to Gaertner's "*De Fructibus . . .*" (He mentions this work in his description of *E. platypodos* [= *E. botryoides* Sm.)]. Cavanilles also states that he knew the generic characteristics of *Eucalyptus* as defined by L'Héritier but had not seen "*Sertum Anglicum . . .*", although he had seen Lamarck's *Recueil de Planches de L'Encyclopedie Methodique.* Plate 422 of Lamarck's work is a reproduction to a smaller scale of L'Héritier's illustration of *E. obliqua* with some rearrangement of details.

Up to the time of receiving Née's specimens, then, it is reasonable to assume that Cavanilles had only a general knowledge of the generic characters, had seen one rather crude illustration of a single species and had not handled previously any actual eucalypt specimens. Cavanilles' ignorance of Smith's work is important and must be kept in mind when considering the true identity of his (Cavanilles') *Eucalyptus* species.

The *Eucalyptus* species which Cavanilles describes are *E. corymbosus*, *E. platypodos* and *E. rostratus*, each at some length and with a figure, and briefly *E. obliquus*, *E. salicifolius* and *E. racemosus*. This is the order in which they appear and in which they are now discussed.

E. CORYMBOSUS Cav.

Synonym of *E. gummifera* (Gaert.) Hochr.,
and of *E. corymbosa* Sm.

I have seen the type specimen which is a spray of leaves and blossoms and it is unquestionably the common Bloodwood of New South Wales. I believe it is the merest coincidence that led Cavanilles to select the same specific name already given by Smith, although a very natural one because of the marked difference between the corymbose inflorescence of this species compared with flowering habits of other eucalyptus species known at that time. The accepted synonymy of these species is confirmed.

E. PLATYPODOS Cav.

Synonym of *E. botryoides* Sm.

I have seen the type which is labelled "*Eucalyptus platypodos* Icon. Tab. 341 ex Nova Hollandia". Another sheet in the Madrid Botanical Gardens has this note—"*Eucalyptus botryoides* Smith *Act. Soc. Linn. Lond.* Vol. 3, pag. 286. Willd. *Sp. Pl.* Vol 2, pag. 976. *Eucalyptus platypodos* Cav. *Ic.* Vol. 4, Tab. 341, N.373. Ex oppido Jackson in Nova Hollandia. Née Itex". Both specimens are of leaves and ripe buds and are unquestionably *E. botryoides* Smith. Again the accepted synonymy is confirmed.

E. ROSTRATUS Cav.

Synonym of *E. robusta* Sm.

The synonymy of *E. rostratus* Cav. and *E. robusta* Sm. has long been accepted, although Cavanilles himself at one time considered them to be distinct. Née's notes on his visit to Australia were written up by Cavanilles in an article entitled "Observaciones sobre el suelo, naturales, y planta del Puerto Jackson y Bahia Botanica". (Notes on the soil, natives and plants of Port Jackson and Botany Bay), and published in *Anales de Historia Natural* (Madrid) No. 3, March 1800, pp. 181-245. On page 192 there is this comment by Née on the forests in the vicinity of Parramatta:

> The trees are large, tall and straight, distinct from those resembling melaleuca and seemed to me to form a new genus. From them flows a resinous substance somewhat resembling dragon's blood.

"Dragon's blood" was the commercial description in those days of a resin won from trees growing in the Canary Islands; today it refers to a resin from a Malayan palm. To the above remark Cavanilles adds a footnote:

> L'Héritier came to the same conclusion and named the genus *Eucalyptus*. I have described several species of it in Volume IV of my *Icones*. The tree mentioned by Née is called by the English (settlers) Brown Gum Tree or New Holland Mahogany, and by Smith in his work on New Holland p. 39, Fig. XIII, *Eucalyptus robusta*. This species closely resembles my *E. rostratus* described in *Icones* Vol. IV, pag. 13 and Tab. 342, but is distinguished from it by the shorter leaves, by the shape and direction of the venation which is marked in this, and by having the peduncles plain (?) as noted by White or the author of his Appendix.

The two references here are to Smith's *Specimen of the Botany of New Holland* and White's *Journal of a Voyage to New South Wales*. There is some confusion here, as *E. robusta* is not mentioned in White's *Journal*. The only species mentioned and described in the Appendix to White's *Journal* are *E. piperita* ("The Peppermint Tree") and *E. resinifera* ("The Red Gum Tree"). J. E. Smith is the author of the Appendix. A reference to original copies of Smith's *Specimen of the Botany of New Holland* and White's *Journal* has failed to explain the confusion.

Cavanilles appears to have changed his view later. There are three sheets of specimens in Madrid, all collected by Née, bearing the following comments:

> (1) (The type) "*Eucalyptus rostratus* Icon. Tab. 342. Arbor 15-20 ped. Habitat in tractu ab oppide Jackson ad agros cultar"—in Cavanilles' handwriting.
>
> (2) "*Eucalyptus robusta* Smith Act. Soc. Linn. Lond. Vol. 3, Pag. 283. Smith Nov. Holl. Tab. 13 Willd. Sp. Pl. Vol. 2 P. 2. Pag. 976"—in old handwriting, and also a note in Née's hand "arbor de 15 a 20 p. Teneo deide Jackson a la huerta".

(3) "*Eucalyptus robusta* Smith Nov. Holl. pag. 39, Tab. 13 Willd. Sp. Pl. Vol. 2, P.2, pag. 976. *Eucalyptus rostratus* Cav. Ic. Vol. IV. Tab. 342, N. 374 ex Nova Hollandia. Née Itex"

Sheets 1 and 2 are of leaves and mature buds and are typical of *E. robusta*. Sheet 3 is of leaves and a very immature inflorescence. The leaves in Sheet 3 are typical of those of *E. robusta*. Here again the accepted synonym is confirmed.

E. OBLIQUUS Cav.

Synonym of *E. capitellata* Sm. (?).

Immediately after the description of *E. rostratus* and before that of *E. obliquus* there is a note,

> *Obs.* Præter istas species alias vidi in laudato herbario, non ita perfecte conservatas ut iconibus eas sistam, quas nihilonimus indigitabo brevi descriptione,

which translated reads. "*Note:* Besides these species I saw others in this excellent herbarium not so perfectly preserved that I could have illustrations made of them which nevertheless I will indicate with a brief description."

The brief description of *E. obliquus* is as follows:

> 375. *E. Obliquus.* Eucalyptus folium ovato-lanceolatis. nervo unico ramoso, nervulis ad ipsum raris: umbellis axillaribus
>
> In hac specie folia non videntur coriacea; nervuli adsurgent formantque angulum actum cum nervo principali: umbellæ quinque floræ: et calyptra hemispherica. Videtur eodem species quam D. de Lamark figuravit tab. 422. 11. gen. cuius descriptionem nondum evulgavit.

It has always been presumed that Cavanilles' *E. Obliquus* was merely a redescription of L'Héritier's *E. obliqua*, and Cavanilles' reference to Lamarck's figure has only served to strengthen that view. However, Née's travels did not bring him even close to areas where *E. obliqua* L'Hérit. occurs and it is geographically impossible for the two species to be synonymous.

There are two sheets of specimens in Madrid. The first bears the note, in what is thought to be Née's handwriting, "*E. obliquus* Cav. Icon. pag. De Bahia Botanica." while the second has the note in Née's hand "*Eucalyptus capitellata*" and in Cavanilles' hand "Smith dédit 1803, ex Nova Hollandia. Icon. Planta 1ª post. *Eucalyptus rostratus.* 375 Eucalyptus figuratus in Encyclopedia 1 Tab. 422." The first specimen is in leaf and bud and the second in leaf and blossom. They could be *E. capitellata* Sm. but the evidence is not sufficient for me positively to identify them as such. Further endeavours are being made to establish the true identity of this species as a matter of historical interest, but the true identification cannot affect the eucalypt nomenclature owing to L'Héritier's prior use of the specific name for another plant.

E. SALICIFOLIUS Cavanilles.

Synonym of *E. saligna* Sm.

The brief description is:

> 376. *E. salicifolius*. Eucalyptus foliis lanceolatis. nervo dorsali inæqualiter partis altera parte versus basim breviore.
>
> Hæc species a reliquis distinguitur foliis altera parte versus basim breviori ut in Begonia et aliis plantis: nervuli sunt etiam adscendentes: umbellæ 7—10 floræ axillares.

The true identity of this species has been in doubt for 150 years. Maiden suggested that it might be *E. amygdalina* Labill. and assumed it to be synonymous with *Metrosideros salicifolia* Solander ex Gaertner. It has also been suggested to be *E. scabra* Dum.-Cours. (*E. eugenioides* Sieb.). Blakely took the extreme step of asserting that it *was E. amygdalina* Labill. and suppressed the latter in favour of Cavanilles' species on grounds of priority. Blakely's action involves two untenable hypotheses: (1) that Cavanilles meant his *E. salicifolius* to be the same plant as *Metrosideros salicifolia* Sol. ex Gaert., whereas Cavanilles himself suggested that his *E. platypodos* might coincide with Gaertner's species; (2) that the type of *M. salicifolia* Sol. ex Gaert. came from Tasmania, whereas Botany Bay is the most southerly point it could possibly have been collected by Banks and Solander. The only localities recorded by Banks for *M. salicifolia* are Bay of Islets, Cape Grafton, Endeavour River, Point Lookout and Possession Island.

There are two sheets of specimens in Madrid Herbarium: (1) the type bearing the note in Cavanilles' hand "376 *Eucalyptus salicifolia* ex Nova Hollandia. Icon. 2a post *eucalyptum rostratum*." (2) with the note in old handwriting "*Eucalyptus saligna* Smith Act. Soc. Linn. Lond. Vol. 3, pag. 285 Willd. Sp. Pl. Vol. 2, Pt. 2, pag. 977. *Eucalyptus salicifolius* Cav. Ic. Vol. 4, pag. 24, N. 376 ex Nova Hollandia Née Itex". Both sheets are sprays of leaves and buds and I agree with the determination of this species as *E. saligna* Sm. It is a curious coincidence that in a species having no conspicuous resemblance to the willow, Smith should choose a name meaning "willow-like" and Cavanilles "willow-leaved". Some years ago I had pointed out that in the absence of a specimen *E. salicifolius* Cav. must fall on account of uncertainty. Now that authentic material has become available the name must still fall because of synonymy.

E. RACEMOSUS Cav.

Synonym *E. microntha* DC.

There have been the same doubts as to the identity of *E. racemosus* Cav. as have surrounded *E. salicifolius* Cav. Maiden suggested, and Blakely affirmed, that this was *E. crebra* F. Muell., the Narrow-leaved Ironbark. The single specimen in Madrid Herbarium has the note in Née's handwriting, "*Eucalyptus racemosus* Cav. Ic. 4 pa. 24. Née dédit 1801". The sheet has two sprays of leaves and buds and one spray of

PLATE V.

Specimen of *Eucalyptus racemosa* Cav. (syn. *E. micrantha* DC.), collected by Luis Née at Botany Bay, 1793, and preserved in the Herbarium of the Royal Botanical Garden, Madrid.

Photo by Antonio Rodriquez, 1952.

buds alone. In my opinion these are conspecific with *E. micrantha* DC., the Snappy Gum of the Hawkesbury Sandstone. Admittedly it is difficult at times to separate herbarium material of some forms of *E. micrantha* DC. from *E. crebra* F. Muell., but the Cavanilles specimens have leaves typically those of *E. micrantha* DC. and appreciably broader than those of *E. crebra* F. Muell. as found in the vicinity of Port Jackson and, more important, the umbels of Cavanilles' specimens have up to 12 or more flowers (as does *E. micrantha* DC.) whereas those of *E. crebra* F. Muell. are typically 7-flowered, frequently of course less by loss of individual flowers during growth of the inflorescence and not recorded as bearing more than 9 in the umbel. (Mueller's type description says 3–6 flowered).

E. micrantha DC., of course, closely resembles *E. hæmastoma* Sm., but is not so coarse in leaf, bud, flower and fruit as that species. Described as a species by De Candolle, it was regarded by many as synonymous with *E. hæmastoma* Sm., then recognised as a variety of that species, but today usually regarded as sufficiently distinct to be regarded as a separate species.

The belief that *E. racemosus* Cav. is the same species as *E. crebra* F. Muell. largely springs from various identifications of Sieber's No. 476. De Candolle in his *Prodromus* thought it to be *E. hæmastoma* Sm. and quoted *E. racemosus* Cav. as a synonym. Sieber himself named his 476 *E. gracilis* in the sets of plants he distributed under the name "Plantæ Exoticæ de Novæ Hollandiæ", but the name was not published until mentioned by Bentham in Flora Australiensis where he considered it to be *E. crebra* F. Muell.

Another specimen of Sieber's 476 is in Herb. Vindob. with the label "*E. hæmatastoma* Sm., *E. racemosa* Cav. No. 476 Sieber". Possibly the unknown writer of this label had seen Cavanilles' *E. racemosa* in Madrid and had recalled its resemblance to Sieber's No. 476. J. H. Maiden had seen the latter specimen in Vienna and also the Kew specimen which Bentham saw, and says of both that he believes them to be *E. crebra* F. Muell. but goes on to say:

> "At the same time I desire to emphasise the fact that herbarium specimens in mature leaf and half-ripe bud of *E. crebra* are very difficult to discriminate between those of *E. hæmastoma* var. *micrantha*. Indeed I do not attach much importance to Sieber's No. 476. They are incomplete; perhaps they are mixed". [*Crit. Rev. Genus Eucalyptus 2*, pt. 2: 64 (1910)].

The argument for the synonymy of *E. racemosus* Cav. with *E. crebra* F. Muell. is therefore: (1) Bentham's very tentative identification of Sieber's No. 476 as *E. crebra* in *Flora Australiensis 3*: 222 ("To this form — the New England form of *E. crebra* — appear to belong also Sieber's specimens Pl. Exs. No. 476"): (2) De Candolle's statement (*Prodr. Syst. Nat. Veg. 3*: 219) that his interpretation of *E. hæmastoma*, based on specimens of Sieber's No. 476, was the same species as *E. racemosus* Cav. This argument falls down if there is any doubt as to the

identity of Sieber's 476. Maiden himself had doubts and drew attention to the possibility that at least some of this material might be referable to *E. micrantha* D.C. Another instance of the confusion of *E. crebra* with *E. micrantha* occurs in Bentham's *Flora* when he refers specimens collected by C. Stuart in New England to *E. crebra*, whereas Stuart's field note on the bark describes it as "white, separating in thin strips". Maiden's comment on this reference is: "Stuart's bark notes are those of *E. hæmastoma* var. *micrantha* (his specimens have got mixed in some way) and herbarium specimens of the variety and of *E. crebra* are often much alike, unless a complete suite be available". [*Crit. Rev. Gen. Euc.* 2, pt. 2: 66 (1910)]. So twice, and in each case with New England specimens, Maiden gets over a confusion of *E. crebra* and *E. micrantha* by suggesting mixed material. But perhaps both Sieber's 476 and Stuart's specimens *are E. micrantha* (or possibly *E. micrantha* var. *signata* Blak, for De Candolle obviously believed Sieber's No. 476 to be distinct from his No. 497 on which he founded *E. micrantha*). I have dealt with this point at some length to show the weakness in the argument that *E. racemosus* Cav. is *E. crebra* F. Muell.

Since the present article was prepared for press, an interesting note has been published by S. T. Blake in the *Australian Journal of Botany 1*, pt. 2: 306 (1953), viz.:

> "Blakely (*loc. cit.*, pp. 59, 248, 319, etc.) used the name *E. racemosa* Cav. for this species [*E. crebra* F. Muell.]. At Melbourne, there is a small, unlabelled specimen in young bud in a packet marked in Mueller's hand 'E. collectione Cavanillesii dedit Colmeiro' (from the collection of Cavanilles; Colmeiro gave it). This specimen agrees well with Cavanilles' description, and is accepted here as being portion of the type [of *E. racemosa*]. The inflorescence is too immature to allow of certain determination, but the venation of the leaves shows that it belongs to a species quite different from *E. crebra*, but apparently allied to such species as *E. micrantha* DC., *E. radiata* Sieb. or *E. amygdalina* Labill.".

E. racemosus Cav. (or *E. racemosa* as it would be written today using the feminine gender) takes priority over *E. micrantha* DC. as the correct name for the N.S.W. Snappy Gum, so that *E. micrantha* must be dropped and *E. racemosa* Cav. be adopted. *E. crebra* F. Muell. is restored as the correct specific name of the Narrow-leaved Ironbark.

SUMMARY.

E. corymbosus Cav. is synonymous with *E. gummifera* (Gaert.), Hochr. and *E. corymbosa* Sm. As the specific epithet *gummifera* has priority of publication, (as *Metrosideros gummifera* Gaert.), this name stands for the N.S.W. Bloodwood and *E. corymbosus* Cav. falls.

E. platypodos Cav. is synonymous with *E. botryoides* Sm., but the latter enjoys priority of publication and therefore stands for Bangalay and *E. platypodos* Cav. falls.

E. rostratus Cav. is synonymous with *E. robusta* Sm., but the latter enjoys priority of publication and therefore stands for the Swamp Mahogany while *E. rostratus* Cav. falls.

E. obliquus Cav. most probably is synonymous with *E. capitellata* Sm. which, however, has priority of publication and—if the synonymy be proved—will still stand. *E. obliquus* Cav. is *not* synonymous with *E. obliqua* L'Hérit. and must fall owing to preoccupation of the specific epithet by L'Héritier's species.

E. salicifolius Cav. is synonymous with *E. saligna* Sm. and, as the latter was first published, it stands for the Sydney Blue Gum and *E. salicifolius* Cav. falls.

E. racemosus Cav. is conspecific with *E. micrantha* DC. and, as it predates that species by 30 years, it stands as the correct specific name of the Snappy Gum and *E. micrantha* DC. is reduced to the status of a synonym. As a result, *E. crebra* F. Muell. is restored as the correct specific name of the Narrow-leaved Ironbark.

It was unfortunate for Cavanilles that the eucalypts studied by himself and by Smith all came from the same restricted area in the vicinity of Port Jackson and therefore it was inevitable that duplication should occur. It is, however, fitting in view of Cavanilles' pioneer work on the Australian Flora, that at least one of his *Eucalyptus* species should be found to stand.

Acknowledgments.

This paper would not have been possible had not Mr. C. S. Booth, Managing Director of Australian Paper Manufacturers Ltd., given me leave to visit Madrid during the course of a business visit to Europe in 1950, and I record my appreciation of his sympathetic interest in this work.

In Madrid, I am indebted to Professor F. Bustinza, of the Laboratorio de Fisiologia Vegeta, who acted as interpreter for me when I arrived at Botanical Gardens there, to Senor Antonio Rodriquez, who located the specimens for my inspection, who carefully photographed all the existing specimens of eucalyptus collected by Née, sending these to me after my return to Australia, and who supplied me with biographical notes on Née; and to Senor Manuel Martin Bolanos of the Forestry Research Institute of Madrid, who assisted as an interpreter, who has corresponded with me, supplying information since my return to Australia, and who brought valuable information with him when he visited Australia late in 1952. The generous and unstinted assistance of these three gentlemen is gratefully acknowledged.

My thanks are also due to Sir Edward Salisbury, Director of the Royal Botanical Gardens, Kew, who had a search made in the Kew Herbarium to determine if any of Cavanilles' material was held there, and who supplied biographical details concerning Luis Née.

A NEW SPECIES OF PESTALOTIOPSIS (FUNGI IMPERFECTI) ON PITTOSPORUM BICOLOR

by

A. B. COURT

(National Herbarium of Victoria)

PESTALOTIOPSIS PITTOSPORI A. B. Court, *species nova.*

Maculæ male definitæ, ellipsoideæ vel rotundæ, 1–3 x 1–2 mm. diametro. *Conidia* 5-locularia, erecta, fusiformia, nunc paulum curvata nunc angulata, 27–33 x 8–11 mic., ad septa parce constricta. Cellulæ interiores simul 15–18 x 5–11 mic. metientes (media 5–8 x 7–11 mic.), olivaceæ, superioribus duobus quam infera fuscioribus. Cellulæ terminales semper ferme hyalinæ, cellula apicalis cylindrata usque ad conica, a 4 (raro 2, 3, vel 5) setis stelliformibus sed distinctis (raro furcatis) terminans, seta quæque 25–35 mic. longa; cellula infima conica obtusa, epedicellata (evidenter proprietas unica).

Maculæ indefinite, ellipsoidal to circular, 1–3 x 1–2 mm. diameter.

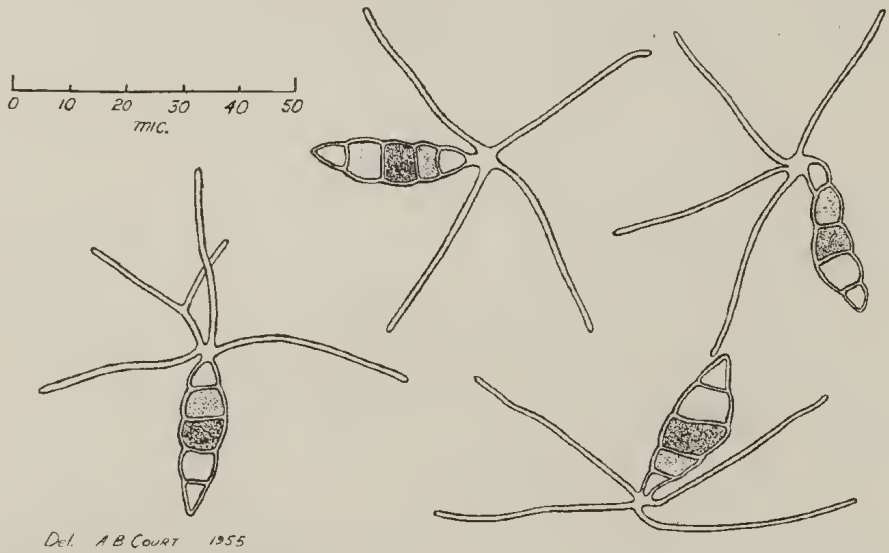
Conidia 5-celled, erect, fusiform, curved or angular, 27–33 x 8–11 mic., slightly constricted at the septa. Interior cells together 15–18 x 5–11 mic. (median 5–8 x 7–11 mic.) olivaceous, the upper 2 darker than the lower. End cells hyaline or nearly so: apical cell cylindrical to conical, bearing 4 setæ, rarely 2, 3 or 5, rarely forked, 25–45 mic. long; basal cell conical, obtuse, pedicel absent (evidently a unique character).

VICTORIA—Sylvia Creek, near Toolangi, on young and mature leaves of *Pittosporum bicolor* Hook., *A. B. Court*, 27 June 1954. A culture of this TYPE has been lodged with the Commonwealth Mycological Institute, Kew.

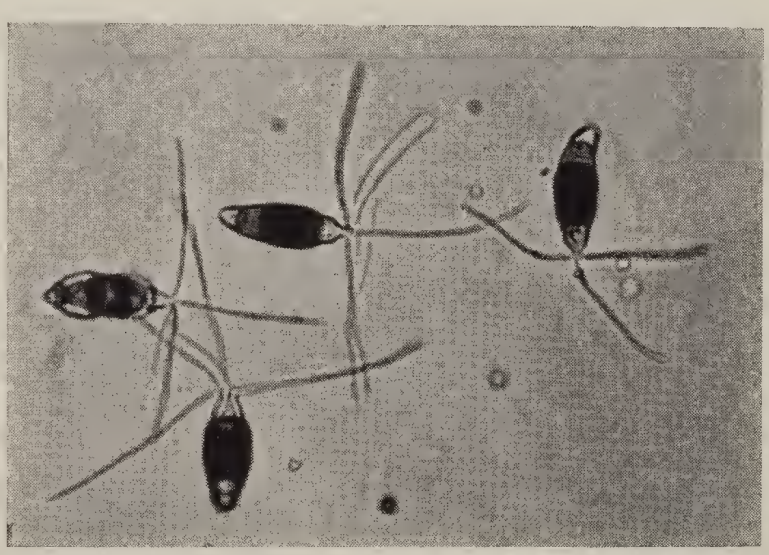
Hitherto, no species of *Pestalotiopsis* Steyært, or of the closely related genus *Pestalotia* DeNot., appear to have been recorded as on *Pittosporum*. All species of *Pestalotiopsis* in the Section *Multisetulatæ* (to which the new species belongs), known to the writer, have a pedicel attached to the basal cell of the conidium; but this species appears to be unique in lacking a basal pedicel which is either completely absent during the development of the conidium or deciduous.

I wish to thank Dr. M. B. Ellis of the Commonwealth Mycological Institute and Dr. E. I. McLennan of the Botany Department, University of Melbourne, for their guidance and help, and Mr. E. Matthaei, also of University of Melbourne, for the photomicrograph [*see* Plate VI.].

PLATE VI



Del. A B COURT 1955
(By camera lucida)



Photomicrograph (x 680) By E. Matthaei

Conidia of *Pestalotiopsis pittospori* sp. nov.

CHANGES IN THE NOMENCLATURE OF THREE VICTORIAN MONOCOTYLEDONS

by

J. H. WILLIS* and A. B. COURT*

1. *POA FAX* Willis & Court, *nomen novum.*

   P. lepida F. Muell. *Fragm. Phyt. Aust. 8*: 130 (1873), non Nees ex Steud. *Synops. Plant. Glumac. 1*: 257 (1854), nec A. Rich. *Tent. Flor. Abyss. 2*: 424 (1851).

As a later homonym, F. Mueller's name *Poa lepida* must lapse (Code of 1952, *Art.* 74). The short epithet *fax* is here bestowed in the necessary new name for this little annual grass of southern Australia (chiefly from coastal and/or Mallee areas) in allusion to its dense, spike-like inflorescence which resembles a torch with ascending tongues of flame.

2. *THYSANOTUS JUNCIFOLIUS* (Salisb.) Willis & Court. *combinatio nova.*

   Chlamysporum juncifolium Salisb. *Paradisus Lond.* T. 103 (1807).

   Thysanotus junceus R.Br. *Prodr. Flor. Nov. Holl.* 283 (1810).

R. Brown considered Salisbury's epithet *juncifolium* inappropriate ("bene, si ex sicco, pessime si ex recenti"), and he changed it to *junceus* when transferring *Chlamysporum* to the genus *Thysanotus* in his *Prodromus.* According to the present (1952) Code of Nomenclature, *Art.* 72, he was not justified and the earlier basinym must be restored in a new combination, *T. juncifolius,* for this lily of coastal New South Wales and far eastern Victoria.

3. *CALADENIA PATERSONII* R.Br., var. *CONCOLOR* (FitzG.) Willis & Court, *status novus et combinatio nova.*

   Caladenia concolor FitzG. *Aust. Orch. I*[7], T8 (1882).

Caladenia patersonii is an extremely variable plant. In *Orchids of New South Wales* 62 (Dec. 1943), H. M. R. Rupp retained *C. arenaria* Fitz.G. and *C. concolor* FitzG. as distinct, but he expressed uncertainty about their status as species. W. H. Nicholls (*Vict. Nat. 59*: 189 (Mar. 1943) had already reduced *C. arenaria* to varietal rank under *C. patersonii.* Both *C. arenaria* and *C. concolor* are little more than colour forms of R. Brown's orchid (type from the Tamar Heads, Tasmania), the former greyish and the latter with intense prune-purplish pigmentation. Accordingly, we make the above new combination which does not seem to have been published previously. *C. patersonii,* var. *concolor* was ignored in Ewart's *Flora of Victoria* (1930) but is known from such widely separated parts of Victoria as the Grampians, Castlemaine, Heathcote, Port Phillip and near Albury.

* National Herbarium of Victoria, South Yarra.

ROBERT BROWN'S BASS STRAIT JOURNAL OF APRIL/MAY 1802

(Embracing landings from the *Investigator* at King Island and Port Phillip.)

Transcribed by J. H. Willis and Coryl I. Skewes* from a Microfilm Copy in Melbourne Herbarium, and Reproduced by Permission of the Trustees of the British Museum.*

April 21, 1802.—We were in sight of land supposed to be the island discovered by Mr. (?) Baudin and also of the shores of N.S. Wales.

April 22.—The island which was 2 or 4 leagues to windward possesses a most unfavourable aspect, sandhills of considerable height, behind which the ground somewhat higher was covered with apparently . . . trees of many of which the dead trunks stripped of their barks alone remained.

April 23.—About 3 o'clock anchored about ¾ of a mile from the island opposite to some low rocks which project a little way from the sandhills and were under . . . of the island the only rocks visible. After dinner I accompanied C. Flinders on shore and staid about an hour. A species of seal different from what we had before met with was seen and one killed. This I did not see, but by the account I received it is most probably new. The cranium of an animal of this (?) kind was also found with very large canine teeth. Two wombats were killed, a kangaroo possessing most of the characters of the . . . but scarce half the size, intermediate between that and the brush kangaroo, it was whitish on the underside of the neck and breast; it was a female with a young one in the false belly. I walked a little way into the brush but was not able, even had time permitted, to penetrate far. I found a few plants which we had not seen on any other part of the coast, as *Styphelia acerosa*, *Fabricia lævigata*, *Casuarina stricta*, etc.

April 24.—At daylight went on shore and remained till 10 o'clock. I got over the first rising ground behind the sandhills, after crossing another, but less deep hollow, found myself near a fresh water lake of no considerable size, probably not much above ½ mile in circumference. The water was highly coloured by decay and vegetable matter . . . in the descent to the lake there were thickly wooded . . . The trees in general (?) small but have often . . . trees of species of *Eucalyptus* of very (?) many different sizes, some of them equal to any we had seen hitherto in New Holland. They were in various stages of decay, some of them still having branches or bark, others fallen and

* National Herbarium of Victoria, South Yarra.

almost entirely decayed, the decay commencing at the centre and proceeding to the circumference. Mosses, lichens and fungs covered them. The ground was in general moist, in some places marshy, and in all places in the neighbourhood of the lake covered with a rich mould formed almost entirely of decomposed gum-trees. The wombat we killed and another was shot by Mr. Bell. The dung of emus was found pretty frequently. They appear to feed strictly on the berries of *Styphelia acerosa*. Tracks of large kangaroos were said to be seen, and the skull of a small animal with large canine teeth, 8 small incisors and 6 grinders in the upper jaw was found. I conjecture, notwithstanding the size of the canine teeth, that it may be a species of New Holland opossum. I observed several new plants today and, among others, 2 small tree ferns, etc.

Prin. Flor. King Insul.

[Remainder of page left blank, apparently for an intended list of King Island plants.—J.H.W.]

About 11 o'clock got under way and stood for the water of N.S. Wales considerably to the westward of Western Port, the same . . . were a few leagues distant from it. The land, very high, was to be seen at 14 leagues from the (?) deck.

April 25.—Wind failed. Barometer still high, nearly 30″ 60; the land continues high.

April 26.—Continued our course along this coast. About 2 o'clock were opposite to a bight, the entrance to which narrow and the extent of the bight not seen. Notwithstanding the forbidding appearance of the entrance and the shoal water, not more than 8 and 6 fathoms without it, we stood into it and deepened our water somewhat, the sounding continuing regular from 7 to 10, near 10 fathoms for a considerable way up, and we now found ourselves in a very extensive sound which at first was suspected to be Western Port of Mr. Bass, although nearly a degree farther to the west; but as we discerned, the appearance of the bay convinced Captain Flinders that it could not be that port, as it appeared to have only one opening whereas Western Port has a double opening, an island being situated in its mouth.

As we advanced, we saw rippling on each side of us and other indications of shoal water. Our object was to get near the east side of the bay and to anchor opposite to the highest point on that side. About 5 o'clock the ship got aground in 2 fathoms, partly I believe in consequence of the man in the starboard chains calling out 4 fathoms, when he had only three, and in consequence of there being no master at three. She remained in the same position and swinging a little. We had but little shore water on any side, 16 feet being the most that the master found anywhere in the neighbourhood. The kedge anchor was now after two hours taken ahead and dropped in three fathoms, and the ship with no great difficulty worked up to it. In about 4 minutes she struck again, her head resting in about 10 feet while she had 12 or 14 feet astern, and on her larboard bow. She was got off in about 15 minutes, and fortunately we got into deep water and anchored in 10 fathoms.

April 27.—About half past 9 o'clock a.m. left the ship, accompanying Captain Flinders in the cutter, to go with the intention of getting upon the hill N. of the ship. We landed at the bottom of the hill, the distance from the ship about 6 or 7 miles. Except for one place about 2 miles from the shore, we had water enough for the ship to within ¾ mile from the shore, having generally about 6 fathoms, sometimes up to 11 and even no bottom with the hand line.

Afternoon. We ascended the hill which was neither distant or difficult, remained on the top, beckoned to the boat, dined there on oysters found at high water mark on the beach! After dinner, left the shore and got on board the ship about 7 o'clock.

Where we landed, the land near the shore was flat but for no great extent. The soil rather light and sandy, but the trees had attained a considerable size, and both they and the shrubs had a healthy appearance. Here we saw a species of *Banksia* forming a tree of very considerable height and girth. As we ascended the hill, the soil improved, deepening and containing a much smaller proportion of sand. On the top of the hill, it was fully as good as on the sides. The trees on the top also were larger than the ones seen on the ascent; the largest were *Eucalyptus*. *Exocarpus cupressiformis* was frequent there, forming small trees with straight branches. A species of *Mimosa, foli. supra decompositis*, and a species of *Banksia* were the most frequent trees.

Our view of the bay was very extensive from the top. In one direction (about N.W.) it was so extensive that we could not see its termination. The water seemed to shut the high and very distant scene in this direction. On the opposite side of the hill we could see an inlet, apparently shoal branched and of considerable extent. It was nearly due east and might (though it didn't very well answer the description of that place) be Western Port. The valleys on each side of the hill, especially that towards the N.E. had a very pleasant appearance, in some places being thickly clothed with wood, in others nearly bare of wood but covered with a bright green verdure, and in others bared spots of a brownish colour were seen. The hill consisted of a very fine grained granite of a reddish-grey colour . . . *vid. specs.*

No other marks of natives, but that of fires, burnt trees and oyster shells scattered in the woods in the lower ground, were met with. The prints of dogs' feet and those of kangaroos were seen. Many birds were seen and heard, and Captain Flinders thought he heard the notes of all at Port Jackson. The *Psittacus Banksii*, a new white-crested species, *Merops carunculatus, Merops nov. sp., Corvus corax*. On the beach a few shells not seen before, chiefly trochus. Oysters we found in considerable numbers thrown up to high water mark on the beach; they were very large and excellent. Mussels, but more sparingly, we also found in the same way.

Mr. Good, who landed opposite the ship, observed nearly the same plants as I had found. At the hills he found the soil good, and from his account and what we could see from the hill that part seemed to resemble very much the bottom of the hill where we were. Mr. Bauer

found the short club of a native. It resembles those of the natives of Port Jackson which they call "waddis" and was . . . with circles of zig zags equidistant and pretty regular. The surface where grasped was made rough. Mr. Foster saw several black swans. *Pelicanus bic*[. . .] and *Pelicanus* |. . .| *remigibus rectricibusque nigris capite dilute* (?) *testaceo* with the common pelican were seen but not in considerable numbers.

April 28.—At 7 got under weigh, at 8 anchored again. About 10, got under weigh and at 3 once more anchored about 2 miles from the hill we ascended yesterday.

April 29.—The Captain left the ship in the cutter, proposing to examine more particularly the bay, and taking provisions for three days.

In the forenoon the ship got under way in order to get down as near the point as possible, there to wait the return of the Captain. We got within our former tract, and got aground once there. It appeared, however, to be a deep bank and we got over in a few minutes. We now stood back for the situation we had left and again came to an anchor about half way between where we grounded and that place.

Messrs. Wahl, Bell and Good went on shore in the afternoon proposing to remain all night, in case of the night getting down, to walk along to the point the following day.

April 30.—In consequence of the wind being foul the ship remained in her present situation, the channel being far too narrow for beating down. In the evening the party that went on shore yesterday returned. They had seen no natives and of Quadrupeds only one native Dog. Of birds they shot a few that we had not seen before. A var. of the Banksian Cockatoo with yellow cheeks and had (?) *Charadrias bil*[. . .| . . . *Psittacus Ham*[. . .] . . . . . Mr. Good found several plants in flower which we had not previously seen. They found fresh water in several places near the beach, abundance of oysters on the beach.

May 1.—In the previous afternoon, Mr. Bauer went on shore. He found scarce any plants we had not before seen. In the afternoon the ship got under way and without grounding got down a considerable way, and as far as known past the shoals. Remained on board.

May 2.—After breakfast I landed on the south shore opposite to the ship and about a mile or mile and a half from the entrance of the Port. The country here consisted of gentle swells and hollows, pretty uniformly covered with grass and in many places rather thinly furnished with trees which grow, either the *Banksia* formerly observed or *Casuarina equisetifolia* and *Mimosa odoratissima*, forming small trees. Besides the grass which forms the greater part of the verdure, some of the herbaceous plants examined in the meadow land as *Geranium ple*[. . .|, *Convolvulus, Scævola, Picris, Glycine lacin*[. . .|, etc.

Towards the opposite shore, within a direct line . . . and half a mile distant, the hills were more sandy and covered with low shrubs as *Fabricia, Correa alba, Croton aff. viscida*, and a few dwarf *Styphelias* and *Styphelia lanceolata* . . . here but a shrub, but in less . . . and more fertile situations forming a small tree. The soil on the slopes of the hills was rather light and sandy but a tolerable depth. In the hollows

it was deeper richer and black, in some places approaching to Bog. We observed the recent dung of Kangaroos but neither saw the animal itself or any Quadrupeds. Very few birds were seen.

After remaining about an hour and a half on shore, returned on board and at 12 o'clock left the ship for the north shore, which we reached about 2 o'clock. We landed a little below the ship on a very narrow neck of land which we crossed and in the inlet saw many black swans. We could not get within certain shot of them, and it appeared that all of them could fly.

The soil on the neck of land and its vegetable productions were principally like those of the opposite shore. The low cliffs on the shore on both sides were calcareous, not containing shells. The only plant I had not previously seen was *Statice exal*|. . . . . .| The shrubby *Salicornia* I found in flower . . . Traces of natives we found in several places. In one the ashes of their fire with boughs on the windward. Here we found a number of cockle shells, a few fish bones and shells of cray fish, with several pieces of bark open at each end and more turned in at the sides, of about a foot or a foot and a half in length. We supposed they were for carrying water, which is not to be found in this neighbourhood. They would contain not more than a pint and a half.

We got on board at sunset. The Captain had returned an hour before. He had sailed around the Bay in the cutter and landed in several places. It is not quite so extensive as from the view we had of it from the hill ascended on the 27 April we had supposed. There being a considerable tract of very low land in front of the hill which the water appeared to skirt—the most considerable hill Capt. Flinders ascended, its distance from the beach was supposed about 10 miles. It is composed of coarse grey granite, exposed in blocks on the summit. Captain Flinders had intercourse with the natives whom he described as apparently better fed and fully as intelligent as those of K. G. Sound. Many of them had the skins of Kangaroos in the same manner as those at K. G. Sound. They paddled with their arms very readily, noticing to wind for any (?) return. They were much pleased with a present of 2 shags which C. Flinders had before given them. Their women were left out of sight.

May 3.—At 7 o'clock got under way, drop and down to the mouth of the bay. Most of the day and during the whole night had a fresh gale.

May 4.—In the morning were abreast of Wilson's Promontory, having been carried on considerably by the westerly current. This promontory consists of very high land, rising with distinct mountains in some places. A very remarkable high hemispherical island lies off it at no considerable distance.

May 5.—In the afternoon were in sight of land supposed to be Cape How.

[Note.—Much of the journal is scribbled on poor paper and is exceedingly difficult to decipher; smudging has rendered some parts illegible. In the foregoing transcription, uncertain words are prefixed by a query (in brackets) while dots indicate that a word or words could not be deciphered. In a few instances, where Brown has used binomials that still remain unpublished (for plants and birds) the specific epithet is deliberately part-spelt in this transcription, so as to render it ambiguous.]

ROBERT BROWN'S COLLECTINGS IN VICTORIA

by

J. H. WILLIS

(National Herbarium of Victoria)

To anyone interested in the history of botanical science in Victoria peculiar importance attaches to those plants which were found within the confines of the State by that greatest collector and elucidator of Australian vegetation — Robert Brown. His specimens were the first ever to be recorded from Victorian soil (such plants as George Caley may have acquired, while at Western Port with Lieut.-Commander James Grant in March 1801, were never made known) and no subsequent collections were taken until Major T. L. Mitchell's overland journey to Portland (June-October 1836). Meanwhile, sundry collectors had been operating in all the other Colonies. Thus Brown may undeniably claim the title "father of Victorian botany".

During his three and a half years' intensive botanizing around Australian coasts (December 1801-May 1805), Brown visited parts of every State in the present Commonwealth and estimated that he had collected approximately 3400 species, more than 2000 being new to science. Less time was spent in what is now Victoria than elsewhere, and correspondingly fewer plant species were collected here. Only the extreme southern portion of Port Phillip Bay was examined, and Brown refers to this region as "Port XVI".

The *Investigator*, commanded by Captain Matthew Flinders, had remained within Port Phillip Heads for a week, between April 26 and May 3, 1802, while Brown ascended Arthur's Seat and explored the surrounding heathlands of Mornington Peninsula, landing also where Portsea now stands and visiting Swan Bay. He was not among the party which crossed Port Phillip to the western plains and climbed Flinders Peak in the You Yangs. On January 18, 1804, Brown returned to Mornington Peninsula from the Tamar (Tasmania) and spent another week in the vicinity of present Sorrento during the closing days of Collins's unsuccessful attempt at a penal establishment there. He left again for Tasmania with the last party of evacuees on the *Lady Nelson*, January 27—having collected *Brunonia* Sm., which now bears his name.

The microfilm of Brown's yet unpublished journal at the British Museum (*see* transcription in preceding paper) describes his ascent of Arthur's Seat (1000ft.), his landings near Point Nepean and Queenscliff between April 27 and May 2, 1802; but we have no available information on his movements during the second brief visit of January 1804 — "Port Phillip" is the only locality written on Brownian herbarium sheets that I have examined. In his journal Brown usually gives more space to general natural history and domestic chit-chat about the voyage than to discussing the flora at his various landing points—but it must be remembered that his official rôle on the *Investigator* was as naturalist, not botanist.

The Mornington Peninsula, at and south of Arthur's Seat, has an average annual rainfall gradient of 25-30 inches and affords a diversity of geological features: granite, dacite, older-basalt, dune limestone, recent sand dunes and alluvium are all present. Vegetational types are also varied, embracing plants characteristic of sea cliffs, freshwater swamps, heathland, stringybark-peppermint forest and even fern gullies. The various species that Brown noted hereabouts were doubtless drawn from all of these communities, as well as the saltmarsh at Swan Bay. The granite and basaltic areas of Arthur's Seat, alone, at present support no less than 250 species of indigenous vascular plants.

Unfortunately both visits to Victoria were made late in the summer season when very little would be in bloom, and Brown most probably did not bother to collect many plants which were already familiar to him from flowering material taken in Tasmania or New South Wales. We have yet to know the full extent of his Port Phillip gatherings. The seven volumes of Bentham's *Flora Australiensis* attribute 76 vascular species to Brown from Port Phillip district. Of these, 16 duplicate collections, half of them types, are now housed in the National Herbarium of Victoria which also has at least seven other Port Phillip species collected by Brown, though apparently overlooked in Bentham's *Flora*.

The publication of a list (alphabetically arranged) of the 96 species, in 74 genera, definitely known to have been collected (or noted) in Victoria by Robert Brown is deemed worthwhile. Additions may then be made, as other of his records come to light. In the following list, the abbreviation "MEL" denotes that duplicate Brownian material is preserved at the Melbourne National Herbarium. Indications are also given wherever Port Phillip was a type locality for any plant (viz.: in 26 instances, 9 types being wholly from there) and where a plant was noted in Brown's journal or manuscript botanical descriptions, but apparently not collected (13 instances). Nine other species are mentioned under ms. names in Brown's unpublished botanical descriptions, but it is not possible to recognise them with any degree of certainty, and they have been omitted from the following list. Microfilm copies of all Brown's ms. botanical descriptions of Australian plants (housed at the British Museum) are held by the Mitchell Library in Sydney, Division of Plant Industry (C.S.&I.R.O.) in Canberra, and by the libraries of Perth, Adelaide, Brisbane and Lae (New Guinea) herbaria. The writer gratefully acknowledges the loan from Miss N. T. Burbidge, Division of Plant Industry, Canberra, of a type-written Index to these unpublished descriptions; from this Index the names of several species noted by Brown at "Port XVI" were abstracted.

Acacia retinodes *Schlechtend.*
A. verticillata *Willd.*
Acæna anserinifolia (*Forst.*) *Domin* (MEL)
[*syn.* A. sanguisorbæ (*L.f.*Q *Vahl*]
Acrotriche serrulata (*Labill.*) *R. Br.* (MEL)
Adriana quadripartita (*Labill.*) *Gaudich.*
Alyxia buxifolia, *R. Br.*
Arthrocnemum arbusculum [Brown's journal, under "*Salicornia*"]
Astroloma humifusum (*Cav.*) *R. Br.* (MEL)
—not in Benth. *Fl. Aust.*
Banksia integrifolia L.f. [Brown's journal as *Banksia*]

Banksia marginata *Cav.*
Beyeria leschenaultii (DC.) Baill. [Brown's journal, under "*Croton*"]
Billardiera ?scandens *Sm.* [Brown's ms. descr. under "*B. media*"]
Bossiæa prostrata *R. Br. in Ait.*
Brunonia australis *Sm.*
Cassytha pubescens *R. Br.* (TYPE in part; also Tas., N.S.W., Q.)
Casuarina stricta Ait. [Brown's journal, under "*C. equisetifolia*"]
Cladium junceum *R. Br.* (TYPE in part; also N.S.W., Tas.)
C. procerum *S. T. Blake* [*syn.* C. mariscus Auctt., *non* (*L.*) *Pohl.*]
Clematis microphylla *DC.*
Coprosma hirtella *Labill.*
Correa alba *Andr.* (MEL)
Culcita dubia (*R. Br.*) *Maxon* [*sub Davallia dubia*]
Cynoglossum suaveolens *R. Br.* (TYPE in part; also N.S.W.)
C. australe *R. Br.*
Daviesia corymbosa *Sm.*
D. latifolia *R. Br.*
Dichondra repens *R. & G. Forst.*
Dillwynia glaberrima *Sm.* (MEL) [*sub* D. ericifolia, var.]—not in Benth. *Fl. Aust.*
Epacris impressa *Labill.*
Epilobium billardierianum *Ser. in DC.* (MEL) [*sub* E. glabellum, No. 4476 ?] —not in Benth. *Fl. Aust.*
Eriochilus cucullatus (*Labill.*) *Reichb.f.* (MEL) (TYPE in part E. autumnalis *R. Br.*; also N.S.W., Tas.) [*sub* Caladenia unguiculata]
Eucalyptus viminalis *Labill.*
Exocarpos cupressiformis *Labill.*
Geranium pilosum *Forst.*
Glycine clandestina *Wendl.*
Gompholobium pedunculare *Lodd.* [*syn.* G. huegelii *Benth.*]
Goodenia ovata *Sm.*
G. geniculata *R. Br.* (TYPE in part; also Tas.)
G. humilis *R. Br.* (MEL) (TYPE wholly)
Hakea nodosa *R. Br.* (TYPE wholly)
Helichrysum dendroideum *N. A. Wakefield* [*sub* Ozothamnus ferrugineus]
Hibbertia fasciculata *R. Br. in DC.*
H. sericea (*R. Br. in DC.*) *Benth.* (MEL) (TYPE wholly) [*sub* Pleurandra sericea, No. 4893]
H. stricta (*R. Br. in DC.*) *F. Muell.* [Brown's ms. descr. as *Pleurandra stricta*]
Hypericum gramineum *Forst.f.* [Brown's ms. descr. under "*H. aureum*"]
Hypoxis glabella *R. Br.* (TYPE wholly)
Imperata cylindrica (*L.*) *Beauv.* [Brown's ms. descr. under "*I. arundinacea*"]
Isopogon ceratophyllus *R. Br.* (TYPE wholly)
Lepidosperma congestum *R. Br.* (TYPE in part: also S.A.) [erroneously cited with L. globosum in Benth. *Fl. Aust.*]
Leptospermum lævigatum (*Gærtn.*) *F. Muell.*
L. lanigerum *Sm.* (MEL) [No. 4643, *det.* F. Muell.] —not in Benth. *Fl. Aust.*
L. myrsinoides *Schlechtend.* (MEL) —not in Benth. *Fl. Aust.*
L. juniperinum *Sm.* (MEL) —not in Benth. *Fl. Aust.*
Leucopogon parviflorus (*Andr.*) *Lindl.* [*sub* L. Richei]
L. virgatus (*Labill.*) *R. Br.* (MEL) —not in Benth. *Fl. Aust.*
Limonium australe (*R. Br.*) *Kuntze* (TYPE in part: also Tas., N.S.W., Q.) [*sub* Taxanthema australis]
Linum marginale *A. Cunn. ex Planch, in Hook.*
Lobelia anceps *Thunb.*
Lomatia ilicifolia *R. Br.* (MEL) (TYPE wholly)
Lycopus australis *R. Br.* (MEL) (TYPE in part; also Tas., N.S.W., Q.)
Melaleuca pubescens *Schauer in Walp.*
Olearia glutinosa (*Lindl.*) *Benth.*
O. myrsinoides (*Labill.*) *F. Muell.*
O. ramulosa (*Labill.*) *Benth.*
Patersonia longiscapa *Sweet*
Pelargonium ?australe *Willd.* [Brown's ms. descr. as *Pelargonium*]
Persoonia juniperina *Labill.* (MEL)
Pimelea glauca *R. Br.* (TYPE in part; also N.S.W., Tas.)
P. octophylla *R. Br.* (MEL) (TYPE wholly)
Plantago varia *R. Br.* (TYPE in part; also N.S.W., Tas.)
Platylobium obtusangulum *Hook.* (MEL) [No. 5074]
Pomaderris apetala *Labill.*
P. oraria *F. Muell. & Reissek* [*syn.* P. racemosa *Auctt., non Hook*]
Pultenæa gunnii *Benth.* (MEL) [*sub* P. revoluta]
P. pedunculata *Hook.*
P. tenuifolia *R. Br. in Sims*
Rubus triphyllus *Thunb* [Brown's ms. descr. under "*R. sterilis*"]

Samolus repens *Pers.* [Brown's ms. descr. under "*S. littoralis*"]
Scævola calendulacea (*Andr.*) *Druce* (TYPE in part S. suaveolens *R. Br.* also N.S.W., Q.)
S. microcarpa *Cav.*, var pallida (*R. Br.*) *Benth.* (MEL)
(TYPE wholly S. pallida *R. Br.*)
Selaginella uliginosa (*Labill.*) *Spring.*
Senecio lautus *Forst.f. ex Willd.* [Brown's ms. descr. under "*S. polymorphus*"]
Sporobolus virginicus (*L.*) *Kunth*
Tetragonia expansa *Murr.*
Tetrarrhena juncea *R. Br.* (TYPE wholly)
Tetratheca ciliata *Lindl.* (MEL)
Thesium australe *R. Br.* (TYPE in part; also N.S.W., Tas.)
Velleia paradoxa *R. Br.* (TYPE in part; also Tas.)
Veronica calycina *R. Br.* (TYPE in part; also Tas.)
V. derwentia *Littlej. in Andr.*
Viminaria juncea (*Schrad.*) *Hoffmgg.* [*syn.* V. denudata *Sm.*]
Viola betonicifolia *Sm.* (MEL)
Wahlenbergia bicolor *N. Lothian* (TYPE in part; also N.S.W.) [*syn.* Campanula gracilis *Forst.*, var. stricta *R. Br.*, No. 2617]
W. billardieri *N. Lothian*
Wilsonia humilis *R. Br.* (MEL) (TYPE in part; also W.A.)
Xyris gracilis *R. Br.* (TYPE in part; also Tas.)

[In the preceding paper, a complete transcript of Brown's journal account of his experiences on King Island and in Port Phillip Bay, April-May 1802, was given. Grateful appreciation is extended to the Photographic Section at Australia House, London, which undertook the immense task of filming Brown's ms. journal and some 50,000 sheets of botanical descriptions.]

NOTES ON THE GROWTH OF AN ENGLISH ELM

In the *Proceedings of the Royal Society of Victoria 31*: 377 (1918), the late Professor A. J. Ewart recorded the growth in circumference of an English Elm, *Ulmus procera*, situated in the King's Domain near the present Shrine of Remembrance, Melbourne.

A smooth surface, which is still apparent, was prepared on a horizontal line, 5 ft. 6 ins. from the ground. The circumference in 1918 was 6 ft. 10 ins., and no growth was shown from July until the end of October. Growth began in November, but even at the middle of December the increase barely exceeded a quarter of an inch. The main growth took place from the 15th of December to the end of February, and amounted to one inch. It remained stationary until March, but at the beginning of April had decreased by 0.2 of an inch, and at the end of April by 0.3 in. Ewart stated: "Probably this contraction is due to the cambium layers being no longer so highly distended as when actually growing".

Reporting on similar experiments, D. T. MacDougal in "Growth in Trees", Carnegie Institute of Washington *Publication* No. 307 (1921), states: "The greatest amount of increase or change in volume is that which results from the multiplication by fission of the cambium cells, and their enlargement accompanied by the differentiations mentioned, all based upon hydration of cell-colloids".

In a similar experiment on the growth of a cultivated deciduous Velvet Ash (*Fraxinus velutina*), he records that trunk enlargements began on March 10th and continued until August 25th. The total increase in diameter of the tree amounted to 26 mm. or an inch per year.

The English Elm tree in the Domain, Melbourne, was again measured along the prepared line on August 15th, 1951, the circumference being then 9 ft. 11.5 ins.—an increase of exactly three feet (36 ins.) in thirty-three years. This corresponds closely to the rate of growth recorded of other similarly cultivated deciduous trees growing north of the Equator, each tree having a five months' growth range.

—P. F. Morris.

THE PRESENT POSITION OF MUSCOLOGY IN VICTORIA

(A Centennial Review)

by

J. H. WILLIS

(National Herbarium of Victoria)

Mr. G. O. K. Sainsbury, the eminent New Zealand authority on mosses, wrote in *Revue Bryologique* (n.s. Vol. 14, p. 30, 1944):

> Bryological research on the Australian continent has been so desultory that it is impossible to estimate the probability of any future discovery.

Insofar as Victoria is concerned, such a rebuke is well-founded. Collections and accurate determinations of the moss flora have only been made from relatively few, scattered centres, while vast areas of the State (including several northern counties) have never been worked bryologically at all. During the 42 years between February 1905 and February 1947 no additional records were made to the State's moss flora and only a few quite inconsequential (and not very accurate) lists were published in natural history journals. The situation with the State's hepatic flora is as bad, or worse.

Interest in our *Musci* has always been at a low ebb and workers in this neglected field have been surprisingly few—probably because of the discouraging lack of literature, not to mention the difficulties of keeping in close touch with experts overseas. Tasmania has fared much better. Its rich bryophytic flora is fairly well known and at least three major accounts of it have been published (the first by J. D. Hooker in 1858, the last by L. Rodway between 1912 and 1916); indeed, the Tasmanian bryophyte manuals are invaluable to anyone wishing to work out species in Victoria, since the majority are common to both States.

HISTORICAL NOTES ON THE STUDY OF VICTORIAN *MUSCI*

Nothing whatever was known about Victorian mosses or hepatics before the arrival here of Dr. (later Baron Sir) Ferdinand von Mueller in 1852; but by October 1854 Mueller was able to compile the first moss census for the Colony—a list of 70 species published as part of the *Second General Report of the Government Botanist*, 1854, p. 17. He had collected them all himself during exploratory trips in various parts of Victoria, and had submitted his specimens to the Hanoverian bryologist E. Hampe who, in collaboration with C. Müller, described 17 of them as new to science [*Linnæa 26*: 489-505 (1853)]. Another 72 species were added to the list in the *Annual Report of the Government Botanist* for 1858, p. 12—largely as a result of Mueller's activity in the high alpine and subalpine country (Mt. Wellington, Mt. Loch, Mt. Feathertop, Mt. Buffalo, the Cobboras, Grampians, etc.). Again, Hampe had made most of the determinations and there were 20 novelties among

them—described in *Linnæa 28*: 203-215 (1856). Hampe's type specimens are now preserved in the British Museum, but there are duplicates of most in the National Herbarium of Victoria.

Simultaneous with his sendings to Germany, Mueller had submitted a large number of specimens to England for examination by W. Mitten who reported on 212 collections of Victorian mosses (besides a few hepatics) in Hooker's *Journal of Botany 8*: 257-265 (1856). There were 110 species involved and 13 were published as new, but in two instances Mitten re-described species that had been diagnosed only a few months previously by Hampe—so his *Meesia macrantha* and *Neckera leptotheca* had to become *M. Muelleri* C. M. & Hpe. (1856) and *N. aurescens* Hpe. (1856) respectively.

No further moss records are listed in Mueller's subsequent Annual Reports to Parliament, but Hampe continued to name material that he received [*Linnæa 30*: 623-646 (1860); *36*: 513 (1870), etc.], and after his death in 1880, Baron von Mueller referred all moss specimens either to Mitten in Sussex, England, or C. Müller in Halle, Germany—both authorities described new species. In 1864 the Baron had published Fascicle 1 of an illustrated work entitled *Analytical Drawings of Australian Mosses* (Govt. Printer, Melbourne), but no succeeding parts ever appeared; this is still the only brochure dealing principally with mosses in Victoria—all but 6 of the 20 species figured.

In 1883, Mueller contributed a systematic list of Australian mosses as enumerated by W. Mitten, to the *Proceedings of the Royal Society of Victoria* (19: 49-96). Mitten here brings together many new records for our Colony, but at the same time he synonymizes numbers of the names previously published. Thus revised and considerably augmented, the State's *Musci* stood at 195 species, while the generic and ordinal nomenclature (as adopted by Mitten) was more in conformity with what we use today. The last determinations of Victorian bryophytes by Mitten seem to have been made about 1894; he died at an advanced age in 1906.

About this time, D. Sullivan (school master of Moyston) and F. M. Reader (a chemist, first in Melbourne and later in Dimboola) became keenly interested in mosses and began forwarding large suites of specimens to Dr. C. Müller of Halle. There were very few species in their respective districts that escaped the eye of these local enthusiasts. Whereas Mitten had been inclined to identify Australian mosses with boreal species, Müller erred gravely in the other direction and regarded all our southern forms as endemic. He published "new" species on the slightest pretext and the numbers affecting Victoria rose to fantastic figures. One of the greatest difficulties now confronting Australian muscologists is how to deal with these multitudes of dubious Müllerian "species". Apart from the inaccessibility of some of Müller's writings, many of his type specimens are presumed lost, although Dr. Froehlich recently reported that material of many Australian moss types are in the Vienna Natural History Museum. Occasionally he *did* succeed in describing a species that was new to science, otherwise one might conveniently disregard *in toto* his later contributions

to Victorian bryology—appearing chiefly in *Hedwigia*, 1897/9. Prolonged work among living mosses in Victoria has given the writer a very conservative attitude toward speciation; but there is a marked tendency for northern bryologists, who study only pieces of exsiccatæ, to "split" our species—in so many cases the supposed new entities turn out to be mere habit forms or mutations of old variable ones, with which the experts were unfamiliar.

C. Müller died early in 1899, within four years of the deaths of D. Sullivan (1895) and Baron von Mueller (1896). For the next decade F. M. Reader worked alone on West Wimmera and Grampian mosses, sending his collections to V. F. Brotherus in Finland—Reader died in 1911. Between 1902 and 1905, Rev. W. W. Watts and T. Whitelegge published a "Census Muscorum Australiensium" as two supplements to the *Proceedings of the Linnean Society of New South Wales*. Unfortunately this check-list embraced only acrocarpous mosses, but it remains today as the most recent record available for the major part of our Victorian moss flora, incorporating the various effusions of Carl Müller and giving literary references for all species.

Rev. Watts paid a brief visit to Melbourne in September 1902 and collected 30 species [q.v. *Victorian Naturalist 21*: 141 (Feb. 1905)] of which four were later described as new by Brotherus [*Proc. Linn. Soc. N.S.W. 41*: 575-596 (Dec. 1916)]. This was the last fragment of critical work to be published on Victorian *Musci* until quite recent years.

R. A. Bastow, a government draughtsman who died in 1920, made a large collection of Tasmanian mosses during the 1880's and wrote two noteworthy brochures on the *Musci* and *Hepaticæ* of the Island State. From 1888 until his death he assiduously collected specimens from various parts of Victoria (Melbourne, Healesville, Warburton, Dandenongs, Otways, Buninyong, Lakes Entrance, etc.). All these are now housed in the National Herbarium, South Yarra, together with two large Mss. volumes of moss descriptions and delineations respectively — many are copied from J. D. Hooker's standard works (*Flora Tasmaniæ*, *Flora Antarctica* and *Flora Novæ-zelandiæ*.); but, unfortunately, few of the sketches fulfil modern requirements for reproduction. For a long period, Bastow was the only man in Victoria with a good working knowledge of the general moss flora, and with his death collecting practically ceased here for the ensuing 20 years, broken only by a few alpine records of A. J. Tadgell in the Bogong region [q.v. *Vict. Nat. 41*: 70 (Aug. 1924)] and sundry specimens — chiefly from Creswick, Cockatoo and Beenak districts—gathered by the writer.

Between 1910 and 1920, J. Breidahl collected some 160 numbers of Victorian mosses from around Melbourne, the Dandenongs, Healesville, Marysville, Plenty Gorge, Werribee Gorge, Mt. Buffalo and Beech Forest (Otways). These were mostly determined by Bastow (not always accurately), and are now incorporated in the Herbarium, Botany Department, University of Melbourne, where are also housed several collectings by Miss Sybil Church (1938/41) at Lorne, Cowes, Healesville and the Dandenongs.

It is a matter for regret that certain organized natural history expeditions to unfamiliar parts of Victoria (e.g. to the Mallee and Lady Julia Percy Island) within the past quarter of a century have, almost without exception, failed to take stock of the *Bryophyta*—surely the easiest and least bulky of all plants to collect.

REVIVED ACTIVITY IN THE PAST DECADE

During 1942 Mr. Frank Robbins took up the study of our mosses and began collecting intensively near his home at Castlemaine, also in the Bendigo, Mt. Macedon and Grampians areas. Every doubtful specimen went to G. O. K. Sainsbury at Wairoa, N.Z., for examination. Within three years he had accumulated a prodigious amount of material and was receiving specimens from several correspondents (notably W. Hunter of Bairnsdale and C. Beauglehole in the Portland district). Since 1947 ill-health has forced Mr. Robbins to abandon bryological researches and his entire collection is now in the possession of Mr. H. T. Clifford, Melbourne. Among several new Victorian records that Robbins established from Castlemaine [*see* Sainsbury in *Vict. Nat. 63*: 222 (Feb. 1947)] was the type of a remarkable new family *BRYOBARTRAMIACEAE*, described by Sainsbury in *The Bryologist 51*: 9-13, Mar. 1948 [*see* also R. D. Lee in *Vict. Nat. 69*: 9 (May 1952)].

The late world authority, H. N. Dixon, published (posthumously) in *Notes from the Royal Botanic Gardens, Edinburgh 20*: 93/4 (Mar. 1948) another two new records for Victoria—*Fissidens pachyneuron* and *Campylopus kirkii*.

Through C. Beauglehole's recent field activity in the far South-west we have available almost complete lists of *Musci* for the region between Portland and the Glenelg River, including the Lower Glenelg National Forest (a rich moss area). He has also made collecting excursions to the Grampians, Otways, Colac district, Dimboola, Little Desert and as far afield as the Kulkyne National Forest near Hattah.

H. T. Clifford is now engaged on the preparation of a full modern check-list of Victorian *Musci* (with synonymy wherever known) and, as a forerunner to this important project, he collaborated with the writer [*Vict. Nat. 68*: 135-138 (Dec. 1951), 151-158 (Jan. 1952)] in publishing the names of 32 mosses that had never been recorded previously for the State—most of these are discoveries within the last decade and ten are also new generic records. All specimens about which there was any uncertainty were submitted to G. O. K. Sainsbury (N.Z.), E. B. Bartram (Pennsylvania), A. LeRoy Andrews (New York) or experts in Europe. In the past three years I have published five critical papers, forming a series, "Systematic Notes on Victorian Mosses," through the *Victorian Naturalist* (*1*. June 1952; *2*. July 1953; *3*. Jan. 1954; *4*. Feb. 1955; *5*. May 1955); in the fourth of this series, 15 additional species are added to the Victorian moss flora, and in the fifth two new species are described and illustrated.

When a State check-list has been published, we propose to follow this up with regional distribution data (as far as this is known) for every species—a task involving the examination of copious material housed in

various herbaria, both departmental and private. It is quite impossible for a Herbarium specialist to visit every part of the State, and he must rely upon co-operation by local collectors. Only through the stimulation of sufficient local interest can one fill in much of the remaining blank space on the moss distribution map of the State—the Murray Valley, between Kulkyne and the Cobboras, for instance. The National Herbarium will undertake to determine, as far as possible, and to place on record any satisfactory specimens that correspondents are willing to send along.

A knowledge of what mosses do occur in Victoria and how to recognize them should precede investigations into the more fascinating realms of general ecology (variations with soil and climate), life histories, etc.

Enough is known already to anticipate the total number of species occurring in the State. When synonymies are fully worked out, this figure will most probably be in the vicinity of 250. More than 1900 reliable county-species records are now tabulated (about 58% of the estimated total, 3300), and 9 or more species are known to occur in each of the 37 Victorian counties—County of Buln Buln (including Wilson's Promontory and part of the Baw Baws, up to 5,100 ft.) is richest, with at least 130 species. Mosses which occur in the greatest number of counties are also those regarded as ecological "wides", including some of cosmopolitan range; for example, *Bryum billardieri*, *Campylopus introflexus* (cosmop.), *Ceratodon purpureus* (cosmop.), and *Funaria hygrometrica* (cosmop.) are each known from 31 counties, while *Bryum pachytheca* and *Triquetrella papillata* occur in at least 30.

[NOTE—In May 1955 the Royal Society of New Zealand published, as Bulletin No 5, *A Handbook to the Mosses of New Zealand* by G. O. K. Sainsbury. This welcome book is liberally illustrated with line drawings, has excellent keys to genera and species, and gives a full description of 440 species known to occur in the Dominion. Since 82 per cent. of the Victorian moss flora is represented also in New Zealand and is so adequately treated in this manual, the latter will be of the utmost use to bryologists in our State.]

A REMARKABLE LICHEN FROM ARID AUSTRALIA

by

P. N. S. BIBBY †

(National Herbarium of Victoria)

PARMELIA SEMIVIRIDIS (F. Muell. ex. Nyl.) P. Bibby, *combinatio nova.*

Scyphophorus (?) R. Brown, No. 525b;
Parmeliopsis semiviridis F. Muell. ex Nyl. *Syn. Meth. Lich. 2*: 57 (1863);
Chondropsis semiviridis Nyl., in Cromb. *J Linn. Soc. 17*: 397 (1879);
Parmelia hypoxantha Müll.-Arg., *Flora 39*: 85 (1881);
Parmelia hypoxantha Müll.-Arg., var. *major* Müll-Arg., *Flora 66*: 77 (1883).,

Thallus 2–6 cm. in diameter, hygrochasic, growing on arid soil, loose and easily blown about by the wind, lobes 2—3 mm. broad, repeatedly dichotomously branched, hardly imbricate; upper surface smooth, greyish-green, lower surface pale-yellow, devoid of rhizinæ, slightly rugose; apothecium rare, sessile 2 mm., disk concave, reddish-brown; ascus and spores wanting. K, reddish, C, none, K+C, none.

Localities: VICTORIA (north-west)—Murray River, *F. Mueller* (TYPE in MEL); Hattah Lakes, *J. H. Willis;* Pink Lakes near Walpeup, *P. Bibby;* Kulkyne National Forest, *C. Beauglehole;* Thurla, *J. H. Willis.* (?) *TASMANIA*—Mt. Wellington (Table Mt.), *R. Brown. SOUTH AUSTRALIA*—Mueller river, *Birch;* Koonamore Vegetation Reserve, *B. S. Barrien;* Colona homestead, *J. H. Willis:* Nullarbor homestead, *J. H. Willis;* Loveday, *E. J. Vickery. WESTERN AUSTRALIA*—Fraser's range, *R. Helms.* Nos. 43 and 73; Eucla, *J. Batt.*

I have previously referred to R. Brown's specimens purporting to have come from Mt. Wellington [see *Victorian Naturalist 67*: 186 (1951)]. Photostat copies of the types of J. Müller's *Parmelia hypoxantha* and *Parmelia hypoxantha*, var. *major*, prove them to be identical with the type of *Parmelia semiviridis*, and I can see no reason to segregate the var. *major*.

Parmelia hypoxantha Stirt. [*Qd. agric. J. 5*: 486 (1899) and *Trans. & Proc. N.Z. Inst. 32*: 76 (1900)] from Queensland is a different plant, the name of which is invalid, since J. Müller (Müll.-Arg.—of Argovie) published his species 18 years before Stirton.

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† While this paper was in press, the author died on 6th June, 1955, after a long illness. He was the only one in Australia carrying out critical taxonomic researches on lichens and hepatics, and his loss will be felt keenly at the Melbourne National Herbarium where he joined the professional staff in 1938.

—J.H.W.

A BIBLIOGRAPHY OF THE AUSTRALIAN BAOBAB

(*Adansonia gregorii* F. Muell. in Hook.)

by

J. H. WILLIS

The Australian Baobab (*Adansonia gregorii*) ranges along tropical coasts from near Broome in the Kimberley Division (W.A.) to the Fitzmaurice River region, north of Victoria River estuary (N. Terr.)—a lineal distance of at least 550 miles—and it is seldom found much more than 100 miles inland. A companion species (*A. digitata*) on the other side of the Indian Ocean is widely distributed throughout tropical Africa, and there is no representation of the genus in such intervening countries as Arabia and India; but eight other species have been attributed to Madagascar. This remarkable disjunction and the extraordinarily inflated trunks of these two baobab trees—which may be almost as wide as high—render them among the most intriguing vegetable productions of the globe.

Ernestine Hill (1940) has given a graphic pen-portrait of the Australian species —"a Caliban of a tree, a grizzled, distorted old goblin with a girth of a giant, the hide of a rhinoceros, twiggy fingers clutching at empty air"—and it is considered that a bibliography may be of some interest to local readers. So very picturesque is the baobab that it is probably the most photographed tree of the Australian tropics, and almost all the published pictures of it are habit studies. In the following chronological list of 55 references, a prefixing asterisk (*) indicates that the particular reference is accompanied by an illustration. The list is as complete as practicable; but newspaper articles have not been taken into account, and it is possible that some fictional references to the tree have been missed. Periodicals are cited in Italic type:

1827.

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1842.

Heward, Robert—"Biographical Sketch of the Late Allan Cunningham" in *London J. Bot. 4*: 261. [The baobab described from Cambridge Gulf and Careening Bay, 24/9/1820].

1846.

* Stokes, J. Lort—Discoveries in Australia; . . . Voyage of H.M.S. Beagle *1*: 128 & *2*: 115-117. [Sketch of tree and fruit, with brief description, in Vol. 2].

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1953.

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RECENT CHANGES IN THE NOMENCLATURE OF THREE AUSTRALIAN CONIFERS

The following is a summary of an interesting paper published by Joao do Amaral Franco in *Anais do Instituto Superior de Agronomia*, Lisbon (Vol. 19, 1952):—

1. *Araucaria columnaris* (Forst. f.) Hook. & *A. heterophylla* (Salisb.) Franco.

Although G. Forster (1786) quotes New Caledonia and Norfolk Island in the geographical distribution of his *Cupressus columnaris*, there is no doubt, after examination of the type specimen preserved in the Herbarium of the Dept. of Botany, British Museum (Natural History), London, that the name *Cupressus columnaris* Forst. f. is based *only* on the New Caledonian type. The right name for this taxon, when transferred to the genus *Araucaria*, is *A. columnaris* (Forst. f.) Hook. (1852). The name *Dombeya excelsa* Lamb. (1807) is illegitimate, since Lambert quotes the above name of Forster's as a synonym. Lambert's description covers also the Norfolk Island type. This last type, for many years named *Araucaria excelsa* (Lamb.) R. Br. (1813)—the Norfolk Island Pine—, must be named *Araucaria heterophylla* (Salisb.) Franco, a new combination based on the older legitimate name, *Eutassa heterophylla* Salisb. (1807). Franco found also that the names *Pinus columbaria* Dum.-Cours. (1811) and *Abies columbaria* (Dum.-Cours.) Dum.-Cours. (1814) belong to the Norfolk Island type although there might be some doubt about the first; but reliable evidence cannot be afforded because the type-specimens could not be found in Paris. These two last specific names are here referred to for the first time.

2. *Callitris huegelii* (Carr.) Franco.

The species called "*C. glauca* R. Br." by R. T. Baker & H. G. Smith (1910) cannot have this name, which was not validly published either by Brown or by Mirbel (1825). An older valid name is *Frenela huegelii* Carr. (1855), from which is here proposed the new combination *Callitris huegelii* (Carr.) Franco. Since the type of Carrière's *Frenela huegelii* was supposed to have been collected at Moreton Bay by Leichhardt in 1845, and *C. glauca* does not occur anywhere near that part of Queensland, there is uncertainty about the correct application of the name *C. huegelii*.

3. *Callitris preissii* Miq.

The species, currently known as *C. robusta* R. Br., must be called *C. preissii* Miq. (1845), since the first valid publication of the name *C. robusta* R. Br. was made by F. M. Bailey (1902) for another species, now called *C. huegelii* (Carr.) Franco.

—P. F. Morris.

W. M. Houston,
Government Printer, Melbourne

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