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and somewhat depressed, enamelled. Scrobicular area large, elevated. Actinal surface flattening suddenly and conspicuously from the ambitus, and the tubercles thereon nearly uniform and gradually diminishing in size and number to the actinosome, which is of medium size, with the *notches broad and rather deep*. Auricles small, arch complete with a square summit and a somewhat oval or perfectly round foramen. Lantern tall, arches stout, and solid, teeth narrow, rather long, acute. *Anal system small* pentagonal. Genital plates, large, irregularly quadrate, with the pore large, subcentral or a tendency towards the outer edge. Ocular plates small subquadrate. Both kind of plates with secondary and miliary tubercles. Madreporic body large, somewhat elevated, broadly heart-shaped, pore quite on the outer edge, with scattered miliaries. Inner plates numerous, decreasing in size to an eccentric depression. Spines numerous: of *almost black purple color*, blunt, slender, but somewhat swollen in the centre, very finely grooved longitudinally. Miliary ring conspicuous but of uniform color. The secondary and miliary spines cylindrical.

The differences between this species and *S. variolaris* are:

1. The size, it being twice and a half times larger.
2. The color.
3. The disposition of the tubercles.
4. The size of the anal system.
5. The form of the genital, ocular, and madreform plates.
6. Actinal cuts.
7. The groove, which is less waved.

I have in this diagnosis marked the special differences in italics. In page 198, Vol. v., Lin. Soc. N. S. Wales Proc., the specific name is misspelt *atropurpurea*.

HIPPONOE VARIEGATA, *Leske*, var. *alba nobis*, Plate 7.

I here figure a small and very interesting variety of this most variable species, in which the spines are small and slender, and the color white, with the test a rose pink. Usually in the tropics the color is pale violet almost approaching blue. In Sydney, if we are to regard the species as the same, the size is very much larger, and the test a deep purple brown.

ON VARIOUS DEPOSITS OF FOSSIL PLANTS IN QUEENSLAND.

BY THE REV. J. E. TENISON-WOODS, F.G.S., F.L.S., &c.

Attention has been called at various times and by different Geologists to the carbonaceous deposits and the included plant remains in Queensland. They have generally been referred to two horizons, namely the Newcastle series and those of the so-called Mesozoic carbonaceous formations as seen in the Ipswich coal beds, the Clarence River series, and those of Jerusalem in Tasmania. The Newcastle series are found at the Bowen River coal beds in Queensland in the upper or freshwater series. The middle or marine series are also found at Bowen, and in the coal beds of the Dawson River. These are in Lat. 23° and were in 1844, discovered by Leichhardt. All these formations are characterized by certain fossils, such as *Glossopteris Browniana* in the lower formation and *Thinnfeldia odontopteroides* in the upper or Mesozoic.

In addition to these deposits I have to chronicle the following:

1. Coal beds in Cooktown with plant remains the only ones of which I could be certain were leaves of *Phyllothea (indica?)*. This plant which is referred to the Equisetæ is found in both the upper and lower formations. It has also a wide range, being found in the Coal formation of India, Africa, and Europe.

2. Coal beds on the Central Railway about 130 miles west of Rockhampton. The coal is bad and full of sulphur. None of the plant remains could be identified.

3. Coal beds on the Burnett River. Five seams of very jet-like coal have been discovered on the Burnett at about 24 miles from the coast. I visited them shortly after their discovery. I venture to think that other valuable seams will be found in the neighbourhood. The plant remains were leaves of *Phyllothea (indica?)*, *Zeugophyllites elongatus*, and probably *Thinnfeldia odontopteroides*. Further down the river there is an exposed section

which I did not see. But fossil plants were brought to me with impressions of a *Sphenopteris* which I do not think has been described. The whole of these beds and those of Ipswich are distinguished by fossil impressions of a very broad and long leaf with parallel veins and no distinct mid rib. At present I do not attempt to refer it to any order.

4. Burrum River coal beds. These are about 30 miles south of those on the Burnett River or half way between Bundaberg and Maryborough. There are several seams. The coal is much like that of the Burnett and inclined at the same angle, but their relative positions have not been ascertained. I recognized some long narrow leaves with parallel veins amongst the plant impressions, and something like *Zeugophyllites elongatus*. Mr. A. C. Gregory informs me that he found *Glossopteris* amongst the plant impressions, but the shale was so friable that it fell to pieces and the impressions were destroyed.

5. Rosewood Station about 25 miles west of Rockhampton. This is a formation of sandstone and a grit of fine waterworn gravel. There is no trace of coal or even dark coloured shale yet every fragment of stone is covered with plant impressions in the most beautiful state of preservation. There seems to be but one or two species amongst them all. One is the broad leaved plant with parallel veins already referred to. The other a fern much like one found in abundance in the Clifton coal seam on the Darling Downs. All the fossils are more or less stained with per-oxide of iron. A more detailed account of this interesting formation will be given on a future occasion.

6. The Clifton coal seam, on the Darling Downs, about half-way between Toowoomba and Warwick. I have never seen a good collection of fossils from this place, and as the workings are now abandoned I could not obtain any on the spot. The only ferns I saw were as just mentioned, a form which is very like the one so common at Rosewood.

7. Coal beds near Peak Mountain, near the Fassifern line of railway, and about 20 miles from Ipswich. This is an outcrop, which has been cut through by a volcanic dyke and destroyed. There are many remains of fossil plants and much Siderite. The fossils are of a dark ferruginous color without any carbonaceous matter. The ferns were extremely like *Rhacopteris*, but await examination. If they belong to that genus, this would indicate a much lower horizon than any beds hitherto found in Queensland.

8. Plant beds in the Rosewood Scrub, about 10 miles from Ipswich. These appear to be quite unconnected with any coal formation, and I should say are of tertiary age. They consist of fragments of palms, and other endogenous plants, with a few ferns. They are imbedded in an extremely hard silico-ferruginous cement. I have not visited the locality, but from the abundance of the fossils brought to me, it must be an extensive and rich deposit.

9. Plant beds on the Darling Downs, near Toowoomba. This deposit is somewhat like that last mentioned, except that ferns are more abundant. I should think it was older. The cement is much more ferruginous and of a darker color, probably including a good deal of carbonaceous matter. I have not visited this locality. The specimens came from some portions of the volcanic rocks of the Darling Downs, and probably they have been entombed under some ash bed or basaltic overflow.

The whole of these different deposits have afforded me an extremely rich collection of vegetable remains, which are now under examination. I have refrained from speaking positively of the characters of any species until the specimens have undergone the most careful comparisons and revision. As far as I have gone I am inclined to the belief that no very clear line of separation can be made between the coal beds of Newcastle and Queensland. They are I believe the lower and upper members of one immense formation, extending over a long period

of geologic time. At present the Newcastle beds are regarded as Paleozoic, and the Ipswich beds as mesozoic. I cannot find any such clearly marked distinction. Many fossils are common to both deposits. The Ipswich coals are very rich in fossils, more rich and in better preservation than those of Newcastle. Yet strangely enough only seven species are recorded. On such slender materials it was hardly to be expected that satisfactory and final conclusions could be arrived at. Dr. Feistmantel's careful work has cleared the way, and made the work much more easy to local paleontologists. His complete figures and the number of them leaves nothing ambiguous or unsatisfactory. All Australian geologists will owe him a debt of gratitude, for his industry and zeal in the cause of our coal floras.
