NOTES ON ACACIA, (WITH DESCRIPTION OF NEW SPECIES), No. I.

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SYNOPSIS.

Introductory.

I have been led to a detailed study of Australian Acacias partly because half a century has elapsed since Bentham's revision of the genus, during which period additional species have been recorded from every State in the Commonwealth,

the descriptions being published in and out of Australia, and material has accumulated in the National Herbarium of New South Wales that demanded attention. We have, in addition to New South Wales plants, some of which have been dealt with in this paper, a quantity of material from Western and Northern Australia, some of which promises to be interesting. The species from the Northern Territory are being dealt with for Professor Ewart's Flora of that area.

There is much work to be done in regard to the revision of many species, and this work, as well as the description of species deemed to be new, may, it is hoped, lead to a better grasp of the facts concerning the largest genus of Australian plants. Perhaps this work may culminate in suggested improvements in affinities and therefore of classification.

I have not absolutely correct figures in regard to Australian species, or even New South Wales; indeed, it is one of the great objects of this research to obtain evidence on these points, but the following figures are approximate:—New South Wales 128, Rest of Australia 283, Total for Australia 411 (1910). Bentham (B. Fl. ii, 1864), gave the number for Australia as 293; Mueller in 1889 (Second Census) 313.

In the Engler-Gilg "Syllabus der Pflanzen-familien" (1912) we have the estimate of the World's Acacias as 500, of which there are about 280 Phyllodineæ in Australia and the Islands.

About two-thirds of all known Acacias are Australian. Section i, (Phyllodineæ) is the largest, and is confined to Australia with the exception of a few North Australian species, which extend to Papua and some of the Pacific Islands (Greater Australia, in fact). The Acacias of all other sections have bipinnate leaves.

Section ii, Botryocephaleæ, and Section iii, Pulchellæ, are all Australian, and are far less numerous than Section i.

Section iv, Gummiferæ and Section v, Vulgares, are all African, American, or Asiatic species, with the exception of the cosmopolitan species *A. (Vachellia) Farnesiana*, which extends to Australia.

The Gummiferæ (Section iv) are especially common in North Africa, Asia Minor, Arabia, and Tropical Africa; they are the group that yield the Acacia gum of commerce, and the thorn-bushes characteristic of the African flora.

Section v (Vulgares), forms the Section next most numerous to the Phyllodineæ, and is distributed over Africa, Mexico, and Tropical America, India and Asia generally. This section is not so thorny as the Gummiferæ, and if thorns are present, they are not of stipular origin.

Section vi, Filicinæ, is a small section confined to America.

Extra-floral Nectaries (the so-called glands).

In this paper I have, in some species, drawn especial attention to the gland which, in Acacia, may be both petiolar and phyllodineous. The term gland refers to a secreting body, and is somewhat loosely used. Bentham used it in reference to Acacia (and other plants) and says "The name of glands is given to several different productions, and principally to the four following":— which he proceeds to define (B. Fl. i, xxiii). At the outset I may say that the term gland, as applied to Acacias, should be disused as unscientific, and the word nectaries used instead. A more descriptive term is "Extra-floral nectaries," but this is too long for frequent use, and hence it is probable that the term nectaries will be employed, leaving the context to explain whether the particular ones referred to are extra-floral or not. In my present paper I will continue to use the term gland for convenience.

My paper is in part a plea for more attention to be given to the gland for diagnostic (taxonomic) purposes. At the outset I am met with the following statement:—"The glands on the upper edge of the phyllodia and on the common petiole in the compound leaf seldom afford even a specific distinction . . . and I have therefore in the description seldom mentioned them." (B. Fl. ii, 301). A statement from such a source demands respect, but I think I shall be able to show that *some* glands are remarkable and characteristic. I am aware that many glands are ill-developed, and afford no special characters for description.

It is such as these that, when speaking of phyllodineous (in contradistinction to petiolar) glands, Mr. Reginald Kelly *(op. cit. infra)* states they are now "almost obliterated." One of the objects of my paper is to ask botanists to give further consideration to glands in Acacia, for it seems to me that they merit further notice.

Mr. A. D. Hardy truly says[1] that the glands of the Acacias have received but little attention, and he makes a valuable contribution to the subject. His paper is illustrated by one plate, in which the glands are not figured or described in detail, but only indicated as regards their number and position on the phyllode, which was, indeed, his object. A large number of species are referred to. At p. 30 there is a useful summary of the paper.

This paper was followed up by Mr. Reginald Kelly,[2] who dealt with the function of these glands. He joins issue with those who call them glands, and reminds us of the use of the term "extra floral nectaries" by some authors. He quotes Solederer that petiolar glands in Acacia have secretory functions; he (Mr. Kelly) found them, rarely, to be tenanted by insects.

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[1] "The distribution of leaf glands in some Victorian Acacias," (Vict. Nat. xxix, 26).

[2] "Observations on the function of Acacia leaf glands," *Ib.*, xxx, 121.

He adds that there is no evidence that the insect is a symbiont by virtue of any protection it affords. He concludes that these organs perform excretory functions, and that they are not, in his opinion, strictly speaking, glands or nectaries. He suggests the name "vents" for them. "In the phyllode they are mere relics—not yet altogether, but almost obliterated, and now functionless."

There is a valuable paper,[1] with excellent illustrations, of nectaries on both petiole and leaf, the illustrations chosen being those of the Cherry leaf and its petiole. Commencing with references to floral nectaries, the author passes on to a brief sketch of the literature of extra-floral nectaries, touching on the work of Belt and Delpino. He points out that microscopical examination of these organs at various stages shows that their development takes quite different courses in different species, and there seems no single underlying principle governing their appearance. Their secretions also vary widely, or they may be absent.

The idea that the presence of these nectaries is to divert the attention of ants from the richer nectaries in the flowers themselves (baits to insects engaged in the work of pollination) appears to have little basis in fact as far as observation goes.

It is also pointed out that in some of the broad-beans *(Vicia)*, it has been found that bees visit the extra-floral nectaries in preference to those in the flower.

But, speaking generally, the conclusion of the anonymous author is that extra-floral nectaries must be looked upon as little better than accidents in the development of the plant; they may of course have been more useful at some earlier stage in the plant's evolutionary history, but at present we can hardly avoid the conclusion, in many cases,

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[1] "Extra-floral Nectaries," Journal of Heredity, August, 1915, p. 367.

that they have no vital function, and that the plant would probably get along just as well without them. They may of course have some diagnostic value nevertheless.

I am putting my opinions to the touch by suggesting (see my remarks under *A. Kettlewelliæ*, below), that the "gland" be a character, in combination with others. When a field botanist makes up his mind that a certain plant differs from every other plant known to him, this difference may be made up of one or more outstanding characters, or it may consist of an aggregation of smaller characters. A minor character may be represented by the gland, and there is a degree of specialisation of form in this organ which should not be lightly brushed aside.

Funicle and Arillus.

Bentham (B. Fl. i, xxii) defines the *funicle* as the stalk by which the seed is attached to the placenta. It is occasionally enlarged into a membranous, pulpy, or fleshy appendage, sometimes spreading over a considerable part of the seed, or nearly enclosing it, called an *aril*. At B. Fl. ii, 302, he further defines it, and speaks of "the small fleshy aril, usually described as a strophiole." He describes some of the foldings of the funicle and adds that "All these and other modifications appear to be constant in each species, but only rarely available for specific diagnosis, for in many species the funicle is as yet unknown."

Speaking from some experience, I endorse Bentham's remarks as to the importance of the funicle, and would point out that Australian botanists have opportunities for the examination of the fresh seed that were denied to him, and I would like to interest my colleagues in this part of the subject. It is best to collect the pods when the seeds are dead ripe, then the shape, colour and lustre of the seed can be best noted, the funicle best examined, and the colour and shape of the fresh aril observed.

Within certain limits I have observed a good deal of variation in the length and folds of the funicle in the same species, but many more observations require to be made in this direction.

It is stated that the long funicle, *i.e.*, where it encircles the seed twice or thrice, is peculiar to Australian Acacias, but the precise number of species with long funicles has not been ascertained.

The following list includes most of the species with encircling or nearly encircling funicles. It will be observed that they mainly belong to the series Uninerves and Plurinerves, and mostly, though by no means inclusively, belong to regions of comparatively high rainfall:—

Pungentes (Uninerves)—*A. genistoides* A. Cunn. and *A. tetragonophylla* F.v.M.

Uninerves (Brevifoliæ)—*A. Meissneri* Lehm.

Uninerves (Racemosæ)—*A. penninervis* Sieb., *A. falcata* Willd., *A. gladiiformis* A. Cunn., *A. Wattsiana* F.v.M., *A. notabilis* F.v.M., *A. retinoides* Schlecht., *A. Mabellæ*, n. sp., *A. rubida* A. Cunn., *A. Flocktoniæ*, n. sp., *A. amœna* Wendl., *A. Chalkeri*, n. sp., *A. Harveyi* Benth.

Plurinerves (Nervosæ)—*A. cyclopis* A. Cunn., *A. homoclada* F.v.M., *A. melanoxylon* R. Br.

Plurinerves (between Dimidiatæ and Nervosæ)—*A. oraria* F.v.M.

Plurinerves (Dimidiatæ)—*A. binervata* DC.

Julifloræ (Falcatæ)—*A. auriculiformis* A. Cunn.

Julifloræ (Dimidiatæ)—*A. cincinnata* F.v.M.

I am much indebted to Miss Margaret Flockton, Artist, Botanic Gardens, for the valuable assistance she has rendered with her drawings (not reproduced) of all the species referred to.

Proposed New Species.

Pungentes (Uninerves).

1. Acacia Carnei n. sp.

Frutex diffusus, ramis subteretibus, ramulis pubescentibus. Phyllodiis tetragonis pubescentibus, super et infra sulcatis minime profundis, angulis rotundatis. Phyllodiis rigidis vix curvatis, in apicem acrum rigidum acute attenuatis, 4 – 5 cm. longis, 1 - 1·5 mm. latis. Capitulis non numerosis, 45 – 50 floris. Calyce simile poculo formata villoso. Petalis ovato-spathulatis calycem duplo superantibus, paucis villis diffusis tectis. Pistillo villoso. Legumine non viso. Species *A. quadrisculatæ* F.v.M., proxima videtur.

A straggling shrub, with nearly terete branches, the branchlets covered with a fine tomentum.

Phyllodes tetragonous, covered with a fine tomentum, sometimes of scattered hairs. The sides of the phyllodes with shallow grooves, with rounded ridges at the angles. The phyllodes rigid, hardly curved, terminating somewhat abruptly in a sharp, rigid point, reddish-brown at the tip. Length of phyllodes 4–5 cm., 1–1·5 mm. wide or thick.

Flower-heads not numerous. Peduncles always (?) solitary, about ·5 cm., bearing each a globular flower-head of 45–50 flowers.

Flowers 4 or 5 merous.

Calyx cup-shaped, hairy. Petals ovate-spathulate, slightly incurved, twice the length of the calyx, clothed with a few scattered hairs; pistil hairy.

Pod not seen.

Habitat. Thackaringa, twenty-two miles from Broken Hill, towards the extreme western part of New South Wales. Joseph Edmund Carne No. 16, October 1907.

I have pleasure in associating this interesting species with the name of my old friend Mr. Carne, Government

Geologist, and that of his son Walter Mervyn Carne, one of my zealous botanical assistants, who is now in training for the defence of his country.

Affinities.

This wattle belongs to the series Pungentes, sub-series Uninerves. Of members of this sub-series I have contrasted it with *A. quadrisulcata* F.v.M., a Western Australian species to which (in absence of pods) it seems to be closest related. I have also compared it with *A. striatula* Benth., —Pungentes (Plurinerves), and also *A. gonophylla* Benth., —Calamiformes, (Uninerves), with both of which it displays some obvious superficial resemblance.

1. With *A. quadrisulcata* F.v.M. The phyllodes of this species are shorter, finer and more deeply grooved, the peduncles are longer and have only about half as many flowers in the head. The sepals are distinct, very small and narrow, linear-spathulate; petals united above the middle. It is obvious that *A. quadrisulcata* is markedly different from the new species.

2. With *A. striatula* Benth. This is another species that invites comparison, but the phyllodes are shorter and not so tetragonous, and the sepals are free, very thin and linear-spathulate.

3. With *A. gonophylla* Benth. This is another tetragonous species, but the phyllodes of *A. gonophylla* are less flattened, narrower, shorter, less rigid, and with a shorter more rigid point than the new species. The flower heads also are in pairs, and each head has only twelve to twenty flowers. The calyx lobes are narrow and the pistil smooth.

Uninerves (Racemosæ).

2. Acacia Mabellæ, n. sp.

Arbor umbrosa mediocriter alta, trunco usque ad 1′ diametro, surculis junioribus et rhachibus inflorescentiæ brevibus pilis aureis

tectis. Phyllodiis longis angusto-lanceolatis apice obtuso, ad 30 cm. longis et longioribus, circa 1 cm. latis. Nervis mediis marginalibusque prominentibus, lateralibus obscurissimis. Glandula non conspicua basi 1 cm. remota. Inflorescentia racemosa, capitulis circa 9 – 13 floris. Calyce corollae aequilonga, calyce truncata vel fere truncata. Sepalorum apicibus pubescentibus, petalis glabris, pistillo laeve. Legumine longiusculo latiusculoque (circa 13 × 1 cm.) subfalcato, seminibus longitudinaliter dispositis; seminis filiforme funiculo semen bis circumcingente, in clavatum arillum apice seminis terminante. Species *A. retinodes* Schlecht, proxima videtur.

An umbrageous tree of moderate height (up to 30 feet), with a trunk diameter up to a foot. Branchlets angular. The young shoots and the rhachises of the inflorescence densely covered with short, golden-yellow hairs. The bark of young growing trees is usually glaucous.

Seedling. **The seedling will be described by Mr. R. H. Cambage in his papers on Acacia seedlings, but its differences from that of *A. penninervis* and *A. rubida* may be briefly stated in the following words: the young phyllodes of *A. Mabellæ* are longer and much narrower than those of the other two species, and the venation is quite distinct from either.**

Phyllodes. **Long narrow-lanceolate and slightly falcate. Up to 20 cm. and even longer. Width for the greater portion of the length about 1 cm. Rather thin in texture, blunt-pointed. Mid- and marginal-veins prominent, the lateral veins very faint, though visible under a lens, spreading. A not very conspicuous gland about 1 cm. from the base, the margin of which is slightly kinked at the place of the gland, and from which a rudimentary oblique vein sometimes proceeds. No stipules observed.**

Inflorescence racemose, the flowers borne in profusion, of a pale yellow colour, and sweet-scented.

Flowers about nine to thirteen in the head, pentamerous, calyx and corolla of about equal length, calyx truncate or nearly so, glabrous except for the tips of the sepals, which are tufted with hairs. Petals glabrous, slightly keeled, the tips a little thickened. Pistil smooth.

Pod moderately long, and broad, (say 13 × 1 cm.), slightly curved. Margins of the valves thickened and somewhat grooved, the valves more or less wrinkled, the seeds arranged longitudinally, distending the valves without making the pods moniliform.

Seed with filiform funicle twice encircling it, and terminating in a clavate arillus at the top of the seed. The length and contour (whether kinked or not) of the funicle is subject to variation, as in *A. rubida*.

Synonym. A. penninervis Sieb., var. *angustifolia* Maiden in "Wattles and Wattle-barks," 3rd Edition, p. 49 (1906). It was described in the following words:—

"A long narrow-phyllode form, found only on the South Coast, so far as I know. Phyllodes commonly six inches long, and under half an inch wide, straight or slightly falcate. The pods are narrower than in the normal form. The young shoots and the rhachises of the inflorescence are sometimes densely covered with golden yellow hairs."

For a photograph of the tree see Part 50 of my "Forest Flora of New South Wales."

Habitat. Twelve to twenty feet high, Mogo about eight miles from Bateman's Bay township (W. Baeuerlen, September, 1890). Bateman's Bay (J. H. M., November, 1892). Conjola (W. Heron, September 1898, and February 1899).

"Black Wattle." Tree good for tan bark. Up to about thirty feet high. Milton (R. H. Cambage, No. 784, December, 1902; No. 4113; November, 1914; No. 4151, August, 1915).

Mr. Cambage informs me that in going south from Nowra, the Black Wattle is first met with by the roadside at about seventeen miles north of Milton. Around Milton this species avoids the most basic soils and grows on a sandy soil which is mixed with a better soil, but does not occur on the poor, highly siliceous Permo-Carboniferous formation.

I constitute the Milton specimens type of the new species, which is named in honor of my young friend Miss Mabel Fanny Cambage. The naming of a wattle after her is appropriate, because she is Honorary Treasurer of the New South Wales Branch of the Wattle Day League in connection with which she has done admirable service, and this particular wattle has associations for her in that many specimens occur on the South Coast property of her grand parents.

Affinities.

This wattle belongs to the series Uninerves and the long sub-series Racemosæ. Because of the general similarity of the structure of the flowers, *Acacia Mabellæ* has hitherto been assumed to be a form of *A. penninervis;* the seed and seedling show that it is not closely related to that species. From the point of view of the seed, with its encircling funicle, its affinity must be sought for near *A. retinodes* Schlecht., and *A. rubida* A. Cunn.

1. With *A. retinodes* Schlecht. The phyllodes of the new species are longer, the marginal veins more marked, and the lateral veins different. The lateral veins in *A. retinodes* (a Victorian and South Australian species) are more or less parallel to the mid-rib; in *A. Mabellæ* they are attached to the midrib at an acute angle.

The flowers of the new species are fewer in the head and are more squat than those of *A. retinodes*, which also have the tips of the petals recurved and the pedicels glabrous. The rhachises of the inflorescence are without the golden yellow pubescence to be seen in *A. Mabellæ*.

The pods of *A. retinodes* are narrower, but the funicles are not dissimilar.

The two species bear, however, such general and detailed resemblance to each other that it is obvious that they are closely related. At the same time I am satisfied that the species are sufficiently distinct from each other.

2. With *A. rubida* A. Cunn. *A. Mabellæ* resembles it in the seedlings and encircling funicle to the seed only. The phyllodes of *A. rubida* are much coarser, of a different colour, and they generally have a fine more or less hooked tip. They have not the pendulous appearance of *A. Mabellæ* neither is the persistent bipinnate foliage of *A. rubida* so obvious. The stems and rhachis of *A. rubida* are waxy smooth except at the extreme tips which have a yellow pubescence.

The flowers also of *A. rubida* are of a rich golden yellow, while in the new species they are of a pale whitish cream colour, and the rhachis matted with hair.

3. With *A. penninervis* Sieb. The rhachis of the new species is densely clothed with a golden pubescence; it is smooth in *A. penninervis*, though there is a tomentum of a similar character (though less copious), in the variety *falciformis* of *A. penninervis.*

The venation of the phyllodes is indistinct, but similar to that of *A. penninervis;* there is no intramarginal vein, but the edges of the phyllodes are nerve-like and the mid-rib prominent on both sides. There is a gland as in *A. penninervis.* The phyllodes are much longer than those of *A. penninervis.*

As regards the new species, the flowers are cream-coloured and sweet scented; those of *A. penninervis* have less odour. The petals are five or six in number, glabrous, broader than those of *A. penninervis*, and much more frail in texture.

The seeds of the new species have a double funicle completely surrounding them; those of *A. penninervis* have a shorter funicle. Bentham (B. Fl. ii, 362) says, "funicle long, dilated and coloured nearly from the base, extending round the seed and bent back on the same side, so as to encircle it in a double fold."

I have not been able to confirm Bentham's observations in this respect. In the specimens belonging to the typical form that I have been able to examine, the funicle has hardly extended half round the seed. In var. *falciformis* I have observed funicles that I cannot distinguish from those of the normal form and, in addition, doubly folded funicles extending more than half way round the seed, but never doubly encircling funicles as in *A. Mabellæ.*

The seedlings of the two species may be briefly contrasted as follows:—the phyllodes of the former are shorter and very much broader and have a distinct venation.

Uninerves (Racemosæ).

3. Acacia Flocktoniæ n. sp.

Frutex gracilis 6 – 12′ altus, habitu debile pendulo, ramulis teretibus glabris. Phyllodiis lineari-lanceolatis, 6 – 8 cm. longis, circa 3 mm. latis, in apicem acutum attenuatis, basin versus angustatis, nervo principale medio paullo remoto, glandula basin versus phyllodiæ. Floribus in racemis folia superantibus, rhache glabro, capitulis 25 – 30 floris, calyce turbinata paullo lobata, angulata, glabra praeter angulos et apicem. Petalis glabris, sepalis dimidio aequilongis, pistillo glabro. Legumine stipitato, valvarum marginibus paullo incrassatis, plano plerumque recto, 6 – 11 cm. longo 6 mm. lato, valvis inter semina contractis sed non moniliformibus, seminibus longitudinaliter dispositis, funiculo semen bis vel saepius circumcingente. Species *A. rubidæ* A. Cunn., proxima videtur.

The over-used name *Acacia crassiuscula* has long had a fascination for me; it has been applied by different botanists to at least four different plants, viz:—

(*a*) By Wendland to a presumably Western Australian plant which is now usually attributed (and I think correctly) to *A. pycnophylla* Benth. (B. Fl. iii, 368). The same plant was also called *crassiuscula* by Meissner.

(*b*) By Sieber[1] to a New South Wales plant which I have since named *A. obtusata* Sieb. var. *Hamiltoni*. It is Sieber's No. 464.

(*c*) By Allan Cunningham[2] to a New South Wales plant made by him a variety of his *A. adunca*.

(*d*) In B. Fl. iii, 372 the *A. crassiuscula* Wendl., probably covers several species. It should be called *A. crassiuscula* Benth., and I am satisfied that Bentham's description applies more or less to more than one species.

A. adunca A. Cunn., has already been referred to.

It will be observed that Bentham refers *A. crassiuscula* to Queensland, New South Wales, and Tasmania. Let us examine some of the plants referred to by him under the various States.

1. *Queensland*—Fitzalan's Moreton Bay specimen I have not seen. Bailey ("Queensland Flora") contents himself with repeating Bentham's statements in the "Flora Australiensis." Certainly there is no *A. crassiuscula* in Queensland and what Fitzalan's plant is should be enquired into.

2. *New South Wales*—Sieber's No. 464 I have already referred to. Robert Brown's Port Jackson to Blue Mountains specimen I have been trying to trace home for many years with the following result.

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[1] See my "Forest Flora of New South Wales," Vol. v, pp. 114 and 153.

[2] *Ib.*, p. 114.

I received a piece of the original from the late Mr. J. G. Luehmann of the Melbourne Herbarium, in 1898, labelled, "*Acacia crassiuscula* Benth. non Wendl. (*A. lunata* Sieb. Mueller's addition). Banks of the Nepean River, Robert Brown (1802-4)."

I carried a portion in my pocket book for years, but failed to match it in my wanderings. It is in flower only. On a special occasion (September 1906) Mr. R. H. Cambage and I accepted the hospitality of the Hawkesbury Agricultural College, got a rowing boat, searched the banks of the Nepean in the vicinity, and also of the Grose River (which we know Robert Brown ascended), but could not find the wattle. Later on (1909) Mr. Cambage collected the plant at Yerranderie, but it was only recently that I identified it with Brown's plant, and it proves to be new. Specimens of Bentham's further record of "barren brushy hills of the Blue Mountains" (Cunningham and Fraser) I have not seen, but I find I collected the wattle at Mount Victoria in December, 1896. I do not remember the precise part of Mount Victoria, but it will give a clue as to where Cunningham and Fraser found it.

3. *Tasmania*—Flinders' Island, Bass' Straits (J.D.Hooker).

Bentham follows Hooker (Flora of Tasmania, p. 108) in this matter. *Loc. cit.*, Hooker quotes Gunn's 1957 for *A. crassiuscula*, and I have a specimen before me. It is Joseph Milligan's No. 581 and was collected 6th March, 1845, and is labelled "Flinders' Island at Establishment." What this locality means, may be seen from my notes on Dr. Milligan's career in Proc. Roy. Soc. Tas. for 1909, p. 22. He superintended the removal of the aborigines from Flinders' Island to Oyster Cove in 1848.

It is a poor specimen, and I have a better one, in bud only, without fruit, from Archer's Herbarium. The material may be described as follows, and it slightly supplements

Hooker:—Gland of phyllode near base. Flowers twenty-three in the head, 5 or 6-merous. Calyx turbinate, hairy at the apex. Petals glabrous, free, thickened at the top. Pistil hairy.

I hope that someone will re-collect the plant from the vicinity of the site indicated in Flinders' Island. My material is not sufficient to say if it is a species hitherto recorded from Tasmania, but it is not *A. crassiuscula* Wendl., which should be removed from the flora of Tasmania. The linear pods should be collected.

Mr. W. V. Fitzgerald makes a contribution[1] to the "crassiuscula" confusion. He says that to *A. crassiuscula* Wendl., "should be referred *A. subbinervia* Meissn., and Bentham's *A. crassiuscula* and *pycnophylla*."

I have a portion of Preiss' No. 924 before me, which is in flower only, and is the type of *A. subbinervia* Meissn. I do not know what evidence there is to upset Bentham's conclusion (B. Fl. ii, 368) that *A. subbinervia* is a synonym of *A. rostellifera* Benth.

As to *A. crassiuscula* Benth. being a synonym of *A. crassiuscula* Wendl. I have abundantly shown the contrary, nor was I the first to do so.

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I will now proceed to describe Robert Brown's "Port Jackson to Blue Mountains" specimen, or to be more precise, the Yerranderie plant with which I have identified it.

A slender shrub of six to twelve feet high, of weak, pendulous growth, with few branches, and these usually borne towards the ends of the stems. It has something of the habit of *A. linifolia* Willd. Branchlets rounded, angular towards the tips, glabrous.

Phyllodes linear-lanceolate, gradually tapering from the middle towards the apex and the base, 6–8 cm. long and

[1] Journal W. A. Nat. Hist. Soc., No. 1, Vol. II, p. 49 (May, 1904).

about 3 mm. broad, the apex forming a sharp point, which is rarely hooked. Texture thin, the principal vein usually not situated along the middle of the phyllode, but a little from the median line: lateral veins few and inconspicuous. No stipules observed. Very small gland near the base of the phyllode.

Flowers bright yellow, often borne at the ends of the branchlets, in racemes, exceeding the leaves. Rhachis glabrous. The individual flowers are very frail and transparent in texture. They are 25–30 in the head.

Calyx turbinate, slightly lobed, angled, the sutures of the sepals well marked, glabrous except on the angles and at the top, sepals about two-thirds the length of the petals.

Corolla. The petals are glabrous, half the length of the sepals.

Pistil glabrous.

Pod stipitate, margin of the valves slightly thickened, flat, usually straight, sometimes curved, 6–11 cm. long, and 6 mm. broad. Valves constricted between the seeds, but not moniliform.

Seeds arranged longitudinally in the pod. The funicle encircling the seed twice or more, and terminating in a white slightly swollen club-shaped aril towards the top of the seed.

Habitat. I have specimens from—

1. Banks of the Nepean River, N.S.W., (Robert Brown, 1802-4). In flower.
2. Mount Victoria (J. H. M., December, 1896). In flower.
3. Six to eight feet high, Byrnes' Gap, Yerranderie on Permo-Carboniferous formation, (R. H. Cambage, No. 2188, 7th June 1909). In flower.
4. Same locality and collector, No. 2189. A narrow leaved form of No. 2188.

5. Same locality and collector, No. 3126 (2nd December, 1911). In fruit.

6. Six to twelve feet, Yerranderie, (J. L. Boorman, July, 1915). In flower.

So that the range at present ascertained can be stated as Mount Victoria, thence due south for about forty miles as the crow flies to Yerranderie. The Nepean River locality cannot be traced.

I constitute the Yerranderie specimens the type. Named in honour of Miss Margaret Flockton, the talented artist of my "Forest Flora of New South Wales," "Critical Revision of the Genus Eucalyptus" etc., who adds to her artistic skill the capacity of working out botanical points in a most intelligent manner.

Synonyms—*A. crassiuscula* Benth., non Wendl., (in part). *A. lunata* Sieb., var. *crassiuscula* Maiden and Betche, in Maiden's "Wattles and Wattle Barks," 3rd Edition, p. 82 (excluding the Tasmanian reference).

Affinities.

1. With *A. rubida* A. Cunn. In such an important character as the double-encircling funicle of the seed, *A. Flocktoniæ* seems to be closest allied to what I may term the "*Acacia rubida* group" (I will define what species I propose to place in this group in a later paper). From *A. rubida*, perhaps its nearest ally, it is separated by the larger, gland-indented phyllodes of *A. rubida*, the more hairy flowers, of somewhat different shape.

2. With *A. adunca* A. Cunn. This is a species, figured at plate 173 of my "Forest Flora of New South Wales." It is one of the species brought into the "Crassiuscula" confusion as already explained. It and *A. Flocktoniæ* are sharply separated in phyllodes and seeds (which have non-encircling funicles in *A. adunca*) and, to a less extent, in flowers.

3. With *A. lunata* Sieb. I mention this because Mueller first suggested the affinity, and the late Mr. Betche and I followed him. He and we had only the flowers (and the affinity of these is not very close), but discovery of the seeds shows that the two species are sharply separated, *A. lunata* having a short non-encircling funicle terminating in a fleshy aril on the top of the seed.

Uninerves (Racemosæ).

4. Acacia Chalkeri n. sp.

Frutex dumosus circa 6′, ramulis angulatis. Phyllodiis oblanceolatis, apice breve mucronata, ad 4·5 cm. longis et 9 mm. latis. Inflorescentia racemosa phyllodios non superante, capitulis non numerosis circa 18-floris. Calyce paullo corolla longiore, corollae apice brevibus pilis fimbriata, petalis glabris, pistillo laeve. Legumine fere plano rectoque circa 7 cm. longo 7 mm. lato, seminibus longitudinaliter dispositis. Funiculo semen bis circumcingente, in arillo clavato terminante.

Species *A. retinodes* Schlecht., et *A. rubidæ* A. Cunn., affinis videtur.

A small bushy shrub of about six feet, with angular branchlets.

Phyllode. Oblanceolate, the apex with a short mucrone, which is sometimes turned a little on one side. Up to 4·5 cm. long and to about 9 mm. in its widest part. Tapers gradually into the point of attachment to the branchlet. Margin slightly thickened, midrib distinct, lateral veins attached to the midrib and almost feather-veined. A gland a little way up the phyllode, but the phyllode is not constricted or bent at the place of the gland.

Inflorescence racemose, not exceeding the phyllodes. No stipules observed.

Flowers about eighteen in the head, heads of flowers not numerous. Calyx a little longer than the corolla, fringed

with short hairs at the top. Petals glabrous. Pistil pale green when fresh and very smooth.

Pod. Nearly flat and straight, slightly constricted between the seeds, which are disposed longitudinally. About 7 cm. long and 7 mm. broad.

Funicle thread-like; at the end of the first kink it is sharply bent and twice encircles the seed, finally terminating in a club-shaped arillus.

Habitat. Wombeyan Caves, N. S. Wales, on the limestone, (R. H. Cambage, E. C. Andrews and J. H. Maiden, October, 1905). The only known locality at present.

Named in honour of Mr. Thomas Michael Chalker, Caretaker of Wombeyan Caves.

Affinities.

It belongs to the series with the funicle twice encircling the seed, and hence it is related to *A. retinodes* Schlecht., and *A. rubida* A. Cunn.

1. With *A. retinodes* Schlecht. The phyllodes are very different, being linear lanceolate and much longer; the funicles are not dissimilar; the flowers are somewhat similar, but usually hexamerous in *A. retinodes*, while sometimes pentamerous.

2. With *A. rubida* A.Cunn. It has resemblances in regard to the funicle and arillus. It also agrees in the truncate calyx and smooth pistil, but the foliage of the two species is very different.

3. With *A. amœna* Wendl. *A. amœna* differs in the flower, the calyx-lobes separating to the base in the *pistil* which is hairy, and in the seed with encircling funicle more than twice round, but this is a somewhat variable character.

The phyllode of *A. amœna* has two or three very prominent glands and is of a very different shape to that of the new species.

4. With *A. prominens* A. Cunn. A much larger plant, with the gland much larger and placed higher up the phyllode and the funicle very different.

5. With *A. obtusata* Sieb. The two species differ in the funicle and also in the pod, both being very different. The flower is somewhat similar, so also is the phyllode.

Uninerves (Racemosæ).

5. Acacia Kettlewelliæ, n. sp.

Arbor parva ad 20′ alta, foliis argenteis ramulis angulatis. Phyllodiis oblanceolatis paullo falcatis 6 – 8 cm. longis, 6 – 8 mm. maxima longitudine, glandula pulchra conspicua "Weaver-bird" nido simile. Nervo medio prominente, nervis lateralibus patentibus. Floribus in racemis densis phyllodios vix superantibus, capitulis globosis circa 10-floris. Floribus 5-meris, rhache glabra. Calyce late conoidea, subangulata, brevibus pilis sparsis. Calycis lobis petalis aequilongis. Petalis glabris liberis paullo incurvatis, pistillo laevo nitente. Legumine plano glauco, seminibus longitudinaliter vel oblique raro transverse dispositis. Semine funiculo breve filiforme in arillum albidum pulvino similem seminis apice terminante. Species *A. prominenti* Willd. proxima videtur.

A tall shrub or small tree up to twenty feet high, with silvery foliage and angular branchlets.

Phyllodes oblanceolate, slightly falcate, the marginal vein on the ventral side bent in, where there is a remarkable gland about two-thirds of the way to the insertion of the phyllode. Midrib prominent with lateral veins spreading. From 6 – 8 cm. long and 6 – 8 mm. in greatest width. No stipules observed.

The large gland on the margin is reminiscent of a weaver bird nest, and is the first I have noticed of this precise shape. It is a beautifully constructed gland, with the mouth opening downwards. At page 466 I have suggested

that examination of the glands in Acacia should be given more attention in future.

Flowers in dense racemes, scarcely exceeding the phyllodes; in globular heads, flowers five-merous, about ten in the head. Rhachis glabrous.

Calyx broadly conoid; slightly lobed, the length of the calyx-lobes about equal to that of the petals. Somewhat angular, besprinkled with a few scattered hairs.

Petals glabrous, free, slightly incurved.

Pistil smooth and shiny.

Pod flat, glaucous, more or less netted, veined, when ripe the edges of the valves with a narrow raised rim, the seeds disposed longitudinally or obliquely and occasionally transversely.[1]

Seed with a rather short filiform funicle terminating in a cushion-shaped white arillus at the top of the seed.

The type is from St. Bernard's Hospice to Harrietville, Victoria, (R. H. Cambage's No. 3714, 18th January, 1913). It is in fruit only and the flowers have been described from Buffalo Mountain, Victoria (Charles Walter, October 1902). I have it also in fruit from Buckland River, Buffalo Mountains (C. Walter, January 1899); I should have made this the type, but the specimen is so sparse that I cannot divide it. Also in fruit from Mrs. T. McCann, Snowy Creek, New South Wales, viâ Tallangatta, Victoria.

I have it in the youngest stage of bud, or in phyllodes only, from Thredbo River, Jindabyne, New South Wales (W. Baeuerlen, February 1890); Mount Kosciusko, N. S. Wales up to 5,500 feet (J. H. M., January 1898); Jindabyne (J. H. M. and W. Forsyth, January 1899); Mount St. Bernard, the type locality (J. H. M., January 1900); Back Creek, Tumbarumba (R. H. Cambage, No. 861, March 1903).

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[1] I emphasise this as showing that the position of the seed in the pod in Acacia varies like every other character.

I dedicate this species in honour of Mrs. Agnes Kettlewell who, with Mrs. Clunies-Ross and myself founded the Wattle Day League, who was the first Honorary Secretary of the Sydney Branch and who still remains in office.

Affinities.

1. With *A. prominens* A. Cunn. This new species comes very near to *A. prominens*, but has a longer and narrower phyllode with a quite different gland, which has the orifice at the top, and descending, instead of in the middle of the gland as in *A. prominens*. In the new species there is generally a narrowing of the phyllode where the gland occurs, until the gland touches the midrib.

The flowers in both species are nearly glabrous, with scattered hairs on the calyx, but in the new species the calyx is more angular and the petals more or less constricted where they meet the top of the calyx. The seeds are alike in both species.

2. With *A. Clunies-Rossiæ* Maiden. The two species are separated by the tomentum of the phyllodes in *A. Clunies-Rossiæ*, and the very different shapes of the glands. The structure of the flower is very different in the two species, the shape of the calyx and the relative proportions of its parts to the corolla, being marked and fundamental.

I am much obliged to my assistant, Mr. E. Cheel, for useful criticism in regard to this species.

Uninerves (Racemosæ).

6. Acacia Clunies-Rossiæ n. sp.

Frutex 15′ vel altior. Phyllodiis fere oblanceolatis, subfalcatis, plerumque apice fere curvata, apicibus juvenibus exalbidis brevibus pilis argenteis. Phyllodiis 4 – 5 cm. longis, 5 mm. – 1 cm. latis, nervo nedio distincto paucis nervis lateralibus obscuris. Glandula unica reniforme phyllodiae basin versus. Capitulis in racemis phyllodios non superantibus, circa 9-floris, rhache pilosa.

Calyce obtuse spathulata, sepalis circa dimidio petalis aequilongis liberis vel fere liberis, parte superiore pilosa. Petalis cymbae similibus formatis, glabris paullo carinatis, pistillo omnino glabre. Leguminibus planis rectis vel sub-falcatis, circa 7 cm. longis 7 mm. latis, maturis non visis, glaucis, valvarum marginibus incrassatis. Seminibus leguminis medio longitudinaliter dispositis. Funiculo duabus plicis in arillum carnosum clavatum lateralem terminante seminis apicem partim circumcingente.

Species *A. prominenti* Willd. proxima videtur.

A tall dense, pale foliaged shrub of fifteen feet high or more with rounded hoary branchlets, angular towards the tips.

Phyllodia slightly oblanceolate, slightly falcate, usually with a slightly hooked point, the young tips nearly whitish, through the presence of an abundance of short silvery hairs, the rest of the phyllode uniformly but more sparsely covered with similar hairs, which are almost absent in very old phyllodes. Length 4–5 cm., width about 5 mm., up to fully 1 cm. in young phyllodes.

A distinct midrib, a few lateral spreading veins scarcely visible except with the aid of a lens. No stipules observed.

One almost reniform gland near the base of the phyllode, perhaps a quarter of the way up, the margin of the phyllode scarcely bent or recessed at the gland-place.

Flowers in racemes, not exceeding the phyllodes. Buds nearly spherical, about nine in the head; rhachis hairy.

Calyx bluntly spathulate, the sepals about half as long as the petals; free to the base, or nearly so, besprinkled with hairs on the upper part.

Corolla petals boat-shaped, glabrous, with a slight keel.

Pistil quite glabrous.

Pods not seen quite mature, flat, straight or oftener slightly curved, about 7 cm. long by 7 mm. broad, glaucous, rims of the valves thickened.

Seeds longitudinally arranged in the centre of the pod. Funicle almost thread-like to the first kink, then a short slightly broader expansion to another kink, then a fleshy, clavate, lateral aril partly encircling the top of the seed.

Habitat. Near the Kowmung River, close to Yerranderie, N. S. Wales. The locality is in the southern highlands, about thirty miles in a direct line westerly of Camden. It is the only locality known at present. All collected by R. H. Cambage, and the numbers and comments (in inverted commas) are his.

1. "Like *A. prominens.* Devonian quartzite 2,000 feet. Kowmung (River), Yerranderie, N.S.W., 7th June, 1909, (No. 2743. I fully believe this to be the same as No. 2296)." Phyllodes only.

2. "Kowmung River, Yerranderie, 6th October 1909, (No. 2296)." In flower.

3. "Towards Kowmung, 2nd December, 1911, (No. 3129; same as 2296). Foliage of young tree, eight feet." Young phyllodes only.

4. "Fifteen feet high. Towards Kowmung, 2nd December 1911, (No. 3128; same as 2296)." Phyllodes and nearly mature pods.

5. "Foliage of young trees, six to eight feet. Towards Kowmung, 2nd December 1911, (No. 3127)." Phyllodes only.

I dedicate this species in honour of Mrs. Elizabeth Clunies-Ross who, with Mrs. Kettlewell and myself, founded the Australian Wattle Day League in the year 1909, and who was, for some years, Honorary Treasurer of the Sydney Branch. It also commemorates her late husband, an esteemed member of this Society for many years and a Vice-President of the League.

Affinity.

With *A. prominens* A. Cunn. This seems its closest affinity. The phyllodes of *A. prominens* are broader and

free from hairs, the gland of that species is different in shape, and projects beyond the margin of the phyllode. The sepals of *A. prominens* are united for the greater part of their length and the tips of the petals are markedly thickened. The pods of *A. prominens* are broader and the seeds are arranged transversely in the pod, but the funicle and arillus are not dissimilar in the two species.

Uninerves (Racemosæ).

7. Acacia Boormani n. sp.

Frutex debilis erectus, nitore argenteo distinguente. Ramulis subangulatis glabris. Phyllodiis angusto-linearibus, circa 3 cm. × 2 mm., uno nervo haud prominente, apice saepe falcata curvataque. Racemis phyllodias vix superantibus vel brevioribus, capitulis breve pedunculatis circa 7 floris. Floribus 5-meris. Calyce patente, angulata fere hemisphærica, prope truncata, sepalorum apicibus paullo pilosis. Corolla calyce bis aequilonga, petalis latiusculis, glabris, basi disjungentibus, saepe imbricatis. Staminibus filamentis brevibus. Pistillo glabre, fructu non viso. Species *A. linifoliæ* Willd. proxima videtur.

A weak upright-growing shrub somewhat denuded of leaves at its base, but becoming very leafy towards the head. Branchlets subangular and glabrous. It grows to about nine to ten feet high in some localities, but is usually three to five feet high. Stems smooth, not seen above an inch in diameter. It forms numerous sucker growths. It is exceedingly floriferous, but, like some other species that propagate themselves vegetatively, is shy to set its fruit, and I have not yet obtained fruits although they have been diligently sought for. The whole plant has a distinctive silvery lustre which affords a ready means of distinguishing the plant from all other species in the district.

Phyllode. Narrow-linear, not long (about 3 cm. × 2 mm.) with one not very prominent nerve; often with a bent, sometimes hooked point. The lower portion of the phyllode

slightly tapering to the point of attachment. A not very conspicuous gland rather low down on the phyllode. Minute lanceolate stipules observed in the phyllodes when the flower-buds are very young.

Flowers. Racemes scarcely exceeding the phyllodia or shorter. Inflorescence golden yellow. Buds nearly spherical. Heads of flowers shortly stalked. About seven flowers in the head, 5 or 6-merous.

The calyx spreading, angled, nearly hemispherical, almost truncate (*i.e.*, the lobes of the calyx very blunt), the tips of the sepals slightly hairy.

The corolla twice as long as the calyx, the petals broadish, glabrous, separating to the base, where they are strongly united; often imbricate, which is very unusual.

The stamens with short filaments.

The bracts at the base of the flower of a bright red-brown when quite fresh.

Pistil glabrous.

Fruit not seen.

Habitat. Shrub about four feet high, in early bud. Slate formation, Cowra Creek, near Cooma, (Macanally Range) N.S.W. (R. H. Cambage, No. 1878, 10th February, 1908).

In bud a little more advanced. The glaucous character of the buds is very evident. Banks of the Snowy River at Tombong, near Bombala (W. Forsyth, May 1908). In flower (R. Bornstein per R. H. Cambage, No. 1878a, September, 1908. Identical with 1878 above). In flower. Fairly plentiful on the sides of Mount (Macanally) and *en route* to the Macanally Mines (J. L. Boorman, 25th September, 1913). Mr. Boorman also collected it in December, 1914, when it was past flowering, but no pods could be obtained. With the exception of the Tombong specimens, all the specimens came from the same district, which may be

referred to as the Macanally Range, fifteen to twenty miles from Cooma. The Tombong locality is fifty miles to the south. Between Tombong and the Macanally Range is the course of the Snowy River, and the species will doubtless be found along its course.

I have chosen the specimens J. L. Boorman, 25th September, 1913, as the type, because I have adequate material of it, and name the species in honour of John Luke Boorman, Collector on the staff of the Botanic Gardens, Sydney.

Affinities.

Its affinities must be uncertain until such time as the pods are available, but I have waited over seven years for them, and feel, after due consideration, that the species is undescribed.

1. With *A. linifolia* Willd. *A. linifolia* has the phyllodes more sparse, the flowers fewer in the head, and the pedunicles and pedicels longer. The corolla is proportionately longer than the calyx. The inflorescence of *A. linifolia* is cream-coloured, not yellow; the plant is more wand-like. Variations in the phyllodes appear to be owing to environment; I do not notice any fundamental differences in these organs.

A. Boormani is a plant of cold regions (Monaro); *A. linifolia* comes from warmer localities, the Hunter to the Picton districts. Nevertheless, in the present state of our knowledge, it would appear that *A. Boormani* comes closest to *A. linifolia*.

2. With *A. decora* Reichb. A good deal of the northern New South Wales material of this species has very narrow phyllodes, (*Cf.* figs. L and M of plate 169 of my "Forest Flora of New South Wales,") but the shape of the phyllodes and the structure of the flower are different.

Julifloræ (Stenophyllæ).

8. Acacia Currani n. sp.

Frutex videtur, ramulis longis tenuibus subteretibus, pilis sericeis mollibus tectis. Phyllodiis 12 – 17 cm. longis linearibus obtuso-acutis, planis striatis pallido sericeo tomento pilorum dispersorum. Floribus pentameris, calyce fere ad basem lobata infra vix constricta, parte superiore pilosa, inferiore sparse pilosa. Pistillo parte superiore pilosa, inferiore sparse pilosa. Leguminibus rectis 4 – 6 cm. longis 3 – 4 mm. latis, pilis albis dense tectis, pedunculis pedicellisque pariter pilosis. Seminibus longitudinaliter dispositis, funiculo circa semen bis plicato, plica una breve altera longa. Species *A. Burkittii* F.v.M. proxima videtur.

Apparently a shrub with long wisp-like roundish branchlets, slightly compressed towards the tips. Silky-downy all through, except on the old wood.

Phyllodes long (12 to 17 cm.), linear, blunt pointed, flattish, striate, with a pale silky tomentum of scattered hairs. Rhachis densely matted in hair. Stipules not observed.

I have not seen a complete spike of flowers, although Mueller, ("Iconography of Australian Acacias," under *A. cyperophylla*, left hand figure), figures spikes which are shortly stalked, are barely 1 cm. long, and which may be intended for *A. Currani.*

All the specimens that I have seen are a mat of over-ripe flowers, but Mueller, by placing it on the *A. cyperophylla* plate assumes that it is spicate; (spikes short and about three times as long as broad; he figures it pedunculate in the enlarged details).

Flowers pentamerous; the various parts of the flower are glabrous or nearly so at the bases, and get increasingly hairy towards the tops.

Calyx lobed nearly to the base, hardly constricted below, hairy on the upper half, very sparsely on the lower half.

Petals united two-thirds of the way up, hairy on the upper half, very sparsely on the lower half.

Pistil hairy on the upper half, sparsely hairy on the lower half.

Bracts large, coarse, some of them bent, and all covered in hair.

Pods stipitate, straight, 4–6 cm. long, 3–4 mm. wide; covered with a mat of white hairs, the stem also, but not matted. The peduncles and pedicels are also hairy.

Seeds longitudinally arranged in the pod; the funicle folded twice round the seed, in a long and a short fold.

Habitat. Cobar, N.S. Wales (Rev. J. Milne Curran, F.G.S.).

So far as I know, only two specimens are in existence and they are in the Melbourne Herbarium.

1. Is labelled (*A. cyperophylla* by Mueller), and "Cobar N.S.W., Rev. Milne Curran, 1887." It is in pod and has over-mature flowers.

2. It is further labelled "Acacia No. 308. Bark peels off portion enclosed (not available, J.H.M.) with remains of withered flowers."

The label of specimen No. 2 is in Father Curran's hand-writing, which I know well. Nos. 1 and 2 are identical in origin, though whether sent at the same time I do not know. I wrote to Father Curran for further particulars of the plant, and for additional material but, owing to his absence from Sydney, I have had no reply.

I then wrote to the Ven. Archdeacon Haviland, now of Cobar, formerly of Bourke, and an authority on the plants of both places. He replied, "I am at a loss to know where he (Father Curran) could have got it; I am pretty well certain it was not in either Bourke or Cobar districts."

This introduces an element of doubt into the locality, but it was not stated how near the township at Cobar the

specimen was obtained, and as special attention has only been drawn to this plant by me, and it could easily have been passed over in the bush for other plants, particularly when not in flower, all that remains is to be on the look out for it.

Affinities.

The affinity of this new species appears to be closest to *A. Burkittii*, but the final word in classification cannot be said until fresh spikes of flowers are available. At present, judging from the pods, it would appear that the spikes are arranged in a racemose manner, and that they are pedunculate.

1. With *A. Burkittii* F.v.M. It is sharply separated from *A. Burkittii*, which is glabrous. The phyllodes of *A. Burkittii* are more rigid and more terete. The heads of flowers in *A. Burkittii* are in pairs. The seeds are different.

2. With *A. cyperophylla* F.v.M. Let us examine the plate of *A. cyperophylla* F.v.M. in Mueller's "Iconography of Australian Acacias, etc." The plate consists of three twigs, and it is a remarkable statement for me to make that each twig is probably a different species.

(a) The central twig is typical *A. cyperophylla* F.v.M., and I will explain matters in Part 60 of my "Forest Flora of New South Wales."

(b) The right hand twig is *Acacia Currani* Maiden, and most (probably all) of the analytical drawings belong to that species.

(c) The left hand twig is probably *A. Burkittii* F.v.M. (the "portions of phyllodia" alongside belong to *A. Currani*). One cannot speak with certainty because the drawing does not enable one to do so.

Notes on Various Species.

a. ACACIA CRASSIUSCULA Wendl.

(See under *A. Flocktoniæ* supra, p. 477.)

b. ACACIA LEPTOPETALA Benth. (Syn. A. MURRAYANA F.v.M.)

I concur in Bentham's observation that *A. Murrayana* differs "from *A. leptopetala* in little besides the long narrow phyllodia."

This dry country wattle has now been found in a number of New South Wales localities. Mr. W. A. W. de Beuzeville, in recently sending it from Wambaduli, Pilliga, remarks "the bark is rather peculiar, being of a mealy white appearance; the only other Acacia that I have seen with a bark at all similar is *A. spectabilis*. I may remark that the Western Australian plants of *A. leptopetala* are similarly glaucous.

c. ACACIA LINEARIS Sims.

Hooker, in recording it[1] from Tasmania, says "This appears to be a very rare Tasmanian plant, and has never been found in fruit. Mr. Gunn, who alone has gathered it, says that he has seen a very few bushes of it, which have since been burnt down; and as the place where they grew has been fenced in, and turned to a pasturage, it is probable that it will become extinct there."

I have a specimen of Gunn's No. 677, which is the plant referred to by Hooker; it is labelled "C.Hd" (Circular Head) and was collected in the year 1837. I have carefully examined this specimen and do not see in what detail it differs from *A. suaveolens* Willd., and recommend that Hooker's record of *A. linearis* for Tasmania be withdrawn.

Mr. L. Rodway records[2] *A. linearis* from George's Bay, Tasmania, and also makes the interesting suggestion that it constitutes a variety *(linearis)*, of *A. mucronata* Willd. I have dealt with *A. mucronata* in Part 57 of my "Forest Flora of New South Wales" now in the press.

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[1] "Flora of Tasmania," 1, p. 109. [2] "The Tasmanian Flora," p. 42.

What I have seen from Tasmania attributed to *A. linearis* has phyllodes 3–4 cm. long, instead of the phyllodes of 8–13 cm. of the typical form. Typical *A. linearis* has scarcely visible lateral veins, while in the Tasmanian plants attributed to *A. linearis* the lateral veins are almost reticulate and the texture apparently thicker. I concur in Mr. Rodway's opinion to merge such a form as this in *A. mucronata* Willd., and suggest that *A. linearis* Sims be not adopted as a Tasmanian plant without further evidence.

d. Acacia pycnantha Benth.

Bentham records this species only from South Australia and Victoria. The New South Wales specimens I have seen have not been entirely satisfactory, and, being an important species for tan-bark, it has been tested from end to end of New South Wales, and it is growing in innumerable places where it is not spontaneous. It is therefore desirable to give authentic records for New South Wales.

Tree of twelve feet, on slopes at head of Cuttagee Lake and Creek, near Bermagui, South Coast.

In flower August, and fruit December 1915 (W. Dunn).

I asked Mr. Dunn, who is a shrewd observer, if there was any possibility of the plant having been artificially sown and he replies emphatically in the negative.

e. Acacia lineata A. Cunn.

This was originally described in G. Don's "Gen. Hist. of Dichlamydeous Plants," II, 403, 1832. The locality for the type was not stated in that work (it can of course be laboriously traced in Allan Cunningham's Mss.), but Bentham quoted "Liverpool Plains, Wellington Valley etc."

It is somewhat variable and occurs from the Mallee country of Victoria through the mid-west of New South Wales to southern Queensland. It is not noted from

Queensland by Bentham, but Bailey records it from Eumundi, and I add Inglewood to it.

The South Australian localities of Bentham are those of *A. imbricata* F.v.M., a form which, if conspecific with *A. lineata*, which is open to doubt, is furthest remote from that species of all the forms. See below, p. 499.

With the help of Miss Flockton and Mr. W. F. Blakely (my assistants) I have examined a good deal of material of *A. lineata*, and the following notes will show the amount of variation observed in the species.

I have divided the material into groups of specimens (provisional groups for the purpose of this paper, and more or less empirical). These groups run into each other a good deal, but there is a sequence in them, beginning at Group 1 until we come to Group 5, which contains the forms nearest to *A. imbricata* F.v.M.

Pictorial illustration is necessary to describe them fully, but I trust that the following notes will be helpful.

Group 1. Phyllodes hairy, nearly all with a gland at base on the *inner* side about a quarter way up. Mid-nerve nearly central, and the tip straight or nearly so, not hooked. Peduncle sparingly hairy.

Flowers in heads on peduncles (hairy) shorter than the phyllodes. Calyx irregularly lobed, hairy. Petals free, glabrous. Pistil hoary or smooth.

Parkes (J. L. Boorman).

Group 2. Phyllode hairy and hooked at tip. Mid-vein nearer to the lower edge, gland towards base.

Flowers on glabrous peduncles, exceeding the phyllodes.

Peak Hill (J. L. Boorman), Tomingley to Narromine (J.H.M.) With these may be associated:—*Not* exceeding the phyllodes, phyllodes hairy, gland; four feet high, spreading habit. Bygo Run viâ Wagga Wagga (J. R. Taylor).

Group 3. Phyllodes 1-nerved, covered in long weak hairs, "an oblique callous mucrone at the apex," stipules minute, very deciduous.

Flower heads on glabrous peduncles not so long as the phyllodes, large sheath-like bracts at the base of the peduncle. Calyx narrow, irregular, free nearly to the base, hairy. Petals free, glabrous, five-merous. Pistil hoary or rather papillose.

Liverpool Plains (?Allan Cunningham); Near Dubbo (E. Betche); Gulgong (F. E. Haviland).

Group 4. Phyllodes clammy, one-nerved, a few scattered hairs, minute deciduous stipules; "oblique-callous mucrone at the apex," gland near base.

Flowers in heads, on glabrous peduncles exceeding the phyllodes, and with a large sheath-like bract at the base. Flowers small and frail. Calyx irregularly lobed, fringed with hair. Petals five-merous, glabrous. Pistil hoary.

Bogan Gate and Wyalong (J. L. Boorman), Wyalong and Temora (Rev. J. W. Dwyer). There are two different looking forms from Temora, one compact in habit and more pubescent than usual (? *A. dasyphylla* A. Cunn.) the other of a more open habit, the phyllodes further apart.

I may remark that Group 3 is closely related to Group 4, but the phyllodes of Group 3 are thinner in texture, and have a marked nerve. In Group 4 the phyllodes are thicker, with thick margins, and the nerve although present is not distinct, but is lost in the thickness of the margin.

I am of opinion that both No. 3 and No. 4 are very near the type of *A. lineata*. It may be desirable to bring under notice the original description of *A. lineata*, which is as follows:—

A. lineata (Cunningh. Mss.), stipulas wanting or deciduous; *phyllodia* linear, ending in an oblique, callous mucrone

at the apex, glandless, one-nerved, the nerve parallel with the superior margin and contiguous with it; *phyllodia as well as the branches hairy;* heads of flowers usually twin; *peduncles* filiform, longer than the phyllodia; *phyllodia* half an inch long. (Don, "Gen. Hist. Dichlamydeous Plants," II, 403, 1832).

I am further of opinion that *A. dasyphylla* A. Cunn., which is a more pubescent form of *A. lineata*, comes under Group 3 or 4.

Group 5 (a glabrous form). Phyllodes glabrous except a few hairs at the base, one-nerved, *one* thick nerve-like edge, point oblique, but not pronounced, gland near base.

Flowers in heads, on glabrous peduncles not exceeding the phyllodes. Calyx narrow, irregular, hairy, free nearly to the base. Petals free, glabrous, five-merous. Pistil hoary.

[This includes *A. runciformis* A. Cunn., in part.]

Specimens falling in Group 5 come from Mallee country of Victoria (St. Eloy d'Alton, C. Walter); Goonoo (Mudgee to Dubbo) (J. L. Boorman); also Dubbo (J. L. Boorman); Gunnedah (J. L. Boorman); W. L. Waterhouse, Ticketty Well, between the Gwydir and McIntyre Rivers (E. H. F. Swain); Inglewood, Queensland (J. L. Boorman).

An affinity of *A. lineata* to *A. aspera* Lindl. is worthy of note. They are in two sub-groups in Bentham's classification, viz.:—subseries Armatæ and Brevifoliæ respectively of the Uninerves, but the latter species may have phyllodes so small, and of such a shape that they may readily be confused with the latter.

f. Acacia imbricata F.v.M.

I have examined a specimen of the type (in fruit) from Tumby Bay, Spencer's Gulf, S.A., through the kindness of Professor Ewart, and have a flowering specimen (cultivated) from another source.

Following is a translation of the original description :—

Glabrous, branches crowded, with acute angles, stipules obsolete, phyllodes small, crowded, sessile oblong or cuneate-linear, with one nerve, veinless, obtuse, having a gland at the apex, obliquely cuspidate apiculate, peduncles solitary in the axils, exceeding the phyllodes; pods broadly linear, papery, somewhat sessile, slightly compressed, full or many seeded, the suture straight, seeds round-ovate, slightly compressed, shining, blackish, twice as long as the acuminate cymbiform aril.

In scrub near Tumbey (Tumby) Bay on the shore of Spencer's Gulf. (C. Wilhelmi).

A dense shrub three to four feet high. Phyllodes two to six lines long, half to one line broad. Peduncles thin, often half an inch long. Pod two to three lines broad. Seeds about one and a half lines long, distinctly areolate.

The species certainly belongs to the Uninerves, and has affinity with *A. lineata.* According to the illustrious Bentham, *l.c.*, it is allied to *A. conferta* (series Brunoideæ) which only flourishes in eastern Australia, but it differs from it. It is of much taller habit, the pubescent branches are not distinctly angled, the phyllodes are acute without a terminal gland, with scarcely any nerve, and with a sufficiently distinct margin, pod very much compressed, crowded, much broader, hoary, few seeded, the sutures flexuose, the larger seeds less shining and more compressed, not distinctly areolate and perhaps in the flowers also. ("Fragm." 1, 5, 1858).

A. imbricata is more willowy, less rigid than _A. lineata._

It comes next in the series (of the groups of _A. lineata_) to Group 5. Its points may be briefly set out.

Phyllode glabrous, one-nerved with a gland on the upper portion of the phyllode, at the apex between the nerve and the margin. This is appressed to a small "oblique callous mucrone" at the apex between the nerve and the lower margin. The apex, with this gland and callous mucrone, appears thickened and bifid. This is very unusual and may be unique.

The phyllodes are imbricate to the extent that I have never seen in *A. lineata*; indeed the appearance is very different.

Flowers in heads, on glabrous peduncles exceeding the phyllodes. Calyx narrow-linear, hairy. Petals free, glabrous, five-merous. Pistil smooth and shiny.

The pod is straight and smooth with a short funicle terminating in not a large aril. The pod of *A. lineata* is much twisted, is covered with glandular hairs and has a larger more folded aril.

It seems to me that a strong case has been made out for the recognition of *A. imbricata* F.v.M. as a species distinct from *A. lineata*.

g. Acacia Bynoeana Benth.

This species is in the "Flora Australiensis" only recorded from the type locality (North West Australia), and also from the Gulf of Carpentaria.

Some years ago, I received from the late Mr. C. Walter of Melbourne, an undated specimen collected by Mr. St. Eloy D'Alton at Nhill, in the Mallee country of Victoria. He (Mr. Walter) had marked it "*calamifolia* var. *Wilhelmsiana* or *nematophylla*." This specimen is *A. Bynoeana*, and there is a reference to an "*A. Wilhelmsiana*" from the Murray Scrub by Bentham under *A. Bynoeana*.

I received the same species from South Australia from Mr. Walter Gill in January and December 1909. It came from the same general district as Mr. D'Alton's specimen. The following note was furnished by Mr. Gill :—

"It is very common in the Parilla Forest, and all about the Mallee scrub, over a wide extent of the Pinnaroo district, which lies between Tailem Bend (on the Melbourne-Adelaide line) on the west, and the Victorian border on the east."

It is also found in New South Wales. There is a specimen in this Herbarium from the Lachlan River, dated September 1882, by an unknown collector. It was also received from P. E. Lewis of Shuttleton near Cobar in January 1908, and from Archdeacon F. E. Haviland from the same locality in September 1911. There is a note by the latter in "Proc. Linn. Soc. N.S.W." XXXVIII, 645, (1913) under the name *A. lineata* A. Cunn., which is my fault.

Both Mr. Gill's specimens (No. 1) and Archdeacon Haviland's (No. 2), are quite satisfactory, but as the species is so little known, I trust that the following notes on them will be helpful:—

No. 1—Phyllodes narrow, semi-terete or thick, two distinct parallel nerves, hooked or curved apex, gland near base, very resinous, stipules minute.

Flower-heads on a peduncle with golden hairs and sheathing bracts. Calyx irregularly lobed, thick, hairy. Petals with a few hairs. Pistil hoary, *i.e.*, not very pubescent.

No. 2—Phyllode, sometimes one, usually two-nerved, curved or hooked very much, resinous, a few hairs on the edges and nerves, chiefly on the lower half of the phyllode. Phyllode articulate between two minute stipules.

Flowers in heads, hairy, the peduncles short, covered in a golden pubescence and subtended by a large bract. The peduncle does not exceed the phyllode. Calyx turbinate, hairy, *i.e.*, similar to the Parilla specimens, but the calyx more expanded. Petals hairy on the upper half. Pistil pubescent.

h. Acacia ixiophylla Benth.

(Syn. *A. glutinosa* F.v.M. and *A. fuliginea* R. T. Baker).

i. A. montana Benth.

I desire to invite attention to the very great confusion which has arisen in regard to the above species. That

confusion, which Mr. Baker tried in part to clear up by the proposal of a new species *(fuliginea)*, was acquiesced in by me, and much material was distributed from this herbarium under that name, but I will show that it is a synonym of *A. ixiophylla*. The confusion of *A. ixiophylla* and *A. montana* is brought under notice for the first time.

To clear the ground, I give translations of the original descriptions of *A. ixiophylla*, *glutinosa* and *montana*.

(A) *Acacia ixiophylla* Benth., Lond. Journ. of Bot., I, 364 (1842).

Very branched, glabrous or minutely pubescent, viscid, phyllodes narrow oblong-lanceolate, subfalcate, obtuse with an oblique apex and minutely mucronulate or glandular, thinly multinerved, narrowed at the base, peduncles downy, solitary or very shortly racemose, capitula under twenty flowers in the head.

Phyllodia under an inch in length, scarcely two lines broad, subcoriaceous and much thinner than *A. sclerophylla*. Most of the racemes two to three headed. North of Liverpool Plains, New South Wales. Cunningham (Allan).

(B) *Acacia glutinosa* F.v.M., in Fragm. IV, 6.

[N.B. the italics are those of the original.]

A shrub somewhat glabrous and *viscid*, the branchlets at first angular. Stipules obsolete, *phyllodes oblong-linear*, *gradually narrowed towards the base with many fine veins which are uniform and immersed (immerse)*, obtuse, minutely apiculate, straight or slightly curved, the two finely-downy peduncles about as long or a little longer than the many flowered capitula. The stipes of the bracteoles hair-like and the lamina sub-cordate or rhombic. Sepals linear, almost free, more than half as large as the corolla, *pods somewhat papery curled and flexuose*, *rather short*, *viscid*, broadly linear, with two valves continued within, seeds ovate, dark black, shining, arranged longitudinally and marked on either side with a large oblong faint areole, with a dark sub-lateral cymbiform strophiole about a third as long as the seed. In New Holland, South West Australia, (Maxwell).

A shrub many feet high. Phyllodes thinly coriaceous, 1 – 2″ long, 1½ - 2½‴ broad, somewhat sessile. The common peduncle very short or none, individual peduncles 2 – 3‴ long. Bracteoles somewhat glabrous, corolla 5 fid, and shorter. Pods glabrous, at the most 1 – 1½″ long, 1 – 2‴ broad, compressed, very undulate, brownish. Seeds about 1½‴ long. I have found no species in our large collection of Eastern Australian Acacias which I could consider to be the same. I much doubt, however, that it is that species concerning which the illustrious Bentham in (Linnæa XXVI, p. 625) notes a likeness to *A. ixiophylla.* (Fragm., IV, 6.)

(C) *A. fuliginea* R. T. Baker is described in English in Proc. Linn. Soc. N. S. Wales, XXXI, 712 (1906), and he gives figures of *A. fuliginea* and of what he deems to be *A. ixiophylla.*

At page 507 I will consider, *seriatim*, all the points to which Mr. Baker draws attention (at p. 713) in contrasting *A. fuliginea* and *A. ixiophylla.*

(D) *Acacia montana* Benth. in Lond. Journ. of Bot., I, 360 (1842).

Very viscid, branchlets subangular and with pubescent peduncles, phyllodes oblong or oblong-lanceolate, very obtuse, scarcely with a callous apex, narrowed at the base, glabrous, two-nerved, peduncles short, brownish, very short, bracts at the base, capitula small, multiflowered.

Affinity to *A. exsudans (A. verniciflua* A. Cunn. var. *latifolia* Benth.)

Phyllodia more obtuse, shorter (1 – 1½ inches), veins more obscure. Peduncles thinner than the bracts at the base. Capitula much smaller. Highlands near the Liverpool Plains, New South Wales, *Fraser.*

A. IXIOPHYLLA Benth. and A. MONTANA Benth.

Mueller figured *A. montana* in his "Iconography of Australian Acacias" but did not figure *A. ixiophylla.*

The most obvious points of *A. montana* Benth. are:—

1. Hairy pod.
2. Peduncles with few or scattered hairs.
3. Laminæ of bracteoles rhomboid or foliaceous.
4. Phyllodes with two main nerves.

Contrasting with *A. ixiophylla* Benth., we have in the latter:—

1. Smooth, narrower pods.
2. Peduncles with short, dense tomentum.
3. Laminæ of bracteoles capitate (like the head of a nail, *i.e.*, with not much lateral expansion).
4. Phyllodes with three or more nerves, anastomosing more than in *A. montana*.

Following are the specimens of *A. montana* in the National Herbarium of New South Wales:—

New South Wales.—Angledool (Miss Newcomen) near the Queensland border.

Brigalow scrubs on the Severn (Leichhardt). [This is near the Queensland border]. Liverpool Plains (without collector's name. Perhaps a fragment of the type).

Deepwater and Emmaville Hill (J. L. Boorman).

Mount Lindsay (at 4,500 feet), Nandewar Mountains (R. H. Cambage, No. 2400). Phyllodes up to $2\frac{1}{2}''$.

Warrumbungle Ranges (W. Forsyth). Phyllodes broader than the type and with slightly fimbriate margins.

Tamworth (Revd. H. M. R. Rupp), Moor Creek near Tamworth (W. M. Carne).

Merriwa (J.H.M. and J. L. Boorman).

Elsmore, ten miles east of Inverell (R. H. Cambage, No. 1772).

The above are northern New South Wales. Then we have a gap to the south, with the following one as an intermediate locality:—

Wirlong-Nymagee (R. H. Cambage, No. 141; in bud only).

"Growing in bunches four or five feet high," five miles east of Temora (R. H. Cambage, No. 615). Temora (Rev. J. W. Dwyer, Nos. 223, 224, 230). Some of the phyllodes of Father Dwyer's specimens are under one inch as are also some of the Victorian ones.

Victoria.—Grampians (A. J. Campbell). Pomonal (J. Staer). Dimboola (St. Eloy D'Alton and J. Staer).

South Australia.—Murray Bridge (J. H. M. phyllodes only).

Drummond's specimens.—I now come to Drummond's fifth collection No. 13, referred to under *A. ixiophylla* by Bentham in B. Fl. ii, 387. Indeed he describes the pods ("very flexuose, hispid or glabrous, two to three lines broad") and also the seeds. These pods (the hispid ones) and seeds are not distinguishable from those of *A. montana*. The pods are, however, not fully grown, and the seeds seem to be arranged obliquely. The phyllodes are viscid, and are more pubescent than those of typical *montana*, but I think the material available is fairly referable to that species. Certainly it is not *A. ixiophylla*.

My specimen is fairly well represented by the right hand figure of Mr. Baker's Plate LXVI of *A. ixiophylla*.

This determination would extend the range of *A. montana* in a westerly direction from St. Vincent's Gulf to Western Australia.

Following are the specimens of *A. ixiophylla* in the National Herbarium of New South Wales:—

Queensland.—Miles, Dalby district (Collector of F. M. Bailey) in flower and fruit. Phyllodes 1–2″ by 4 mm. Pod as figured for *A. fuliginea* by Mr. Baker. Condamine River

(Leichhardt); Six to eight feet of weak, pendulous growth, Inglewood (J. L. Boorman).

New South Wales.—Brigalow scrub beyond the Severn (Dr. Leichhardt); Warialda (W. A. W. de Beuzeville No. 8 of 24th October, 1913). Pod as figured for *A. fuliginea*. Most phyllodes a little broader than those of the preceding specimens. "Middle sized shrub," Yagobie, between Moree and Warialda (District Forester). Wee Waa (T. W. Taylor, No. 5).

The following from the Pilliga Scrub:—(*a*) Brigalow Creek, eight to ten miles from Cuttabri (Dr. H. I. Jensen, No. 44). (*b*) On red soils between Wongan and Baradine (Dr. H. I. Jensen No. 71). (*c*) Twelve to eighteen feet (?) common in the Pine Scrub (J. L. Boorman). (*d*) eight to ten feet, much branched, common throughout the scrub, always liable to a smut. Cuttabri (J. L. Boorman). (*e*) About ten feet. In sandy clay with Pine and Ironbark. Cuttabri (E. H. F. Swain, No. 46). (*f*) Ten feet, Goona Creek (W. A. W. de Beuzeville, No. 2).

The following are co-types of Mr. Baker's *A. fuliginea* and I cannot see in what respect they differ from *A. ixiophylla*. They simply continue the series of *ixiophylla* specimens. The position is that either *A. ixiophylla* or *A. fuliginea* cannot stand.

Bylong Ranges, also Camboon, seven miles north of Rylstone, October 1893 (R. T. Baker); also Goulburn River 1896, same collector.

A. IXIOPHYLLA Benth. and A. FULIGINEA R. T. Baker.

We now come to consideration of the points Mr. Baker advances (Proc. Linn. Soc. N.S.W., xxxi, 713) as differences between these two species.

1. *Flowers in the head.*—Of *A. ixiophylla* Bentham says (Lond. Journ. Bot.) "under 20 flowers." In B. Fl. ii, 337, he says, "15 to 20 or rarely more."

Mr. Baker says—(*a*) "It (*fuliginea*) has twice as many flowers in the head" as *A. ixiophylla*, and at p. 712, *A. fuliginea* has "about 40 flowers."

The material at my disposal has been very carefully examined with the following results: I have seen no head with as few as 20, but various numbers up to 35. On the evidence I should give the limits as 24 and 35. All in the following list have been hitherto regarded as *A. ixiophylla* (some have actually passed through the hands of Bentham, Mueller and F. M. Bailey). The co-types of *A. fuliginea* fall into the series quite naturally.

Bylong Ranges and Rylstone, co-types of *A. fuliginea* R. T. Baker, flowers in the head 35. All the rest are *A. ixiophylla*.

Brigalow Creek, Pilliga (Jensen), flowers in the head average 24; Wongan and Baradine (Jensen), flowers in the head between 30 – 35; Pilliga (J. L. Boorman), an average of 25 flowers in the head; Cuttabri, Pilliga (J. L. Boorman), an average of 30 flowers in the head; Pilliga Scrub (E. H. F. Swain), flowers in the head 30; Goona Creek (W. A. W. de Beuzeville), flowers in the head 30; Wee Waa (T. W. Taylor) flowers in the head not less than 35; Brigalow Scrub beyond the Severn (Dr. Leichhardt, seen by Bentham and Mueller), flowers from 30 to 35 in the head; Condamine River (Leichhardt, seen by Bentham and Mueller), flowers in the head 30; Inglewood (J. L. Boorman), flowers in the head 25; Miles (seen by F. M. Bailey), flowers in the head 35.

2. *Phyllodes*.—For the original description of them in Lond. Journ. Bot. I, 364, see above.

In B. Fl. ii, 387, Bentham adds a few modifications, the principal of which are, "$\frac{3}{4}$ to $1\frac{1}{2}$ or near 2 in. long, 2 to 3 or rarely 4 lines broad."

Mr. Baker *(loc. cit.)* says *(b)* "The phyllodes (of *A. ixiophylla* and *A. fuliginea*) have quite a different shape and are larger in size." Let us consider these points *seriatim*.

Shape.—The original shape is "narrow oblong lanceolate, sub-falcate, with an oblique apex."

Bentham later (B. Fl. ii, 387) does not alter this description in an important manner. Mr. Baker figures *A. ixiophylla* much longer and narrower than *A. fuliginea*.

After examining a long series I fail to find any difference between *A. ixiophylla* and *A. fuliginea* in respect of shape.

Size.—The original description for *A. ixiophylla* says "under an inch in length, scarcely two lines broad." In B. Fl. ii, 387, he alters it to $\frac{3}{4}$ to $1\frac{1}{2}$ or rarely nearly 2 in. long, 2 to 3 or rarely 4 lines broad.

Mr. Baker gives the size of *A. fuliginea* as "2 to 3 or even 4 cm. long, and varying up to 1 cm. wide." These figures are included in Bentham's as regards the length, and, as regards the width, Bentham's are $\frac{1}{6}$ to $\frac{1}{3}$ inch, and Mr. Baker's are "varying up to $\frac{2}{5}$ inch." I find phyllodes of *A. ixiophylla* agreeing with Bentham's dimensions for *A. ixiophylla* and with Mr. Baker's figure of *A. ixiophylla*, and with his description and figure of *A. fuliginea*.

Venation.—Bentham in the original says "thinly multinerved." In B. Fl. ii, 387, he amplifies this into "striate, with numerous fine but prominent nerves, anastomosing when the phyllodium is broad."

Mr. Baker says of his *A. fuliginea* "with several nerves and intermediate reticulations." These words are simply Bentham's in another form. In his figure, however, Mr. Baker figures *A. ixiophylla* with three or more nerves, and *A. fuliginea* with three to five. I fail to note any difference between them.

It is sometimes difficult to say how many nerves there are in *A. ixiophylla* as the texture of the phyllodes may be thickish and resinous, and it is difficult to distinguish between the nerves and the striæ. Mueller expresses the idea in the use of the word "immerse" when speaking of the veins of *A. glutinosa*. One sees long fissures but one cannot exactly state their character with a lens.

Gland.—Mr. Baker, in describing *A. fuliginea* speaks of "gland wanting," but that is a slip. There is in all *A. ixiophylla* material (whether attributed to *A. fuliginea* or not), a rather large gland, but it is near the base of the phyllode and not easy to see unless the phyllode is detached. The liability to pass it over is enhanced by the ruggedness of the surface of the phyllode owing to the glandular protuberances.

Indument.—There is variation in the species. Bentham expresses it as "glabrous or pubescent glutinous." This is worthy of emphasis. The name *fuliginea* is owing to the sootiness of the phyllodes, which can be observed in *A. ixiophylla* from widely separated localities.

Inflorescence.—(*c*) The inflorescence is referred to by Bentham, . . . "solitary, or very shortly racemose." . . . Most of the racemes 2–3 headed." In B. Fl. ii, 387, "Peduncles in pairs on short racemes of three or four."

Mr. Baker says of *A. fuliginea* (*d*) "The inflorescence is not in racemes," and again . . . "Solitary or in pairs on the end of the newly formed branchlets."

Careful examination of a long series of *A. ixiophylla* (including specimens labelled *A. fuliginea* by Mr. Baker) shows that the flower-heads are in pairs on short racemes. In one case (viz. Miles, Queensland, F. M. Bailey), the flower-heads are solitary, in pairs or threes, on short racemes. It will be seen that they all come under *A. ixiophylla* as described by Bentham.

Pods.—Bentham in describing *A. ixiophylla* does not describe the pods. In his later and amplified description (B. Fl. ii, 387) he adds a description of Western Australian pods (Drummond's in fact, which do not belong to this species, and which I attribute to *A. montana*).

Mr. Baker *(loc. cit.)* contrasting the pods of *A. fuliginea* with those as described by Bentham says:—

(*e*) "The pods are much longer and narrower."

I have already referred to specimens which are *A. ixiophylla,* have its narrow pod, and which in no way differ from the flowering and fruiting specimens attributed by Mr. Baker to his *A. fuliginea,* and credit is due to that gentleman for prominently drawing attention to the pod of *ixiophylla (fuliginea).*

A. glutinosa F.v.M. A translation of Mueller's original description has been already given. It is quite clear, and Professor Ewart has favoured me with a portion of the type. (Maxwell, Western Australia).

It will be seen that Bentham (B. Fl.ii, 387) has referred it to *A. ixiophylla,* qualifying it by "the western specimens," but, so far as I am aware, no specimens other than those from Western Australia have ever been referred to *A. glutinosa.*

I have also a specimen from Kellerberrin, West Australia (R. B. Leake). As these Western Australian specimens are but little known and seem to be conspecific, I will describe them in a few words:—

1. *Type.*—Phyllode finely veined, two nerved, sharp mucrone, glabrous.

Flowers about thirty-five in the head.

Bracteole slight, oblique-capitate, glandular or hoary on the top.

Calyx-lobes divided half way down or more, nerved, hairy at the top.

Petals free or united near the base, glabrous.

Pistil hoary at the top.

Pod much twisted (convolute), smooth, with transverse veins.

Seed placed longitudinally in the pod, with short funicle.

2. *Kellerberrin specimen.*—Phyllode entirely glabrous, with oblique sharp-pointed tip, two main nerves.

Flower-heads in pairs on a short peduncle about twenty-three in the head. A narrow bract at the base of each head of flowers. Each bracteole capitate or with a slight point, and having a few hairs. Flowers five merous.

Calyx cup-shaped, lobed, extremely thin and transparent, thickened at the tip, a few hairs at the apex, no central nerve.

Petals thickened at the top, with a central nerve, glabrous.

Pistil smooth, sometimes hoary at the top.

As regards the pods of *A. ixiophylla,* Bentham never saw them, but assuming that the Western Australian specimens are that species, he described the pod as "very flexuose, *hispid (A. montana* Benth., J.H.M.) or glabrous, *(A. glutinosa* F.v.M., J.H.M.) two lines broad." He is thus combining the pod of Drummond's fifth Coll. No. 13[1] which is *A. montana* and which is hispid (see Mr. Baker's figure of *A. ixiophylla),* and Maxwell's specimen of *A. glutinosa* which Mueller tells us has "Legumina glabra." (Fragm. IV, 7.)

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[1] Drummond's specimens were unaccompanied by localities as every botanist knows, and as regards Maxwell's, Mueller often labelled them "South West Australia" as in the present case, and often "West Australia." Maxwell collected chiefly in the King George's Sound and Stirling Range district and accompanied Drummond to the Stirling Range. See Proc. W.A. Nat. Hist. Soc., 1909.

As regards Drummond, some of his fifth collection undoubtedly came from the King George's Sound-Stirling Range district.

Allowing for some variation in plants separated from each other by the width of a continent, I think that the resemblance of *A. glutinosa* F.v.M. to *A. ixiophylla* Benth., is remarkably close, and concur in Bentham's proposal to combine them.

The range of *A. ixiophylla*, as we know it, affords a remarkable instance of geographical distribution. The species is a denizen of moderately dry localities, and we have it from central Queensland south to the Rylstone district in New South Wales. Then we have a gap until Western Australia is reached and I would invite the attention of botanists to the matter. It (and indeed *A. montana*, when not in fruit) are species which can readily be passed over for allied species.

I have a specimen from the Mallee, Wimmera River, Victoria, C. Walter, 10th March 1887, which that gentleman sent to me as *A. montana*. It is in pod, without seeds. I have little doubt that it is one of the localities destined to bridge the present *A. ixiophylla* gap.
