

*Acacia retinoides*, Schlecht. (N. O. Leguminosæ).

Sample from Victoria, kindly sent by Baron von Mueller.

This gum is in tears of an amber colour, transparent, bright and somewhat brittle. It dissolves entirely in water, the solution being slightly tinged with brown. It is fairly adhesive being of good viscosity. It gives a slight precipitate with ferric chloride, and slightly darkens to a lemon colour when heated with dilute soda. It may be considered a promising specimen of the arabin gums, unfortunately the specimen we have is too dark in colour to be of first rate quality. The other tests, usual with a gum of this class, were not carried out on account of the small amount of material at our disposal, as a portion was required for permanent display in the Gums Collection in the Technological Museum.

*Acacia Bakeri*, Maiden (N.O. Leguminosæ).

Collected at Mullumbimby, N. S. Wales.

Our specimens of this gum are principally in tears, very bright and transparent, dark amber coloured, very brittle and bright in fracture. It is entirely and readily soluble in cold water, and is in this respect one of the best of the coast *Acacia* gums of this Colony; it is very adhesive and its comparative viscosity is high. Unfortunately our samples darken much in aqueous solution. The solution is slightly acid to litmus paper. Ferric chloride gives a cream coloured solid mass exactly resembling in bulk and colour that from *A. Maideni*, and it behaves in the same way as that gum with a saturated solution of borax, mercuric chloride and basic acetate of lead. Both these gums belong to the arabin group, and if obtainable in quantity would be of some commercial value. As far as our samples show at present, the gum of *A. Maideni* has a better colour than that of *A. Bakeri*, but it is inferior to it as regards its adhesive properties. When warmed with dilute soda solution, the aqueous solution of the gum darkens considerably. The ash of this gum is remarkable in that it contains a large proportion of manganese. It contains 15.2 per cent. moisture and 3.6 per cent. ash.



*Acacia Maidenii*, F.v.M. (N. O. Leguminosæ).

"Broad-leaved Sally."

Collected at Woodburn, N. S. Wales.

Our sample of this gum is in small pieces of a light amber colour, rather brittle, with very bright fracture, but without the dark brown objectionable portions so common in the *Acacia* gums, especially *A. decurrens*. When treated with cold water, almost the whole of the gum slowly goes into solution, forming a very pale coloured liquid which is very adhesive, of good body or having a high viscosity. It is however, rather tedious to dissolve. The solution is slightly acid to test paper. It forms a solid cream-coloured jelly with ferric chloride, thus showing absence of tannin. It does not thicken with borax solution, nor does it undergo any change with mercuric chloride. It gives a precipitate with basic acetate of lead. It gives a dense white precipitate with alcohol in acid solutions. It slightly darkens to a canary colour when warmed with dilute soda solution. It contains 16.15 per cent. water and 4.67 per cent. ash; the ash consists principally of the carbonates of lime and manganese and potassium, with sulphuric acid, and only the merest trace of phosphoric acid. The ash contains fusible salts and is difficult to incinerate, it contains only a trace of manganese.

*Albizzia pruinosa*, Benth. (N. O. Leguminosæ).

Usually known as "Stinkwood."

Collected at Cumbulum, near Tintenbar, N. S. Wales.

This sample is in small amber coloured pieces, and is very much admixed with woody matter. It is fairly transparent and breaks with a bright fracture. It is only partly soluble in water, the soluble portion being arabin; it forms a fairly adhesive liquid. It gives no precipitate with ferric chloride nor does it form a jelly, and only slightly darkens when heated with dilute soda. The insoluble portion is soluble in dilute alkalis, and is precipitated as arabin on acidifying with acetic acid and adding alcohol.



## KINOS OR ASTRINGENT EXUDATIONS.

*Eucalyptus hæmastoma*, Sm., var. *micrantha*, Benth.

(N. O. Myrtaceæ).

"White Gum," "Cabbage Gum," "Brittle Gum."

Collected at Bungawalbyn, Richmond River, N.S.W., July 1895.

This kino is freshly exuded for the most part. It belongs to the ruby group of kinos, being practically identical with the kino of the normal species described in the proceedings of the Linnean Society.<sup>1</sup>

*Eucalyptus Planchoniana*, F.v.M. (N. O. Myrtaceæ).

We have two small samples. The first was received from F. M. Bailey, F.L.S., Colonial Botanist of Queensland, and is of Queensland origin.

When received, this kino was rather dark in colour, evidently through having been collected some time. It is in small pieces, principally in portions of tears, breaks with a bright fracture, and is shiny on the outside. It dissolves in alcohol to a clear liquid, bright but dark, it is very tough and difficult to powder. It belongs to the ruby group.

Our second sample collected on the Evans River, N. S. Wales, is unfortunately also not a good sample for complete examination, since it is old and much dried up, while phlobaphenes have formed to a very large extent. From experiments independently made it falls in the ruby group, being another addition to that fairly large group of Eucalypts giving exudations that entirely dissolve when fresh in both alcohol and water. We hope to obtain a better specimen for further examination.

*Schizomeria ovata*, Don. (N.O. Saxifrageæ).

Collected at Evans River, N. S. Wales.

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<sup>1</sup> Proc. Linn. Soc. N. S. Wales, (2) iv., p. 614.

Z—Nov. 6, 1895.



This exudation has the appearance of kino.<sup>1</sup> When treated with alcohol the greater portion of the tannic acid goes into solution. This tannin gives a brownish green colour with ferric chloride, when a fairly strong solution of the kino is tested, but on sufficient dilution (in a very dilute aqueous solution), it gives a purple colour with the same reagent; an aqueous solution of the tannin was the material tested. The insoluble portion has the appearance of a gum, but is insoluble in water on heating until a small quantity of dilute soda has been added. When the original substance is treated with water the tannin dissolves, while the gum remains insoluble, but much swollen. This insoluble portion is soluble in dilute soda, and is precipitated on acidifying the solution, or on the addition of alcohol. It is thus found to be metarabin. The reactions and composition of this exudation show it to be identical with that yielded by the *Ceratopetalums*<sup>2</sup> and the exudations thus confirm the affinities of these trees belonging to different genera of the Saxifrageæ.

#### GUM RESINS.

*Medicosma Cunninghamii*, Hook. (N. O. Rutaceæ).

The tree is locally known as "Glue Gum."

Collected at Mullumbimby, N. S. Wales.

This is a red, brittle, resinous substance with a very bright fracture, in small transparent pieces, and of a bright rather light, ruby colour. It is very brittle and readily powders, the colour

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<sup>1</sup> A number of our Eucalyptus and other astringent exudations of variable composition have been called "kinos," because of their resemblance, more or less strong, to the astringent exudation of *Pterocarpus marsupium*, known in medicine as "kino." The use of the term is convenient, and is used in these papers "without prejudice." It seems to us quite unnecessary, at present, to coin another term for astringent exudations whose composition is not precisely identical with that of the original kino; we also look upon it as undesirable, until very many more have been examined, and before those who lay stress upon nomenclature of this kind are in a position to select a suitable term or terms.

<sup>2</sup> Observations on the gums yielded by two species of *Ceratopetalum*.—Proc. Aust. Assoc. Adv. Sci., II., 381, (1890).



of the powder being a dark pink. It was apparently very liquid when exuding, as the adherent wood and bark are varnished with it. It burns with a very smoky flame, resembling ordinary resin in this respect, and burns away almost without residue. When treated with ether the resin slowly dissolves, forming a lemon coloured solution. The powder acts in a very peculiar manner in ether, agglutinating itself at once into an elastic ball which can be stretched in the same way as caoutchouc, thus preventing the solution of the resin in the interior portions. In rectified alcohol the resin goes into solution, forming a bright orange coloured liquid, the residue not agglutinating. When the resin has been removed and the residue dried, it powders readily to a light brown colour. The resin is of an orange brown colour.

The gummy portion, after thoroughly washing with alcohol, is much swollen and somewhat elastic. When dried until of constant weight it was found to amount to 20·02 per cent. of the whole. The original substance in powder on being heated in an oven until of constant weight, 2·14 per cent. was lost ; this was probably moisture contained in the gummy portion, as no volatile oil appeared to be present. The resin when evaporated to dryness and heated till of constant weight equalled 77·2 per cent, while the ash only amounted to ·2 per cent., so that the proximate constituents may be stated as

Resin	...	...	77·20 per cent.
Gummy substance?	20·02	„	
Moisture, etc.	2·14	„	
Ash	·20	„	
			<hr/>
			99·56
			<hr/>

The gummy portion contains some albuminoids, as indicated by the presence of nitrogen. The dried portion after separating the resin is not soluble in water on boiling in any degree ; when boiled with dilute soda it becomes brown, but only a small portion goes into solution, nor is it soluble in dilute acids. From the above it



appears that this insoluble substance contained in this resin is a body of some interest, and when sufficient of the exudation shall have been obtained, it will be desirable for its composition and constituents to be determined. For the present we are only able to describe it as "gummy substance"?

The collector (Mr. W. Bäuerlen) says that, when fresh, this exudation is exceedingly sticky, hence the local name of the tree. It is not abundant, but is widely diffused, and well known locally because of its brilliant colour. It readily stains the fingers a vermilion colour, and that, when dry, it reminded him of grass-tree gum (*Xanthorrhœa*).

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## GEOLOGICAL LABORATORY NOTES—No. 1.

By J. MILNE CURRAN.

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[Read before the Royal Society of N. S. Wales, November 6, 1895.]

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### I.—ON SELENIUM ASSOCIATED WITH GOLD AND BISMUTH, FROM MOUNT HOPE, N. S. WALES.

Some twelve months ago I received a box of gold bearing stone from the Mount Allen Mine near Mount Hope, in this Colony. The stone was packed loosely, and on opening the case, a peculiar smell suggestive of selenium was easily detected. The same odour could be produced at any time by shaking the stones together. The material is being mined for gold, and is part of an auriferous belt of slate, interbedded with Silurian slates to the north of Mount Hope. The slate is of a rich red ale colour, and splits readily into laminae, which correspond with, or are generally parallel to the original bedding planes. Occasionally strings and knots of a harder clay-slate occur, not so bright in colour, but rather inclining to a chocolate brown. Through this last nodules of quartz are sometimes developed. So far no sulphides have



been detected in the stone, although there can be little doubt that this oxidised lode-stuff has been derived from some form of pyrites. The gold is noted as occurring in three ways.

1. In plates and patches spread out along the laminae of the slate, appearing bright and burnished-like in lustre, but in thickness hardly more than a mere film. 2. In specks and grains associated with quartz. 3. In grains and irregular masses enclosed completely in an aggregate of bismuth oxide and carbonate.

The selenium is irregularly distributed through the stone. There is no character that I could recognise, to guide one in identifying the portions richest in this rare element. Heated in a closed glass tube most of the stone gives a black sublimate with the characteristic odour of volatilized selenium. When the portions of the stone richer in selenium are so treated, the sublimate shows a red ring, inclining to crimson below the black. Any samples of the stone when rubbed briskly together emit the characteristic disagreeable smell suggestive of bisulphide of carbon.

The oxide and carbonate have evidently been derived from some mineral not now determinable. It is probable that the selenium and the bismuth existed as a selenide or a sulphide of bismuth. This sulphide or selenide of bismuth was probably auriferous, as in the case of the telluride of bismuth described by Professor David and Mr. Mingaye.<sup>1</sup> As work is progressing at the Mount Allen Mine we may hope for further information in regard to this occurrence of selenium.

## II.—ON A GRAPHITIC SLATE FROM YALCOGRIN, N.S. WALES.

Graphitic slates crop out at a point about twelve miles northwest of Yalcogrin Station. They are interstratified with slates of Silurian age. These are again succeeded unconformably by Devonian Sandstones and quartzites. The lustrous and polished appearance of the slate would lead one to believe that it contained a high percentage of graphite. It marks paper readily when

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<sup>1</sup> Records of the Geological Survey, N. S. Wales, Vol. 1., pp. 26, 29.



abraded in the direction of its cleavage. The cleavage surfaces of some of this slate are pitted with obscure markings which may prove of organic origin. On analysis the slate gives 12·5% of graphite.

### III.—ANALYSIS OF WATER FROM WYALONG.

A remarkable feature in the Wyalong goldfield is the great depth to which the prevailing rock, granite, is decomposed. Shafts have been put down to a depth of one hundred and fifty to one hundred and ninety feet through a granite decomposed *in situ*. A tract of country of this description must absorb a large percentage of the rainfall, with little chance of an outlet underground to completely drain the saturated decomposed rock. Mr. Farant Cox found a very considerable supply of water sufficient for a six foot Huntingdon mill without making any impression on the available supply. The water was highly mineralised, and as one would expect, holds in solution magnesia, lime, soda, and potash. A preliminary examination showed that the water held close on 2,000 grains of total solids per gallon. A careful analysis in duplicate was made by my former assistant Mr. James Petrie and myself.

Analysis of water from shaft at Cox's Huntingdon Mill, Wyalong.

Silica	...	...	...	...	37·268
Alumina	...	...	...	...	3·052
Lime...	...	...	...	...	43·540
Magnesia	...	...	...	...	109·144
Soda...	...	...	...	...	551·236
Potash	...	...	...	...	6·188
Sulp. trioxide	...	...	...	...	192·430
Chlorine	...	...	...	...	924·784
Water of crystallisation	...	...	...	...	209·300
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					2076·94
Less O equiv. of Cl.	...	...	...	...	208·39
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					1868·55



The water contained traces of zinc and large quantities of "soluble" organic matter. The large percentage of sodium and chlorine opens up the question as to whence this sodium chloride—as it exists in the water—was derived.

#### IV.—ON THE TRACHYTES OF THE CANOBLAS AND THE WARRUMBUNGLE MOUNTAINS.

The first reference to a trachyte from the Warrumbungle Mountains that I can find is a note by the writer.<sup>1</sup> This typical trachyte was described as coming from Timor rock. Subsequently a trachyte from the Coonabarabran district was described by Mr. G. W. Card.<sup>2</sup> I do not know that any record has been made hitherto of a trachyte from the Canoblas near Orange. About six miles west of Coonabarabran there is an isolated hill some eight to nine hundred feet in height. The weathering of the rocks on its sides is quite suggestive of the trachytes of the Drachenfels. The base of the hill is composed of a grey trachyte that in hand specimens shows a mottled appearance. Under the microscope the rock shows an abundance of sanidine, and the mottling is due to aggregates of "blue hornblende" that abound in the rock. An exactly similar rock is found on the Canoblas near Orange, on the eastern slopes of the mountain above Mr. George Plowman's farm. Both at Timor and on the Canoblas I have seen sufficient to convince me that these trachytes are older than the basalts and more basic lavas that abound in those districts.

About half way up Timor the character of the trachyte changes. The rock is there of a dull green colour with a shade of yellow. Abundant needles of sanidine are seen glistening in the rock. The microscope shows a decided flow structure, and a constitution corresponding to a typical trachyte.

About ten miles to the north of Coonabarabran there is a hill of a compact trachyte that breaks with a fracture not unlike quartzite. Under the microscope the rock shows as composed

<sup>1</sup> Proceedings Linnean Society, N. S. Wales, Vol. ix., p. 467, Series 2.

<sup>2</sup> Records of the Geological Survey of N. S. Wales, Vol. iv., p. 115, pl. x.



almost wholly of sanidine, so disposed as to be described as a panidiomorphic sanidine trachyte. I exhibit micro-photographs of the rock herewith. Some of the Canoblas rock resembles this trachyte. On the western slopes of the Canoblas a wall of trachyte, standing some fifty feet above the surface, can with difficulty be distinguished from the same rocks at Coonabarabran.

Associated with the trachytes of Timor is a rock that I can only describe as an enstatite-andesite. A rock similar to this too is largely developed on the Canoblas. I am at present engaged on an exhaustive examination, chemical and microscopical, of the rocks mentioned herein, and take this opportunity to record their occurrence, and exhibit characteristic photographs.

In addition to the rocks named, I exhibit a fine specimen of the acidic lava known as rhyolite from the Canoblas. It is the first example I have met of a rhyolite *in situ* amongst Tertiary rocks in Australia. Rolled blocks of a somewhat similar rock are found in the Tumberumba valley.

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## ON THE OCCURRENCE OF ARTESIAN WATER IN ROCKS OTHER THAN CRETACEOUS.

By EDWARD F. PITTMAN, A.R.S.M., Government Geologist, N.S.W.

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[Read before the Royal Society of N. S. Wales, December 4, 1895.]

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IN September last I had the honour to report, to the Hon. the Minister for Mines, the discovery of palæontological evidence proving that artesian water occurs in rocks of greater age than the Lower Cretaceous sediments, to which it had hitherto been supposed to be confined, and the object of the present paper is to place upon the records of this Society a brief account of the facts referred to, together with some additional evidence gathered dur-



ing a recent trip through parts of Queensland and New South Wales.

The railway now in course of construction between Narrabri and Moree passes over black-soil plains, on which there is no permanent water supply which could be utilised for the locomotives, and it was an enquiry by the Railway Commissioners as to whether there were any prospects of obtaining artesian water at Woolabrar, on Dobikin run, about midway between Narrabri and Moree, which led to my making an examination of this country. The rocks penetrated by wells on the Dobikin run were found to consist of white and greyish sandstones, bluish-grey sandy shales, brownish clays, and nodules of clay ironstone. A characteristic feature of these sediments was that they crumbled or became disintegrated freely on exposure to the atmosphere, owing no doubt to the quantity of water contained in them. In these rocks were found numerous plant impressions, amongst which *Tæniopteris Daintreei*, (McCoy), a fossil plant characteristic of the Mesozoic coal measures of Victoria, the Clarence River series of New South Wales, and the Ipswich coal measures of Queensland, was readily recognizable. Another plant from this locality was identified by Mr. W. S. Dun, Assistant Palæontologist to the Geological Survey, as belonging to the genus *Baiera*.

Similar rocks were observed on the Terry-Hie-Hie run, about twenty-five miles to the north-east, and still further north at an old shaft known as Moloney's well, fourteen miles east of Moree, *Tæniopteris Daintreei* was again obtained. On arriving at Moree an examination of the drillings showed that, in their lithological characters, the rocks penetrated by the bore very strongly resembled those met with at Dobikin and Terry-Hie-Hie, and a subsequent examination of the contents of the core-box in Sydney, enabled me to detect *Tæniopteris Daintreei* in one of the few solid pieces of rock which had been obtained by 'reaming,'—the greater part of the drillings having been extracted in a fine state of division, owing to the percussive action of the Canadian drill.



The evidence thus obtained proves beyond doubt that the Moree bore, which yields about three million gallons per day of artesian water of very good quality, is not in the Lower Cretaceous rocks as was previously supposed, but in rocks of the same age as the Ipswich beds of Queensland, the coal measures of Victoria, and the Clarence River coal measures of New South Wales.

In subsequently examining the core-box from the Coonamble bore, I identified, in a solid piece of 'reamings,' a specimen of *Tæniopteris Daintreei*, and one of *Thinnfeldia odontopteroides*, Morris, another fossil plant characteristic of the Hawkesbury series, which are regarded as homotaxial with the Clarence series. The Coonamble bore yields a supply of about one million, eight-hundred thousand gallons of artesian water per day.

On the 20th January, 1894, a paragraph appeared in the *Daily Telegraph*, stating that the Revd. J. M. Curran had furnished a report to the Minister for Works to the effect that in his opinion the rocks pierced by the Coonamble bore were Triassic and not Cretaceous. Enquiries recently made at the Works Department elicited the reply that no such written report had ever been received from Mr. Curran, but I understand that our respected President, Professor David, questioned Mr. Curran at the time, as to his reasons for supposing these rocks to be Triassic, and his reply was that although he had no definite palæontological proof of the age of the rocks, his opinion was based upon their lithological resemblance to those of the Dubbo district with which he was familiar, and upon the occurrence of a number of indeterminable plant remains, similar to those common in the Dubbo beds.

In 1891, Mr. Robert Etheridge, Junior, identified a specimen of *Tæniopteris Daintreei* from the Nyngan bore, and during the present year, Mr. W. S. Dun recognized another specimen of the same fossil plant in some rocks forwarded by Mr. W. L. R. Gipps, from Terabile Creek, four and a half miles from the Castlereagh River.

It is clear therefore that a large portion of the area hitherto regarded as Lower Cretaceous, is in reality occupied by rocks of





Maiden, J. H. and Smith, Henry George. 1895. "Contributions to a knowledge of Australian vegetable exudations, No. 1." *Journal and proceedings of the Royal Society of New South Wales* 29, 393–404. <https://doi.org/10.5962/p.359219>

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