

the superimposed films. The incrustation on the teeth is apparently a deposit of tartar, and perhaps partly due to superficial decay of the tooth. I think similar coatings on sheeps' teeth have been recorded even in classical times, but I cannot recall a reference. It would be interesting to know whether this deposit on sheeps' teeth is common or not.

I also exhibit a calculus of a similar metallic looking character from a sheep's stomach, deposited in distinct layers round a piece of twig, but of rather a darker bronze tint than the substance on the teeth—this specimen belongs to the Sydney Technological Museum and was kindly lent by the Curator, Mr. R. T. Baker.

OBSERVATIONS ON THE ILLUSTRATIONS OF THE BANKS AND SOLANDER PLANTS.

By J. H. MAIDEN, Government Botanist and Director of
Botanic Gardens, Sydney.

[*Read before the Royal Society of N. S. Wales, July 5, 1905.*]

THE issue of the third and final volume of the plates contemporaneously prepared by Banks' artists, is an event which assuredly demands the most marked emphasis that we Australians can give it. It is, to us at least, an important historical event. New South Wales was settled 17 years later as a consequence of Cook's voyage, and the

¹ "Illustrations of Australian plants collected in 1770 during Captain Cook's voyage round the world in H.M.S. "Endeavour," by the Right Honorable Sir Joseph Banks, Bart, K.B., P.R.S., and Dr. Daniel Solander, F.R.S., with determinations by James Britten, F.L.S., Senior Assistant, Department of Botany, British Museum, Part iii., 1905." [Part i., 1900; Part ii., 1901].

only place (Botany Bay—called by Cook Stingray Harbour) in modern New South Wales visited by the expedition is a suburb of Sydney. This voyage, therefore, has special interest for us, and it would be regrettable if the appearance of this work were ignored by Australian scientific men.

Through the good offices of Mr. Britten, the Trustees of the British Museum recently presented nearly 600 specimens collected by Banks and Solander to the National Herbarium, Sydney. Many of them are depicted in the work before us.

Mr. Britten's "Introduction" is very interesting. It describes what preparations had been made by Banks for an extensive work to be illustrated by many hundreds of plates and how the issue of it fell through, partly because of Solander's death in 1782 and partly on account of Banks' devotion to his duties as President of the Royal Society. Then follows some description of the various MSS connected with the voyage, including Solander's notes on "Plantæ Novæ Hollandiæ" which are in two volumes (small quarto) and are in the British Museum.

"The Australasian collections are represented by 412 sketches; from these 362 finished drawings were prepared, of which 340 were engraved. From the copper plates of these, the plates illustrating this volume have been lithographed; they represent 328 of the engravings, most of the remainder being unfinished or imperfect representations. Three of the drawings of which no plates exist—*Tribulus Solandri*, *Pleiogynium Solandri*, and *Myrmecodia Beccarii*—being of special interest, were drawn on stone by the late Robert Morgan, and raise the number of plants represented to 331."

That the copper plates of the present work should have remained in the British Museum unpublished for nearly 130 years is a remarkable occurrence, and shows how leisurely the progress of British science can be. While grateful for its belated appearance it seems difficult to believe that this most regrettable delay has been unavoidable.

The excellent illustrations are from contemporary copper-plates engraved from drawings executed by (a) Frederick Polydore Nodder, "Botanic painter to Queen Caroline" whose drawings date from 1777-1783; 173 drawings are from his pencil. (b) John Cleveley's drawings date from 1773-1775, and he is represented by 18 in the present work. (c) James Miller's drawings date from 1773-1775 and there are 47 of them. (d) John Frederick Miller's drawings were also executed from 1773-1775 and are 61 in number.

Useful notes are given of the engravers D. Mackenzie ("who probably did most of the work") and G. Sibelius. Information is given in regard to Mackenzie's other botanical work. But few of the plates are marked by the engraver's name. The value of the work is enhanced by the fact that it includes representations of many plants which have not been hitherto figured, so far as I am aware.

Mr. Britten gives for each plate a Latin description of each plant depicted (this is the work of Solander) also notes on the localities whence the specimens were obtained, and critical notes. We are informed that descriptions of other plants by Solander are extant, but only those are printed of which there are plates.

The work contains a reduction of Captain Cook's original chart of East Australian coast-line (1770), from originals in the British Museum. This is in a North Sheet and South Sheet. Also a chart of the coast-line of East Australia, as determined by recent surveys to 1890 (inserted for comparison with Cook's coast-line). Also a chart of New Zealand, explored in 1769 and 1770 by Lieutenant J. Cook, Commander of His Majesty's Bark "Endeavour," engraved by J. Bayly. These maps, which render reference to the localities whence Banks and Solander collected exceedingly

easy, are reproductions of those which were issued with Wharton's "Captain Cook's Journal" (1893).

In another place¹ I have given some notes on the synonymy adopted in this work, and herewith continue these observations:

No.	Name on Plate.	Name in <i>Flora Australiensis</i> .
251	<i>Myristica cimicifera</i> R.Br.	<i>M. insipida</i> , R.Br.
	Bentham (and Mueller) unite <i>M. cimicifera</i> R.Br. and <i>M. insipida</i> , R.Br. under the name <i>M. cimicifera</i> . Britten maintains they are distinct species, so the name <i>M. insipida</i> should be added to the flora by the side of <i>M. cimicifera</i> .	
253	<i>Atylus anethifolius</i> , O. Kuntze.	<i>Isopogon anethifolius</i> , Knight
254	„ <i>anemonifolius</i> , O. Kuntze	„ <i>anemonifolius</i> , Knight
256	<i>Linkia falcata</i> , O. Kuntze	<i>Personia falcata</i> , R.Br.
257	<i>Linkia lævis</i> , Cav.	<i>Personia lanceolata</i> , Andr. var. <i>lævis</i>
	Bentham states that <i>Linkia lævis</i> , Cav. is syn. with <i>P. lanceolata</i> , var. <i>lævis</i> . Britten says it is identical with <i>P. salicina</i> , Pers. In my opinion the illustration is clearly <i>P. salicina</i> , Pers. and not <i>P. lanceolata</i> var. <i>lævis</i> , unless they are both identical. See full notes by Britten, and also by Bentham in "Flora Australiensis."	
258	<i>Linkia lanceolata</i> , Britten	<i>Persoonia lanceolata</i> , Andr.
261	<i>Grevillea pteridifolia</i> , Knight	<i>Grevillea chrysodendron</i> , R.Br.
263	„ <i>parallela</i> , Knight	„ <i>polystachya</i> , R.Br.
264	„ <i>glauca</i> , Knight	„ <i>gibbosa</i> , R.Br.
268	<i>Isostylis ericifolia</i> , Britten	<i>Banksia ericifolia</i> , Linn. f.
269	„ <i>integrifolia</i> , Britten	„ <i>integrifolia</i> , Linn. f.
270	„ <i>serrata</i> , Britten	„ <i>serrata</i> , Linn. f.
271	„ <i>dentata</i> , Britten	„ <i>dentata</i> , Linn. f.
272	<i>Banksia cornucopiæ</i> , O. Kuntze	<i>Pimelea cornucopiæ</i> , Vahl.
273	„ <i>linifolia</i> , O. Kuntze	„ <i>linifolia</i> , Sm.
277	<i>Santalum oblongatum</i> , R.Br.	<i>Santalum lanceolatum</i> , R.Br.
296	<i>Omalanthus Leschenaultianus</i> , A. Juss.	<i>Carumbium populifolium</i> , Reinw.
303	<i>Hæmodorum corymbosum</i> , Vahl.	<i>Hæmodorum coccineum</i> , R.Br.
309	<i>Chlamysporum Banksii</i> , R.Br.	<i>Thysanotus tuberosus</i> , R.Br. var.
312	<i>Lomandra longifolia</i> , Labill.	<i>Xerotes longifolia</i> , R.Br.
313	„ <i>multiflora</i> , Britten	„ <i>multiflora</i> , R.Br.
314	„ <i>filiformis</i> , Britten	„ <i>filiformis</i> , R.Br.

The part includes figures of *Piper Betle*, Linn. and *Blephocarya involucrigera*, F.v.M., which are not in the *Flora Australiensis*. Figures of recently described plants

¹ Proc. Linn. Soc. N.S.W., 1903, pp. 711-716.

in the present part are *Petalostigma Banksii*, Britten and S. Moore, and *Eugenia Banksii*, Britten and S. Moore.

Some of the propositions of nomenclature gives us a shock. Our familiar *Banksia* is to be suppressed in favour of *Isostylis*. A new *Banksia* is to spring up from the ashes of the almost as familiar *Pimelea*. Our *Persoonias*, in every one's mouth, are to give way to *Linkia*; our *Isopogons* to *Atylus*. *Thysanotus* is to become *Chlamysporum*, while the well-known *Xerotes* is to be *Lomandra*. But the whole of the changes can only be understood by examination of those also proposed in Parts i. and ii.

As I write, the International Botanical Congress (adjourned from Paris, 1900) is meeting at Vienna, and, as the result of its deliberations, it is to be hoped that we shall have the authority of such an influential Congress for a settled nomenclature. When this Congress reports the names proposed in the present work will be passed in review.

Mr. Britten throughout the work, doubtless rightly, attributes to Banks and Solander plants for which in many instances Solander was originally quoted. He says:

"A careful study of the various memoranda and MSS preserved in the Department of Botany makes it clear that Banks, who had come to be regarded as a patron of science rather than as a man of scientific attainments, had much more botanical knowledge than was at one time supposed."

In conclusion, the publication of these fine folio volumes simply whets the appetites of Australians for more. We yearn for the publication of Solander's and Brown's manuscripts, and trust that they will not be kept back from any considerations of nomenclature of species. Such a reason, if advanced, seems to us inadequate in the case of priceless historical documents of the deepest interest to Australians. We would have liked our fathers to have had the privilege of seeing them; shall the privilege be denied to the living

and only be bestowed on a generation yet to be born? With all respect to the eminent specialists forming the scientific staff of the British Museum, we feel sure that these manuscripts must contain observations which can only be fully interpreted and appreciated by Australians.

THE REFRACTIVE INDICES, WITH OTHER DATA, OF
THE OILS OF 118 SPECIES OF EUCALYPTUS.

By HENRY G. SMITH, F.C.S., Assistant Curator,
Technological Museum, Sydney.

[*Read before the Royal Society of N. S. Wales, August 2, 1905.*]

THIS work has been undertaken to determine whether results of value could be obtained by the investigation of the physical constants of eucalyptus oils in this direction. The oils worked upon have—with a few exceptions, added under particular species for comparison—all been distilled at the Technological Museum, from material which was botanically investigated by my colleague Mr. R. T. Baker, F.L.S., before distillation. All the specimens were thus authentic and true to name. The whole of the oil contained in the leaves was distilled over as far as possible, and not the more volatile constituents only, which result can be largely accomplished by regulating the method and time of distillation. The richer commercial oils of *E. polybractea* under No. 22 have been thus obtained.

The general results, concerning most of this material, have already been published by Mr. Baker and myself in our work "Research on the Eucalypts and their Essential Oils," Sydney 1902, so that this paper may be considered