NOTES ON ACACIA, No. III.—EXTRA-TROPICAL WESTERN AUSTRALIA.

(With Descriptions of New Species.)

By J. H. Maiden, I.S.O., F.R.S., F.L.S.

[*Read before the Royal Society of N. S. Wales, September 5, 1917.*]

Pungentes (Plurinerves).

I. A. xerophila W. V. Fitzgerald, Journ. W.A. Nat. Hist. Soc., p. 8, (May, 1904). (Syn. *A. Fitzgeraldi* Pritzel, Engler's Bot. Jahrb. xxxv, 291, 1905).

Originally described from Bardoc, thirty miles north of Kalgoorlie. It has since been collected by Mr. Surveyor Anketell in Muir's Transcontinental Railway Survey, 1901 (Kalgoorlie, going east).

Pungentes (Uninerves).

II. Acacia Prainii n. sp.

Frutex parvus, erectus, glaber, pungens, 2 – 3′ altus, ramulis paullo angulatis; phyllodiis angusto-linearibus, pugioniformibus, nervo medio prominente, mucrone longo, acuto, non striato; capitulis in racemis axillaribus gracilibus, pedunculis fere filiformibus; floribus glabris, 5-meris ca. 20 capitulo; calyce angusto, fere lineare, corollæ dimidio æquilongo; petalis libris; pistillo laeve, nitente; legumine seminibusque non visis.

A free-flowering small, erect bushy glabrous shrub of two or three feet, prickly to the touch because of the pungent tips of the phyllodes; branchlets slightly angular.

Phyllodia about 3 cm. ($1\frac{1}{4}$ inch) long, narrow linear, thickish, rigid, pugioniform, with a prominent midrib, and a long sharp mucrone; not striate. There are usually two but sometimes three glands, which vary somewhat in regard to the distance from the base.

Flower-heads in slender axillary racemes, the peduncles almost filiform. Flowers glabrous, 5-merous, about twenty in the head, which is globular. Bracts at base of flowers not seen. Calyx narrow; almost linear, free, thin, half as long as the corolla. Petals free, thickened at the apex. Pistil smooth and shiny. Pods and seed not seen.

Southern Cross (J. H. M., October, 1909).

Named in honour of Sir David Prain, F.R.S., Director of the Royal Botanic Gardens, Kew, who has been most kind in assisting me with material of this genus.

The following specimens are referred to this species:—

1. A shrub six feet high, Jibberding, Watheroo Rabbit-proof fence, August, 1905, in flower only (Max Koch, 1030a, formerly mixed with and labelled 1030), is referable to this species. The specimens are not good, but the flowers appear to be smaller and with ciliate tips to the sepals.

2. Coolgardie, flowers only (H. Nathan, October, 1899, and L. C. Webster, 1900).

The structure of the flowers is the same as that of *A. Prainii*, although it appears to have fewer flowers (13–16) in the head, but it has longer and narrower phyllodes, and the varietal name *linearis* is therefore proposed for it.

If the phyllodes be alone considered, *A. Prainii* comes under Pungentes (Uninerves), and in that series would be placed near *A. sphacelata*, *A. genistoides*, and *A. inæquiloba*.

But its racemose inflorescence takes it to Uninerves (Racemosæ) where, however, it seems to have no close relations. Its position can be reconsidered when pods are available.

Affinities.

1. With *A. sphacelata* Benth. In *A. sphacelata* the phyllodes are smaller, narrower and not flattish.

2. With *A. genistoides* A. Cunn. In *A. genistoides* the midrib is scarcely if at all evident, and the phyllode is not flattened. The flower in *A. genistoides* is ciliate, typically spathulate and not linear.

3. With *A. inæquiloba* W. V. F. *A. inæquiloba* differs from *A. Prainii* in the phyllodes, which are less rigid, and have the central nerve less defined, less numerous phyllodes, which are slightly narrower and longer (4 – 5 cm.); tips curved.

The flower-heads are in racemes, each raceme having leafy bracts with ciliate margins, which spring from a peduncle not in the axil, but a little removed from it, along the rhachis. The flower-heads are slightly oblong in shape, whereas those of *A. Prainii* are globular. Flowers about 23 in the head. Sepals narrow. The petals have black hairs on the outside on the upper half.

4. With *A. heteroneura* Benth. This species has phyllodes generally similar in outline and a similar midrib, but the fine lateral nerves of this species are absent in *A. Prainii*. *A. heteroneura* is also few-flowered, has a broad calyx and a pubescent pistil.

Pungentes (Uninerves).

III. A. INÆQUILOBA W. V. Fitzgerald, Journ. Bot., L, 18, (1912).

This species is hitherto known only from R. Helms' specimens collected on the Elder Exploring Expedition, Victoria Desert, Camp 56, 19th September, 1891. The following specimens appear to be referable to it.

1. A shrub about four feet high, in flower only. Cow-cowing, August, 1904 (Max Koch, No. 1030).

2. A shrub of three feet. In fruit only. Kellerberrin, November, 1907 (W. V. Fitzgerald).

Attention may be invited to the tendency of the flower-heads to be oblong in the type.

The Cowcowing specimens (1030) are inequilobed (as regards the calyx) but not so much so as the type.

The Kellerberrin specimens are in fruit, which may be described as follows, as the fruit has not been previously described. Straight or slightly curved, 5 or 6 cm. long (but not fully ripe), 5 mm. broad, margins slightly thickened, moniliform. Seed (not quite ripe), longitudinally disposed, with a broadish funicle once or twice folded terminating in large granular basilar arillus.

Affinities.

1. With *A. genistoides* A. Cunn. Mr. Fitzgerald's own unpublished remarks are "The foliage and general appearance are those of specimens of *A. genistoides*. It differs from that species in the bracteate peduncles, conspicuous differently shaped bracteoles, fewer mostly 4-merous flowers in the heads, markedly distinct calyx, and broader thin, unribbed petals."

2. With *A. Prainii* n. sp. It is not necessary to fully repeat the remarks under *A. inæquiloba* at p. 240. The two species present considerable resemblance, but the inflorescence is racemose in *A. Prainii* and the flower-heads globular, while they are slightly oblong in *A. inæquiloba*, which also possesses leafy bracts, and also long black hairs on the petals, neither of which characters occurs in *A. Prainii*.

Uninerves (Triangulares).

IV. Acacia Rendlei n. sp.

Frutex spinosus, glaucus, $2\frac{1}{2}'$ altus; phyllodiis sub-triangularibus vel irregulariter trapeziformibus, ca. 7 mm. longis, apice ca. 7 mm. latis, phyllodiis plerumque spinis tenuibus, flexibilibus, brunneis, stipularibus ca. 1 cm. longis suppletis; phyllodiis duobus nervis

principalibus, uno nervo inferiore margini approximato et in mucronem acutem terminante, altero e basi phyllodiæ in marginem dorsalem terminante; nervis minoribus ex nervis principalibus provenientibus; floribus in capitulis solitariis, axillaribus, globosis, pedunculis filiformibus 1 – 1·5 cm. longis; calyce profunde lobato, hirsuto, corolla ca. triplo æquilongo; petalis partim disjunctis, glabris; pistillo longo, laeve; legumine seminibusque non visis.

A spinous glaucous shrub of two and a half feet. Phyllodes sub-triangular to irregularly trapeziform, about 7 mm. long and about as wide at the top; the phyllodes largely replaced by thin, flexible brown stipular spines up to 1 cm. long. The phyllodes have usually two main nerves, one nearly following the lower straight margin, and terminating in a sharp mucrone, while from the base of the phyllode usually springs a second thinner nerve terminating in the dorsal margin. From both nerves some smaller nerves proceed.

Flowers in single axillary globular heads, about thirty in the head, on filiform peduncles of 1 – 1·5 cm. Flowers 5-merous; calyx deeply lobed and hairy, about a third as long as the corolla. Petals divided part of the way down; glabrous. Pistil long and smooth. Pod and seeds not seen.

Type in clayey sand near Fraser Range, 2nd November, 1891, Elder Exploring Expedition (R. Helms).

Named in honour of Dr. Alfred Barton Rendle, F.R.S., Keeper of the Department of Botany of the British Museum, London, who has been most kind in assisting me with material of this genus.

Referable to this species is a specimen from Coolgardie, 1900 (L. C. Webster).

Affinities.

1. With *A. strongylophylla* F.v.M. In *A. strongylophylla* we have a longer, larger, entirely glabrous flower; the calyx is very slight, with a spoon-shaped apex to each sepal. The petals are divided one-third of the way down, and the

calyx is two-thirds as long as the corolla. In *A. strongylophylla* also, the phyllode is less triangular or trapeziform, and has only one main nerve.

At the same time it seems to me that in habit of the plant, in the presence of stipular spines, and prominent mucrones, in the general shape of the phyllodes, the new species presents an obviously very close affinity to *A. strongylophylla.*

Mueller (Fragm. viii, 227) hesitated about the position of *A. strongylophylla.* He placed it in the neighbourhood of *A. idiomorpha* A. Cunn., *A. pyrifolia* DC., *A. anceps* DC., all of which belong to the Series Uninerves, but to the Sub-series Armatæ, Racemosæ, Brevifoliæ respectively. I have already suggested that the place of *A. Rendlei* is with the Sub-series Triangulares.

2. With *A. dilatata* Benth. In this Sub-series it exhibits obviously close affinity to *A. dilatata*, in the shape, size and venation of the phyllodes and in the pungent mucrones. *A. dilatata* differs in the comparative fewness and small size of the spinescent stipules, and in the hispid covering. The flowers of *A. dilatata* are hispid all over (not the calyx only, as in *A. Rendlei*), and the calyx is half as long as the corolla.

3. With *A. Luehmanni* F.v.M. There is a general similarity in regard to the phyllodes of the two species which is drawn attention to as matter of convenience. The stipular spines are quite small and the structure of the flowers is quite different. The phyllodes are plurinerved, that is to say, one is (or occasionally two are) not dominant, as in uninerved species.

The placing of *A. Luehmanni* F.v.M. in the Plurinerves (Triangulares) draws attention to the fact that the boundary line between that Series and the Uninerves (Triangulares) rests on minor and not larger details. The Series of

Bentham have been of great value, but in view of the additional knowledge we have acquired concerning Australian Acacias during the last half century, the broad classification requires amendment in certain directions.

Uninerves (Brevifoliæ).

V. A. TYSONI Luehmann, Vict. Nat., xiii, 112 (1896).

Following are supplementary notes:—

(1) Called by the settlers "Limestone Wattle" at Mount Narryer, Murchison River (Tyson).

(2) "Twelve feet high." Nannine (W. V. Fitzgerald).

(3) 1·3–2 metres high. Cowcowing (M. Koch, No. 1666).

This is probably correct, but No. 3 specimen consists of little more than phyllodes.

Uninerves (Racemosæ).

VI. A. ÆSTIVALIS Pritzel, in Engler's Bot. Jahrb. xxxv, 300 (with a figure), was described as a small glabrous tree, about three metres high, and was recorded from near Moora and near Watheroo. Mr. W. V. Fitzgerald collected it, a shrub of 8–10 feet, Cunderdin, 104 miles east of Perth. Dr. Stoward now sends it from cultivated land near Baandee Railway Station (149 miles east of Perth). Land of best quality, Salmon Gum and Gimlet. A strong growing shrub of six feet high, spontaneous. He also sends it from Kunonoppin (No. 68). Mr. L. C. Webster collected it at Coolgardie, 351 miles east of Perth.

Uninerves (Racemosæ).

VII. A. SCLEROSPERMA F.v.M.

(Syn. *A. spodiosperma* F.v.M. and *A. leucosperma* F.v.M.)

(1) *A. sclerosperma* F.v.M. in Wing's Southern Science Record ii, 150, (July, 1882).

I have not seen the type, which is "near the Gascoyne River, Oliver Jones," but I have seen a specimen labelled

A. spodiosperma from the Gascoyne River, Mrs. Gribble, 1886, given me by Prof. Ewart, and also a specimen labelled *A. sclerosperma* F.v.M. (by Mueller) in pod only, Nickol River, W.A. (A. Forrest), given by Mr. Luehmann to me in 1897. I consider them, from the material available, to be identical with (2) and (3).

In the original description of *A. sclerosperma*, Mueller says "Foliage resembling that of *A. dentigera* (misprint for *dentifera*) and *A. pycnophylla*.

(2) *A. spodiosperma* F.v.M. type, Proc. Linn. Soc. N.S.W. iii, (2nd Ser.) 164 (1888). Near Lake Austin, W.A. H. S. King. Considered by Mueller at the time to be aff. *A. scirpifolia* and *A. calamifolia*, but now, I think correctly, placed near *A. salicina* Lindl.

(3) *A. leucosperma* F.v.M. MSS. Quoted by Pritzel in Engler's Bot. Jahrb., xxxv, 302, (1905), and described by him as F.v.M. ined. and Pritzel. See also a note on it by Ewart and White, Proc. Roy. Soc. Vict., xxii, 91 (1909).

I offer a translation of Diels and Pritzel's remarks, as the species has been otherwise only imperfectly described.

A. leucosperma F.v.M. ined. et E. Pritzel n. sp.

In the Melbourne Herbarium I found a specimen collected by H. S. King near Lake Austin, named by F.v. Müller *A. leucosperma* n. sp. but never publicly described. From more complete specimens collected by us this species may be described :—

A shrub or tree up to 3·5 m. high, very glabrous, the young parts often glaucescent. Phyllodes spreading, linear, obtuse at the apex, subtruncate or curved back, somewhat thick, without nerves except for the prominent middle nerve, pale or glaucous green. Heads solitary in the axils or shortly (up to 3), racemose, peduncles conspicuous, heads conspicuous about 20 flowered. Flowers 5-merous, calyx shortly truncate, petals smooth. The pod when quite ripe having woody valves strongly arched above

the seeds, dark brown, narrowed in breadth between the seeds about towards the middle, seeds more or less globular, dark yellow, shining. Unripe pods somewhat smooth, glaucescent. Phyllodes 5 – 8 cm. long, 2 – 4 mm. broad. Peduncle 1 – 2 cm. long. Ripe pod 10 – 12 cm. long, up to 13 mm. broad above the seeds. Ripe seed ·5 – ·8 mm. in diameter. Habitat in the Austin district near Carnarvon at Shark's Bay, most frequent in the sandy muddy sea coasts, flowered in the month of August (D. 3653). There is an incomplete indeterminate specimen of the same species in the Berlin Herbarium, collected by Gaudichaud at Shark's Bay about 1830.

The species bears a strong affinity to *A. salicina* Lindl., and is not certainly distinguished from that species except in the fruits and seeds (which are very distinct); it differs, however, in having much narrower phyllodes.

The late Dr. A. Morrison collected it at Onslow, Ashburton River, so that it is recorded from Shark's Bay (Carnarvon), round the coast as far as Nickol Bay, but it has not yet been recorded from the Northern Territory.

VIII. A. Blakelyi n. sp.

Frutex parvus, suberectus, ramulis rotundatis, paullo curvatis, glabris; phyllodiis lineari-lanceolatis, 10 – 11·5 cm. longis, 7 – 8 mm. latis, rectis v. paullo falcatis, crassiusculis, marginibus incrassatis, costa media prominente, duabis venis parallelibus minus prominentibus, uno utroque latere costae mediae; costa media glandulam phyllodiae basin versus gerente; capitulis paucis in brevibus racemis, floribus numerosis, 5-meris; calyce tenue, non ciliato, truncato, plus triplo petalis aequilongo; petalis basi facile disjungentibus; pistillo laeve; legumine lineare, paullo contorto, moniliforme, phyllodiis longiore, marginibus pallidis, seminibus angustis, funiculo bis curvato et in arillum paullo inflatum terminante.

A small sub-erect shrub. Branchlets rounded and slightly curved, glabrous. Phyllodia linear-lanceolate, 10 – 11·5 cm.

(4 – 4·5 inches) long, 7 – 8 mm. broad, straight or slightly falcate, the apex a rather sharp point, texture rather thick, margins thickened, with a prominent midrib, and two less prominent, but usually quite distinct, parallel veins, one on each side of the midrib. One prominent gland on the midrib, an unusual situation, near the base of the phyllode. Flower-heads few, in short racemes, on peduncles of about 1 cm., with numerous 5-merous flowers.

Calyx very transparent, not ciliate, without midribs, truncate, rather more than one-third as long as the petals; the petals easily separating to the base, and without midribs. Pistil smooth.

Pods linear, slightly twisted and moniliform, longer than the phyllodes, with pale-coloured, smooth, thickened valve-margins. Seeds narrow, the funicle usually bent twice and terminating in a slightly swollen arillus.

Minginew, in flower and fruit. Type. (J.H.M., Oct. 1909).

The following specimens are referable to this species:—

1. Minginew, in flower only, and phyllodes narrower than the type (W. V. Fitzgerald, September, 1903).

2. Yandanooka, south of Minginew, in flower only. (A. Morrison, September, 1904).

3. Northam, in flower only (J. H. Gregory, 1900).

4. Geraldton, in flower and fruit, with phyllodes narrower than the type. (Dr. J. B. Cleland, 1907).

In honour of William Faris Blakely, Botanical Assistant, Botanic Gardens, who has given me most valuable assistance in the elucidation of this genus.

Affinities.

1. With *A. bivenosa* DC. Perhaps its closest affinity is to *A. bivenosa* DC., and particularly to that form of it originally named *A. xanthina* by Bentham. *A. Blakelyi* is primarily uninerved, although the secondary veins are some-

times almost continuous, and thus may simulate a plurinerved phyllode. Similarly the "bivenose" character of *A. xanthina* is not always present.

As a rule the phyllodes of *A. Blakelyi* are narrower than those of *A. bivenosa* (and even of the narrower *A. xanthina* form), while the conspicuous gland of the former is not present in the latter species.

The flowers of the two species resemble each other a good deal in structure, but the pods are very different, those of *A. bivenosa* considerably resembling those of *A. salicina.*

2. With *A. rostellifera* Benth. There is no doubt that it has often been confused, on general resemblances, with *A. rostellifera* Benth. In that species we have one-nerved phyllodes, with two to four glands on the *edge* of the phyllodes, axillary flowers, calyx finely ciliate and a hairy pistil. It is sharply separated from *A. Blakelyi*, which has a gland in an unusual position,—on the midrib.

As regards fruits, while I have excellent ones as regards *A. Blakelyi*, I have only fruits from a cultivated shrub of *A. rostellifera*, the spontaneous specimens corresponding to the seeds, having been misplaced. I therefore speak with diffidence in regard to them, since the pods of *A. rostellifera* have not been described. The cultivated pods referred to have valves very much wider than those of *A. Blakelyi*, while the arillus is smaller.

IX. A. PYRIFOLIA DC. var. MORRISONI, var. nov.

Globe Hlll, Ashburton River (banks of river). (Dr. A. Morrison, 6th October, 1905).

In a short paper in the Scottish Botanical Review, April, 1912, p. 98, Dr. Morrison described this form as a new variety, but omitted to give it a name, and I rectify this omission by naming it after our lamented friend.

Compared with the type, it has narrower and smaller phyllodes, and is less glaucous. The pods are narrower and smaller, the seeds more globular and the funicle is about half the length of that of the typical form. Dr. Morrison describes the funicle in the variety and it varies in *A. pyrifolia.*

Plurinerves (Nervosæ).

X. A. MULTILINEATA W. V. F., in Journ. W. A. Nat. Hist. Soc., 13 (May, 1904).

The pods have not been described. The following is from Mr. Fitzgerald's MSS., and the pods were collected at Kellerberrin in November, 1907.

"Pod linear, torulose, compressed, tomentose, seeds longitudinal, ovate, dark brown, funicle short, terminating in a pale-coloured cupular basilar arillus."

Julifloræ (Rigidulæ).

XI. A. CHISHOLMI Bail., in Queensl. Agric. Journ. IV, 47 (1899).

Manutarra, Ashburton River, A. Morrison, 4th October, 1905. In fruit only.

This seems to be conspecific with *A. Chisholmi* Bailey, a species hitherto only known from Northern Queensland. It differs slightly from the type in the rather more curved pod, and in the depression of the seeds, which is not so deep in the type.

The specimen appears to be taken from a well developed plant. *A. Chisholmi* approaches some specimens of *A. linarioides* Benth. closely. The chief differences are in the more numerous phyllodes, which are obscurely one-nerved, and the narrower pods of the latter.

Julifloræ (Rigidulæ, but closer allied to *A. aneura*.)

XII. A. CRASPEDOCARPA F.v.M., Melb. Chem. and Drugg., New Ser. ii, 73, 1887. (Syn. *A. euphleba* W. V. F.)

The co-types came from Lake Austin, H. S. King, and between Yuin and the Murchison River, Ernest Giles. (To quote more than one specimen as a type is to be deprecated, and has often led to uncertainty).

(1) Mr. I. Tyson, Mount Narryer, Murchison River, sent it to the late Mr. R. Helms in 1897 with the note "The native name is "Turla." Settlers sometimes call it "Round-leaf Mulga."

(2) *A. euphleba* W. V. Fitzgerald, in Journ. W. A. Nat. Hist. Soc. (May, 1904), was described from a small leaved form of *A. craspedocarpa* in young bud and without pods. Type of *A. euphleba* from near Milly's Soak, near Cue, Murchison River district.

(3) This specimen (No. 2) may be identical with "A plant with smaller phyllodia, obtained near Stuart's Range by Mr. Winnecke, may belong to *A. craspedocarpa* also; the specimens however are in a young flowering state only."

(4) Diels and Pritzel in Engler's Bot. Jahrb., xxxv, 304, with fig. 35a, also found it in the Austin district.

(5) A dense, sturdy shrub of 6–8 feet. In both flower and fruit. Cue to Milly's Soak (J.H.M., September, 1909). The flowers, the only ones I have seen, are sub-spicate.

(6) Tampa, 120 miles north of Kalgoorlie, in early fruit (J. F. Jutson, No. 9, July, 1915).

Mueller says "The phyllodia of our new species are not dissimilar to those of *A. translucens*, though generally broader, but there is a wide difference in flowers and fruit; of real affinity is *A. lysiphlœa*, from which however, as well as from nearly all other species, it is really distinguished by its remarkably broad-margined fruit, reminding in that of *A. sericata*."

Fitzgerald gives the affinity as *A. dictyophleba* F.v.M., doubtfully, basing it on the venation of the phyllodes.

Diels and Pritzel (*op. cit.*, p. 305) give the affinity as *A. aneura* F.v.M., based on the pods, and I independently arrived at the same conclusion. Their figure of the pod might be better, particularly as regards reticulation, but the yellow coloured, varnished, reticulated pod is strikingly like that of *A. aneura*, particularly of Western Australian plants of the species.

Juliflorae (Stenophyllae).

XIII. A. Grasbyi n. sp.

Frutex divaricatus ad 10′ altus. Phyllodiis teretibus 4 – 5 cm. longis, minute striatis, tomento breve tectis. Floribus 5-meris, spicis ca. 2 cm. longis, pedunculis subaequilongis. Calyce truncato, magno, basi hirsuto. Petalis glabris, dimidio longitudinis conjunctis. Pistillo pruinoso. Legumine 8 – 11 cm. longo, 1 cm. lato, applanato, inter semina incincto, valvarum marginibus incrassatis. Semine applanato, fere oblongato, fusco, funiculo longo, applanato, rugoso, in arillum parvum, rotundatum, rugosum terminante.

A divaricate shrub up to about 10 feet high, and usually nearly as broad as high. Phyllodes terete, 4 – 5 cm. long, minutely striate when seen under a good lens, covered with a fine, short tomentum. Flowers 5-merous, in spikes, about 2 cm. long, on peduncles nearly as long. Bract long, capitate or spathulate, stipe hairy. Calyx large, truncate, hairy at the base. Petals glabrous, united about half way up. Pistil hoary.

Pod straight or curved, 8 to 11 cm. long, up to 1 cm. wide, flattish, constricted between the seeds, the valves with thickened edges, with dull or waxy lustre, with almost transverse markings or fissures on the outside of the valves, and very oblique ones on the inside through the contraction of the membrane.

Seed flattish, oblong, nearly 9 mm. long, colour brown, with a long white thin, flattish, wrinkled funicle, terminating without folds in a small rounded wrinkled arillus.

Type from the Cue-Milly's Soak road (J. H. M., October, 1909). I have taken this as the type, as I have a number of specimens from this locality; I have compared the others quoted, and do not find any differences from the type.

Named in honour of William Catton Grasby, Agricultural Editor of the "Western Mail," in recognition of his work, extending over a number of years, in diffusing a knowledge of the indigenous flora of Western Australia.

In addition to the type-specimens of *A. Grasbyi* I have small specimens of the following, belonging to the same species:—

1. Mount Narryer, Gascoyne River to Murchison River. In flower only (Isaac Tyson, 1898).

2. Murchison Goldfields (W. V. Fitzgerald, September, 1903. No flowers or fruit).

As regards No. 1, on 25th September, 1914, a specimen belonging to the late Mr. R. Helms, came into my hands. It bears the following label in Mr. Isaac Tyson's handwriting (Mr. Tyson was a friend of Mr. Helms):—"No. 9, *Acacia palustris*. Seeds much liked by sheep, used as food by the natives. "Cogada" is the native name."

Coming to No. 2, the following two paragraphs are from Mr. W. V. Fitzgerald's MSS.:—

1. "*A. cyperophylla* F.v.M. Shrub to a tree of 30 feet; trunk to 10 feet, diam. to 1 foot; bark reddish, rather rough, and curly; timber almost black, hard and rather heavy. Vernacular name 'Minnie Ritchie.'" Then follows a portion which is a copy of a passage by him in Journ. W. A. Nat. Hist. Soc. 2, Pt. i, p. 51 (1904).

2. "*A. palustris* J. G. Luehmann. Erect shrub to a tree of 20 feet; trunk and branches very tortuous, the former to 6 feet, diam. to 1 foot; bark reddish-brown, rather rough and curly; timber very dark, hard and heavy. 'Snakewood.'"

A clue to the identity of the above two species (in Mr. Fitzgerald's mind), is given in the following specimen (phyllodes and twigs only, but the material is quite unmistakable), labelled by him:—

"*Acacia cyperophylla* F.v.M. (with *cyperophylla* struck out and *palustris* substituted). Erect with crooked stem and curly bark, 10 feet high. 'Snakewood.' Murchison Goldfields, September, 1903."

What the plant is, described in paragraph one as *A. cyperophylla*, one cannot say. Certainly *A. Grasbyi* in part, but certainly not the true *A. cyperophylla* F.v.M., see Part LX of my "Forest Flora of New South Wales."

Diels and Pritzel say, "*A. palustris* Luehmann (nomen ineptum). Shrub up to 2·5 metres high, the bark coming away in twisted or curly flakes. In the Austin district near Cue, in muddy and stony soil. Flowering in June (D. 3276). (Engler's Bot. Jahrb. XXXV, 308)." *A. Grasbyi* is doubtless referred to.

The new species has therefore been confused with *A. cyperophylla* F.v.M. and *A. palustris* Luehmann. *A. Grasbyi* appears to be closest to *A. cyperophylla* F.v.M., a species I have carefully defined and illustrated in Part LX of my "Forest Flora of New South Wales." I will take the opportunity of indicating the principal differences between *A. Grasbyi* and both species.

A. cyperophylla is a broom-like bush; *A. Grasbyi* is more spreading and round-headed. The phyllodes of *A. Grasbyi* are short, averaging 4–5 cm. long, while those of *A. cyperophylla* are 15–25 cm. long. The flower-spikes have much longer peduncles than those of *A. cyperophylla*. The flowers do not differ in important characters from those of *A. cyperophylla;* these differences may be stated as follows: The calyx is rather larger in *A. Grasbyi*, and is hairy at the base. The petals of *A. Grasbyi* are united about half

way up, and are sometimes reflexed. Pistil smooth or hoary. The pods of *A. cyperophylla* are thinner and smaller than those of *A. Grasbyi*, but there is undoubtedly affinity between them.

The more important differences between *A. Grasbyi* and *A. palustris* appear to be as follows:—The phyllodes of the former are 4 – 5 cm. long, those of the latter 8 – 15 cm. long and much more markedly striate, and somewhat thinner. The spikes of *A. Grasbyi* have long peduncles; those of *A. palustris* are shortly pedunculate. The species are sharply separated by the truncate calyx of the former, as compared with the spathulate sepals of the latter.

The original type-specimen of *A. palustris* alone is known, and it would be desirable to obtain additional material of it and field-notes.

XIV. A. LONGIPHYLLODINEA n. sp.

Frutex crassus, rigidus, 6 – 8′ altus, caule glauca. Phyllodiis omnino glabris, fere 38 cm. longis, rigidissimis, teretibus crasse striatis, aliis costis prominentioribus quam aliis. Spicis plus quam 2 cm. longis, pedunculo 1 cm. Floribus 5-meris. Calyce truncato vel semi-truncato, paulo lobato, corolla plus dimidio aequilongo, apicibus crassatis, paucis nerviis sparse hirsutis. Petalis plus dimidio longitudinis conjunctis, glabris. Pistillo laeve. Leguminibus seminibusque non visis.

A coarse wiry, rigid, glaucous stemmed shrub of six to eight feet. Phyllodes quite glabrous, nearly 38 cm. (15 inches) long, very rigid, terete, coarsely striate, some ribs more prominent than others. The attachment to the branchlet not wrinkled, but decurrent and not articulated.

Flower-spikes more than 2 cm. long, with a peduncle of 1 cm. (about $\frac{3}{8}$ inch). The flowers closely packed in the spike and 5-merous. Bract long and narrow with hairs and a capitate head. Calyx truncate or semi-truncate,

slightly lobed, reaching about two-thirds up the corolla; tips thickened, long scattered hairs on some of the nerves and tips, edges ragged. Petals united two-thirds up, glabrous. Pistil smooth.

Pods and seeds not seen.

Jibberding, and Lake Monger, Victoria district. Growing on sand-plains. September, 1905 (Max Koch, No. 1341). In flower. (Distributed by Mr. Koch as *A. cyperophylla* F.v.M.).

The closest affinity of this species is to *A. cyperophylla*, and the differences may be indicated as follows:—

The phyllodes of *A. longiphyllodinea* are even more rigid and coarse than those of *A. cyperophylla*, and are up to half as long again. They are entirely glabrous, deeply grooved and ribbed. Some ribs stand up more prominently than others. There is an absence of the constricted base as seen in *A. cyperophylla*, the phyllode broadening a little at the base, and becoming decurrent, with the grooves and ridges continuous. Branchlets glaucous. The peduncles are 1 cm. long, those of *A. cyperophylla* are shorter.

The flower spikes of the latter species are shorter.

The truncate calyx of *A. longiphyllodinea* reaches about two-thirds up the corolla; (half-way in *A. cyperophylla*). The calyx is more definitely nerved than in *A. cyperophylla*, and it has longish scattered hairs.

[Jibberding is just east of the 120 mile peg, north of Cunderdin, on the East Goldfields Railway. The south end of Lake Monger commences about four miles north of Jibberding, about three miles east of the 124 mile, and extends north for about 40 miles parallel to Rabbit-proof fence (Watheroo section), and thence north-east another 30 odd miles. The camp known as Lake Monger would be situated to the west of the fence, opposite the 141 mile,

and about 21 miles north of Jibberding. This Lake Monger is not to be confused with a Lake Monger in the Perth district.]

XV. A. RAMULOSA W. V. Fitzgerald, in Journ. W.A. Nat. Hist. Soc. No. 1, p. 15 (May, 1904).

This Western Australian species which has long been confused with *A. brachystachya* Benth., I have figured and described it in Part LXI of my "Forest Flora of New South Wales." I refer my readers to that work for details as to synonymy, localities, etc.

XVI. A. LINOPHYLLA W.V.F., Journ. W. A. Nat. Hist. Soc. 16, (1904).

Described without flowers, and the affinity given as *A. xylocarpa* A. Cunn., on the pods. Type from Mount Magnet. A label of Mr. Fitzgerald's gives the additional localities of Nannine and Cue.

A specimen from Isaac Tyson, about 1897, from Mount Narryer, Murchison River, has the label "No. 50, one of the principal food seeds of the natives. Name 'Burgedur.' Settlers' name is 'Wanderry Mulga'."

Cue (W. D. Campbell, June, 1902; J. H. M., October, 1909).

This pungent phylloded Acacia with succulent pods has the pods suspended vertically like tallow candles hanging by their wicks, giving the shrub or tree a singular appearance. The pods are quite straight. Around Cue the plant is a tall shrub, beyond Yalgoo, going west, it becomes a tree of say 20 feet, with a stem of six inches and more.

The flowers are undescribed, and may be described as follows:—Flowers in nearly sessile spikes. Floral bracts thick and short. Calyx divided nearly to the base; has a few hairs. Calyx about a third as long as the corolla.

Corolla united two-thirds of the way up, glabrous. Pistil tomentose.

The affinity of this species both in flowers and fruits is with *A. ramulosa* W. V. F.

XVII. A. EPHEDROIDES Benth.

A. TRATMANIANA W.V.F. A. FILIFOLIA Benth.

Those who have carefully studied *A. ephedroides*, described without ripe fruit, do not need to be reminded that it is in an unsatisfactory state. Mueller declined to touch it in his Iconography, and no recent writer has critically dealt with it and its affinities. Following is a translation of the original description of *A. ephedroides*.

"Glabrous, branchlets terete; phyllodes elongated-subulate, somewhat compressed-terete, uncinate-subulate at the apex, very finely striate, spikes shortly cylindrical, dense, solitary or in twos, sessile. It has the habit and phyllodes of *A. calamiformis*. The flower-bearing spikes about $\frac{1}{2}$ inch long, shortened before the flowering, amentiform with crowded imbricate flowers. Cape Porteray, *Fraser*, Swan River, *Preiss*." Bentham in London Journ. Bot. i, 370, (1842).

It will be seen that specimens of Fraser and of Preiss were described. I have not seen a specimen of Fraser, but I have of Preiss, which must be taken as a co-type, and it is a very hairy form. It is quoted by its number (974) in Bentham's amended B. Fl. ii, 399, description.

Preiss says of it that it was collected on this (Perth) side of "Halfway House, Darling Range, 13th September, 1839." It is described by him in language of which the following is a translation:—

"Shrub of 8 feet. Branches somewhat compressed, obtuse-angled, the young shoots with a minute, ashy pubescence. Spikes oblong in one specimen, scarcely half an inch long, in another (but entirely similar) almost globose."

It may be described as follows:—

Phyllodia grooved, with a few scattered hairs; more on the tip, flattened. Flowers in short spikes ($\frac{1}{2}$ inch), peduncle covered with short white hair. Rhachis silky pubescent, 5-merous. Floral bract large, covered with hair. Calyx lobed half way down, covered in soft hair, half as long as the corolla. Petals smooth, separating about half way down, generally recurved, and with a slight midrib. Pistil covered in a thick mat of hair.

I have also seen Drummond's Fifth Collection, No. 2, which I understand was also collected on the Darling Range. This specimen, collected in 1849, could obviously not have been seen by Bentham when penning his original description of 1842, but he includes it in his amended description of B. Fl. ii, 399. The present specimen, as compared with Preiss's No. 974, shows the following differences:—

No. 974 is silky hairy everywhere, except in the adult foliage, and this silky hairiness extends to the floral bracts. The phyllodes are longer and more deeply grooved, and its calyx-lobes are pronounced, while the calyx-tube is almost truncate in Drummond's specimen. Floral bracts stipitate in Preiss's specimen and foliaceous in Drummond's No. 2. The latter specimen may be thus described.

Phyllodia terete, flexuose, smooth, more lined than grooved. Flowers in ovoid heads, sessile; rhachis glabrous, 4-merous. Floral bract hoary. Calyx truncate, lobed, with minute points, glabrous. Petals smooth, much thickened at the tips. Pistil hairy.

Pods in both cases unknown. I trust that Perth botanists and collectors will make satisfactory collections and notes of Darling Range (and indeed other localities) specimens believed to be *A. ephedroides.*

The *A. ephedroides* of Fig. 35 of Diels and Pritzel, Engler's Jahrb., xxxv, 306, shows a rather rigid plant with

flowers more distinctly spicate. I have not seen the plant figured, and therefore suspend my judgment concerning it.

The late Dr. A. Morrison, in the "Scottish Botanical Review" for April, 1912, p. 99 gave a description of the pods of *A. ephedroides* (Kunonoppin, F. E. Victor). I have not seen them, and the specimens should be re-examined.

The following specimen (Minginew, W. V. Fitzgerald, September, 1903) is temporarily attached to *A. ephedroides*, pending the receipt of pods and further information. It appears to differ from *A. ephedroides* in the young phyllodes which are terete and covered with a close white tomentum. The lobing of the calyx is also much more pronounced than in typical *A. ephedroides.*

Phyllodes when young, weak, covered in a close white tomentum; when mature smooth, and lined rather than grooved as in *A. ephedroides.* Flowers in short ovoid spikes half an inch long, very irregular, 5-merous, and sometimes 4-merous. Peduncle short and covered in white hair. Rhachis hairy. Floral bract capitate or thin, hairy. Calyx more or less deeply lobed, lobes rather narrow, fully half as long as the corolla, hairy. Petals united half way up when young, free when mature, smooth. Pistil hairy. Pods not seen.

A. TRATMANIANA W. V. F. in Journ. W.A. Nat. Hist. Soc. p. 8 (1904).

The author says "It may ultimately prove to be a viscid form of *A. ephedroides* Benth." This may be so; I do not think so, but until complete material of *A. ephedroides* is available it is best to let *A. Tratmaniana* stand, especially as the four-angled phyllodes appear to be distinct, and there are other differences.

Mr. Fitzgerald describes his *A. Tratmaniana* with "calyx broadly turbinate." The type comes from Cunderdin. I

have it also from Kellerberrin (F. H. Vachell and A. E. Lankester); also Kwelkan, north of Kellerberrin, a shrub of 7–8 feet (Dr. F. Stoward, No. 153).

A. FILIFOLIA Benth.

This species was described in Hooker's Lond. Journ. Bot. I, 369, (1842) in words of which the following is a translation.

161. Glabrous with terete branchlets; phyllodes long, filiform, rigid, terete, very finely striate, shortly and straightly mucronate at the apex; spikes ovoid, dense, solitary, sessile. Phyllodes 4 – 6 in., much thinner than in the following ones (*ephedroides*, *xylocarpa*, *arida*, *oncinophylla*, J.H.M.) and not uncinate at the apex. Spikes sometimes almost globose. Swan River, *Drummond*. Bentham in London Journ. Bot. I, 369 (1842).

It will be observed that the describer had only phyllodes and unexpanded flower-buds.

There is a reference to the species in Pl. Preiss, I, 18, with a statement that Drummond's No. 302 (one of the specimens quoted under *A. ephedroides* in B. Fl. ii, 400) is referable to it, and he adds that it is not found in Preiss's collection.

While Bentham sinks it under his *A. ephedroides* Benth., the specimens that I attribute to *A. filifolia* are certainly not that species. I will supplement the description of *A. filifolia* as I interpret it in the following particulars. [I may say that I have not a specimen of the type, and that the specimens I have seen attributed to that species only agree in having filiform leaves.]

Phyllodia 4 – 6 inches long, terete, or slightly flattened, with fine striate lines, some more nerve-like than others. Sometimes with a slight hoary tomentum. Attachment terete, slightly wrinkled. Flowers in short ovoid spikes, sessile or with very short peduncles, about $\frac{1}{4}$ inch long, 5-merous. Occasionally in pairs. Floral bract capitate,

rugose. Calyx narrow-lobed, free to the base or nearly so, spathulate with rugose apex, thin, smooth. Petals united about half way up, separating at a touch, glabrous. Pistil hoary-tomentose. Pods terete, smooth, with a resinous incrustation. Seeds longitudinally placed, and when ripe suspended from the pods by a filiform funicle, which is attached to a broad arillus.

I have seen it from Coolgardie (L. C. Webster). "A tall shrub," Cowcowing (Max Koch, 1025, and also found mixed with 1338). 132 miles and upwards, Watheroo Rabbit Fence (Max Koch, 1338a). Kurrawang, near Kalgoorlie (Dr. J. B. Cleland). Dr. F. Stoward, Nos. 223 and 224, no localities. Bruce Rock-Merriden district (Dr. F. Stoward, Nos. 8 and 14). Kunonoppin (Dr. F. Stoward, No. 75). The only pods I have seen. These are identical with the pods from the same place (F. E. Victor), described by the late Dr. A. Morrison as *A. aciphylla* Benth. in the "Scottish Botanical Review," April, 1912, p. 99.

There is some danger (with flowering material) of confusion with *A. leptoneura* on a casual glance, but the flower-heads of the latter are uniformly spherical, while those of *A. filifolia* are either ovoid or a little longer. The young phyllodes of *A. leptoneura* are soft, golden pubescent; those of *A. filifolia* are stiff, rugose, resinous.

The pods and seeds display a marked difference. The pods of *A. leptoneura* are flattish; those of *A. filifolia* are terete. The seeds of *A. leptoneura* have a funicle with two folds and a barely expanded arillus; those of *A. filifolia* have a very broad arillus, and the commencement of the filiform funicle is on the opposite (the ventral) side of the seed or base of arillus to that from which the attachment of the funicle springs. In other words, the funicle appears to cross over from one side of the valve to the other.

XVIII. A. Jutsoni n. sp.

Frutex, ramulis angulatis v. fere teretibus. Phyllodiis linearitetragonis, rigidis, leniter curvatis mucrone breve pungente, 6·5 – 8 cm. longis, utroque latere striatis, junioribus partibus viscidis, cum costis parallelibus, brevibus pilis tectis. Floribus in spicis brevibus ovoidiis densis, breviter pedunculatis, ca. 7 mm. longis. Calyce turbinato, pilis paucis sparsis disperso. Petalis calycem ca. triplo superantibus, sub lobis cohaerentibus. Legumine non viso.

Apparently an erect shrub, branchlets slightly angular or nearly terete. Phyllodia linear-tetragonal, rigid, slightly curved, with a short pungent point, 6·5 – 8 cm. long, each of the sides uniformly exhibiting a rounded rib, giving the phyllode a grooved appearance, the young growth viscid, but with parallel ridges covered with short white hair, the mature phyllodes covered with a very short tomentum.

Flowers in short ovoid dense spikes, shortly pedunculate, about 7 mm. long. Flowers mostly 5-merous. Calyx turbinate, sprinkled with a few scattered hairs, about a third the length of the corolla. The petals united immediately below the lobes. Pistil small and smooth. Pod not seen.

The type is from Comet Vale, near a railway station 63 miles north of Kalgoorlie (John Thomas Jutson, Nos. 160 and 49 of December, 1916).

The following specimens belong to this species, although their phyllodes are, for the most part, less tetragonal, sometimes becoming almost terete, with striæ.

a. Elder Exploring Expedition, Camp 54, Victoria Desert, 17th September, 1891 (R. Helms, No. 14). "On sand." Latitude 29° 33′ 25″, Longitude 124° 50′, height 1,100 feet.

b. Phyllodes resinous all over. Coolgardie (L. C. Webster, year 1898).

Affinities.

1. With *A. resinomarginea* W. V. F. It seems that this species is perhaps closest to *A. Jutsoni*, subject to the discovery of fruits. The phyllodes of *A. resinomarginea* are somewhat flatter and have "the angles margined with a crenulated resinous line;" the spikes of flowers of *A. resinomarginea* are more interrupted, but the individual flowers of the two species resemble each other very closely.

2. With *A. microneura* Meissn. This species has a general resemblance to *A. Jutsoni*, but in *A. microneura* the phyllodia are flattened, and the spikes sessile; the flowers are different, *e.g.*, in *A. microneura* the calyx is more divided and more hairy, while the petals are divided low down, the corolla not being gamopetalous as in *A. Jutsoni*.

3. With *A. Tratmaniana* W. V. F. The leaves of this species are more filiform, more rigid and more numerous, but the individual phyllodes are quadrangular, although the sculpture is different, there being an absence of the central rib on each side. The spikes of *A. Tratmaniana* are sessile, the calyx more deeply cleft, and the petals separate.

Juliflorae (Falcatae).

XIX. A. ACUMINATA Benth.

A. OLDFIELDII F.v.M. A. SIGNATA F.v.M.

A. LASIOCALYX C. Andrews.

Under his own *A. acuminata*, Bentham in B. Fl. ii, 404, quotes Drummond's 3rd Coll. No. 99. A large specimen received from the British Museum is neither in flower nor fruit, but there is no doubt it is *A. lasiocalyx* C. Andrews. Drummond's specimen, quoted as No. 9, also without flower and fruit, is the same species. This reputed 9 is probably a reversed 6, and is Drummond's 5th Coll. No. 6, as quoted in B. Fl. ii, 404.

A. acuminata has smaller phyllodes, with the margins often ciliate. Fruits of *A. acuminata* are very rare in collections; they were described by Bentham, and also by Mr. W. V. Fitzgerald in Journ. W. A. Nat. Hist. Soc., p. 52 (May, 1904). I have received fruits from Kununoppin, January, 1917 (Dr. F. Stoward) and they present a very considerable similarity to those of *A. lasiocalyx*, additional evidence of the affinity of the two species. The *A. acuminata* pods I have are pale brown, glabrous, with valves more woody, more embossed by the seeds, and the rims more marked.

A. Oldfieldii F.v.M., Fragm. iv, 7.

Bentham (B. Fl., ii, 404) considers this to be a synonym of *A. acuminata.*

I have been favoured by Professor Ewart of the Melbourne Herbarium with a sight of the type. The material consists of a twig with a few mature phyllodes with some small young shoots with golden pubescence, some loose phyllodes, a fragment of a spike of flowers (loose), and a detached pod with ripe seeds. Such material is obviously unsatisfactory. At the same time, it is very desirable that descriptions of species should be investigated, and I therefore submit the following notes.

I do not disagree with Bentham's opinion that *A. Oldfieldii* is synonymous with *A. acuminata* Benth.

Phyllodes $2\frac{1}{2}-4\frac{1}{2}$ inches long, $1\frac{1}{2}-2\frac{1}{2}$ lines broad, as seen by me. The old phyllodes are quite glabrous, but the young growth is golden pubescent as in *A. acuminata.* Branchlets angular.

Flowers 4-merous. Calyx yellow pubescent, denticulate. Corolla short-glabrous. Pods $2-4$ inches long, $1-1\frac{1}{2}$ lines broad. Seeds elliptical and longitudinally arranged. They are not the pods of *A. acuminata.*

The type of *A. Oldfieldii* came from the Murchison River "in rather dry places," and was collected by Oldfield.

A. SIGNATA F.v.M., Fragm. iv, 7.

In B. Fl. ii, 404, Bentham says "Foliage of *A. acuminata*, but the fruit different."

There has been a good deal of confusion in Australia in regard to *A. signata*, and I am inclined to think that Bentham had wrong, or poor, material before him. (The type consists of phyllodes and pods only). First of all let me re-describe the plant from ample and fresh material.

Small tree, about 15 feet high, with branchlets sub-angular towards their extremities, round when older, the young branchlets and pods slightly glaucous.

Phyllodia linear-lanceolate, slightly falcate 10—14 cm. (say 4—5½ inches) long, and 5 mm. broad, tapering slightly into a dark-coloured curved, moderately sharp apex, moderately thick, with numerous fine parallel nerves, the central one more prominent. With thin nerve-like margins, reddish in colour, like the branchlets.

Flowers in short pedunculate spikes, the spikes 1—1·5 cm. long, and the peduncles about 1 cm. The spikes sometimes so short as to be almost ovoid; 5-merous.

Calyx matted with white hairs, sepals free nearly to the base, not quite half as long as the corolla. Petals glabrous, free, very thin, separating about half way down, the tips somewhat thickened. Pistil silky pubescent. Pods shortly stipitate, linear, slightly falcate, about 11 cm. long by 5 mm. broad, glaucous; the rather small, ovoid, flattish seeds longitudinally arranged, and pendulous when ripe; areole oblong, the funicle very narrow, soon passing with one or two folds, into a crumpled, broad ribbon-like mass terminating in a cup-shaped arillus.

The type of *A. signata* comes from the Murchison River, *Oldfield*.

I have it also from Minginew (E. W. Hursthouse through W. V. Fitzgerald, as *A. acuminata*).

Dr. F. Stoward has sent it from Bruce Rock to Merriden, September, 1916, in flower; December, 1916, in flower and fruit, and also on poorest sandy land, about 10 miles south of Merriden and Totadgin district. December, 1916, in fruit. The above description has been drawn up from Dr. Stoward's specimens checked with the scanty specimen of the type, which Prof. Ewart has had the kindness to lend me. The flowers are described for the first time.

Affinities.

1. With *A. acuminata* Benth.

Bentham (B. Fl., ii, 404), speaking of *A. signata*, says "Foliage of *A. acuminata*, but the fruit different."

A. acuminata is the "Jam" or "Raspberry Jam" tree that every West Australian knows. Its young foliage has a golden pubescence, while the margins of the phyllodes are often ciliate.

A. signata is never more than a shrub or very small tree. It is usually less floriferous, its phyllodes are usually broader and have more of the lustre of parchment, with red branchlets and red phyllode-margins. Its branchlets are more angular. Its venation is finer, the pods have a more waxy or hoary lustre.

2. With *A. lasiocalyx* C. Andrews.

The phyllodes differ in dimensions and in venation, but the flowers are quite different, the calyx of *A. lasiocalyx* being truncate and the pistil smooth, as compared with a pubescent pistil in *A. signata*.

The pods of *A. signata* are somewhat smaller than those of *A. lasiocalyx*, and the seeds are more orbicular and

flatter, the areole more distinct and from oblong to elliptical in shape. The funicle is longer and the seeds are more persistent; remaining hanging from the pod.

E. Pritzel's No. 559, recorded as *A. signata* in Engler's Bot. Jahrb. xxxv, 308, is *A. lasiocalyx*.

3. With *A. stereophylla* Meissn. There is a general similarity of appearance between *A. stereophylla* and *A. signata* when in flower, but the phyllodes of the former are much more rigid and thick, with hardly visible nerves, and there is an absence of the reddish nerve-like margins seen in *A. signata*. As regards the structure of the flower, the calyx and pistil of *A. signata* are far more hairy than that of *A. stereophylla*, and the shapes and relative sizes of the calyces are different.

4. With *A. Beauverdiana* Ewart and Sharman. There is considerable superficial resemblance with the broader phylloded forms of this species. The phyllodes of both species have numerous parallel veins, but those of *A. signata* have a more prominent central one. The spikes of *A. Beauverdiana* are nearly sessile and more ovoid, while the structure of the flowers is different, the calyx of *A. Beauverdiana* being truncate.

A. LASIOCALYX C. Andrews, Journ. W. A. Nat. Hist. Soc., 41 (May, 1904).

Contrasted by the describer with *A. doratoxylon* A. Cunn. The pod was not seen, and the type came from sand plains near the Gairdner and Hammersley Rivers (at Jerramungup).

Pods have been received from Kununoppin, January, 1917 (Dr. F. Stoward). They differ from those of *A. signata* in being slightly larger, with thicker, more oblong and larger seeds marked by a spherical areole. The funicle is shorter and the seeds are not pendulous from the pod, as in *A. signata*.

The type locality is the most northerly one known to me, and we have it from "In fruticetis Moore River"(E. Pritzel, No. 559, as *A. signata*).

Following is a translation of a brief account of this plant, which I find to be *A. lasiocalyx*.

"*A. signata* F.v.M. Phyllodes up to 30 cm. long, falcate, up to 4 mm. broad. Habitat in Avon district in 'Victoria Plains,' in sandy places. Flowering in August (D. 3970; E. Pritzel, No. 559). South towards the Eyre district near Peniup. (D. 4739)." (Diels and Pritzel in Engler's Bot. Jahrb. xxxv, 308, 1905).

We have it on the Eastern Railway and its branches from Kunonoppin (Dr. F. Stoward, No. 61); Kellerberrin (Miss Leake, F. H. Vachell); Bruce Rock to Merredin (Dr. F. Stoward, No. 24); Coolgardie (L. C. Webster).

Going further south, Mr. Muir collected it from "100 miles north of Stirling Range," and I have received it from Prof. Ewart from the Tulbrunup Swamp, which is of course adjacent to the Stirling Range (collector not given).

Then we have *A. acuminata* Benth. var. *glaucescens* E. Pritzel in Engler's Bot. Jahrb., xxxv, 308. The following is a translation.

"Straight phyllodes with the pods thickly marginate, glaucescent. In the Coolgardie district near Karalee, form scrub with Eucalypts (D. 5579). Fruiting in November."

In the absence of specimens I suggest that this variety may be *A. lasiocalyx*.

XX. A. Beauverdiana Ewart and Sharman, in Proc. Roy. Soc. Vict. xxvii, (2nd Series) 230. As Plurinerves (Microneura), aff. *A. coriacea* DC.

Type from Cowcowing. I have since obtained it from the Bruce Rock-Merriden district (Dr. F. Stoward). It varies a good deal in the width of the phyllodes, and not

only are the flowers in "globular heads very slightly cylindrical," but some are so distinctly cylindrical as to justify removal of the species to the Julifloræ. I think its position is next to *A. signata*.

The pods are hitherto unknown, and may be described as follows:—

Stipitate, linear-moniliform, the seeds longitudinally arranged, the valves thin, with a marginal thickening, 6 – 7 cm. long, with a width of 3 mm. where distended by the seeds, and half this width between the seeds; seeds shining, elongated, suspended by a delicate ribbon-like funicle which terminates in a slightly expanded arillus. (Poor sandy land, ten miles south of Merredin, March, 1917. Dr. F. Stoward, No. 82).

XXI. A. Stowardi n. sp.

Frutex glaber. Phyllodiis lato-linearibus, rectis vel paullo falcatis in acumen obtusum leniter curvatum terminantibus, 4 – 6 cm. longis, 3 mm. latis, rigidis, crassis, tenuiter striatis, nervis numerosis tenuibus parallelibus, nervo medio prominentiore. Pedunculis 5 mm. longis, solitariis, capitulo ovoideo v. spica subcylindrica v. sub-laxa, 1·5 cm. longo. Floribus 5-meris. Calyce sinuato-dentato corollam minus dimidio æquante, glabro. Petalis dimidio longitudinis cohaerentibus, glabris. Pistillo pruinoso. Leguminibus tenuibus sub-obliquis, 4 v. 5 cm. longis, 1 cm. latis, valvarum marginibus angustis incrassatis, valvis leniter nervosis. Seminibus ovatis, obliquis v. fere transversis, funiculo duplo plicatis in arillum leniter incrassatum terminante.

A glabrous shrub, the young tips slightly resinous, the young branchlets angular, but soon becoming terete.

Phyllodia broad-linear, straight or slightly falcate, terminating in a slightly curved blunt point, gland near base, sometimes narrowed at the base into a distinct yellowish curved petiole, mostly 4 – 6 cm. (say $1\frac{1}{2}$ – $2\frac{1}{2}$ inches) long,

3 mm. broad, rigid, thickish, finely striate with numerous fine parallel nerves, scarcely visible without a lens, the central one sometimes rather more prominent than the rest, and so visible to the naked eye.

Peduncles somewhat angular, resinous, erect, short, usually about 5 mm. long and single, straight, bearing an ovoid head or a subcylindrical or a somewhat loose spike of 1·5 cm. (say $\frac{1}{2}$ inch) long.

Flowers 5-merous. Calyx sinuate-toothed, not half as long as the corolla, glabrous. Petals united about half-way down, glabrous. Pistil hoary.

Pods thin, somewhat oblique, somewhat narrowed at the base, 4 or 5 cm. long, and 1 cm. wide, the sutures edged with a narrow thickened margin, and the valves slightly veined. Seeds ovate oblique or almost transverse, prominently embossing the valves, the funicle in two folds, terminating in a not very much thickened arillus.

Comet Vale, 63 miles north of Kalgoorlie. (John Thomas Jutson, No. 281, in flower; No. 175, in fruit).

This may be a puzzling species, because it varies from inflorescence in heads to inflorescence in spikes, but the spikes are so marked in some of the specimens that it had better be put in the Julifloræ.

The following specimens illustrate the above variation:—

(*a*) Ovoid heads scarcely more than globular, Goongarrie, 55 miles north of Kalgoorlie (J.H.M.); Tampa, 120 miles north of Kalgoorlie (J. T. Jutson); Comet Vale (J. T. Jutson, No. 253).

(*b*) Short oblong spikes, hardly twice as long as broad. Comet Vale (J. T. Jutson, Nos. 271, 253).

(*c*) Decidedly spicate (Comet Vale, J. T. Jutson, Nos. 281, 282). So far, therefore, the species has been traced between sixty and seventy miles north of Goongarrie.

It is named in honour of Dr. Frederick Stoward, Government Botanist and Vegetable Pathologist, Department of Agriculture of Western Australia, who has vigorously helped me in the elucidation of this beautiful and interesting genus, so well developed in his State.

A. Beauverdiana Ewart and Sharman affords another illustration of a species having flowers both in globular heads and cylindrical spikes, and this has been noted in regard to a few others. It is but another illustration of the fact that all morphological characters used in classification vary, and must be interpreted philosophically.

Affinities.

1. With *A. Beauverdiana* Ewart and Sharman.

As already pointed out, this is another species which hovers between the groups with globular and cylindrical heads. The two species appear to be closest allied.

But the phyllodes of *A. Beauverdiana* are more erect; they resemble each other in venation. The peduncles are very often recurved in *A. Beauverdiana*, straight in *A. Stowardi*. As regards the flowers, the calyx is proportionately much longer in comparison with the corolla in *A. Beauverdiana*, while the two species are sharply separated by the pods, those of *A. Beauverdiana* being narrow and moniliform.

2. With *A. duriuscula* W.V.F.

There is a good deal of external similarity between these two species, but if we examine them carefully, we find that flowers in spikes are unknown in *A. duriuscula*, while the calyx is more than half as long as the corolla in that species, and not half as long in *A. Stowardi*. The phyllodes of *A. duriuscula* are shorter and more resinous, though in neither species is it abundant; those of *A. duriuscula* are less smooth to the touch, as the venation is coarser, *i.e.*, the

veins are thicker and more prominent, yet in both it would be termed fine. The pod of *A. duriuscula* is unknown.

XXII. A. QUADRIMARGINEA F.v.M., Fragm. x, 31.

Was described without flowers. The following description of them is by Mr. Fitzgerald.

"A bushy shrub, 5–7 feet high; peduncles often two together, 4 lines long; flowers in ovoid or semi-spicate heads of 20, mostly 5-merous; bracts ciliate; calyx shortly toothed, half the length of the corolla, hirsute; corolla divided half-way down, the petals with prominent midribs. In sandy soil. Referable to *A. heteroneura* Benth." (MSS.)

The type locality is Ularing, in the Menzies district, W. A. (Young); Mr. Fitzgerald found it at Gwalia, W. A.

The following specimens are referable to this little known species.

1. Coolgardie. In flower, June, 1899 (R. Helms).

2. On granite plateau, three miles north-east from Cue. In flower, June, 1902. (W. D. Campbell).

3. Tampa, 120 miles north of Kalgoorlie. In flower. July 1915 (J. T. Jutson, No. 29).

4. Bushy shrub, 5–7 feet high. In fruit. November, 1903 (W. V. Fitzgerald). In two forms, one with phyllodes slightly narrower than the type, and the other very much narrower than the type (neither in flower or fruit), almost linear.

I have not seen any flowering specimen collected or seen by Mr. Fitzgerald, and do not understand his words "Referable to *A. heteroneura* Benth." (Plurinerves: Nervosæ). At the same time his description of the flowers is accurate, although it will bear amplifying.

A. quadrimarginea belongs to the Juliferæ (Falcatæ) and some of the heads are short and nearly ovoid. Under the

circumstances it may be desirable to partly re-describe the species, taking Helms' Coolgardie specimen for the purpose.

Phyllodes with one central nerve, finely striate, gland near base, edges resinous and granular. Flowers 5-merous, in short spikes, the peduncle clothed with hair; floral bracts capitate. Calyx very narrow, spathulate, about half as long as the corolla; with long irregular, transparent processes. Petals glabrous, united about half way down. Pistil very resinous, probably smooth.

A. heteroneura is quite distinct from *A. quadrimarginea*. The phyllodes of the former are almost trigonous, the central nerve is much raised on both sides of the phyllode, and there are three or four fine distinct nerves on each side. Gland near base. The phyllodes of *A. quadrimarginea* are flat with a faint central nerve. The nerves on each side are indistinct. The plant appears to be quite glabrous, and the gland is some distance from the base. The pods of *A. heteroneura* are very narrow, those of *A. quadrimarginea* broad, angled and almost winged.

Mueller (in absence of flowers) was naturally uncertain as to the position of *A. quadrimarginea*, and suggested affinities to *A. quadrisulcata* and *A. lineolata*. Its position appears to be near *A. tarculensis* J. M. Black. It differs from that species in the longer and narrower phyllodes, in the single spikes, and in the glabrous pistil (that of *A. tarculensis* being pubescent).

Bipinnatæ (Pulchellæ).

XXIII. A. Drewiana W. V. Fitzgerald, n. sp.

An erect unarmed shrub, invested with white spreading hairs; the branchlets slightly angular; leaves bipinnate, the pinnæ in two pairs, the lower at the base of the common petiole, the latter terminating in recurved acute points;

leaflets 3 – 4 pairs, lanceolate to oblong, obtuse, scabrous-hirsute above, pale and glabrous beneath, margins recurved, midrib evident; peduncles solitary, hispid, each bearing a globular head of about 30 mostly 4-merous flowers; bracts setaceous; sepals linear-spathulate, scarcely half as long as the corolla, free or almost so, ciliate; petals almost free, ovate, obtuse, glabrous, with evident midribs.

Type from Cannington (W.V.F.). Height 3 – 4 feet. Pinnæ to $\frac{1}{2}$ inch long, the common petiole 7 – 9 lines long. Leaflets 2 – 3 lines long. On a heathy flat. Named after the Honourable J. M. Drew, a former Colonial Secretary, Western Australia. Affinity to *A. nigricans* R. Br.