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of the

Straits Branch

of the

Royal Asiatic Society

SEPTEMBER, 1908

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1908.

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THE

STRAITS BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

COUNCIL FOR 1908.

DR. D. J. GALLOWAY, *President.*

MR. W. D. BARNES, *Vice-President for Singapore.*

HON. R. N. BLAND, *Vice-President for Penang.*

MR. H. N. RIDLEY, *Honorary Secretary.*

MR. R. J. BARTLETT, *Honorary Treasurer.*

DR. HANITSCH,
MR. V. S. FLOWER,
MR. A. KNIGHT,
MR. C. B. KLOSS,
MR. H. MARRIOTT,
} *Councillors.*

PROCEEDINGS

of the

Annual General Meeting.

The Annual General Meeting was held March 23, 1908.

Present:

DR. GALLOWAY, (in the Chair.)

MR.	KNIGHT.	MR.	R. A. J. BIDWELL.
,	HELLIER.	,,	S. V. FLOWER.
,,	BRYANT.	,,	R. J. BARTLETT.
,,	MARRIOTT.	,,	W. D. BARNES.
,,	C. B. KLOSS.	DR.	HANITSCH.
		MR.	H. N. RIDLEY.

The minutes of the last annual general meeting were read and confirmed.

The secretary's report was laid on the table and accepted. The Treasurer's account was also passed.

It was resolved that the members of the society were desirous of expressing their sense of the loss which the society had sustained by the departure from the East of the Right Reverend Bishop Hose D.D., their President, on his well-deserved retirement after a period of over forty years. It was to him, the Founder of the Society in 1877 that the

society was indebted for its inception and for its continuance for thirty years, during which he occupied the position of President almost without a break, till the actual date of his retirement. He also contributed on various occasions to its Journal and in every way possible assisted in the furthering of the objects of the society.

A letter from Mr. H. C. Robinson was read stating that a scheme for the systematic study of the Fauna of the Peninsula had been laid down. The Reptiles. Batrachians and birds had been well studied but the mammals had been as yet little investigated. The Government of the F. M. S. had sanctioned the insertion of a certain sum of money in the estimates for the purpose and it was suggested that the society might provide a substantial grant to be devoted to the same purpose. Eventually the sum $500 a year for three years was voted.

The officers for the ensuing year were then elected *viz.*

President:	DR. GALLOWAY.
Vice-President Singapore:	W. D. BARNES.
„ *Penang:*	HON. R. N. BLAND.
Secretary:	H. N. RIDLEY.
Treasurer:	R. J. BARTLETT.
Councillors:	DR. HANITSCH.
„	V. S. FLOWER.
„	A. KNIGHT.
„	C. B. KLOSS.
„	H. MARRIOTT.

List of Members for 1908.

* Life Members. † Honorary Members.

Patron: H. E. Sir John Anderson, K.C.M.G.

Abbott, Dr. W. L.	Singapore.
Acton, R. D.	K. Lumpor, Selangor.
Adams, A. R. Hon. M.L.C.	Penang.
Anderson, E.	Singapore.
Anthonisz, Hon. J. O.	Singapore.
Bampfylde, Hon. C. A.	England.
*Banks, J. E.	Iowa. U. S. A.
Barker, Dr. A. J. G.	Sarawak.
Barnard, B. H. F.	Selangor.
Barnes, W. D.	Singapore.
Bartlett, R. J.	Singapore.
Beatty, D.	Penang.
Bentara Luar, Hon. Dato, S.P.M.J.	Batu Pahat.
Bicknell, W. A.	Penang
Bidwell, R. A. J.	Singapore.
Birch, Hon. J. K.	England.
Birch, E. W., C.M.G.	Taipeng, Perak.
*Bishop, J. E.	N. Sembilan.
Bishop, Capt. C. F.	Pulo Brani.
Blagden, C. O., M.A.	Switzerland.
Bland, Hon. R. N.	Penang.
Bland, Mrs. R. N.	Penang.
Brockman, Hon. E. L.	Kuala Lumpor.

BROWN, DR. W. C.	England.
BRYANT, A. T.	Singapore.
BUCKLEY, C. B.	Singapore.
BURGESS, P. J.	England.
BURN-MURDOCH, A. M.	K. Lumpor, Selangor.
BUTLER, A. L.	Khartoum, Egypt.
BYRNE, H. E.	K. Lumpor, Selangor.
CAMPBELL, J. W.	Kuala Lumpor.
CAMPBELL, A.	
CAMUS, M. DE	
CARRUTHERS, J. B.	K. Lumpor, Selangor.
CERRUTI, GIOVANNI BATTISTA.	Ulu Slim, Perak.
CHAPMAN, W. J.	
CLIFFORD, HON. H.	Ceylon.
COLLYER, HON. W. R., I.S.O.	England.
COLLINGE, H. B.	Larut, Perak.
*CONLAY, W. L.	K. Lumpor, Selangor.
COOK, REV. J. A. B.	Singapore.
CURTIS, C., F.L.S.	England.
DALLAS, HON. F. H.	Sarawak.
DANE, DR. R.	Singapore.
DENT, SIR ALFRED, K.C.M.G.	England.
DENT, DR. F.	Singapore.
*DESHON, HON. H. F.	Sarawak.
DEW, A. T.	Batang Padang, Perak.
DEW, E. COSTA.	Singapore.
DICKSON, E. A.	Kuala Pilah, Negri Sembilan.
DONALD, DR. J.	Penang.
DOUGLAS, F. W.	Batang Padang, Perak.
DOUGLAS, R. S.	Baram, Sarawak.
DUNKERLEY, VEN. ARCH. W. H. C., M.A.	England.
EDGAR, DR. P. GALISTAN.	Ipoh, Perak.

EDMONDS, R. C.	Penang.
EGERTON, HIS EXCELLENCY SIR W., K.C.M.G.	Lagos, W. Africa.
ELCUM, J. B.	Singapore.
EVERETT, H. H.	Santubong, Sarawak.
FLEMING, T. C.	Pahang.
*FLOWER. CAPT. S. S., F.L.S.	Ghizeh, Egypt.
FLOWER, V. A.	Singapore.
FORT, HON. HUGH.	Singapore.
FREER, DR. G. D.	Singapore.
GALLOWAY, DR. D. J.	Singapore.
GARDNER, N. E. A.	N. Sembilan.
*GERINI, LT. COL. G. E.	Bangkok, Siam.
GIBSON, W. S.	Singapore.
*GIMLETTE, DR. J. D.	Kelantan.
GRANDJEAN, W. D.	Singapore.
GUERITZ, E. P. HIS EX:	Sandakan.
HAINES, REV. F. W.	Penang.
HALE, A.	Taipeng, Perak.
HANITSCH, DR. R.	Singapore.
HARRISON, DR. H. M.	Pekan, Pahang.
HAYNES, A. SIDNEY.	England.
HELLIER, MAURICE.	Singapore.
HEMMANT, G.	Kuala Pilah, Negri Sembilan
HERVEY, D. F. A., C.M.G.	Aldeburgh, England.
HEWITT, JOHN.	Sarawak.
HALL, G. A.	Singapore.
HILL, HON. E. C.	Singapore.
HINKS, LT. T. C.	England.
†HOSE, RT. REV. BISHOP G. F., M.A.	England.
HOSE, E. S.	K. Lumpor, Selangor.
HOSE, R. E.	Busau, Sarawak.
HOYNCK VAN PAPENDRECHT, P. C.	Germany.

HULLETT, R. W., M.A.	England.
HUMPHREYS, J. L.	Malacca.
IZARD, REV. H. C.	Singapore.
JANION, E. M.	Singapore.
JOHNSTON, L. A. M.	Hongkong.
KEHDING, DR.	Medan, Deli.
KER, J. CAMPBELL.	Johore.
KINSEY, W. E.	Kuala Pilah, Negri Sembilan.
KIRKPATRICK, JIVONE.	Sarawak.
KLOSS, C. BODEN.	Kuala Lumpor.
KNIGHT, ARTHUR.	Singapore.
KNOCKER, F. W.	Taipeng, Perak.
KRIECKENBEEK, J. W.	Pahang.
LAIDLAW, G. M.	Telok Anson, Perak.
†LAWES, REV. W. G.	New Guinea.
LAWS, G., M.E., A.I.M.M.	Singapore.
LAWRENCE, A. E.	Sarawak.
LEMON, A. H.	Singapore.
LERMIT, A. W.	Singapore.
LEWIS, J. E. A., B. A.	Kuching, Sarawak.
LIM BOON KENG, DR.	Singapore.
LUERING, REV. DR. H. L. E.	Penang.
LYONS, REV. E.	Dagupan, Philippine I.
MACHADO, A. D.	Sungei Siput, Perak.
MACLAREN, J. W. D.	Singapore.
MACDOUGAL, DR. W.	Christmas Island.
MAHOMED, BIN MAHBOB, HON. DATO.	Johore.
MAKEPEACE, W.	Singapore.
MARRIOTT, H.	Singapore.
MARRINER, J. T.	Kelantan.
MARSHALL, F. C.	Raub, Pahang.

MASON, J. S.	Selangor.
MAXWELL, ERIC.	Ipoh, Perak.
MCCAUSLAND, C. F.	Batu Gajah, Perak.
MAXWELL, W. GEO.	Singapore.
MOORHOUSE, SYDNEY.	Malacca.
NANSON, W., B.A., F.S.A.	Singapore.
NAPIER, HON. W. J., D.C.L.	Singapore.
NORMAN, HENRY.	Jugra, Selangor.
NUNN, B.	Malacca.
PEARS, FRANCIS.	Muar.
†PERHAM, VEN. ARCHDEACON, A.	England.
PYKETT, REV. G. F.	Penang.
PRA, C. DA.	N. Sembilan.
PRINGLE, R. D.	Singapore.
PUSTAU, R. VON.	Germany.
RANKIN, H. F.	Amoy.
RIDLEY, H. N. M.A., F.R.S.	Singapore.
RIGBY, J.	Perak.
RICHARDS, W. S. O.	Singapore.
ROBERTS, J. A., M.A.	Ipoh, Perak.
ROBERTS, B. G.	
ROBINSON, H. C.	K. Lumpor, Selangor.
ROSTADOS, E.	Tras, Pahang.
ROWLAND, W. R.	Port Dickson, Negri Sembilan.
†SARAWAK, H. H. RAJAH OF, G.C.M.G.	Sarawak.
SARAWAR, H. H. THE RANCE OF	England.
†SATOW, SIR E. M., K.C.M.G.	England.
SAUNDERS, C. J.	Singapore.
SCHWABE, E. M.	Tanjong Rambutan Perak.
SCRIVENOR, J. B.	Selangor.
SEAH LIANG SEAH	Singapore.

SEAH SONG SEAH	Singapore.
SHELFORD, R.	Oxford.
SHELFORD, W. H.	Singapore.
SHELLABEAR, REV. W. G.	Malacca.
SIMMONS, J. W.	Tampin, N. Sembilan.
SINGER, C.	England.
SKEAT, W. W.	England.
SKERTCHLY, E. J.	Penang.
†SMITH, SIR CECIL C., G.C.M.G.	England.
STAPLES, F. W. M.	Klang Selangor.
ST. CLAIR, W. G.	Singapore.
SUGARS, J. C.	Batang Padang, Perak.
TAN CHENG LOCK.	Malacca.
TATLOCK, J. H.	Ipoh, Perak.
THOMAS, G. E. V.	Singapore.

VAN BENNINGEN VON HELSDINGEN, DR. R. Tanjong Pandan, Billiton.

WALKER, LT. COL. R. S. F., C.M.G.	Taipeng, Perak.
WATERSTRADT, J.	Batjan, Sourabaya.
WATKINS, A. J. W.	Singapore.
WELHAM. H.	Penang.
WELLINGTON, DR. A. R.	Sarawak.
WEST, REV. B. F.	U. S. A.
WICKETT, F., M.I.C.E.	Lahat, Perak.
WILLIAMS, J. H.	Singapore.
WINSTEDT, R. O.	Tapah, Perak
WOOD, E. G.	Kuala Lumpur.
WOLFF, E. C H.	Selangor.
*YOUNG, H. S.	Bau, Sarawak.

Annual Report for 1907.

The Council are glad to be able to state that during the year the financial state of the Society has been satisfactory and that there have been a considerable number of new members added to the Society.

The following were elected this year:

Mr. J. W. Krieckenbeek	Mr. H. Wellman
„ E. M. Janion	„ Humphries
Dr. T. Hayward Hays	„ J. T. Marriner
Mr. E. Costa Dew	„ B. T. K. Johnson
„ C. Da Pra	„ E. Anderson
„ G. A. Hall	„ Dr. F. Dent
„ N. E. A. Gardner	„ Hon. A. R. Adams

The Council have to record the loss to the society of the Right Reverend Bishop Hose who has lately retired from the East. Bishop Hose was the founder of the Society in the year 1877 and was the last member of the original council of the Society in the Straits Settlements. He was the first president of the society and occupied that position almost without break till his retirement in February of this year.

During the past year, the Hon. Secretary, Mr. H. N. Ridley was absent on leave for nine months and Mr. Hellier kindly acted for him.

A journal No. 48 was issued and another No. 49 is ready for distribution to the Members.

A Map Committee was formed to bring out a new edition of the map, the old edition being sold out, and they commenced the work of compiling and revising.

An Index to the Journal was compiled by Mr. W. D Barnes and offered to the Society. It was decided to complete and publish it when volume 50 was published.

A number of books and pamphlets were added by presentation to the Library of the Society.

The Treasurer's report is appended.

HONORARY TREASURER'S ACCOUNT FOR THE YEAR 1907.

	$	c.	$	c.		$	c.	$	c.
Balance brought forward from 1906 :—					Payments in 1907 :—				
Mercantile Bank, Fixed Deposit	2700	..			Methodist Publishing House—Printing ...	653	87		
Chartered Bank, Fixed Deposit	2300	...			Jones and Evans—Books	31	63		
Mercantile Bank, Current Account	68	50			Ah Tep—Book case ...	95	...		
Chartered Bank, Current Account	292	36			Abu Bakar—Book binding	23	...		
Cash in hand	5	...	5365	86	Clerk's Salary ...	60	...		
					Peon's Salary ...	24	...		
Receipts in 1907 :—					Postages, petties and discount on foreign cheques	103	66	991	16
Subscriptions for 1905 ...	10	...							
,, ,, 1906 ...	100	...			Balance carried forward :—				
,, ,, 1907 ...	385	...			Mercantile Bank, Fixed Deposit	2700	...		
,, ,, 1908 ...	20	...			Chartered Bank, Fixed Deposit	2300	...		
,, Life Membership	50	...			Mercantile Bank, Current Account	425	58		
Sale of Journals ..	340	67			Chartered Bank, Current Account	70	36	5495	94
Sale of Maps	11	57							
Bank Interest, Fixed Deposits	204	...	1121	24				6487	10
			6487	10					

Audited and found correct,

A. KNIGHT.

R. J. BARTLETT,

Honorary Treasurer, Straits Branch Royal Asiatic Society.

RULES

OF THE STRAITS BRANCH

OF THE

Royal Asiatic Society.

I. Name and Objects.

1. The name of the Society shall be 'The Straits Branch of the Royal Asiatic Society.'

2. The objects of the Society shall be:—

(a) the increase and diffusion of knowledge concerning British Malaya and the neighbouring countries.

(b) the publication of a Journal and of works and maps.

(c) the formation of a library of books and maps.

II. Membership.

3. Members shall be of two kinds—Ordinary and Honorary.

4. Candidates for ordinary membership shall be proposed and seconded by members and elected by a majority of the Council.

5. Ordinary members shall pay an annual subscription of $5 payable in advance on the first of January in each year. Members shall be allowed to compound for life membership by a payment of $50.

6. On or about the 30th of June in each year the Honorary Treasurer shall prepare and submit to the Council a list of those members whose subscriptions for the current year remain unpaid. Such members shall be deemed to be suspended from membership until their subscriptions have been paid, and in default of payment within two years shall be deemed to have resigned their membership.

No member shall receive a copy of the Journal or other publication of the Society until his subscription for the current year has been paid.

7. Distinguished persons and persons who have rendered notable service to the Society may on the recommendation of the Council be elected Honorary members by a majority at a General meeting. They shall pay no subscription, and shall enjoy all the privileges of a member except a vote at meetings and eligibility for office.

III. Officers.

8. The officers of the Society shall be:—

A President.

Three Vice Presidents, resident in Singapore, Penang, and the Federated Malay States respectively.

An Honorary Secretary.
An Honorary Treasurer.
An Honorary Librarian.
Four Councillors.

These officers shall be elected for one year at the annual General Meeting, and shall hold office until their successors are appointed.

9. Vacancies in the above offices occurring during any year shall be filled by the Council.

IV. Council.

10. The Council of the Society shall be composed of the officers for the current year, and its duties and powers shall be:—

(a) to administer the affairs, property and trusts of the Society.

(b) to elect ordinary members and to recommend candidates for election as Honorary members of the Society.

(c) to obtain and select material for publication in the Journal and to supervise the printing and distribution of the Journal.

(d) to authorise the publication of works and maps at the expense of the Society otherwise than in the Journal.

(e) to select and purchase books and maps for the Library.

(f) to accept or decline donations on behalf of the Society.

(g) to present to the Annual General Meeting at the expiration of their term of office a report of the proceedings and condition of the Society.

(h) to make and enforce by-laws and regulations for the proper conduct of the affairs of the Society. Every such by-law or regulation shall be published in the Journal.

11. The Council shall meet for the transaction of business once a quarter, and oftener if necessary. Three officers shall form a quorum of the Council.

V. General Meetings.

12. One week's notice of all meetings and of the subjects to be discussed or dealt with shall be given.

13. At all meetings the Chairman shall in the case of an equality of votes be entitled to a casting vote in addition to his own.

14. The Annual General Meeting shall be held in February in each year. Eleven members shall form a quorum.

15. (i) At the Annual General Meeting the Council shall present a Report for the preceding year and the Treas-

urer shall render an account of the financial condition of the Society. Copies of such Report and account shall be circulated to members with the notice calling the meeting.

(ii) Officers for the current year shall also be chosen.

16. The Council may summon a General Meeting at any time, and shall so summon one upon receipt by the Secretary of a written requisition signed by five ordinary members desiring to submit any specified resolution to such meeting. Seven members shall form a quorum at any such meeting.

17. Visitors may be admitted to any meeting at the discretion of the Chairman but shall not be allowed to address the meeting except by invitation of the Chairman.

VI. Publications.

18. The Journal shall be published at least twice in each year, and oftener if material is available. In the first number in each year shall be published the Report of the Council, the account of the financial position of the Society, a list of members, the Rules, and a list of the publications received by the Society during the preceding year.

19. Every member shall be entitled to one copy of the Journal, which shall be sent free by post. Copies may be presented by the Council to other Societies or to distinguished individuals, and the remaining copies shall be sold at such prices as the Council shall from time to time direct.

20. Twenty-four copies of each paper published in the Journal shall be placed at the disposal of the author.

VII. Amendments to Rules.

21. Amendments to these Rules must be proposed in writing to the Council, who shall submit them to a General Meeting duly summoned to consider them. If passed at such General Meeting they shall come into force at once.

A List of the Ferns of the Malay Peninsula.

By H. N. Ridley, F.R.S.

As might be expected in a wet tropical forest region such as the Malay Peninsula, the number of ferns is very large, no less than 382 species being recorded, and further the number of individuals is so large that they form a very conspicuous feature in the forests and damp open spots.

That the number of species occurring here will be very largely increased by futher discoveries may be taken as certain, for there still remains a very large area of the country especially in the centre and northern part of the peninsula which has not as yet been investigated by the lovers of ferns.

The ferns of the plain country of the west coast are probably pretty well known and the Thaiping Hills and some of the other hill-ranges have been the collecting grounds of Day, Scortechini, and Kunstler. The ferns of Penang were well collected by Curtis, but the hill-ranges of Selangor and Pahang and the low country of the east coast have as yet been only partially searched and that mainly by myself. The northern states on the borders of Siam have been hardly investigated at all, and are likely to produce many additions to our flora.

In following the arrangement of Beddome's Ferns of British India, I have incorporated into the list some species recorded by him from definite localities in the peninsula which have not been seen by me. There are however a good many recorded by him as from "Malay peninsula" without special localities, and which have not been apparently met with again. These I have excluded at present as some authors include Tenasserim as part of the Malay peninsula and the plants thus vaguely localised may have been obtained across the border.

I am indebted to Dr. Christ of Basle for identification of many species, as well as to Bishop Hose, and Surgeon General C. T. Matthew, who always spent his spare time in Singapore during the short stays of his ship in searching the forests of Singapore for ferns, with no little success.

The chief collectors of ferns in the peninsula have been Father Scortechini, Mr. Day, Mr. Kunstler, who collected for the Calcutta Gardens, Mr. Hullett, Right Reverend Bishop Hose, Mr. Curtis and in earlier days W. Norris, Lady Dalhousie, Mr. Pinwill, Dr. Wallich and Cuming.

Habitats. The most abundant and conspicuous fern is perhaps the well-known "Resam" *Gleichenia linearis* which covers considerable tracts of country on the edges of forest, and where the forest has been felled and burnt. In such spots it produces dense thickets very troublesome to penetrate. In the hill districts it is replaced by other species of *Gleichenia, G. hirta, G. glauca* and *G. flagellaris.* In more sandy places in the low country, we find the common bracken, *Pteris aquilina* taking its place. This is probably the most widely distributed and abundant of any vascular plant in the world. It is remarkable too how little this plant varies in different regions of the globe. There is but little visible difference between the bracken of the woods of Kent and that of the hot sandy country of Singapore, the chief difference being the more woody texture of the stalks in the tropical form.

Another fern which forms thick masses is the local *Matonia pectinata* of Mount Ophir and others of our higher hills. This beautiful fern often occurs growing in close thickets, like bracken.

Dipteris Horsfieldii grows in a similar manner over the sea-coast cliffs and on clay banks at 2000 feet and upwards in close masses. It is noticeable that all these ferns are remarkably difficult to cultivate, abundantly and readily as they grow in a natural state. All attempts to grow *Dipteris* and *Matonia* have failed, while the Gleichenias and the Bracken too are notoriously troublesome to transplant.

Very common and conspicuous too are the *Lygodiums,* known here as "Ribu-Ribu," literally "thousands," from

their numerous leaflets, *L. circinatum* and *L. microphyllum*. So abundant are these ferns climbing over bushes and through grasses, that they are extensively used in decorating ballrooms in the form of twisted ropes of the ferns.

Anisogonium esculentum is a very common fern fringing the banks of muddy rivers in dense thickets, and very abundant too is the "Lamiding" *Stenochloena palustris* scrambling and climbing over trees and bushes. Both of these last mentioned ferns are eaten as potherbs by the Malays.

Acrostichum aureum a big tufted fern occurring in tidal river mud all over the warmer parts of the world is very abundant. It occasionally is to be met with in damp places far away from the sea or any tidal river. In most of these places however I believe that it has merely persisted for many years after the river on whose banks it formerly grow has been silted up and now forms part of the dry land. A large clump still grows in the Economic Gardens at Singapore where the original river on which it doubtless first started its growth has been dry land since any history of it has been known, though Nipah fruits still dug up in the surrounding soil prove that at one time the tides reached this spot. I have also found the *Acrostichum* far inland at the base of Gunong Pantai in Johor, and still further from the sea at Bukit Asahan at the foot of Mount Ophir and over thirty miles from the Coast. Most of the ferns however occur in a more isolated manner, though many are very abundant.

The richest localities for ferns are the wet densely forested hills at altitudes of from 1000 to 5000 feet but the damp rocky woods of the plains are also very rich. The drier woods are less abundantly supplied, but many species are very characteristic of this kind of locality. Such are the Schizoeas, Lindsayas, Nephrodiums.

Even the sands of the sea-coast produce some species such as *Davallia solida* and *D. elegans*, the *Humatas* and *Schizaea dichotoma*. At high elevations there is a noticeable disappearance of the thin textured ferns such as the Nephrodiums and Lastraeas, which are replaced by the more cori-

aceous leaved xerophytic *Dipteris, Matonia, Polypodiums, Oleandras* and such ferns.

Epiphytic species are very abundant frequently covering the trees, especially at high altitudes, but as it seen in other groups of plants, ferns which in the plants only occur on the upper branches of lofty trees, grow at an altitude of three or four thousand feet quite low down, and not rarely on rocks. Some of these high growing ferns are not at all easy to cultivate at low altitudes, but *Davallia triphylla* which only occurs in a wild state on the topmost boughs of trees a hundred or a hundred and fifty feet high, I have met with on several occasions transplanted, accidentally or intentionally to the base of trees a few feet from the ground and thriving well. This fern was formerly considered so rare that about 20 years ago few herbaria in Europe had a specimen, but as a matter of fact it is by no means a rare plant. Growing as it does only on the inaccessible branches of lofty trees, it could only be obtained by searching for fallen boughs on which it happened to be growing.

Two of the most curious of our ferns are epiphytic plants remarkable for their rhizomes being modified so as to form nests for ants. They are *Lecanopteres carnosa* and *Pleopeltis sinuosa*. The former which occurs abundantly on trees at 3000 much after the manner of the rubiaceous plant *Myrmecodia*. *Pleopeltis sinuosa* has a thick scaly rhizome hollow inside and also inhabited by ants. It is abundant in Singapore. It is curious that fleshy and succulent as the rhizome of this plant is, it is one of the first epiphytic plants to die during a short dry spell. One would have thought its supply of water in the rhizome would have been sufficient to have prevented this.

Distribution of Ferns. As ferns are disseminated by the floating of their dust-like spores on the wind to immense distances it will easily be understood that many of the species have a very wide distribution over the surface of the globe. Ferns indeed are among the first of the higher plants to appear on newly cleared ground, if the soil and climate suit them.

The majority of our ferns occur in the Malay islands also, and a large proportion are found in the Mascarene islands, as well as India and Polynesia and South America, which is not the case with the higher flowering plants, few of which except some weeds carried about by human agency have as wide a distribution. Six species even occur in the British Isles, viz., *Trichomanes radicans, Hymenophyllum Tunbridgense, Pteris aquilina, Lastrea Thelypteris* and *Polystichum aculeatum* and *Adiantum Capillus-veneris.*

There are however about 40 species which are endemic, never having been collected anywhere else except in the peninsula at present.

Uses of Ferns.

A good many of the local ferns are used for food in the form of pot herbs in place of spinach, or as sumbuls with curry, but chiefly by natives; for excellent as many of these are, Europeans are not acquainted with their merits and rarely use them. Among the most popular are *Stenochloena palustris* the "Miding" or "Lamiding" of the Malays, *Anisogonium esculentum* "Paku Anjing," and the water-fern *Ceratopteris thalictroides,* which occurs often abundantly in ditches. Of these ferns the young fronds are collected and boiled.

From the stems of Resam, (*Gleichenia linearis*) are made pens, and they are also used for making the walls and partitions of the fishing-stakes.

The fronds of the common *Pleopeltis Phymatodes,* when dry, exhale a delicious odour of Coumarin, like that of the Tonkin bean. Hence this fern is known as Paku Wangi or scented fern. The fronds are dried and put among clothes, especially I am told by the Eurasian population in order to give them a pleasant perfume.

Comparatively few ferns are accredited here with medical properties. The golden brown hairs on the rhizome of *Cibotium Barometz* are used as a styptic for wounds for which they are very suitable, and the rhizomes are sold in the drug-shops

under the name of 'Penawar Jambi.' This vegetable fur is even exported to Europe for the same purpose, being used not only as a styptic but as an antiseptic in planters.

The fronds of the number of a softer textured ferns are used pounded up as poultices for boils or sores; such are those of *Cyathea Brunonis* (also eaten as a pot herb by Jakuns), and *Phegopteris punctatum*.

The ashes of *Drynaria quercifolia* fronds are applied to the abdomen in cases of miscarriage.

GLEICHENIACEAE.

GLEICHENIA.

Gl. circinata (Sw.) Damp rocks and streams at about 4000 feet elevation. Malacca, Mt. Ophir (Hullett, Derry 605); Perak, Gunong Bubu (Cantley); Kedah, Gunong Jerai (Ridley). Distrib. Australia, New Zealand and New Caledonia.

Gl. dicarpa (Br.) Perak, Gunong Berumbun (Wray 1584); Province Wellesley, Bukit Panchur (Ridley 12633).
var. *alpina* Bedd. Perak (Scortechini, King's Coll. 7345). Distrib. Malay isles, Australia, New Zealand.

Gl. hirta (Bl.) Hill districts. Malacca, Mt. Ophir (Lang, Ridley); Perak (Scortechini); Penang Hill (Norris, Hullett); Kedah, Gunong Jerai (Ridley).

Gl. Norrisii Mett. Hill districts. Perak, Bujong Malacca (Ridley 9599, Curtis 3314); Gunong Bubu (Wray 240); Gunong Batu Putih (Wray 243). Endemic.

Gl. glauca (Hook.) *G. longissima* Bl. Very abundant at about 1000 feet elevation and upwards, forming dense masses. Johor, Gunong Pulai (Ridley 12127); Malacca, Mt. Ophir (Lang); Perak, Larut Hills (Fox 131, Ridley 10658); Penang Hill very abundant (Ridley 7082); Kedah, Gunong Jerai (Ridley). Distrib. Malaya, China, Australia, Polynesia, Trop. America.

Gl. flagellaris Spr. Abundant on hill tops from about 1000 feet upwards. Malacca, Mt. Ophir (Derry 604); Negri Sembilan, Gunong Angsi (Ridley); Perak, Maxwell's Hill (Ridley 10659); Penang Hill (Hullett). Distrib. Mascarene isles, Malay isles, Polynesia.

Gl. linearis (Burn). *Gl. dichotoma,* Willd. The commonest occurring everywhere in the low country, in immense almost impenetrable masses. Native name "Resam." The stems used for making pens, and also for fishing stakes. Singapore, Tanglin, etc. (Ridley); Malacca; Johor, Gunong Pulai (Ridley 12128); Perak, Gopeng, Sungei Rayah (King's Coll. 1065); Penang. Distrib. India, Japan, Australia, Polynesia, Trop. America.

Cyathea.

C. Brunonis Wall. Common in woods at no great elevation. Native names "Paku Pahat," "Paku Gajah Payah," "Paku Hitam Payah," "Paku Salamah." The leaves are eaten as a vegetable by the Jakuns, and also used to poultice sore legs. Johor, near Castlewood, Batu Pahat (Ridley 11061); Negri Sembilan, Perhentian Tinggi (Ridley); Malacca, Bukit Kayu Arang (Cantley's Coll.), Bukit Tungul (Ridley 4403), Bukit Bruang; Pahang, Tahan River (Ridley); Selangor, Kwala Lumpur (Ridley 10483), Batang Padang (Murdoch); Perak, Goping (King's Coll. 475), Larut (King's Coll. 4885); Penang Hill near the top (Ridley 7036). Distrib. Malay islands.

Amphicosmia.

A. alterans Hook. Singapore, Bukit Timah (Ridley 12554); Johor, Batu Pahat (Hullett); Selangor, Kwala Lumpur (Ridley 10173); Perak, Gunong Bubu (Cantley); Penang Hill, Penara Bukit (Ridley 7153, 7156, 10139). Distrib. Borneo.

A handsome tree fern in damp forests.

ALSOPHILA.

A. latebrosa Hook. The commonest tree fern in the low country, stem 8 to 12 feet tall. Singapore common, Bukit Timah, Chan Chu Kang (Ridley 6123), Chua Chu Kang (Ridley 6029); Johor, Tanjong Kupang (Ridley 4400); Malacca, Ayer Panas, Ayer Keroh (Ridley 10705); Selangor, Batang Berjuntai (Ridley 7870), Gua Batu (Ridley 8141); Perak, Larut (King's Coll. 23591, 7317), Thaiping (Curtis); Penang Hill, Province Wellesley, Tasek Gelugur (Ridley 6965); Kedah, Yan (Ridley 5177).

A. comosa Hook. Not rare in the low country, stem 8 or 9 feet tall. Singapore, Bukit Timah, Jurong (Ridley 5156). Reservoir woods. Perak, Kinta (King's Coll. 7148), Larut (Bishop Hose); Penang Hill (Hullett), Road to Penara Bukit (Ridley 7153). Distrib. Malay isles.

A. Ridleyi Baker. Stem very short almost none. Damp low-woods. Singapore, Sungai Morai (Ridley 4401), Chan Chu Kang (Ridley 6122), Chua Chu Kang (6031). Endemic.

A. commutata Mett. Hills at 4000 feet. Malacca, Mt. Ophir (Ridley 9857, 3319); Pahang, Kluang Terbang (Barnes); Selangor, Bukit Hitam (Ridley 7869); Perak, Larut (King's Coll. 1908, 7150), Gunong Bubu (Cantley), Bujong Malacca (Ridley 9604).

A. glabra Hook. Perak (Scortechini); Kedah Peak (Ridley 5156, 5157); Langkawi, Gunong Rayah (Curtis). Distrib. India, China, Malaya.

A. glauca (Sw.) *A. contaminuus* Hook. A splendid tree fern sometimes 20 feet tall, with the rachis and petiole ashy blue. Johor, Bukit Soga (Ridley 1066); Sungei Ujong (Hullett); Selangor, Pahang track (Ridley 8633), Ginting Bidai (Ridley 7868); Perak, Larut Hills (King's Coll. 4032). Common near the top of the hills.

Penang Hill common at the top (Ridley 7150). Distrib. India and Malay islands.

I found a very curious form with fasciated fronds on the Thaiping hills near the top.

A. Kingii Bedd. Johor, Gunong Panti (Ridley); Perak, top of Gunong Bubu (King's Coll. 7402, Wray 3860). Endemic.

A. crenulata Mett. Johor, Gunong Panti (Ridley); Selangor, Bukit Kutu (Ridley 7865); Dindings, Lumut (Ridley); Perak, Gunong Keledang (Ridley 9548), Bujong Malacca (Ridley 9551); Waterfall, Thaiping Hills (no 7865). Distrib. Java.

A. dubia Bedd. Perak (Scortechini), Larut (King's Coll. 2493). Endemic.

A. obscura, Scort. Perak, Gunong Hijau (Scortechini). Endemic.

A. trichodesma Bedd. Perak (Scortechini). Endemic.

Matonia.

M. pectinata Br. By no means one of the rarest ferns as Beddome says. It is local but usually very abundant growing like bracken, where it occurs usually in open spots on the top of hills. Malacca, Mount Ophir, Padang Batu, (all collectors) 3000 feet elevation. Selangor, Hulu Semangkok (Ridley); Perak, Gunong Bubu (Scortechini 761); Kedah Peak (Ridley).

It also occurs in the Carimon islands quite low down near the Waterfall and in Borneo.

DICKSONIEAE.

Dicksonia.

D. ampla Bak. Perak, Maxwell's Hill (Ridley 5188), (King's Coll. 2159). Also Borneo.

D. Kingii Bedd. Perak, Gunong Batu Putih (King's Coll. 8058) and Larut (2118). Endemic.

Cibotium.

C. Barometz, Link. In woods at no elevation, not rare. Native name "Penawar Jambi." The hairs from the rhizome sold as a styptic. The rhizome usually short creeping but I found it with a stem 4 feet tall on Kedah Peak. Johor, Batu Pahat (Ridley 10981); Selangor, Bukit Kutu (Ridley 7864); Perak, Bujong Malacca (Ridley 9532), Gunong Batu Putih (Wray 489), Gunong Hijau (Scortechini 1226); Kedah, Gunong Serai (Ridley 5176); Penang, Mt. Erskine (Curtis). Distrib. Malay islands and S. China.

Lecanopteris.

L. carnosa Bl. Epiphytic with great irregular hollow tuberculated rhizomes full of ants. On very lofty Dipterocarpus trees in the lower country, on lower trees in the hills. Singapore, Bukit Timah (Ridley); Malacca, Sungei Hudang (Goodenough no 1477); Selangor, Bukit Hitam (Kelsall); Perak, Thaiping Hills (Hervey, etc.) very abundant, Gunong Bubu (Cantley). Distrib. Malay isles.

Hymenophyllum.

H. polyanthos Sw. Common on trees and rocks, in the low country and up to a considerable altitude. Singapore, Bukit Timah, Bajau, Kranji (Ridley 5607); Johor, Kampong Bahru, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (R. Derry); Perak, Bujong Malacca (Ridley 9609); Penang Hill (Hullett, Ridley 7072); Kedah, Gunong Jerai (Ridley).
var. *Blumeana.* Singapore, Bukit Timah (Matthew), Sungei Morai (Ridley 4406), Bukit Mandai (Ridley

8938); Pahang, Tahan River (Ridley); Selangor, Bukit Kutu (Ridley 7872); Perak (Scortechini 320).

H. javanicum (Spreng). Rocks and trees from about 1000 feet upwards. Johor, Gunong Pulai (Hullett); Malacca, Mt. Ophir (Ridley 9992); Selangor, Pahang Track (Ridley 8773, 8774); Perak, Thaiping Hills (King's Coll. 2187, Scortechini, Wray), Bujong Malacca (Ridley).
var. *badium*. Perak, Maxwell's Hill (Bishop Hose, Ridley 5182, Curtis 2084); Penang Hill (Hullett). Distrib. Mascarene islands, India to Australia.

H. Smithii Hook. Singapore, Kranji (Matthew); Johor, Gunong Banang, Batu Pahat (Ridley 10985); Selangor, Semangkok Pass (Ridley 12034); Penang Hill (Ridley 7072). Distrib. Malay isles.

H. productum Kze. Singapore, Kranji (Ridley 1687); Perak, Maxwell's Hill (Wray); Kedah, Gunong Jerai (Ridley). Distrib. Malaya, Polynesia.

H. dilatatum (Sw.) Perak, Larut (King's Collector). Distrib. Java and New Zealand.

H. tunbridgense Sm. Rare. Kedah Peak (Ridley 5178). Distribution Europe, Africa, South America and New Zealand. Identified by Dr. Christ.

H. aculeatum V. D. Bosch. Singapore, Woodlands (Christ); Perak at 4000 feet alt. (King's Coll.); Penang 3000 feet alt. (Day). Also Java.

H. affine V. D. Bosch. Johor, Mt. Austin (Ridley 12539, 12540), Gunong Pulai (Ridley 12135). Distrib. Java.

H. denticulatum Sw. Singapore, Kranji (Ridley 1687); Perak, Maxwell's Hill (Wray); Kedah, Gunong Jerai (Ridley). Distrib. Java.

H. Neesii Hook. Common on trees low country up to 4000 feet elevation. Singapore, Bukit Mandai (Ridley 9840), Kranji, Woodlands, Selitar; Johor, Pengaram, Tanjong Bunga (Ridley); Malacca, Mt. Ophir, Gunong Mering (Ridley), Batu Tiga (Derry); Pahang, Tahan River

(Ridley 2153, 2174), Kluang Terbang (Barnes); Selangor, Rawang, Bukit Kutu (Ridley 9852), Hulu Semangkok (12036); Negri Sembilan, Perhentian Tinggi (Ridley); Dindings, Lumut (Ridley 7145); Perak (Scortechini), Maxwell's Hill (Curtis 2083), Bujong Malacca (Ridley 9610); Penang Hill, Penara Bukit (Ridley 7146). Distrib. Malay isles, Fiji.

TRICHOMANES.

Tr. Motleyi V. D. Bosch. Singapore, Stagmount (Ridley). Distrib. Tenasserim, Andamans, Ceylon, Borneo, New Caledonia.

Tr. Henzaianum (Parish). Singapore, Feruvalley, Bukit Timah (Matthew). Distrib. Burmah.

Tr. muscoides (Sw.) On Rocks. Singapore, Feruvalley, Bukit Timah; Malacca, Mt. Ophir (Ridley). Distrib. India and Tropical Africa and America.

var. *sublimbatum*. Very near the last species. Perak, Rocks, Bujong Malacca (Ridley).

Tr. neilgherrense, Bedd. Perak (Scortechini). Distrib. S. India.

Tr. parvulum Poiret. Perak (Scortechini); Penang Hill (Ridley 1748); Kedah Peak (Ridley). Distrib. Madagascar, India, Malay isles, Japan, China and Polynesia.

Tr. humile Forst. Singapore, Woodlands (Matthew). Distrib. Pacific islands, Philippines.

Tr. palidum Bl. On trees and rocks usually at a considerable elevation, easily recognized by its ashy grey color when alive. Singapore, Kranji (Matthew); Johor, Gunong Panti (Ridley 4161); Malacca, Mt. Ophir (Ridley 9885); Perak, Gunong Hijau (Scortechini). Distrib. Java.

Tr. digitatum Swartz. On trees. Singapore, Kranji (Ridley); Pahang, Tahan River (Ridley); Selangor, Bukit Kutu (Ridley 7873); Perak (Scortechini), Gunong

Hijau (Ridley); Penang Hill (Bishop Hose), Penara Bukit (Curtis 3062); Kedah Peak (Ridley). Distrib. Mauritius and Java.

Tr. proliferum Bl. Perak, Larut 100-4000 feet (King's Coll. 2565). Distrib. Java, Philippines.

Tr. bipunctatum Poir. *T. Filicula* Bory. On rocks. Singapore, Chan Chu Kang (Ridley); Johor, Gunong Panti (Hullett); Selangor, Bukit Hitam, Petaling, Langat, Batu Caves (Ridley 8143), Pahang Track (Machado); Dindings, Lumut (Ridley); Perak, Larut (King's Coll. 1860, 1913, Scortechini), Thaiping (Ridley), Bujong Malacca (Ridley 9606). Distrib. African islands, India, Ceylon, Pacific islands.

Tr. pyxidiferum L. Perak (Scortechini), Goping (King's Coll. 4185); Penang Hill (Ridley). Distrib. Brazil.

Tr. javanicum Bl. very common on rocks in forest. Singapore, Bukit Timah (Ridley 9569); Johor, Gunong Panti, Batu Pahat (Ridley 11065); Pahang, Tahan Woods (Ridley 2181); Selangor, Rawang, Bukit Hitam, Pahang Track (Ridley 8665); Dindings, Lumut (Ridley 7149*a*); Perak, Maxwell's Hill at 3000 feet (Scortechini 541), Goping (King's Coll. 584); Penang Hill (Ridley 7149); Lankawi (Curtis 2423). Distrib. India, Malay Archipelago.

Mixed with garlic and onion the dried fronds are smoked as tobacco to cure headaches.

Tr. rigidum, Swartz. Common in woods. Singapore, Bukit Timah, Sungei Buluh, Chan Chu Kang (Ridley 6119), Toas (4407); Johor, Castlewood, Gunong Pulai (Ridley); Pahang, Tahan River (Ridley 2161); Malacca, Mt. Ophir (Ridley 3332, 3320); Negri Sembilan, Gunong Angsi (Ridley 11815); Selangor, Batu Caves (Ridley 8661), Bukit Hitam (Kelsall), Bukit Kutu (Ridley 7871); Perak, Larut (King's Coll. 2404); Penang Hill (Ridley); Kedah, Gunong Jerai (Ridley); Tringanu,

Bundi (Rostado). Distrib. S. Africa and islands, Ceylon, Malay Archipelago, Polynesia and S. America.

Tr. pluma Hook. Not rare in the hills at about 4000 feet alt. Malacca, Mt. Ophir (Bishop Hose, etc.); Selangor, Bukit Hitam, Ginting Bidai, Semangkok Pass (Ridley 12107); Perak, Bujong Malacca (Ridley), Gunong Bubu (Cantley), Gunong Hijau (Wray, Scortechini 344).

Tr. parviflorum Poir. *Tr. foeniculaceum* Bory. Singapore, Moores Herb (fide Beddome); Perak, Gunong Bubu (Murton). Distrib. Mascarene isles, Borneo, Queensland.

Tr. gemmatum Sm. Malacca, Mt. Ophir, Mering and Tunduk (Ridley 9881, Derry 607). Distrib. Malay isles, Polynesia, S. America.

Tr. apiifolium, Presl. Malacca, Mt. Ophir (King's Collector fide Beddome). Distrib. Malay isles, Polynesia.

Tr. hispidulum Mett. Singapore, near Selitar (Matthew and Ridley); Perak and Goping (King's Coll. 531), Tapa (Wray 1365). Distrib. Borneo.

Tr. maximum Bl. Johor, Gunong Panti (Ridley); Malacca (loc. incert.), (Hervey); Selangor, Pahang Track (Ridley 8638), Semangkok (12032); Perak, Bujong Malacca a curious small form (Ridley 9534), Larut 2500-3000 (King's Coll. 2225-5286), Maxwell's Hill (Scortechini 225), Tea Gardens (Ridley 3059). Dsitrib. Malay isles and Polynesia.

Tr. radicans, Sw. Johor, Patani, Batu Pahat (Ridley 10979); Malacca, Jeram Nyalas (Derry 1126); Sungei Ujong (Hullett); Perak, Maxwell's Hill (Ridley 5183, 1670), Gunong Batu Putih (King's Coll. 8045); Penang Hill at 2500 feet (Hullett). Distrib. Both hemispheres.

Tr. denticulatum Bl. Johor, Gunong Pantai, Gunong Pulai (Ridley 12135); Negri Sembilan, Perhentian Tinggi (Ridley); Penang Hill; Kedah Peak (Ridley). Distrib. Java.

Tr. auriculatum Bl. In the hill woods on trees. Selangor, Ginting Bidai (Ridley 7874); Perak, Maxwell's Hill (Curtis, Scortechini), Gunong Batu Putih (Wray 351). Distrib. Malay isles, Japan and Guiana.

Tr. malaccense Christ. Malacca, Mt. Ophir (Lang); Perak, Bujong Malacca (Ridley 9611), Thaiping Hills. Endemic.

Tr. obscurum Bl. Malacca, Mt. Ophir, Gunong Tunduk (Ridley 9882, 9883); Perak, Bujong Malacca (Ridley 9608). Distrib. Java.

Tr. Ridleyi Chr. Singapore, Bukit Timah (Ridley).

Tr. sp. Penang, Moniots Road (Matthew).

DAVALLIEAE.

Humata.

H. heterophylla Smith. On dead trees or high up on living ones, or also on the ground near the sea. Singapore, Kranji (Ridley 8940), Bajau, Changi beach (4355), Pulau Brani and Pulau Ubin (Hullett); Johor, Bukit Patani, Batu Pahat (Ridley); Pahang, Pekan (Ridley 2160); Perak, Lampatang (Scortechini 1554), B. P. D. (King's Coll. 7821). Malay isles, Polynesia.

H. angustata Wall. Singapore (Cuming 335), Sungei Morai, Chan Chu Kang (Ridley 3599); Johor, Bukit Pengarum, Kampong Bahru (Ridley); Malacca, Mt. Ophir (Ridley 3336); Selangor, Pahang Track (Ridley 8647); Dindings, Lumut (Ridley 7136); Perak, Sungei Ryah (King's Coll. 828), Maxwell's Hill (Scortechini 408), Bujong Malacca, Gunong Keledang (Ridley 9550); Penang, Waterfall (Ridley), Hill (King); Kedah Peak (Ridley 5179). A very curious form crenately deeply lobed to the midrib grows on the rocks on Padang Batu, Mt. Ophir (No. 3339). Endemic.

H. parallela Wall. Singapore, Tanjong Merawan (Ridley); Malacca and Johor; Pahang, Pekan (Ridley); Lankawi (Curtis). Distrib. Burmah to Polynesia.

H. pedata Smith. Singapore, Kranji; Johor, Sungei Bau, Mt. Austin; Malacca, Tanjong Kling (Ridley); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Dindings, Lumut (Ridley 7155); Tringganu, Bundi (Rostado); Penang (King 1374), Penang Hill (Ridley 7077); Kedah Peak (Ridley 5179); Lankawi (Curtis). Distrib. Malay isles, India, Ceylon, Mascarene isles.

H. pinnatifida Baker. Rare. Malacca Mt. Ophir (Ridley); Perak, Larut 3-4000 feet alt. on trees (King's Coll. 6393). Also Borneo.

H. sessilifolia Bl. "Singapore Sinclair") Beddome. Distrib. Java. Not seen.

LEVCOSTEGIA.

L. hymenophylloides Bl. On rocks and rotten trees. Perak, Bujong Malacca (Ridley 9545), Gunong Batu Putih (King's Coll. 8046), Kinta (King's Coll. 7128); Penang, near Richmond pool (Hullett, King). Distrib. Malay isles to Polynesia.

L. nodosa Presl. Perak, top of Gunong Bubu 5000 to 5300 feet alt. (King's Coll. 7421, Wray 383). Distrib. India and Java.

L. parvula Sm. On trees in mangrove swamps. Singapore, Sungei Buluh, Tanjong Merawan, Kranji (Ridley 87). Distrib. Malay isles.

L. affinis Hook. Perak, Gunong Batu Putih (Wray 1030); Penang (Lady Dalhousie). Distrib. Ceylon and Malay isles.

PROSAPTIA.

P. Emersoni Presl. On trees and rocks usually on the hills. Johor, Gunong Pulai (Hullett); Malacca, Batu Tiga (Derry); Selangor, Rawang, Bukit Kutu and Bukit Hitam (Ridley 8964); Perak, Hermitage Hill, Bujong Malacca (Ridley), Maxwell's Hill (Scortechini 120,

215); Prov. Wellesley, Bukit Panchur (Native Coll.); Penang, Government Hill (Ridley, Kunstler 1307); Kedah Peak (Ridley 5170). Distrib. Malay isles and India.

P. contigua Swartz. Pahang, Tahan River (Ridley); Sungei Ujong (Hullett); Perak, Gunong Hijau (Scortechini 490). Distrib. Malay isles and India.

DAVALLIA.

D. solida Swartz. Common on tree trunks and in dry sandy spots. Singapore, abundant in the Botanic Gardens, Sungei Morai (Ridley); Johor, Jaffaria (King); Pahang; Perak, Kinta (King's Coll. 7068); Selangor, Ginting Bidai (Ridley 984); Penang, above the Waterfall (Hullett); Kedah, Yan (Ridley). Distrib. Polynesia and Malay isles.

D. elegans Swartz. On trees or sandy points, "Paku Terutep." Singapore, Changi beach (Ridley 4351); Pahang, Pekan, Kota Glanggi (Ridley 1598*a*); Malacca, Sungei Hudang (Ridley), Pulau Undan (Cantley's Coll.), Jasin (Goodenough); Selangor, Semangkok Pass (Ridley); Perak (Scortechini), Thaiping Hills Cottage (Hervey); Tringganu, Cherating River (Ridley); Prov. Wellesley, Permatang Bertam on cocoanut trees (Ridley); Kedah, Kedah Peak (Ridley 5159). Distrib. Africa, India, China, Malay isles, Polynesia.

D. epiphylla Bl. On rocks. Perak, Gunong Batu Putih (King's Coll. 8037). Distrib. Polynesia and Java.

D. divaricata Bl. Perak (Scortechini). Distrib. Java.

D. bullata Wall. Selangor, Pahang Track (Ridley 8637); Perak, Larut Hills 3500-4000 feet alt. (King's Coll. 6081), Caulfield's Hill (Scortechini 391); Kedah Peak, rocks of the precipice (Ridley 5158). Distrib. Assam and Nepal.

D. triphylla Hook. On boughs of lofty trees rarely low down. Singapore (Cuming 339), Woodlands, Bukit Timah

(Ridley 9095); Johor, Bukit Patani, Batu Pahat (Ridley 11064), Gunong Pulai (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 10819); Perak (Scortechini). Endemic.

MICROLEPIA.

M. pinnata Cav. "Paku Merah" on banks in the hills. Johor, Gunong Pulai (Ridley); Malacca, Mt. Ophir (Ridley 3318); Selangor, Batang Padang (Near dock), Bukit Hitam (Ridley), Pahang Track (Ridley 8660); Perak, Larut Hills (Scortechini 153, 407), Gunong Keledang (Ridley 9541) and Bujong Malacca (9533); Penang Hill abundant at the top (Bishop Hose, Ridley, Wallich, Lady Dalhousie).

var. *luzonica*. Perak, Larut (King's Coll. 2144). Distrib. Philippines.

M. strigosa Swartz. Selangor, Rawang, Ginting Bidai, Bukit Kutu (Ridley 7860); Penang, Penara Bukit (Curtis 3061).

M. Kurzii Clarke. Perak, Gunong Bubu (King's Coll. 8331).

M. marginalis Thunb. Lankawi (Curtis) not in fruit but the frond resembles this plant.

D. Mooreana aff. but pinnules much larger. Perak, Larut Hills (Curtis 3723).

M. speluncae L. Singapore, Ang Mo Kio, Changi (Ridley 6034), Gelang by a tidal stream (6248); Johor, Tebing Tinggi (Ridley); Pahang, Kuala Tahan; Selangor, Caves, Kuala Lumpur (Ridley 8641), Ginting Bidai (Ridley 7855); Negri Sembilan, Perhentian Tinggi (Ridley 9856); Perak, Thaiping (King's Coll. 8371), Tanjong Malim (Ridley), Telor Pinang (9746); Penang (Curtis); Prov. Wellesley, Tasek Gelugur (Ridley); Kedah (King's Coll. 1245), Lankawi (Fox); Kelantan, Kamposa (Ridley) a very glabrous form.

var. *hirta*. Selangor, 15th mile Pahang Track (Ridley 8637); Perak, Ulu Kerling (King's Coll. 8661).

M. moluccana Bl. Perak alt. 3000-4000 feet (Scortechini), Maxwell's Hill (Curtis 2085); Selangor, Pahang Track (Ridley 8634). Distrib. Malay isles.

STENOLOMA.

S. chinensis Swartz. The Lace fern, on banks at considerable altitudes, this plant seems to prefer stiff yellow clay. Pahang, Kuala Pahang near the Sultans tombs (Ridley 4230), Tahan River; Selangor, Ginting Bidai, Semangkok Pass common (Ridley); Penang, Penara Bukit, etc. common (Ridley). Distrib. Mascarene, India, Malay isles, China, Polynesia.

LINDSAYEAE.

LINDSAYA.

L. cultrata Swartz. On rocks and banks. Pahang, Tahan River (Ridley 2151); Malacca, Mt. Ophir (Ridley); Selangor, Rawang, Ginting Bidai (Ridley 7876); Perak, Larut (Scortechini, King's Coll. 2473), Tea Gardens (Ridley), Bujong Malacca (Ridley 9605); Kedah Peak; Lankawi (Curtis).

var. *Lobbiana*. Pahang, Tahan River (Ridley). Distrib. Mascarene isles, India, Japan, Australia.

L. repens Thw. Singapore, Bukit Timah (Ridley); Malacca (Hervey); Selangor, Ginting Bidai (Ridley 7845), Pahang Track (Ridley 8661); Perak, Bujong Malacca (Ridley 9603), Larut Hills (Fox). Distrib. Mauritius, India, Malay isles, Polynesia.

L. scandens Hook. Johor, Sempang Kiri (Ridley), Gunong Pulai (Hullett); Pahang, Kluang Terbang (Barnes); Malacca, Selandau (Goodenough), Sungei Hudang, Machap (Ridley); Perak, Thaiping Hills (Hervey, Wray), Bujong Malacca (Ridley); Penang, Government Hill (Ridley), Richmond pool (Fox). Distrib. Malay isles.

L. orbiculata Lam. Pahang, Tahan River (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 2349); Selangor, Hulu Semangkok (Ridley); Perak, Bujong Malacca (Ridley 9560), Gunong Bubu (Scortechini 133), Thaiping Hills (Ridley); Penang, Government Hill road (Ridley), Richmond Pool (Fox); Kedah Peak (Ridley 5163, 5165).

var. *tenera*. Perak, Gunong Batu Putih (King's Coll. 8039). Distrib. India, China, Australia.

L. Lancea L. Common in woods. "Paku Dudok bukit" "Paku Gurmang." Singapore, Chan Chu Kang (Ridley 1653), Bukit Timah (Ridley 10815); Johor, Gunong Panti (Ridley 4148), Hadji Senawi, Sempang Kiri (Ridley 10967); Malacca, Mt. Ophir (Ridley 3347); Selangor, Batu Tiga (Ridley); Negri Sembilan, Perhentian Tinggi (Ridley), Bukit Danan (Cantley's Coll.); Perak (Scortechini); Tringanu, Bundi (Rostado); Penang, Hill (Hullett); Kedah Peak (Ridley 5164). Distrib. Ceylon, Malay isles, S. America.

L. borneensis Hook. In woods. Singapore, Sungei Jurong (Ridley 9842); Johor, Gunong Pulai (Ridley 12132); Pahang, Tahan River (Ridley); Perak, Thaiping Hills (Ridley 3062). Distrib. Borneo.

L. rigida Sm. On clayey soil in woods. Singapore, Sungei Buluh (Ridley); Malacca, Mt. Ophir, Gunong Mering (Ridley 3350, Griffith, Lobb, Cuming 397); Perak, Bujong Malacca (Curtis 3311), Larut at 2300 to 2500 feet alt. (King's Coll. 3086). Endemic.

L. Walkerae Hook. In water in woods. Singapore, Tampinis (Ridley 26791), Changi (6035); Malacca, Mt. Ophir (Ridley 3333). Distrib. Banka.

L. divergens, Wall. In dry woods common. Singapore, Bukit Timah (Ridley 4231*a*), Bajau (4321), Sungei Morai (1660), Pulau Ubin (Murton); Johor, Gunong Banang (Ridley 10970), Tanjong Kupang; Malacca, Batu Tiga (Derry) and Ayer Panas; Negri Sembilan,

Gunong Angsi (Ridley); Perak, Maxwell's Hill (Scortechini 499); Penang Hill (Hullett, Roxburgh); Tringanu, Bundi (Rostado); Kedah Peak (Ridley). Distrib. Borneo.

L. lanuginosa Wall. On trees usually near the sea. Singapore, Jurong (Hullett), Bajau (Ridley 6553) also established in the Botanic Gardens; Perak (Scortechini); Penang (Wallich). Distrib. Africa, Burmah, Australia.

SCHIZOLOMA.

S. lobata Poir. Common in woods. Singapore, Bukit Timah (Ridley 9561); Malacca (Cuming 392); Johor, Gunong Pulai (Ridley 12131); Pahang, Tahan River (Ridley 2168); Perak, Larut Hills (Scortechini, Ridley 10670), Gunong Batu Putih (Wray 292); Penang, Government Hill (Fox). Distrib. India.

S. davallioides, Bl. Common in woods. Singapore, Bukit Timah common; Pahang, Tahan River (Ridley 2179); Malacca, Mt. Ophir (3348, 3351); Negri Sembilan, Gunong Angsi (Ridley); Perak, Larut Hills at 4000 feet (Scortechini 230, 437*a*), Gunong Batu Putih (King's Coll. 8044); Penang Hill; Tringanu, Bundi (Rostado); Kedah Peak (Ridley). Distrib. Malay isles.

S. ensifolia Swartz. Singapore, Chua Chu Kang (Ridley 6033, 6028); Johor, Gunong Pulai (Ridley); Penang Hill. Distrib. Africa, India, Polynesia, Australia.

Sc. heterophylla Dry. *L. Finlaysoniana* Wall. No. 2197. Singapore, Pulau Brani (Hullett); Malacca (Robertson) fide Hooker. Not to be found now, perhaps a garden escape. Distrib. Mauritius, India, Malay isles, Hongkong.

Sc. media Br. Singapore, Pulau Brani (Hullett). Lost like the last. Distrib. Tropical Australia.

Sc. cordata Gaud. "Malay Peninsula" (fide Beddome). Distrib. New Guinea and Rawak.

Sc. Gueriniana Gaud. Malacca (fide Beddome). Distrib. Eastern Malay islands. I have seen no specimens of these last two.

ADIANTUM.

A. caudatum L. Perak, Bukit Kupayiang, Sungei Siput (Ridley), Gunong Tundok (King's Coll. 8351); Selangor, Limestone rocks, Batu Caves (Ridley 8142). Distrib. Tropics of Old World.

A. flabellulatum L. Singapore, Pulau Ubin, on rocks near the sea (Ridley 865), Road side near Changi, a flaccid form on shady banks (Ridley 2680); Malacca, Cape Rachado (Hervey). Distrib. Eastern tropics.

A. Capillus-veneris L. Kedah, Pulau Songsong, an island off the Kedah coast, on rocks by the sea (Ridley 5155). Distrib. Whole World.

A. aethiopicum L. Pahang, Tahan River (Ridley 2173) rocky banks of the river; Penang (Curtis); Malacca (Bishop Hose). Distrib. Africa and South America.

A. lunulatum Burm. Penang, Banks by the road side at Balik Pulau (Ridley 9416) apparently an escape from cultivation; Lankawi (W. Fox). Distrib. Africa, Indo-Malaya, South America.

A. stenochlamys Bak. Singapore, Graves in the old cemetery (Ridley); Malacca, Walls of the old chapel. Distrib. Borneo.

CHEILANTHES.

Ch. tenuifolia Sw. "Paku Telor Belankas," "Paku Resam Padi," "P. Resam Lumut," common on dry banks, etc. Singapore, Pulau Ubin, Sungei Brih (Ridley), also collected here by Norris, Seemann and Wallich; Malacca, Ayer Keroh, Kesang; Negri Sembilan, Seremban; Penang, Penara Bukit, Pulau Tikus; Prov. Wellesley, Tasek Gelugur (Ridley). Distrib. India to Australia and New Zealand.

Hypolepis.

H. punctata Bedd. Perak, Larut (King's Coll. 5015).

Pteris.

Pt. longifolia, L. Common on walls and dry spots, "Paku Uban Bukit." Singapore, on the aqueduct near the Reservoir, etc.; Johor, Batu Pahat (Ridley); Malacca, on the old chapel, Mt. Ophir (Ridley); Selangor, Batu Caves (Ridley 8145); Perak, Kuala Dipang (Ridley 9549), Bukit Kupayiang, Sungei Siput (Ridley); Penang (Ridley 7079); Tringanu, Bundi (Rostado). Distrib. Whole World.

Pt. cretica L. Rather rare, usually a peculiar grey form. Johor, Gunong Pulai (Ridley, Hullett); Perak, Upper Perak (Wray 3699); Penang Hill (Hullett); Lankawi, Gunong Rayah (Curtis 3381); Selangor, Pahang Track (Ridley). Distrib. Europe, Africa, Asia and America.

P. Grevilleana Wall. Pahang, Pekan (Ridley 2163); Perak, Tambuan near Ipoh (Ridley). Distrib. India.

Pt. ensiformis Burm. Common in dry spots, sometimes in burnt up lalang fields, "Paku Padang." Singapore, Garden Tanglin, Bukit Timah (Ridley), Pulau Ubin (Murton); Johor, Tanjong Bunga (Ridley 6549); Malacca, Bukit Panchur (Cantley), Selandau, Sungei Udang (Derry); Negri Sembilan, Seremban (Ridley 9877); Penang (Bishop Hose); Kedah (King's Coll. 1744); Tringanu, Bundi (Rostado).

var. A very stunted tufted plant growing between stones in streams on Gunong Mering, Ophir (Ridley 3340) and on Kedah Peak at 3000 feet altitude (Ridley 5165). Distrib. Type Indo-China, Australia.

Pt. semipinnata L. "Paku medang," "Paku Pelandok." Malacca, Alor Gajah (Hervey); Pahang, near Pekan (Ridley); Selangor, Ginting Bidai (Ridley 7838); Sungei Ujong (var. *dispar*) (Hullett); Perak, Upper

Perak (Wray 3528); Kinta River (King's Collector 830). Distrib. Malaya, Chino-Japan.

Pt. Dalhousiae Hook. Perhaps only a fine form of *Pt. semipinnata*. It was first found by Lady Dalhousie in Penang, but was not seen there again till it was rediscovered by Mr. Curtis on rocks, near Mt. Erskine where the original Government house was, and where doubtless Lady Dalhousie found it. Malacca, Hulu Belangkas (Derry 1082), Bukit Besar, Mt. Ophir (Ridley 9867); Selangor, Langat (Ridley 1681); Penang (Lady Dalhousie), Penara Bukit (Curtis 635, Ridley 7270). Endemic.

Pt. quadrianuita Retz. Singapore, Serangoon Road (Ridley); Johor, Batu Pahat, Patani (Ridley); Malacca, Pulau Undan (Cantley), Bukit Panchur; Selangor, Batu Caves (Ridley 8153), Petaling; Perak, Tambun, Ipoh (Ridley 9543), Goping (King's Coll. 524). Distrib. all the tropics.

Pt. patens Hook. Malacca (Hervey); Selangor, Caves, Kuala Lumpur (Ridley 8640) and 15th mile Pahang Track; Perak, Upper Perak (Wray 3706); Lankawi, Foot of Gunong Raya (Fox). Distrib. Indo-Malaya, Polynesia.

Pt. longipinnula Wall. Perak, Upper Perak (Wray 3741). Distrib. Indo-Malaya.

Pt. aquilina L. Common all over the Peninsula, usually in sandy soil, from the plains to 1000 feet elevation or more. The most remarkable forms are a very pubescent one. Selangor, Bukit Kutu (7837) and a variety with very long pinnules found in Malacca by Mr. Hardy. Distrib. the whole world.

Campteria.

C. biaurita L. Singapore, Serangoon Road (Ridley); Dindings, Bruas (Ridley 7268); Penang, Penara Bukit (Ridley 6946). Distrib. Tropics old world.

DORYOPTERIS.

D. ludens Wall. Selangor, Limestone rocks at the Caves (Ridley 8135); Perak, Batu Kurau (Scortechini 507). Distrib. Indo-Malaya.

The Selangor form is a very curious one with thick ovate cordate quite obtuse sterile fronds and all the pinnules of the fertile ones narrow and entire.

LITOBROCHIA.

L. incisa Thunb. Singapore, Tanglin, Holland Road; Johor, Tanjong Kupang (Ridley); Perak (Scortechini 471), Larut (King's Coll. 2363, Scortechini 102, 419), Maxwell's Hill abundant.

var. *integrifolia*. Grows with the ordinary form on Maxwell's Hill. Distrib. all tropics.

L. marginata Bory. Malacca (fide Beddome); Selangor, Batu Caves, Kwala Lumpur (Ridley 8146), Bukit Kutu (Ridley 7836). Distrib. Africa, Asia, Australia, Polynesia.

CERATOPTERIS.

C. thalictroides L. In ditches. This plant has a habit of disappearing altogether at certain times of the year and reappearing in abundance. Singapore, Gardens, Ang Mo Kio, Seletar, Changi (Ridley 4227); Pahang, Pekan (Ridley 1509); Malacca (Hervey); Selangor, Bukit Bintang (Goodenough); Penang, Tanjong Bunga (Curtis); Kelantan, Kamposa (Ridley); Lankawi isles (Curtis). Distrib. whole world tropics.

LOMARIA.

L. procera var *vestita*. Perak, Gunong Batu Putih (3-4000 feet) (King's Coll. 8065).

PLAGIOGYRIA.

P. pycnophylla Kze. Larut 5-5500 feet alt. near top of Gunong Bubu (King's Coll. 7324). Distrib. Indo-Malaya.

P. euphlebia Kze. Perak, Gunong Bubu (Wray 3852). Distrib. India, Japan, Australia.

BLECHNEAE.

BLECHNUM.

B. serrulatum Rich. Singapore, Serangoon Road (Ridley 10917); Malacca (Hervey), Ching (Derry); Pahang, Pekan (Ridley 2160*a*). Distrib. Malaya, Australia, America.

B. orientale L. Very common in open country "Paku Ular," Paku Ikan." Singapore, Tanglin, Bukit Timah; Johor, Batu Pahat, Gunong Pulai (Ridley 3750); Malacca, Pulau Besar; Negri Sembilan, Bukit Berumbang (Cantley), Seremban (Ridley 9875); Penang Hill (Ridley). Distrib. Indo-Malaya, China, Australia.

B. Finlaysonianum Wall. Singapore, Chan Chu Kang (Ridley 6121), Reservoir Woods (Ridley 4821); Malacca, Sungei Hudang (Derry); Selangor, 15th mile Pahang Track (Ridley 8656); Pahang, Tahan River (Ridley). Endemic.

SADLERIA.

S. cyatheoides, Kaulf. Perak (Day) fide Beddome.

ASPLENIEAE.

THAMNOPTERIS.

Th. nidus L. Common everywhere on trees. The bird's nest fern. It is supposed to be the home of the demon known as the Langsuir. There are several forms.

var. *musaefolia* Mett. The form with long broad leaves, 6 feet or more long a foot wide.

var. *phyllitidis* Don. Leaves narrow 2- feet long 2-3 inches wide. A crested form also occurs. Distrib. Indo-Malaya, Mascarenes.

ASPLENIUM.

A. Scortechini Bedd. Perak (Scortechini 128), Maxwell's Hill (Ridley 5186). Endemic.

A. Mactieri Bedd. Penang (Mactier) (fide Beddome) not seen.

A. squamulatum Bl. On rocks and stumps in wet woods common, bulbiferous at the extremity of the fronds. Singapore, Bukit Timah on rocks, Chua Chu Kang, etc.; Johor, Batu Pahat, Hadji Senawi (Ridley 10964), a curious branched form, Tanjong Kupang; Perak, Larut (King's Coll. 6320), Maxwell's Hill (Ridley). Distrib. Malay islands.

A. normale Don. Perak, Larut (King's Coll. 2705). Distrib. India, China.

A. subavenium, Hook. Penang (Beddome). Distrib. Madagascar.

A. amboinense Willd. Perak, Thaiping (Scortechini). Distrib. Malay isles.

A. longissimum Bl. On trees and rocks not rare. Singapore, Mandai (Ridley 10930), Bukit Timah abundant (10810), Tanglin on trees in the Gardens; Prov. Wellesley, Bukit Panchur (Native Collector); Pahang, Pekan (Ridley); Malacca (Hervey), St. John's Hill (Derry); Dindings, Bruas (Ridley); Perak, Larut (King's Coll. 2550). Distrib. Mascarene isles, Indo-Malaya.

A. Wightianum Wall. On rocks. Sungei Ujong (Hullett); Perak (King's Coll. 8130, 10959). Distrib. Indo-Malaya.

A. sumatrana Hook. On rocks. Johor, Batu Pahat (Ridley 11067); Selangor, Ginting Bidai (Ridley 7841); Dindings, Pangkor (Ridley); Penang, Penara Bukit (Ridley 7074). Distrib. Malaya.

A. tenerum Forst. On trees and rocks. Singapore, Bukit Timah, Ang Mo Kio (Ridley); Johor, Batu Pahat; Pahang, Pulau Tawar (Ridley); Selangor, Pahang Track (Ridley), Gunong Hitam (Goodenough), Bukit Rutu (Ridley 7847); Perak (Scortechini); Penang, Government Hill. Distrib. Ceylon, Malaya, Polynesia.

A. lunulatum Sw. Perak, Maxwell's Hill (Ridley), Gunong Batu Putih (King's Coll. 8043). Distrib. India.

A. boneense Hook. Perak, Bujong Malacca (Curtis 3312, Ridley 9553), Larut (King's Coll. 1998). Distrib. Malaya.

A. hirtum Kaulf. Pahang, Tahan (Ridley); Penang, Government Hill. Distrib. Indo-China, Malaya, Polynesia.

A. falcatum Lam. Singapore, Bukit Timah (Hullett). Distrib. Africa, India, Australia.

A. macrophyllum Sw. Rocks and trees. Singapore, Pulau Ubin (Kunstler), Sungei Buluh, Chan Chu Kang, Bukit Timah; Selangor, Batu Caves; Negri Sembilan, Perhentian Tinggi; Prov. Wellesley, Bukit Panchur; Perak (Scortechini 1079); Penang, Bukit Erskine (Curtis), Balik Pulau (Ridley). Distrib. of the last.

A. caudatum Forst. Perak, Larut (King's Coll. 2351), Caulfield's Hill (Scortechini 390). Distrib. Africa, India, Australia, S. America.

A. dimidiatum, Sw. Perak, Goping (King's Coll. 432). Distrib. W. Indies.

A. cuneatum Lam. Perak (Scortechini), Bujong Malacca (Ridley 9546). Distrib. all the tropics.

A. melanophyllum Scort. Perak, Gunong Bubu (King's Coll. 7403). Endemic.

A. paradoxum Bl. Penang (fide Beddome); Perak, Kinta (King's Coll. 7164). Distrib. Malaya.

A. heterocarpum, Wall. Sungei Ujong (Hullett). Distrib. India, China, Malaya.

A nitidum Sw. On rocks and trees. Singapore, Bukit Timah; Johor, Gunong Pulai (Hullett), Hadji Senawi, Batu Pahat (Ridley 10965); Pahang, Tahan River, Pulau Tioman; Selangor, Batu Caves (Ridley 8144); Perak, Goping (King's Coll. 8180) var. *obtusatum.* Distrib. Africa, Indo-Malaya.

A. unilaterale Lam. *A. resectum* Hook. Pahang, Tahan River (Ridley); Malacca, Jeram Nyalas (Derry); Selangor, Batu Caves (Ridley 8286, 8649), 15 mile Pahang Track; Perak, Gunong Batu Putih (Wray 1010), Thaiping Cottage (Hervey). Distrib. Africa, Indo-Malaya, Japan Polynesia.

A. Belangeri Kze. Perak, Thaiping Hills (Scortechini, Hervey); Penang, Government Hill (Fox). Distrib. Malaya.

A. bulbiferum Forst. Penang (fide Beddome probably cultivated).

Athyrium.

A. Ridleyi Christ. Malacca, Bukit Besar, Ophir (Ridley 9866). Endemic.

Diplazium.

D. subserratum Bl. Hills at about 3000 feet elevation. Selangor, Ginting Bidai (Ridley); Perak, Maxwell's Hill (Ridley); Penang Hill. Distrib. Java.

D. larutense, Bedd. Larut (King's Collection 1913). Endemic.

D. pallidum Bl. Singapore, Toas (Ridley); Pahang, Tahan River (Ridley 2167); Sungei Ujong (Hullett). Distrib. Burmah to Malaya.

D. porrectum Wall. Common in woods "Paku Naga." Singapore, Chan Chu Kang (Ridley 4399), Holland Road (5700), Reservoir Woods, Garden Jungle; Johor, Batu Pahat (Ridley 10978), Gunong Pulai (3751); Malcaca, Batu Tiga (Derry 985), Ayer Panas (Derry 16); Pahang, Tahan River (Ridley); Negri Sembilan, Gunong Angsi (Ridley 9868), Sungei Ujong (Hullett); Selangor, Pahang Track (Ridley 8648); Perak, Larut (King's Coll. 2255), Ulu Kul (10503) and Batang Padang; Kedah, Gunong Jerai (Ridley). Distrib. Malaya.

D. sylvaticum Presl. Singapore (Hullett); Pahang, Tahan River (Ridley 5818); Malacca, Ayer Panas (Hervey); Selangor, Batu Caves, Bukit Kutu (Ridley 7844); Perak, Kinta (King's Coll. 7146), Thaiping (Scortechini), Maxwell's Hill (Fox); Penang Hill (Hullett). Distrib. Africa Indo-Malaya.

D. bantamense Bl. var. *Prescottianum*. Singapore (Hullett); Malacca, Ayer Keroh and Ayer Panas (Ridley); Selangor, Ginting Peras (Ridley 7031); Perak, Maxwell's Hill (Fox), Larut (King's Coll. 2698); Penang Hill. Distrib. Indo-Malaya, China.

D. speciosum Mett. *D. acuminatum* Bl. "Paku Kijang." Singapore, Serangoon Road (Ridley 8937), Garden Jungle, Stag Mount (11271), Reservoir Woods (12202); Johor, Gunong Pulai (Ridley 12130); Malacca, Ayer Panas (Derry); Selangor, Batu Caves; Dindings, Gunong Tungul (Ridley 7271); Kedah, Gunong Jerai (Ridley 5166). Distrib. India.

D. tomentosum Hook. In woods, terrestrial, "Paku Binet." Singapore, Bukit Timah; Pahang, Tahan River; Selangor, Labu River, Petaling, Sungei Ujong, Bukit Sulu (Cantley's Coll.); Perak, Goping (King's Coll. 658), Thaiping Hills (King's Coll. 11428). Distrib. Burma, Malaya.

D. chlorophyllum Bak. Penang (Curtis). Endemic.

D. sorzogonense Presl. Singapore, Selitar (Ridley 6557); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll. 2532), Kinta (King's Coll. 7151), Thaiping (Scortechini).

var. *major* Bedd. Perak, Gunong Bubu (King's Coll. 7403). Distrib. Malaya.

D. asperum Bl. *D. polypodioides.* var. *asperum.* Malacca (Hervey); Perak (Scortechini), Ulu Bubong (King's Coll. 10849).

var. *polypodioides.* Pahang, Kuala Tahan (Ridley 2400); Penang abundant (Curtis). Distrib. Indo-Malaya.

D. latifolium Don. Selangor, 15th mile Pahang Track (Ridley 8652); Perak, Larut (King's Coll. 2214, 2346), Gunong Bubu (King's Coll. 8420). Distrib. Indo-Malaya, Australia.

ANISOGONIUM.

A. lineolatum Mett. Perak (Scortechini), Gunong Batu Putih (King's Coll. 8026); Penang Hill (Hullett). Distrib. Malaya.

A. cordifolium Mett. Woods, terrestrial, "Paku Tunjok Langit." Singapore, Bukit Timah (Ridley 5867); Selangor, Kuala Lumpur; Negri Sembilan, Kupaiyiang (Cantley's Coll.); Perak, Larut (King's Coll. 2711), Cottage, Thaiping Hills (Hervey). Distrib. Malaya.

A. decussatum Sw. Rare. Perak, Thaiping Hills, Gunong Hijau (Ridley), Birch's Hill (Day). Distrib. Malaya.

A. esculentum. "Paku Anjing." Common on stream banks, leaves eaten as spinach. Singapore, Stream along Bukit Timah Road; Selangor, Dusun Tua (Ridley 7863); Pahang, Pulau Manis (Ridley); Negri Sembilan, Seremban; Perak (Scortechini 437). Distrib. Indo-Malaya, China.

ASPIDIEAE.

DIDYMOCHLAENA.

D. lunulata Desv. Selangor, 15th mile Pahang Track (Ridley 8659); Perak, Gunong Chey at 2600 feet (Murton), Gunong Keledang (Ridley 9538), Thaiping Hills (Scortechini, Ridley). Distrib. Burma, Malaya, Mascarene, Polynesia, America.

MESOCHLAENA.

M. polycarpa Bl. Woods "Paku Surai." Singapore, Bukit Timah (Ridley 1658); Pahang, Pulau Padang (Ridley 2401) and Tahan River (2396); Negri Sembilan, Bukit Sumaiyiang (Cantley's Coll.); Perak, Thaiping (Scortechini 464), Goping (King's Coll. 371) and Gunong Bintang (243). Distrib. Malaya.

POLYSTICHUM.

P. semicordatum Sw. Pahang, Tanjong Antan, Pahang River (Ridley); Perak, Kuala Dipang (King's Coll. 8282). Distrib. Malaya, Burma, Tropical America.

P. aculeatum var. *biaristatum* Sw. Perak, Larut 2500 to 3000 feet alt. (King's Coll. 6258); Penang, Richmond Pool. Distrib. of type whole world.

ASPIDIUM.

A. singaporianum Wall. Woods common, "Paku Todak, Paku Biawak, Paku Murak." Singapore, Bukit Timah, Chua Chu Kang, etc. (Ridley); Pahang, Tahan River; Malacca, Jasin, Sungei Hudang (Derry); Sungei Ujong, Bukit Sulu, Gunong Berumbun (Cantley's Coll.); Selangor, Kuala Lumpur (Curtis), Bukit Kudah (Ridley); Perak, Ipoh; Tringanu, Bundi (Rostado); Penang Hill. Distrib. Malaya.

A. Kunstleri Bedd. Perak, Goping (King's Coll. 405). Endemic.

A. tricuspe Bedd. Perak, Goping (King's Coll. 975). Endemic.

A. vestum Bl. Woods "Paku Jari." Johor, Batu Pahat (Ridley 10669); Pahang, Tembeling River (Ridley 2399); Selangor, Batu Tiga, Batu Caves (Ridley); Perak, Kota Bahru (King's Coll. 382); Penang (Bishop Hose). Distrib. India, Malaya.

A. angulatum Sm. Singapore, Bukit Timah (King's Coll. 342), Bukit Panjang (Ridley 12534); Perak (Scortechini), Goping (King's Coll. 580, 586).

A. semibipinnatum Wall. In tidal river mud. Johor, Castlewood (Ridley 12225), Gunong Pulai (Hullett); Muar, Sungei Segal (Ridley 12278); Perak (Scortechini); Penang (fide Beddome). Distrib. Malaya.

A. subtriphyllum, Hook. Perak, Goping (King's Coll. 4713), Tambun near Ipoh (Ridley 9542).

A. variolosum Wall. Singapore, Bajau (Ridley 2419), Bukit Mandai, Bukit Timah (9566, 8939); Johor, Gunong Pulai (Ridley 12129); Selangor, Bukit Kudah (Ridley 1684), Batu Caves (8148), Langat (1685); Perak, Goping (King's Coll. 5908); Penang (King's Coll. 4862), Waterfall (Curtis 1608). Distrib. India.

A. polymorphum, Wall. "Paku Kikir." Selangor, Kuala Lumpur (Ridley 2409); Sungei Ujong (Hullett), Bukit Sulu (Cantley's Coll.); Perak, Larut (King's Coll. 2289, 2395). Distrib. Africa, India, Malay isles.

A. repandum Willd. Perak, Larut (King's Coll. 6305). Distrib. Malaya.

A. pachyphyllum Kze. Perak, Larut (King's Coll. 1816, 2347), Maxwell's Hill (Scort. 218, 493). Distrib. Malaya.

A. decurrens Presl. Perak, Bujong Malacca (Ridley 9535); Tringanu, Bundi (Rostado). Distrib. India, Malaya, China, Polynesia.

A. cicutarium Sw. Woods, "Paku Larat," "Paku Sagala," "Paku Tembaga." Singapore, Bukit Timah, Pulau Ubin (Ridley 4396); Johor, Batu Pahat (Ridley 10976)); Malacca, Sungei Hudang; Sungei Ujong, Bukit Payong, Bukit Danan (Cantley). Distrib. all tropical countries.

A. multicaudatum Wall. Perak, Larut (King's Coll. 2297), Upper Perak (Wray 3604).

A. ternatum Bak. Pahang, Pekan (Ridley). Distrib. Borneo.

Pleocnemia.

P. membranifolia Presl. Selangor, Batu Caves (Ridley 8149); Pahang, Tahan River (Ridley); Perak, Goping (King's Coll. 5871). Distrib. India.

P. membranacea Hook. Selangor, Batu Caves (Ridley 8140, 8136, 8643); Perak Scortechini). Distrib. Malaya, China.

P. Lenzeana Hook. Singapore, Cascade Valley, Bukit Timah (Matthew); Malacca (Cantley); Perak, Larut (King's Coll. 2093), Goping (720). Distrib. Indo-Malaya, China, Australia.

P. gigantea Bl. Singapore, Bukit Timah (Ridley); Negri Sembilan, Tampin (Goodenough); Penang, Pulau Butong (Curtis 3401).

P. megalocarpa Hook. Perak, Larut 2-3000 feet alt. (King's Coll. 2236). Distrib. Java.

Lastrea.

L. gracilescens Bl. Rare. Perak (Scortechini). Distrib. India, China, Malaya.

L. immersa Bl. In Woods. Pahang, Kuala Tahan (Ridley); Selangor, Bukit Kutu (Ridley 7848) at the Batu Caves and on the Tras route (8658); Perak, Batu Gajah, Kul (King's Coll. 10502). Distrib. Malay islands.

L. calcarata Bl. Hill woods. Pahang, Tahan River (Ridley).

var. *sericea*. Larut (King's Collector 1571).

var. *ciliata*. Kedah, at Yan (Ridley 5161). Distrib. India.

L. (Dryopteris) Ridleyi Christ. Perak, Bujong Malacca (Ridley 9600); Pahang, Kuala Tahan; Malacca, Base of Mt. Ophir; Selangor, Bukit Hitam (Ridley 7849).

This plant was identified first as *L. viscosa* by Dr. Christ, later he distinguishes it as a species. It much resembles *L. calcarata* in many points. The first number quoted is that of the type. The other plants seem to me to be identical with it.

L. unidentata Bedd. Perak, Gunong Bubu (King's Coll. 7434). Endemic.

L. Thelypteris Desv. Rare. Perak, Tea Gardens (Ridley 3058). Distrib. Europe, Asia, S. Africa, New Zealand.

L. crassifolia Bl. Common "Paku Knau." Singapore, Sungei Morai (Ridley 4397), Bukit Panjang (12532); Johor, Tanjong Kupang (Ridley 6556); Malacca, Sungei Hudang (Goodenough), Ulu Bumban (Hervey), Gunong Mering, Ophir (Ridley 3335); Pahang, Kota Glanggi (Ridley 2159); Selangor, Pahang Track (Ridley 8654); Perak, Larut (King's Coll. 3814), Maxwell's Hill (Scortechini 221); Penang (Ridley).

L. ochthodes Kze. Singapore, Chan Chu Kang (Ridley 9843); Penang, Balik Pulau (Ridley 9579).

L. Dayi Bedd. Singapore (Bishop Hose); Penang (Matthew); Perak, Maxwell's Hill (Day, Kunstler 2126). Endemic.

L. singalanensis Bak. Perak, Thaiping (King's Coll. 3520 8520).

L. fuscipes Wall. Singapore, Bukit Timah (Ridley 5874); Perak, Ulu Kerling (King's Coll. 8742), Upper Perak (Wray 3712). Distrib. Burma, Malaya.

L. padangensis Beddome. River bank close to water's edge. Perak, Batang Padang, Padang River (King's Coll.). Endemic.

L. syrmatica Willd. Perak, Goping (King's Coll. 8178); Penang, Penara Bukit (Ridley). Distrib. Indo-Malaya.

L. tenericaulis Wall. Penang (King's Coll. 1493); Singapore, established in Tanglin. Distrib. India, China, Australia.

L. intermedia Bl. Perak (Day); Penang (Curtis).
var. *Blumei.* Perak (Scortechini), Larut (King's Coll. 6952).

L. megaphylla Bak. Perak, Larut at 3000 feet alt. (King's Coll. 2822, 6952, 2822).

NEPHRODIUM.

N. unitum L. Damp spots, "Paku Hudang." Singapore, Selitar (Ridley 4394), Galang (4392); Malacca, Ayer Panas; Perak, at sea level (Day, King). Distrib. All tropics.

N. pteroides Retz. *N. terminans* Wall. Singapore, Bukit Timah; Johor, Bukit Soga, Batu Pahat (Ridley 10973); Dindings, Pulau Sembilan (Ridley 3145); Perak, Maxwell's Hill (Ridley 5187); Lankawi (Ridley 8346). Distrib. Indo-Malaya.

N. extensum Bl. Penang Hill (Ridley). Distrib. Indo-Malaya.

N. cucullatum Bl. Singapore, behind the General Hospital (Ridley), Chan Chu Kang, Changi 3596*a*, 2602); Malacca, Bukit Bruang; Negri Sembilan, Seremban (Ridley 9873). Distrib. Masearene, Indo-Malaya, Polynesia.

N. aridum Don. Singapore, Jurong, Kranji (Ridley), Green Hill (Hullett); Johor, Castlewood (Ridley); Pahang, Pekan (Ridley); Perak (King 1025). Distrib. India.

N. glandulosum Hook. Perak, Ulu Kerling (King's Coll. 8660). Distrib. Java.

N. lineatum Bl. Perak (Day, Scortechini, King's Coll. 497). Distrib. Malaya.

N. urophyllum Wall. Common in woods, "Paku Gajah," "Paku Merah." Singapore, Bukit Timah (Ridley 5870); Malacca, Bukit Besar, Mt. Ophir (Ridley), Bukit Bruang (Derry 681); Pahang, Temerloh, Kota Glanggi, Tahan River (Ridley 2398); Sungei Ujong, Bukit Danan (Cantley's Coll.), Bukit Putus (Ridley); Selangor, Batu Caves (Ridley 8154), Ginting Bidai (7839); Perak, Slim (King's Coll.), Upper Perak (Wray 3592); Penang Hill (Ridley); Lankawi, Gunong Raya (Curtis). Distrib. Indo-Malaya.

var. *Pinwillei*. Malacca (Pinwill); Perak (Day).

N. moulmeinense Bedd. Johor, Gunong Pulai (Ridley 12123).

N. costatum Wall. *Polypodium penangianum* Hook. Penang (Beddome). Distrib. India.

N. pennigerum Bl. Singapore, Rifle Range (Ridley); Johor, Pinerong (Cantley); Selangor, Dusun Tua (Ridley 7861); Perak, Maxwell's Hill (Scortechini 237); Penang Hill (Hullett).

var. *Malayense*. Perak (Scortechini, Day, King's Coll. 2360). Distrib. Indo-Malaya, Africa.

N. molle Desv. Singapore, common Selitar (Ridley 4395), Chan Chu Kang (6120), Bukit Timah (5893), Changi (6037), Pulau Brani (Hullett); Johor, Castlewood (Ridley); Selangor, Bukit Hitam (Ridley 7854); Perak, Ulu Bubong (King's Coll. 10127), Ulu Kerling (8657); Penang (King's Coll. 1570). Distrib. whole world.

N. amboinense Presl. Singapore, Green Hill (Hullett); Pahang, Khol, Tembeling River (Ridley); Selangor, Dusun Tua; Perak, Telok Pinang (Ridley 539), Bernam River (King 8800). Distrib. Indo-Malaya.

N. tectum (Wall.) Singapore (Wallich 394 and 354 past), Bukit Timah (Ridley 9567); Perak, Ulu Kerling (King 86507), Ulu Bubang (10157? 1205, 8757).

N. crinipes Hook. Perak (Scortechini, King's Coll. 7126). Distrib. India.

N. ferox Moore. Hill forests. Selangor, Ginting Peras (7854); Perak, Larut (King's Coll. 4064); Penang Hill (Ridley 7080). Distrib. India, Malaya.

N. Ridleyi Christ. Selangor, 15th mile Pahang Track (Ridley 8655); Perak, Bujong Malacca (Ridley 9536). Endemic. This very closely resembles *N. ferox*.

N. truncatum Presl. Singapore, Sungei Jurong (Ridley 10774); Johor, Batu Pahat; Selangor, Batu Caves Ridley 8137); Perak, Telok Pinang (Ridley 9540) and Tambun (9544), Goping (King's Coll 556), Maxwell's Hill (Scortechini); Penang, Waterfall (Curtis).
var. *subintegra* Christ. Penang (Ridley 10136). Distrib. Indo-Malaya, Australia.

N. brachyodon Hook. Perak, Maxwell's Hill (Scortechini 221), Bujong Malacca (Ridley 9537). Distrib. West Indies and Peru.

N. sakayense Zeiller. Perak, Valley of Kiang River near Riam Mountain (Scortechini). Endemic.

N. heterocarpm Bl. Singapore, Green Hill (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 9869); Perak, Larut (Scortechini, King's Coll. 6345); Penang Hill (Ridley 9225).

N. larutense Bedd. Selangor, Rawang (Ridley 7850), 15th mile Pahang Track (Ridley 8632); Perak (Day, King's Coll. 850, 2398).

N. glaucostipes Bedd. Perak, Larut (King's Coll. 2046). Endemic.

N. perakense Bedd. Perak, Thaiping Hills, Birch's Hill (Day). Endemic.

N. Haenkeanum Presl. Singapore, Bukit Mandai (Ridley 1655), Bukit Timah (Matthew).

NEPHROLEPIS.

N. exaltata L. Very common in open country. "Paku Pinang." Singapore, Holland Road, Ang Mo Kio (Ridley); Malacca, Pulau Besar, Lubok Kedondong, St. John's Hill (Ridley); Selangor, Kuala Lumpur (Ridley, a curious crested form); Perak, Bujong Malacca (Ridley 9607), Larut (King's Coll. 5220); Penang Hill (Ridley 7038).

var. *hirsutula*. Singapore, Tanglin; Malacca (Hervey).

var. *pilosula*. Selangor, Kuala Lumpur (Ridley 2408). Distrib. Tropics of old world.

N. volubilis Smith. "Paku Baging," "Paku Racha," "Paku M'rah," "Paku Ningek." Climbing on trees in damp spots. Singapore, Rochor, Sungei Morai (Ridley 4405); Johor, Tanjong Kupang (Ridley); Malacca, Ayer Keroh, Jus (Goodenough); Perak, Batu Kurau (Curtis); Dindings, Pulau Sembilan (Ridley); Tringanu, Bundi (Rostado); Lankawi, Kwah (Curtis). Distrib. India, Malaya.

N. acuta Presl. Johor, Tanjong Kupang; Pahang, Tahan River (Ridley 2373); Selangor, Batu Caves; Perak (Wray 2826, King's Coll. 165, 4955).

var. *lancifolia* Christ. Malacca, Pulau Besar (Ridley 2422). Distrib. Africa, India.

N. davallioides Kze. Selangor, Bukit Hitam (Ridley); Perak, Thaiping (Scortechini), Larut (King's Collectors 6325 and 5007). Distrib. Java.

OLEANDRA.

O. neriiformis Cav. Common from 3000 feet and upwards. Malacca, Mt. Ophir; Selangor, Bukit Hitam (Ridley 7832), Ulu Semangko; Perak, Ulu Batang Padang (Wray 1601), Thaiping Hills Cottage (Hervey, Wray, etc.); Kedah, Gunong Jerai (forming dense thickets) (Ridley); Lankawi (Curtis). Distrib. India, America.

O. Cumingii Sm. Kedah Peak (Ridley 5172) with the variety *longipes*. Distrib. Burmah, China, Malaya.

O. musaefolia Kze. Perak (Scortechini). Distrib. India.

POLYPODIEAE.

PHEGOPTERIS.

P. punctatum, Thunb. "Paku Resam Paya." Fronds used for poulticing boils. Selangor, Ginting Bidai (Ridley 7867); Perak, Larut (King's Coll. 5015, Scortechini), Caulfield's Hill (Scortechini 396), Maxwell's Hill (Fox); Malacca, Bukit Kanding (Cantley's Coll.); Penang, Balik Pulau (Ridley 9470). Distrib. Tropics and subtropics.

P. Kingii Bedd. Perak, Larut (King's Collector 2250). Endemic.

P. laserpitiifolia Scort. Perak (Scortechini, King's Coll. 2208). Endemic.

DICTYOPTERIS.

D. Barberi Hook. Common in woods. Singapore, Bukit Timah (Ridley 10778); Malacca (Beddome); Selangor, Rawang (Ridley 7840). Distrib. Malaya.

D. difformis Bl. "Paku Siar." Malacca (Hervey); Pahang, Tanjong Antan, Pahang River (Ridley); Negri Sembilan, Seremban (Cantley's Coll.); Selangor, 15th mile Pahang Track (Ridley 8631); Perak (Scortechini). Distrib. Burma, Malaya.

D. polycarpa Mett. Malacca (fide Beddome) who says however he has not seen this species and doubts if there is a specimen in Europe. (*Dictyopteris heterosora* Baker is *Aspidium vastum*).

POLYPODIUM.

§ 1. Fronds entire.

P. parasiticum Mett. Malacca, Mt. Ophir (Hullett); Penang Hill (Fox). Distrib. India.

P. subevenosum Bak. Johor, Gunong Pulai; Gunong Pantai (Ridley); Malacca, Mt. Ophir (Hullett, Ridley 8961); Pahang, River Ban Tahan (Ridley); Perak (Scortechini) Endemic.

P. hirtellum, Bl. Malacca, Mt. Ophir, Gunong Mering (Ridley 3354); Perak (Scortechini), Tea Gardens, Thaiping Hill (Ridley), Gunong Brumber; Pahang (Wray 1553). Distrib. Ceylon, Malaya.

P. sessilifolium Hook. Penang Hill (Ridley 10172, 7134). Distrib. Malaya.

P. universe Bak. Richmond Pool (Matthew); Penang (Curtis). Endemic.

P. Ridleyi Christ. A very small plant with entire fronds thin and undulate when dry; on knots on *Baccaurea parviflora* on Gunong Pulai, Johor (Ridley 12136).

P. adspersum Bl. Singapore (Lobb), probably wrongly localised.

P. setigerum Bl. Singapore (Moore's Herbarium).

§ 2. Fronds lobed.

P. trichomanoides Sw. Malacca, Mt. Ophir, Mering (Ridley 9863) "forma fronde glabra, soris subterminalibus" (Christ); Selangor, Hulu Semangkok (Ridley 12035). Distrib. India, Africa.

P. cucullatum Nees. Malacca, Mt. Ophir (Hullett); Pahang. Kluang Terbang (Barnes); Selangor, Bukit Kutu (Ridley 7877); Perak Bujong Malacca on rocks in a stream (Ridley 9612). Distrib. Ceylon.

P. triangulare Scort. Perak (Scortechini), Gunong Batu Putih (Wray 294). Endemic.

P. cornigerum Bak. Perak, Thaiping Hills, Gunong Hijau (Day, Scortechini). Distrib. Ceylon.

P. streptophyllum Bak. Singapore (Murton) not seen since.

P. Khasyanum Hook. Johor, Gunong Pulai (Hullett); Perak at 4000 feet alt. (Day). Distrib. India.

P. obliquatum Bl. Perak, Larut at 3-3500 feet alt. (King's Coll. 2094), Thaiping Hills (Scortechini, Hervey). Distrib. India.

P. nutans Bl. Malacca, Mt. Ophir on trees (Moore's Herbarium). Distrib. Java.

P. subfalcatum Bl. Perak, at 3-4000 feet (Scortechini, Day). Distrib. India.

P. decorum Brack. On trees in mangrove swamps, and on mountain tops. Singapore, Kranji (Ridley); Johor, Gunong Panti, Gunong Pulai, (Ridley 3704) and Tanjong Bunga; Malacca, Mt. Ophir, and Gunong Mering (Ridley 3342 and 3343); Perak, Gunong Keledang (Ridley 9558); Penang Hill; Kedah Peak (Ridley). Distrib. Indo-Malaya, Polynesia.

P. malaccanum Baker. Malacca, Mt. Ophir, Gunong Mering (Ridley 3345), Gunong Ledang (9884). Endemic.

P. fuscatum Bl. Perak (Scortechini), Gunong Bubu (Wray); Kedah Peak (Ridley).

P. alternidens Cesati. Malacca, Mt. Ophir (Ridley 9862); Perak, Thaiping Hills, Tea Gardens (Ridley). Distrib. Borneo.

P. subpinnatifidum Bl. Perak, Gunong Kerbau (De Morgan). Distrib. Java, Polynesia.

P. papillosum Bl. Perak, Larut (King's Coll. 1994), Gunong Haram Parah (Scortechini 665), Kinta on limestone rocks 500 to 1000 feet alt. (King's Coll. 7206). Distrib. Malaya.

P. tenuisectum Bl. Perak (Scortechini). Distrib. Java.

GONIOPHLEBIUM.

G. subauriculatum Bl. Perak (Scortechini); Selangor, Semangkok Pass (Ridley 12033, differs in its pinnules being sessile and somewhat decurrent). Distrib. Indo-Malaya, Australia.

G. verrucosum Wall. Common in open country. Singapore, Pasir Panjang, Bukit Mandai (Ridley 3597*a*); Johor, Gunong Pulai (Hullett); Selangor, Dusun Tua, Batu Caves (Ridley 8138); Perak, Larut (King's Coll. 5559), Sungei Raya (King's Coll. 965), Thaiping Hills Cottage (Hervey); Lankawi (Curtis). Distrib. Malaya.

G. Korthalsi Mett. Perak, Larut on trees (King's Coll. 2943), Thaiping Hills Cottage (Hervey); Penang Hill (Fox).

NIPHOBOLUS.

N. adnascens Sw. "Sakat Batu" on rocks and trees. Singapore, Pulau Ubin (Ridley 9510), Changi Beach (4347); Johor, Gunong Pulai (Hullett); Malacca, Pulau Undan (Cantley's Coll.), Ayer Keroh; Dindings, Lumut (Ridley 10145); Perak, Harum Parah (Scortechini 844), Kamuning (Machado); Penang Hill (Ridley).
var. *longifolius*. Perak, Thaiping (King's Coll. 8336). Distrib. Africa, India, Malaya, China, Polynesia.

N. acrostichoides Sw. Common on trees in open country. Singapore, Tanglin, Chan Chu Kang (Ridley 6684); Johor, Batu Pahat (Ridley), Jambu Larang (Fielding); Malacca, Mt. Ophir; Pahang, Kuala Pahang; Perak, Gunong Batu Putih (Wray 1232). Distrib. Burmah.

N. Heteractis Mett. Perak, Kuala Dipang (King's Coll. 8275). Distrib. India.

N. stigmosum Sw. Perak, Gunong Pondok (King's Coll. 8361), Batu Kurau (Scortechini). Distrib. India.

N. penangianus Hook. Pahang, Kota Glanggi (Ridley); Selangor, Kuala Lumpur (Curtis); Perak, Kinta (King's Coll. 7083); Penang, just above the waterfall (Hullett). Distrib. Burmah.

N. hoyaefolium T. Moore. Singapore, Woodlands (Matthew); Johor, Mt. Austin (Ridley).

N. nummulariaefolius Sw. On trees, "Berunas Jantan." Pahang, Kuala Pahang (Ridley); Sungei Ujong, Bukit Sulu (Cantley); Perak, Tambuan near Ipoh (Ridley 9829), Kuala Dipang (King's Coll. 8270). Distrib. India.

Dipteris.

D. Horsfieldii Br. On rocks by the sea, and also on mountain tops. Singapore, Harbour, Kranji (Ridley 1673), Pulau Tekong (4227); Johor, Gunong Pulai, Gunong Panti, and by the Scudai River (Ridley); Malacca, Mt. Ophir; Selangor, Pahang route (Machado), Hulu Semangkok (Ridley); Perak (Scortechini); Penang Hill (Hullett, etc.); Kedah Peak (Ridley). Distrib. Malay isles, Polynesia.

D. Lobbiana Hook. On banks of streams. Johor, Gunong Panti (Ridley 4141); Pahang, Tahan River (Ridley 2170); Malacca, Mt. Ophir (Derry); Perak (Scortechini, Wray 2920), Bujong Malacca (Ridley); Kedak Peak Ridley). Distrib. Borneo.

Drynaria.

D. splendens Hook. Singapore (fide Beddome).

D. quercifolia L. Common on trees, "Sakat Laipang." The leaves are burnt and applied to the stomach for mis-

carriage. Singapore, Pulau Ubin (Ridley 9484), Bukit Timah, Tras (1673); Johor, Scudai River (Ridley 12223); Pahang, Tembeling River; Malacca, Bukit Bruang (Cantley); Perak (Scortechini), Batang Padang (King's Coll.); Penang Hill (Ridley). Distrib. Indo-Malaya.

D. Linnaei Bory. Singapore, Changi, Serangoon (Ridley 4352), Tanjong Gol; Pahang, Pulau Datoh, Pulau Chengei (Ridley); Perak, Batang Padang (King's Coll. 8087); Penang, near the Bath (Ridley 7077); Tringanu, Bundi (Rostado). Distrib. India.

D. Heracleum Kze. "Paku Sulo." Johor, Tanjong Kupang (Ridley 4353); Perak, Maxwell's Hill (Scortechini 228), Larut (King's Coll. 6302), Box Hill (Fox).

D. rigidula Sw. On rocks and trees. Selangor, 15th mile Pahang track (Ridley); Perak (Scortechini), Bujong Malacca (Ridley 9552); Penang, Penara Bukit (Ridley 6945); Kedah Peak on Precipices (Ridley 5151). Distrib. Malaya, Australasia.

Pleopeltis.

Pl. accedens Bl. Sungei Ujong (Hullett); Selangor, 15th mile Pahang Track (Ridley); Perak, Bujong Malacca (Ridley 9616), Larut (King's Coll. 1900), Kuala Kangsa (Ridley). Distrib. Malaya, Polynesia.

P. Wrayi Bak. Pahang, Kluang Terbang (Barnes); Perak, Gunong Hijau, Cottage and the Tea Gardens, Thaiping Hills (Day, Scortechini, Wray, King 2358, 3673, Ridley, Hervey). Endemic.

P. stenophylla Bl. High up on lofty trees in the low country, on rocks and low trees in the hills. Singapore, Bukit Timah (Ridley 4350); Johor, Gunong Banag, Bukit Pahat (Ridley 1255); Perak, Maxwell's Hill (Scortechini 263); Penang (Cantley); Kedah Peak (Ridley). Distrib. Malaya.

Pl. sinuosa Wall. On trees common in the south, remarkable for the thick hollow rhizomes full of biting ants. Singapore, Gardens, Bukit Timah, Jurong (Ridley 5864); Johor, Gunong Pulai (Hullett); Penang (Curtis 10137). Distrib. Malaya.

Pl. rupestris Bl. Perak at 4000 feet alt. (Scortechini 251, King 7355), Gunong Inas at 5000 feet (Wray 4123).

Pl. longifolia Mett. Singapore, Sungei Morai, Bukit Timah (Ridley); Johor, Tebing Tinggi (Ridley), Gunong Pulai (Hullett); Negri Sembilan, Perhentian Tinggi (Ridley 10820); Perak, Larut (King's Coll. 1904, 2741), Waterloo (Curtis), Bujong Malacca (Ridley 9614). Distrib. Indo-Malaya.

Pl. superficialis Bl. Perak, Larut 3 to 4000 feet (King's Coll. 2180, Scortechini), Maxwell's Hill (Ridley). Distrib. India, China.

Pl. angustata Sw. "Paku Hilan," common on trees. Singapore, Gardens (Ridley 10162), Pulau Ubin (King's Coll. 201); Sungei Morai, Bajau, Changi (a forked form); Johor, Tanjong Bunga, 4th mile from Johor Ridley); Perak, Thaiping Hills (Ridley, Scortechini 1082),Kuala Kangsa (Ridley); Penang, Government Hill, Convalescent Bungalow (Ridley). Distrib. India, Australia.

Pl. platyphylla Sw. On rocks and trees at high elevations, a beautiful species. Selangor, Pahang Track (Ridley 8653) and Semangkok Pass; Perak, Gunong Haram Parah (Scortechini); Kedah, Yan (Ridley 5169).

Pl. membranacea Don. Perak (Scortechini).

Pl. punctata L. *Pl. irioides.* Common on low trees and stumps. Singapore, Chan Chu Kang, Serangoon (Ridley 8935), Sungei Buloh, Gardens, etc; Malacca, Pulau Besar; Selangor, 15th mile Pahang Track (Ridley 8657); Perak, Thaiping (Scortechini 538); Penang (King's Coll. 5069), Pulau Badak (Curtis 3958). Distrib. Tropics of Old World.

P. musaefolium Bl. Selangor, Ginting Bidai, Batu Caves (Ridley); Perak, Sungei Rayah (King's Coll. 862) and Larut 1890). Distrib. Malaya.

P. Scortechinii Bedd. Perak, Maxwell's Hill (Scortechini 2161), Thaiping (King's Coll. 8382). Endemic.

Pl. pteropus Bl. Perak (Scortechini), Kinta River (King's Coll. 386). Distrib. Indo-Malaya, China.

Pl. incurvata Bl. On rocks and trees at high elevations. Selangor, Bukit Hitam; Perak, Bujong Malacca (Ridley), Cottage Thaiping Hills (Hervey); Kedah Peak (Ridley) one form with simple ovate sterile fronds, and simple linear fertile ones. Distrib. Malaya.

Pl. insignis Bl. Malacca (fide Beddome).

Pl. Phymatodes L. "Pulau Wangi," "Sakat Hitam." A very common and variable fern. The sweetly scented fronds have an odour of Coumarin when dry and are used for putting among clothes to scent them by natives. Singapore, Gardens, Passir Panjang, Tampinis River, Changi (Ridley 2681), Pulau Ubin (4360), Bukit Timah 4359); Johor; Pahang, Kuala Pahang (Ridley 1448), Pekan (1581); Malacca, Pengkalan Minyak; and Bukit Panchur (Cantley); Perak, Thaiping (Scortechini 539); Dindings, Lumut (Ridley); Penang, Top of the Hill (Ridley 7005); Lankawi (Curtis). Distrib. All the Tropics of the Old World.

Pl. longissima Bl. Perak, Kinta River (King's Coll. 402). Distrib. Indo-Malaya.

Pl. nigrescens Bl. "Paku Chiai." Singapore, Bukit Timah (Ridley, King's Collector 349); Sungei Ujong, Bukit Sulu (Cantley's Coll.); Selangor, Batu Caves (Ridley); Perak (Scortechini); Tringanu, Bundi (Rostado). Distrib. India.

Pl. laciniata Bl. Perak, Thaiping Hills, Coulfield's Hill (King's Coll. Day).

Pl. palmata Bl. Perak, Gunong Batu Putih (Wray 580), Maxwell's Hill (Scortechini); Penang Hill (Ridley 7154); Prov. Wellesley, Bukit Panchur (Ridley 12639). Distrib. Malay islands.

GRAMMITIDAE.

Monogramme.

M. paradoxa Fee. Penang Hill, rocks at Richmond Pool (Ridley 7135). Distrib. Ceylon, Malaya, Australia.

M. trichoidea Sm. Rocks in forest. Singapore, Bukit Timah (Ridley); Selangor, Pahang track, 15th mile (Ridley). Distrib. Philippines.

M. dareaccarpa Hook. A minute hair-like plant. Singapore Bukit Timah, on rocks at the base of the hill (Matthew). Distrib. Borneo.

Stegnogramme.

S. aspidioides Hook. Perak, Kinta (King's Coll. 7207). Distrib. Indo-Malaya.

Gymnogramme.

G. calomelanos Kaulf. "Paku Merak." Probably introduced but now scattered widely over the whole Peninsula and often far from cultivation. Singapore, Chan Chu Kang, Pulau Ubin, etc. (Ridley); Johor, Tanjong Kupang; Malacca (Hervey); Selangor, Rawang (Ridley 7834), Kuala Lumpur (Goodenough); Penang, Waterfall Hill (Ridley 3064); Tringanu, Bundi (Rostado).

Syngramme.

S. fraxinea Don. Perak, Larut at 2-2300 feet elevation (King's Coll. 2251, Scortechini). Distrib. Africa, Indo-Malaya, Polynesia, Japan.

S. Lobbiana Hook. Johor, Gunong Panti (King 205).

S. Wallichii Hook. Damp places in forests. Singapore, Bukit Timah (Ridley 5869) a variety with branched fronds is not rare, Chua Chu Kang (Ridley 10694); Johor, Tanjong Kupang; Perak, Maxwell's Hill (Ridley); Penang Hill. Distrib. Borneo.

S. alismaefolia Hook. "Paku Tombak." Less common than the last but really hardly distinct. Singapore, Chan Chu Kang; Malacca, Merlimau (Cantley's Coll.), Ayer Keroh (Ridley); Negri Sembilan, Bukit Kayu Arang (Cantley); Perak, Thaiping (Scortechini). Distrib. Mal.

S. Dayii Bedd. Perak Pass between Kuala Kangsa and Kinta at 2000 feet elevation (Day). Endemic.

SELLIGUEA.

S. Feei Hook. On trees low down. Common in mangrove swamps. "Paku Galah Hantu Laut." Singapore, Kranji, etc.; Johor, Gunong Pulai; Malacca, Batu Tiga (Derry); Pahang, Tahan River (Ridley); Perak, Larut (King's Coll 3942), Box Hill (Fox), Bujong Malacca (Ridley); Penang Hill (a branched form). Distrib. Malaya.

S. membranacea Hook. Singapore (Moore's herbarium); Perak, Ulu Kerling (King's Coll. 8844, 948, 2986), Upper Perak (Wray 3638). Distrib. Malaya.

S. Maingayi Baker. Malacca (Beddome). Endemic.

S. campyloneuroides Bak. Perak, Selama River (King's Coll. 3112), Goping on shrubs (8145). Distrib. Borneo.

LOXOGRAMME.

L. lanceolata Sw. Malacca, Bukit Tampin (Goodenough); Selangor, 15th mile Pahang Track (Ridley 8646); Perak, Kinta (King's Coll. 4754), Larut (2235), Bujong Malacca (Ridley 9615). Distrib. Africa, Indo-Malaya, China, Polynesia.

L. involuta Don. Selangor, 15th mile Pahang Track, Rawang Camphor woods (Ridley 7831); Sungei Ujong (Hullett); Perak, Kuala Dipang (King's Coll. 8280), Kinta (Kunstler 373), Cottage Thaiping Hills (Hervey). Distrib. Indo-Malaya, Polynesia.

L. avenia Bak. Pahang, Tahan River (Ridley's Collector); Selangor, 15th mile Pahang Track (Ridley); Penang Hill (Ridley). Distrib. Malaya.

Brainea.

Br. insignis Hook. On the ground near the sea. Dindings, Pulau Sembilan (Curtis and Ridley 3056). Distrib. India, Hongkong.

Meniscium.

M. triphyllum Sw. Singapore, Ditches near Macpherson Road (Ridley 9146); Pahang, Tahan River (Ridley); Perak, Upper Perak (Wray 3522). Distrib. Indo-Malaya, China.

M. cuspidatum Bl. Singapore, Bukit Timah, Chan Chu Kang, Upper Mandai (Ridley 4399); Johor (Hullett), Batu Pahat on Bukit Soga (Ridley 10972); Malacca, Sungei Hudang Road (Derry 86); Sungei Ujong, Tampin (Goodenough) Penang, Government Hill (Ridley). Distrib. Indo-Malaya.

M. salicifolium Wall. On rocks. Singapore, Selitar (Bishop Hose); Perak, Relau Tujor (Wray 183), Bujong Malacca (Ridley); Penang, Government Hill (Ridley). Endemic.

M. sp. Perak, Larut Hills (Curtis 3717).

Antrophyum.

I doubt if any of these species are specifically distinct except perhaps the last.

A. reticulatum Kaulf. On rocks. Singapore, Bukit Timah, Selitar (Ridley 4345); Johor, Batu Pahat (Ridley

11069); Pahang, Tahan, Kota Glanggi (Ridley); Malacca, Alor Gajah; Selangor, Gunong Hijau (Goodenough), Labu River, Batu Caves (Ridley); Perak (Scortechini), Bujong Malacca (Ridley); Penang Hill. var. *parvulum* Bl. Perak (Hullett). Distrib. India, Australasia.

A. plantagineum Kaulf. Penang Hill (Ridley). Distrib. Indo-Malaya, Polynesia.

A. semicostatum Bl. Dindings, Lumut (Ridley); Perak, Maxwell's Hill (Scortechini 237). Distrib. Malaya, Polynesia.

A. latifolium Bl. Sungei Ujong (Hullett); Perak (Scortechini). Distrib. Indo-Malaya.

VITTARIA.

V. elongata Sw. Common on trees. Singapore (King's Coll. 223), Thomson Road (Murton), Green Hill (Hullett), Passir Panjang, Sungei Morai, etc. (Ridley); Johor, Pengaram (Ridley); Muar, Sungei Pauh; Malacca, Selandan, Mt. Ophir (Ridley); Pahang, Pekan (Ridley); Selangor, Ginting Bidai; Perak, Bujong Malacca (Ridley). Distrib. Tropics of Old World.

V. lineata Sw. Common on trees. Selangor, Ulu Selangor (Goodenough); Kedah (King's Coll. 1739). Distrib. All Tropics.

V. sulcata Kuhn. On trees at high altitudes. Selangor, Bukit Hitam (Ridley); Malacca, Gunong Mering, Ophir (Ridley 3352); Perak (Scortechini); Kedah Peak (Ridley). Distrib. Ceylon.

V. falcata Kze. Malacca, Gunong Tunduk, Ophir (Ridley 9864); Pahang, Keluang Terbang (Barnes); Selangor, Hulu Semangkok; Perak, Bujong Malacca (Ridley).

V. scolopendrina Presl. Singapore, Kranji, Tanglin, Chua Chu Kang (Ridley 1030); Pahang, Tahan River (Ridley); Perak, Maxwell's Hill (Scortechini), Goping (Bishop Hose), Gunong Batu Putih (Wray 1132);

Kedah (Curtis); Lankawi, Gunong Raya at 2500 feet (Curtis). Crested and branched forms occur in Tanglin and elsewhere in Singapore. Distrib. Africa, Indo-Malaya.

Taenitis.

T. blechnoides Sw. Common in woods all over the Peninsula, and very variable. "Paku Pijai," "Paku Balu."

var. a. Fronds simple. Malacca, Mt. Ophir (Ridley 3366) and Mering. A branched form occurs on Ophir; Selangor, Pahang Track (Ridley).

var. b. Fronds pinnate narrow. The commonest form. Singapore, Garden jungle, Sungei Morai, Selitar (Ridley 4334); Johor, Gunong Pulai (Ridley); Malacca, St. John's Hill, Pulau Besar (Ridley 4335); Pahang, Tahan River, Kuala Semantan (Ridley); Perak (Scortechini 34); Kedah Peak.

var. c. Fronds pinnate very broad. Singapore, Bukit Timah, Tras (Ridley 8568) and Changi (2683). Distrib. India, Malaya.

Drymoglossum.

D. piloselloides Presl. Extremely common on trees, and very troublesome, covering the branches "Sakat Ribu-Ribu." A curious crested form on the trees of the Cathedral close (Bishop Hose). Singapore, everywhere Bukit Mandai (Ridley 6032), Teban (4346), Pulau Ubin, Tanglin, etc.; Johor, common; Malacca, Ayer Panas; Perak, Thaiping (Scortechini), Kamuning (Machado); Tringanu, Bundi (Rostado). Distrib. Indo-Malaya.

Hemionites.

H. arifolia Burn. In limestone districts usually on the rocks. Perak, Kamuning on the ground (Ridley), Larut (King's Coll. 4174); Lankawi (Curtis). Distrib. Indo-Malaya.

H. sp. Selangor, Gua Batu (Ridley 8135).

ACROSTICHEAE.

ELAPHOGLOSSUM.

Most of the local species much resemble each other, and are rather difficult to separate. The species are not so rare as might appear but seldom fruit.

E. laurifolium Bedd. *E. latifolium* Bedd. Singapore, Kranji (mangrove swamps); Pahang, Tahan River (Ridley), Kluang Terbang (Barnes); Perak, Top of Gunong Batu Putih (Wray 319); Kedah, Gunong Jerai (Ridley 5168).

E. conforme Sw. Pahang, Tahan River (Ridley); Penang Hill (W. Fox).

E. Norrisii Hook. Malacca, Mt. Ophir (Ridley 3334, 9870); Penang (Ridley); Perak (King's Coll. 2222). Endemic.

STENOCHLAENA.

S. palustre L. One of the commonest ferns, "Paku Ramu," "P. Mesin, or P. Miding or Lamiding." The young leaves very popular as a vegetable. Singapore, Tanglin, Balestier Road (Ridley 6249); Johor, Tanjong Kupang (Ridley 4234) and Kota Tinggi; Malacca (Hervey), Pulau Undan (Cantley's Coll.); Perak, Goping (King's Coll. 834), Waterfall Thaiping (Wray, Scortechini 469); Tringanu, Bundi (Rostado). Distrib. India, China, Polynesia.

S. sorbifolia L. Common in forests. The variation in the form of the fronds is very remarkable. Singapore, Bukit Timah; Johor, Gunong Pulai (Hullett); Pahang, Tahan River (Ridley); Selangor, Semangkok Pass, Ulu Langat, Batu Caves (Ridley); Perak (Scortechini), Larut (King's Colo. 4205), Upper Perak (Wray 3703), Waterfall Hill, Maxwell's Hill, etc. Distrib. All tropics.

S. perakense Bedd. Perak, Thaiping (King's Coll. 8345). Endemic.

POLYBOTRYA.

P. appendiculata Willd. On rocks in forest. Singapore, Bukit Timah (King's Coll. 335) and all other collectors, abundant. Dindings, Lumut (Ridley); Perak (Scortechini); Lankawi (Curtis).
var. *subintegra* Bedd. Johor, Batu Pahat (Ridley). Distrib. Indo-Malaya, China.

STENOSEMIA.

S. aurita (Sw.) Limestone Rocks. Pahang, Kota Glanggi (Ridley); Selangor, Batu Caves (Ridley); Perak, Kwala Dipang (Ridley 9547), Goping (King's Collector 442). Distrib. Malay islands to the Solomon isles.

S. sp. Penang Hill (Ridley 7078).

GYMNOPTERIS.

G. variabilis Hook. Perak, Kinta (Scortechini 7107).
var. *axillaris*. Perak, Ulu Bubong (King's Coll. 10028). Distrib. India.

G. spicata Linn. fil. Not very common. Pulau Tioman (Ridley); Perak, Maxwell's Hill, Cottage Thaiping Hills (Ridley, King's Collection 6373); Penang Hill rocks on the top (Ridley, King's Coll. 1597); Kedah. Distrib. India.

G. flagellifera Wall. In muddy spots by streams. Singapore, Stagmount (Ridley), Pulau Tioman; Selangor, Rawang; Perak (Scortechini), Goping (King's Collection 1097). Distrib. India.

G. subrepanda Hook. Singapore, Bukit Timah (Ridley); Perak, Chanderiang (King's Collection 5797), Upper Perak (Wray 3379), Thaiping Hills Cottage (Ridley). Endemic.

G. Presliana Hook. In dense forests. Singapore, Bukit Timah (Hullett, Ridley, etc.). Distrib. Concan and Philippines.

G. contaminans Wall. Perak (Scortechini).

G. costatum Wall. Penang, Balik Pulau (Curtis). Distrib. India and Burmah.

LOMAGRAMMA.

L. perakensis Bedd. Perak at 400 feet elevation (Day, King's Collector 8345). Endemic.

ACROSTICHUM.

A. aureum L. Common in tidal rivers, but sometimes long persisting after the river has disappeared. I have seen it thus in open places far inland as at the base of Gunong Pantai (Johor), Bukit Asahan (Malacca) and in the Botanic Gardens in Singapore. It is abundant in Singapore even in the town canals; Johor, Batu Pahat, etc.; Dindings at Lumut; Selangor, Klang, etc.; Perak; Kedah; Penang. Distrib. All tropics.

PHOTINOPTERIS.

Ph. rigida Wall. On boughs of trees overhanging rivers and mangrove swamps. Singapore, Kranji, Woodlands (Matthew); Johor; Perak, Goping (King's Coll. 861); Penang (Curtis). Distrib. Malaya.

P. drynarioides Hook. Rare. Penang Hill (Bishop Hose). Distrib. Malay isles.

CHRYSODIUM.

Ch. bicuspe Hook. In mossy spots by streams at 3000 feet elevation. Malacca, Mount Ophir on the banks of the stream above Padang Batu (Ridley 9872); Perak, Thaiping Hills (Ridley). Distrib. Java and Formosa.

PLATYCERIUM.

Pl. grande Sm. Singapore (fide Beddome, but no one else seems to have seen it here); Lankawi islands, Curtis

found one or two plants there. Distrib. Malaya, Australia.

Pl. biforme Bl. The common elk's horn fern, abundant everywhere and attaining a very large size. Singapore, Tanglin, Selitar (Ridley 3595), Bukit Timah (Ridley 4354, 8049). All over the peninsula. Distrib. Indo-Malaya.

var. *erecta*. A much smaller plant with the fertile fronds erect and short. Sterile ascending fronds a foot long and as wide, very strongly ribbed, rounded in outline, and dotted over with hairs arranged stellately, fertile fronds stiffly erect 8 to 18 inches long, 8 inches across, dichotomously branched, the tips of the branches rounded, fertile lobe spathulate or obovate pedicelled 2-5 inches long and as wide in the widest part. Singapore, Bukit Timah on very lofty branches of trees (Ridley 10830). Bishop Hose first pointed out this plant to me some years ago on perfectly inaccessible boughs of a lofty *Shorea* tree 100 feet or more from the ground. There are a number of plants on the boughs, all are quite similar and there are no typical specimens of *Platycerium biforme* on the tree though it is abbundant in the surrounding forests. I have only been able to obtain fallen fronds. Mr. C. J. Matthew took specimens to Kew and Mr. Wright notes on them as follows. "I do not think this can be separated as a distinct species from *Platycerium biforme* Bl. but is a form produced by growing in exposed situations and is worthy of a varetal name. It has also been collected in Borneo by Motley who remarks "on the highest branches of trees in very exposed places perhaps only [a form] of the long drooping plant growing in damp and shade." The plant is certainly most closely allied to *P. biforme* Bl., but I hardly think it can be classed as merely a form or state of that plant. I have seen the ordinary form growing in quite exposed places, on lofty trees and showing no variation. The variety with its short stiff erect fronds, has a most curious appearance, and really looks more distinct from the typical form than any other *Platycerium* I have seen. I note however that

in *P. biforme* the young branched fronds when first protruded point directly upwards and then first spread out horizontally, then deflex. On the same trees which bear this curious fern, grows also *Lecanopteris carnosa* the only lowland locality I know for this plant.

SCHIZEACEAE.

SCHIZAEA.

S. malaccana Bak. Mossy places at 4000 feet elevation. Malacca, Mt. Ophir (Ridley 9860); Kedah Peak (Ridley). Distrib. Malay isles.

S. dichotoma Sw. Common in dry woods or sandy spots, whole peninsula, "Paku Tumbar," "Paku Jarum." Singapore, Toas, Passir Panjang, Kranji, etc. (Ridley); Johor, Pengaram, Gunong Pulai (Ridley); Pahang, Kwantan (Craddock), Rumpin River, Pekan (Ridley); Malacca, Brisu and Sungei Hudang (R. Derry); Perak, Ulu Kul (King's Coll. 10759). Distrib. nearly all the tropics.

S. digitata Sw. Common in woods. Singapore, Garden Jungle, Reservoir Woods, etc. (Ridley); Johor, Tana Runto (Ridley); Pahang, Kuala Tembeling; Malacca, Pengkalan Ampat, Selandau (Ridley); Negri Sembilan, Kuala Pedas; Selangor, Batu Caves on the top of the rocks; Perak (Scortechini), Thaiping Hills, Tea Gardens (Ridley), Waterfall Hill (Wray); Penang Hill; Kedah Peak. Distrib. Indo-Malaya, Polynesia.

LYGODIUM.

L. circinatum Sw. *L. dichotomum* Bedd. One of the commonest and best known ferns, "Ribu-Ribu Dudok," or "Bukit," "Paku Jari Merah" (Tringanu). Leaves used for headache. Singapore, Tanglin, Bajau, Chan Chu Kang (Ridley 4229, 8057), etc.; Malacca, Sungei Udang, Chabau (Ridley 9871); Pahang, Tahan River;

Perak, Waterfall Hill (Wray 2324), Larut (King's Coll. 7503); Tringanu, Bundi (Rostado); Lankawi (Curtis). Distrib. Indo-Malaya, China.

L. microphyllum Br. Not rare in open grassy places. Singapore, Kranji, Botanic Gardens (Ridley 6917); Johor, Kampong Bahru, Tebing Tinggi (Ridley); Perak (Scortechini). Distrib. Indo-Malaya.

L. flexuosum Sw. Common in the low country, "Akar Sidin," "Ribu-Ribu Gajah." Singapore, Botanic Gardens; Pahang, Kuala Tembeling (Ridley); Malacca, Pengkalan Minyak, Gunong Berumbun (Cantley's Coll.); Penang Hill, Telok Bahang (Curtis 625); Tringanu, Bundi (Rostado); Kedah Peak (Ridley); Kelantan, Kuala Lebir (Dr. Gimlette).

var. *alta* Clarke. Perak (King's Coll. 2975). Distrib. Indo-Malaya, Africa, Australia.

L. polystachyum Wall. Pahang, Kuala Tembeling (Ridley 2156); Perak, Upper Perak (Wray); Penang, Waterfall (Hullett). Distrib. Burmah.

MARATTIACEAE.

Angiopteris.

A. evecta Hoffm. Not rare in woods, commonly known locally as the elephant fern. Singapore, Bukit Timah (Hullett, etc.); Pahang, Pekan (Ridley); Perak, Maxwell's Hill (Scortechini 219, King's Coll. 5203). Distrib. Indo-Malaya, Australia, Madagascar.

Kaulfussia.

K. aesculifolia Bl. Terrestrial in damp spots or on rocks. Selangor, Batu Caves covering the ground in great masses, in damp spots (Ridley 8640); Perak, Thaiping Hills (Curtis 3718, Ridley, Scortechini) on rocks or the ground, Kinta (King's Coll. 4784). Distrib. Indo-Malaya.

OPHIOGLOSSACEAE.

Ophioglossum.

O. reticulatum L. Penang in dry spots in the waterfall valley (Ridley 9837, 11394). Distrib. Eastern Tropics.

O. nudicaule L. fil. In grassy spots. Singapore, Bukit Panjang (Ridley 4205), Chan Chu Kang (Ridley 2421). Distrib. Tropics.

O. pendulum L. Singapore, Tanglin, Bukit Mandai, etc. (Ridley); Selangor, Rawang, Camphor Woods (Ridley); Perak, Gunong Batu Putih (Wray 1133). This plant usually grows on *Platycerium* but also on trees. It has a habit of suddenly appearing and spreading widely and then apparently disappearing. At one time the only locality I knew for it was on a tree in the Barracks Grounds. This died and the plant disappeared there, but then appeared in the Botanic Gardens, and spread rapidly. Distrib. Eastern Tropics.

Helminthostachys.

H. zeylanica L. In damp muddy spots in open country in thickets. Malacca, Brisu (Derry); Pahang, common along the Pahang River, Pekan, Pulau Manis, Pulau Jellam, Kuala Tembeling; Selangor, near the Batu Caves (Ridley 8152); Perak (Scortechini), Blanja (Wray 140); Tringanu, Ismail Rantau (Down). Distrib. Eastern Tropics.

Addendum.

Alsophila glabra Hook. Bukit Timah and other forests in Singapore in damp spots. This is the plant mentioned as *Amplicosmia alterans* from Singapore. It is named by Mr. Matthew.

Some Visits to Batam Island.

C. Boden Kloss, F.Z.S.

Pulo Batam though so close to Singapore and frequently visited by pig-shooters, has never been investigated by a naturalist, so perhaps the following extracts from journals—though of trivial happenings as must necessarily be the case where the fauna of small islands is concerned—kept during two short visits I paid to it to collect animals may be of interest.

This island is 9 miles distant from Singapore, about 15 miles long and 10 miles broad. The northern side is indented and elsewhere it is closely surrounded by other islands. There are hills in the interior covered with jungle, where large outcrops of quartz occur and the boulders are a quartz grit. Much of the low land which has at one time been cleared is swampy or sandy and very poor but where red laterite soil occurs pineapples flourish under the cultivation of Chinese and Bugis settlers. Many young getah trees (*Dichopsis* sp.) are found in the forests where roam a tribe of Proto-Malays still little affected by outside influences.

My first visit was paid in September 1905. I left Singapore in a 10-ton cutter-yacht at 11 a.m., got caught in a squall off Pulo Sambu in the afternoon, ran on to a sand-bank at low tide later on but poled off, and anchored off a kampong at the head of Senimba Bay at 5.30 p.m. The upper part of the bay is very shoal and at low water wide mud-flats are exposed all round. I collected some interesting small sponges of bright colours on them. There were seven houses in the kampong and others building further along the shore.

After getting the baggage landed next morning we found a deserted Chinese shop behind the village. This we broke open and throwing all the rubbish it contained into a side compartment, I set up my bed, table and chair in the centre room while the boy fixed up his kitchen and sleeping place

in a third. There was a hole of good drinking water at hand and a bathing well a little farther off so we felt very comfortable.

A row of wooded hills ran south-easterly towards the centre of the island, a river debouched at the head of the bay and across the water a couple of miles away were the slopes of a long peninsula.

As I sat talking to the natives in the doorway of my house in the afternoon we saw the eyes of a large crocodile above the calm water about 140 yards away and I was asked to shoot it but refused since my gun was only sighted to 100 yards. However, being pressed, I took a very full sight and fired from my chair; there was a furious turmoil and the reptile disappeared. The natives said it was hit, and indeed three or four days later we found it in the mangroves with its brains flicked out—a 13-footer. When afterwards invited to repeat the performance I was not to be tempted—it was a case of letting well alone.

At 3 p.m. I went out with a parang and found a path going up the hills; cleared it and set 3 dozen traps. Coming back found a pair of "tupai tanah" (*Tupaia ferruginea batamana* sp. nov.) just caught and saw several small pigs. Skinned tupaia and after dinner went along the shore for pig but saw none.

"16th. Set off at 5.30 a.m. to examine the traps which contained a number of rats (*Mus lingensis*) and some tupaia, all much ant-eaten. Found this hill jungle practically lifeless as the forest was poor being without fruit trees, but got a species of civet cat (*Arctogalidia simplex*) which was a valuable prize, and a horn-bill—the "burong klinking" (*Anthracoceros convexus*). Skinned till 5.30 and then reset traps. Lent the gun in the evening to a man who wanted to try for pigs in his plantation.

"17th. No pig seen by the natives. Very little in traps so brought some away and set them lower down amongst coconuts. Got a pair of horn-bills and some squirrels (*Sciurus vittatus*) with the .410 gun amongst the palms; both these are numerous near the village and horn-bill steak is

very good. Some men went to set "jerats" for napu and borrowed the gun in order to try for lotong and krawar (*Ratufa* sp.) and coming down myself from setting traps without it I saw a large bearded pig!

"18th. Some fresh rats from the coconuts: one appears to be *Mus jarak* and the other rather like *Mus griseiventer* of Johor. Went to the Bugis plantations inland to the S. W. of the range. They are on poor flat land and consist of pines, bananas and tapioca: the forest beyond, which was swampy and largely composed of Melaleuca trees, was quite empty. The napu-trappers had no luck.

"19th. A couple of small concolorous rats from the coconuts. Away to another patch of jungle beyond the gardens but was disappointed as it was merely a small clump with swamp on the far side. A boy brought some "tikus padi" caught in his house. In afternoon went along foot of hills after pig: saw monkeys only but couldn't get near as they went to ground at once, which makes me think they were "berohs." 25 skins to date.

"20th. Set off for the distant jungle beyond the hills and almost immediately got a "klabu" in the mangroves near the house—a female *cristata,* weight 11 lbs. Had much trouble getting through secondary growth and "resam" fern but finally entered the forest and found a path running along a deep gully where a *Didymocarpus* with violet flowers was growing amongst the rocks. Saw a few common birds but no animals, except another lotong which I got. Found a better way home where two napus were awaiting me, both very large and bright with clear orange necks. Set traps and waited again for pig.

"21st. Heavy rain all morning so stopped in and skinned the napus. Went out later along the ridge of the hills but got nothing. The view of land and water, north and west was very fine but could see very little jungle in the interior.

"22nd. Off to the far jungle where I saw absolutely nothing but think I heard the cry of a *Ratufa.* The few traps out had been interfered with by a pig. 39 animal skins.

"23rd. Hired a large leaky boat and paddled and sailed to Pulo Sambu where we found a launch going to Singapore which gave us a lift: arrived home 9 p.m."

My second visit to Batam was the outcome of a desire to collect on Bulang Peak. I left Singapore on March 18th 1906. I had a Malay prau on this occasion which didn't sail anything like as well as the cutter and we had to do a lot of rowing, particularly amongst the tide-rips behind Pulo Sambu. However we got to Pulo Boyan, where the Controleur is stationed, at seven o'clock and anchored in the strong tide of the Batu Hadji Straits for the night.

I found that the Controleur, who was newly appointed, could give me no information about Bulang but he courteously offered me the services of a constable for the trip which I refused as a useless encumbrance. There was a strong tide against us and no wind all the morning so we passed the time in filling our water-jars from a well on Bulang, as there is no water on the small island, and in the afternoon when the tide slackened we made sail again, reaching at night-fall the kampong where I had hoped to put up. It was in ruins and had evidently been deserted for a long time but I was less disappointed, in that next morning when I made a trip to the Peak I found the way thither to be through swamps while the hill itself had been cleared except on the top, and there was no sign of animal life anywhere. So we sailed back again looking for a place to stop at, but both sides of the strait had been long cleared and were no use for collecting and as I was not provided with any sort of material to form a shelter I decided to put in at Telok Senimba once more—as I was particularly anxious to shoot the bearded pig—and see if I could not add to my former list of specimens, though the locality was not a good one as there was so much cleared land and swamps while the accessible jungle was on hill sides and exceedingly poor. There are no doubt more satisfactory places in the interior but thither one would have to go prepared to camp out.

After leaving the sheltered strait we had a lively time against a strong head wind: the prau, with peak dropped,

wouldn't tack in the rough weather and we had to wear every time but when we got into Senimba Bay it was a nice reach down to the kampong. It was low tide and there was a pig on the mud as we arrived so I paddled off towards him with the gun but lost his track in the mangroves. I had been at the tiller for eight hours without a spell and was painfully sun-burnt.

My old dwelling place had been pulled down but another Chinaman had built another unsuccessful shop so we appropriated the empty place as before; and then I had a most glorious bath, hitherto having to be content with a dip in the sea of nights which was a great discomfort but this occasion squared it all.

"22nd. Went along the range at day-break but saw only "krahs": cut a path down the far side along the bed of a dry ravine in hopes of finding jungle beyond but there were only stretches of dense scrub. Spent the afternoon on the mud collecting stone-corals and sponges, small kinds of every possible shape and colour. The kampong women catch shell fish in a rather ingenious manner: they search the exposed mud for the hole in which the mollusc lives and then push down a stout piece of the midrib of a rattan palm about twenty inches long and armed at the end with a pair of reversed thorns, and the bivalve lying open at the bottom of the hole closes on the thorns when touched and is drawn up. Got my traps out towards evening and then watched for pig, with no success.

"23rd. Found a *Mus firmus* in the traps; this was not in the last collection. A blank morning on the hill except for a specimen of the beautiful rose-breasted pigeon (*Ptilopus jambu*). Tried a small island across the mud flats where pig were reported but saw none: the mud was fearful stuff to travel through.

"24th. An absolutely blank morning in the jungle but two napus were brought in and gave something to do. Full moon is said by all hands to be the best time for catching mouse-deer. Lent a gun to a would-be shooter who as usual swore to whole rafts of pigs which never seem to materialise.

Found that the new lantern I intended to do night shooting with had no wick so made some out of a piece of towel and went for a long walk with it on my belt after dinner: no result except that I was nearly choked by the smell of burning paint.

"25th. A futile morning in the forest: found a collection of old shelters, Malay *pondok* type, probably made by the "orang utan" of Batam. Half a dozen rats, but all badly damaged by ants. Sat out all the evening in a deserted garden and just before dark a medium-sized "nang-oi" trotted up. Fired at 60-70 yards and found immediately—not for the first time—I had forgotten to put the rifle lever over. Pig cleared away into lallang warmed up by slugs: nothing else put in an appearance except mosquitoes. My gun-borrowing friend said with truth pigs were to be seen in the clearings if watched for long enough!

"26th. Nothing in the traps and only monkeys in the jungle. Set some large traps for musang and afterwards watched for pig. Went for a walk with bulls-eye after dinner but saw nothing.

"27th. Only two specimens in the traps: had to shoot squirrels to make work. The pig-shooter returned his gun; says he has sat up for three nights without seeing anything. A large trap caught a tortoise (*Cyclemys platynota*) later in the day. No luck with the pigs again. Found a large centipede in my mosquito net which should evidently have been taken as a sign that the bed was not safe as in the night a coconut crashed through the roof and landed on my pillow (Memo. always to strip coco-palms before dwelling beneath them).

"28th. The usual frost in the jungle. A young napu was brought in and another tortoise got into the traps; evidently these reptiles are attracted of the putrid meat which forms the bait. A pig had also been caught but he successfully pulled out."

This sort of thing went on for several days during which I got nothing but monkeys, rats, squirrels and tupaia. Traces of pigs were everywhere, huge tracks some of them, and I

twice stampeded the animals in dense vegetation but I was never able to catch sight of them and the spring-guns I set were never effective. However I got a new rat in some beach forest, a very beautiful specimen of the *jerdoni* type which made me feel glad I had come to the island again.

One afternoon I went up the river which after some distance turned completely on itself and ran south. It was entirely mangrove bordered, though once or twice there were glimpses of old clearings. A number of small side streams were probably only drainage of the swamp. We landed on an isolated hill where were paths and found some old "jerats" for mouse-deer. The jungle trees were nearly all of a bark-shedding kind but I saw a quantity of the red stemmed palm (*Cyrtostachys* sp.) and collected some orchids—*Grammatophyllums* being plentiful on the mangroves.

As I appeared to have exhausted the district after having made 49 mammal skins, many of the species reported apparently not occuring there, on April 3rd we loaded the prau and rowed down the bay to its head where we got a slight breeze. Outside a strong ebb set us to the eastward but as we neared Singapore Island we met the flood which carried us into the harbour in time to get everything home before night.

I obtained thirteen species of mammals during the two visits and observed two others, while nine more were reported to exist. Thus Batam is by no means exhausted: for if they really occur, the determination of the reported *Presbytes, M. nemestrina, Paradoxurus, Sciuropterus* and *Ratufa* will be interesting, but to obtain this it would probably be necessary to camp in the middle of the island where good jungle may still exist.

Mammals of Batam.

1. *Presbytes cristata* (Raffles) is fairly common in small herbs both in forest and mangroves. It is known to the natives by the name of "Klabu."
2. *Presbytes species.* A "Kaka" with a white breast was reported to occur. If this is a fact I am inclined to

think it will be the *P. cana,* Miller, of Pulo Kundur and E. Sumatra rather than *P. rhionis,* Miller, of Bintang Island. These are local forms of *P. femoralis* which, though found in the Peninsula and Sumatra, does not occur on the islands of the Rio-Lingga Archipelago.

3. *Macaca nemestrina,* Linn. The "beroh" was said to occur but has not yet been taken in the Archipelago.
4. *M. fascicularis,* (Raffles). The "krah" is common everywhere.
5. *Cynopterus montanoi,* Robin. Bats, apparently of this species, were fairly common and were the only kind I obtained. Malay nama "klawar."
6. *Galeopithecus volans,* Linn. The "kubong" was said to occur.
7. *Tupaia ferruginea batamana,* Lyon. This new subspecies of the "tupai tanah" was exceedingly common. Externally it only differs from *T. ferruginea,* Raffles, in its slightly greyer tail. It is easily separated however by its longer and wider skull.
8. *Arctogalidia simplex,* Miller. This is the Archipelago form. A specimen, the third known, was shot early one morning while it was running along the branch of a high tree. As the people called it a "musang" which they said was common I presume that
9. *Paradoxurus hermaphroditus,* Pallus, or an allied form occurs.
10. *Mus concolor,* Blyth was taken in the Kampongs where it was not uncommon.
11. *Mus firmus,* Miller, is the Sumatran form of the Peninsula *M. validus,* Miller. I have never taken these except on the banks of fresh water streams.
12. *Mus lingensis,* Miller. The Sumatran form of *Mus surifer,* Miller. A dry jungle rat and exceedingly common. It seems to begin feeding at early twilight

as traps specimens are always more damaged by ants than any other kind.

13. *Mus sp.* near *rattus*. The rats provisionally grouped under this heading are most perplexing. They fall readily into two groups which handle in the flesh as extremely distinct. The one division, almost black above with whitish bellies, are finely built animals with very pointed noses and closely resemble *M. jarak*, Bonhote, from Johore. The others with greyish bellies and backs rather like *M. norvegicus* are coarsely built and muzzled and somewhat approximate to *M. griseventer*, Bonh., of Johore. All these were taken in swampy ground near the sea as was *Mus jarak* which I found only amongst mangroves. *Mus griseiventer* however is a Kampong rat.

14. *Mus batamanus*, Lyon. This new species is of the *jerdoni* type. It is a very beautiful shaped rat and the only specimen I obtained was captured in damp littoral forest. Swampy ground seems the habitat of all this group.

15. *Mus musculus*, Linn. Some specimens of the "tikus padi" were brought me by a Bugis boy who had captured them in his house.

16. *Sciuropterus*, sp. Reported; possibly the *amœnus*, Miller of Kundur Island.

17. *Petaurista*, sp. The "kubin" was said to occur.

18. *Ratufa*, sp. Reported. A yellow type, probably near *R. insignis*, Miller, of Pulo Sugi.

19. *Sciurus vittatus*, Raffles. Exceedingly common in the coco-nuts where it was very destructive. Cannot be distinguished in any way from Sumatran and Peninsula forms.

20. *Sciurus tenuis*, Raffles. Reported as very rare. I only know of one specimen from the Archipelago, taken on Lingga Island.

21. *Sus rhionis,* Miller. Observed. This is the "babi bakau" of the natives and is common everywhere. It is the island form of *S. vittatus.*

22. *Sus oi,* Miller. Observed. The "nang-oi" is plentiful but to a solitary collector pigs are difficult to obtain. Generally one is only aware of their presence by a rush through the undergrowth and distant snorts and unless one is lucky in meeting them in the open they rarely figure in collections. The "nang-oi" does great damage to the pineapple plantations and is said to be far less timid than other pigs: in fact the natives reported that boars often merely grunted when they tried to scare them away. They are afraid to shoot it with their ineffective ammunition as it charges when wounded. It ranges from Batam to Banka and throughout the swamp of E. Sumatra.

23. *Tragulus kanchil,* sp. A "pelandoc" is said to occur.

24. *Tragulus javanicus perflavus,* Miller. This new species is a strongly marked form having very bright pelage and a pure orange neck entirely free from black shading. I have it also from Pulo Galang and it has been taken since on Bulang. It affords a particularly good illustration of local variation as *T. formosus,* Miller of Bintang Island, only five miles away, is exceedingly dark with a collar strongly washed with black.

Thus the mammal fauna of Batam is Sumatran and not Peninsular for the above definitely identified species *Mus concolor* and *Cynopterus montanoi* alone are from the Peninsula only. On the other hand, *Mus lingensis, M. firmus* and *Sus oi* are known from the Sumatra and the Rio-Lingga Archipelago only. *Arctogalidia simplex, Sus rhionis* and *Tragulus perflavus* are found elsewhere only in the Archipelago while *Tupaia ferruginea balamana* and *Mus batamanus* are so far known from Batam alone.

I am inclined to think that Batam, Bulang, Rempang and Galang form a small group which faunistically is more nearly related to the islands to the westward than to Bintang

on the east, though Pulo Sauh forms a stepping stone to the latter which is only five miles away. Bintang, however, when it is fully investigated will prove to be by far the most interesting island of the whole archipelago. A bank of less than 20 fathoms connects all these islands with both Sumatra and the Peninsula, but the 10 fathom contour lines break them up into various groups of which that above noted is one of the largest.

I have no notes of value about birds for they were scarce and of common species and I soon left off shooting them.

Small collections of reptiles and insects were made but they contained nothing remarkable.

I preserved a few plants during my visits and two of them, which were new, have lately been described by Mr. H. N. Ridley, viz:—*Neckia Klossii* and *Didymocarpus battamensis*.[1] The latter is interesting since it grows at sea-level while I believe that the habitat of the *Didymocarpi*, in this locality at least, is at some altitude.

A few notes on the inhabitants of Batam are given elsewhere in this Journal.

1. J. S. B. R. A. S. No. 49.

Some Ethnological Notes.

C. Boden Kloss, F.R.A.I.

In the Journal of the Royal Anthropological Institute Vol. XXXVII., Mr. F. W. Knocker in the course of some notes on the aborigines of Sungei Ujong—the Orang Belanas —relates that they tell in respect of the Sakais, how "the parents plant a parang in the fore-arm of the young, both male and female, projecting a few inches beyond the elbow. The flesh grows round it and it eventually become part of the fore-limb. In after life this limb weapon is used to clear the jungle and not for hostile purposes."

I am able to go one better than this. When living in Johore, it was my practice when travelling in the jungle to endeavour to ascertain whether there were current any traditions of the existence of the orang utan (*Simia satyrus*) in that part of the peninsula. The native name for this great ape is "mawas." In the swampy country south of Gunong Pulai I found that the name was known and the people of the locality told me tales of its possessor. The information was interesting but not quite what I then wanted. The *Orang Mawas* were a kind of devil-men who lived in the swamps where their foot-prints might sometimes be seen. Their feet were turned backwards and, with sharp parangs which grew from their elbows like spurs, they killed any human beings they met and afterwards devoured the bodies.

Nothing discouraged I continued my enquiries elsewhere and learned that the Jakuns of the Endau Sembrong were also acquainted with a strange beast that seemed to be of the kind I was after. This was a huge red hairy man who lived in the trees and was called *tuhu*. I felt I was on the right track at last, but unfortunately the story went on to the effect that the *tuhu* spoke Chinese to a Chinaman when it met him in the jungle, Malay to a Malay, and the Jakun dialect to a Jakun!

The head-men of the Belanas are given as 1, Batin; 2, Jinang; 3, Jukrah—the usual titles among the southern inland tribes. I find that a variant of the latter also occurs among the Proto-Malays of the Kallang estuary in Singapore, a fact which Messrs. Skeat and Ridley failed to elect during their short visit thither (J. S. B. R. A. S. No. 33).

These enquirers state that the head-men of the Kampong they visited were 1, Jinang; 2, Batin. I further find in the neighbourhood one Kampong administered by 1, Batin; 2, Dukrah: and another under 1, Penghulu; 2, Jinang. At Telok Senimba , Pulo Batam, a dozen miles away, the people who are a branch of the "Orang Sabimba" referred to by Logan (Journal of the India Archipelago Vol. I.) have 1, Penghulu; 2, Batin.

The communities of the Kallang River have evidently been drawn from various sources and some guidance may be afforded by these titles as to their derivation.

Amongst these primitive tribes the title of Batin extends throughout their range from the farthest north of Biliton, and in the islands appears to be the only one except where they have come under the influence of the ruling Malays, in which cases a Malay has often been appointed as Penghulu.

In the Peninsula however there are amongst themselves officials subordinate to the Batin known as Jinang and Jukrah. Where (according to Logan and others) a Malay has been appointed to supervise them he also is called, possibly because of his functions, Jinang, and it is needless to say that in these cases the title would occasionally become the superior one. This might account for the reversed "Table of Precedency" noted by Messrs. Ridley and Skeat, as Kampong Roko is a small village hedged in by dominant Malays. The anomaly of Penghulu and Jinang noticed by myself in another Kampong I can only account for by supposing that long ago the title of Batin dropped out of use.

The word *bidoh,* boat (also the name of a stream in Singapore) given as a Non-Malay expression, is in common use amongst the Malays of the west coast of Borneo.

Messrs. Skeat and Ridley suggest that "the Sea-gypsies of Singapore owe their origin largely from "Sakai" hill-tribes of the Rio-Lingga Archipelago" and class the Belandas as "Sakai" also: surely this is a slip and should be Jakun or Proto-Malayan or some other equivalent of these!

It is regrettable that all those English writers who have dealt so interestingly with the primitive people should be restricted in experience to the Peninsula for the Jakuns are only the mainland representatives—and probably least pure—of that large family that is spread throughout a great part of Eastern Sumatra and the islands adjacent. Such, for instance, are the *Orang Akit* of Bengkalis and Rupat Islands, the *Palong* of the upper tributaries of the Siak River, the *Mantong* and many others of the Rio-Lingga Archipelago, the *Orang Gunong* of Banka and the *Sika* of Biliton. The *Kubus* and *Lubus* of the interior of Sumatra also appear to be members of the same family.

To Journal 41 of the Society Dr. W. L. Abbott contributes a note on "Human Images among the Orang Manlong."

According to an old inhabitant of a Kampong at Tanjong Ru, an Oorang Laut by descent—though he would never admit himself to be other than a pure Orang Malayu—these images are called "Tukar Ganti" and, in common with the "Kapal Hantu" and "Rumah Sakit," are constructed, to his knowledge, by all the inhabitants of the Rhio Archipelago and of the creeks round Singapore in times of sickness. When the Tukar Ganti is completed the "penyakit" (sickness) is induced to enter it and it is then taken away to the jungle or some distant spot and there left. Further, all these objects—and this was unknown to me and perhaps is so to others—are used for prophylaxis as well as cure. A current instance was related.

"Ten days ago the village *pawang* came to the people, 'I see the evil spirits,' said he, 'the *hantus* are gathering thickly to afflict the Kampong. Now if we want to escape their machinations every house must contribute 40 cents so that a large vessel may be built into which the *hantus* will

enter and can then be sent away to sea.' On the day it is sent off the pawang's house will be under a *pantang* (tabu) to Europeans and all strangers."

My acquaintance also said that once these objects pass from the charge of their makers their superstitious attributes end and no one who takes possession of them is affected in any way. He observed that Europeans called his people idiots for practising such ceremonies. "But," I asked, "what does the Imam say?" "Oh he laughs at us or is angry and says that we are idiots too, for such *hantus* don't exist and such practices are not compatible with Islamism. But our pawang tells us otherwise and as it is a thing we have always done we shall continue to do so."

Mention has been made of the Orang Senimba (Sabimba). They are the people of whom Logan (Jour. Ind. Arch. Vol. I. p. 295) records that a portion were transferred from Batam Island to Johore and settled on the Tebrau River. In Johore all trace of them as a distinct tribe has now disappeared and the names seems forgotten also. Such also I found to be the case with the Biduanda Kallang settled once on the Pulai River. Nevertheless, all the creeks of the Old Straits and of the Johore River estuary are occupied by people who, although now Islamised, are still primitive in habits and appearance and quite distinct from the dominant Orang Malayu by whom they have been absorbed.

These are the people once known as Orang Seletar (J. I. A. Vol. I.) and they, with all the above, belong to the Sea-Jakun, or Orang Laut, branch of the Proto-Malays. Except for a small party on the Sungei Masai, merely brought down by a Chinaman to cut fire-wood, I could ascertain no traces of the inland division south of a line drawn between the Batu Pahat and Sedili Rivers. In this latitude they are to be found on the Lenggiu and Sayong streams, the head waters of the Johore. In this connection the cropping up of the parong legend given above is interesting as it shows that the state of affairs was other in the past.

The remaining Orang Senimba live on the shores of Senimba Bay, behind Pulo Sambu—though Logan speaks of

them as essentially a forest people—and do a little fishing, cultivating and fire-wood cutting. They are now Mohammedans which is to say that they have lost all ethnographical individuality.

But in the interior of Batam still exist an almost unspoilt people who, although the island is so small and they are nomadic, never come down to the sea. These are evidently Logan's "Orang Muka Kuning" (for his other tribe the Treng-Bubong" appear to have shared the fate of the Sabimba) although the name seems unknown to the shore people. I have not seen them personally, for living in temporary shelters and wandering about, they are not easily met with during a short visit but it was stated that they are less than a hundred in number. They trade a little jungle produce occasionally and wear bark *chawats* when they possess no cotton garments.

The most interesting fact in connection with them is that they still use the sumpitan and ipoh poison. They do not themselves manufacture the weapon but use one of a Borneo pattern obtained by trading. My informants assured me that though the poisoned darts were effective against wild animals yet they would never kill a fowl.

A similar tribe occupies the interior of Pulo Galang where a Belgian Planting Company has recently had some communication with them.

As these are probably the only island tribes who have maintained practically uncorrupted their paganism and their isolation, speedy investigation is most desirable.

The White-Handed Gibbon.

So far as I am aware the white-handed gibbon (*Hylobates lar*) has been regarded as an animal restricted in range to the mainland of Asia, inhabiting there the Tenasserim Province and the Malay Peninsula only. I therefore wish to place on record its occurrence in the swampy regions of East Sumatra, where it has been met with in large numbers by Dr. W. L. Abbott and myself, particularly in the Siak and Indragiri districts.

It occurs there, as elsewhere, in the biscuit-coloured, in brown and in sooty pelage, and as far as my observations are worth anything it is impossible to consider these varieties as colour races in any way. I have several times noted, though this does not seem to be general, dark females with pale infants and vice versâ and have also shot pie-bald adults with the colours so distributed that it would be impossible to say whether they are dark-furred individuals becoming pale or pale becoming dark. As however the pale form is comparatively scarce it is to be inferred that the latter metamorphosis is what is happening and that the light specimens are born so.

The statement that gibbons are monogamous is one that I thoroughly agree with: whether however they divorce each other and take new partners from time to time we have yet to learn. The point is interesting since such an able reasoner as Westermarck (The Origin of Human Marriage) has come to the conclusion that the marriages of mankind are an inheritance from some ape-like progenitor.

I do not ever remember meeting Malayan gibbons in parties of more than five at a time, but the most usual numbers are four or less. A small district may often contain a large number of apes but the little groups seem to live quite independently of each other and do not combine. These parties consist of two parents and their off-spring of different

births, but as a rule it seems that about the time the third infant appears the eldest is sufficiently adult to take a partner with whom it starts life on its own account.

It is thus rather interesting to note that while the lower monkeys of nearly all species go about in bands—*Presbytes obscurus* is inclined to pair, however—in the case of the man-like apes (with the exception of the chimpanzee, perhaps the most intelligent of them all; the siamang and the Indian hoolock) the social unit is the family. This is, by many authorities, held to have been the state of primitive man before he became intellectual enough to recognise the advantages derived from union.

While their inactive habits compelled the gorilla and orang and possibly primitive man to be practically solitary as otherwise they would have exhausted their food supplies, this is not the case with the gibbon the most agile of all the apes. I hope to contribute to a forth-coming journal some notes on the relationship between the gibbon's structure and its habits.

C. B. K.

Curriculum of a Course in Malay in Paris.

Hôtel du Mont Blanc Les Rasses s/ Ste. Croix
Switzerland, 3/2/08.

The Honorary Secretary,
Straits Branch, Royal Asiatic Society,
Singapore, Straits Settlements.

Dear Sir,

I am permitted by the Professor of Malay at the Paris School of Oriental Languages to communicate to you the enclosed programme of the curriculum of his department, which I venture to think may be of interest to some of the members of the Society. Should it be desired to print this programme in the Journal for the information of members, I am authorised to add that Professor Cabaton has (at my suggestion) given his consent thereto.

It is rather remarkable that France, which has very few Malay-speaking subjects, should possess a Professorship of Malay (once filled, it may be remembered, by the Abbé Favre, whose name is still held in honour in the East), whereas England has made no move in this direction. The fact seems hardly creditable to ourselves.

I am,
Yours very truly,
C. Otto Blagden.

Ecole des Langues Orientales Cours de Malais 1907-8.

Première année. *Programme du cours:* Eléments de malais classique (Principes de grammaire: a) Phonétique ou Etude des sons; b) Ecriture: alphabet arabico-malais et ses transcriptions en caractères latins; c) Etymologie ou Formation des mots; d) Morphologie ou Etude des formes grammaticales; e) Syntaxe). Exercices practiques.

Examen écrit: Version et thème malais.

Examen oral: Explication de textes préparés à l' avance; a) Interrogations sur la grammaire; b) sur l' histoire, la géographie et les mœurs des Malais péninsulaires.

Textes à préparer: Maleisch Leesboek voor Eerstbeginnenden (Livre de lecture, en malais, pour les débutants), fasc. I, p. 1-20; f. II, p. 5-25.

Ouvrages à consulter: Reclus (Elisée), Géographie universelle, t. VIII, p. 715 sqq. Swettenham (Frank), British Malaya, London, 1906. Dennys (N. B.), Dictionary of British Malaya. Montano (Dr.), Voyage aux Philippines et en Malaisie.

Deuxième année. *Programme du cours:* Le malais, langue d' échange de l' Extr.-Orient. a) Grammaire et syntaxe (Revision); b) Explication de textes tirés du *Bloemlezing* de G. K. Niemann; c) Exercises pratiques: Dictées au tableau, thèmes oraux, exercices de conversation; d) Traduction de lettres et de documents.

Examen écrit: Version et thème malais.

Examen oral: Interrogations sur la grammaire, la géographie, l' histoire et la religion des Malais.

Textes à préparer: Bloemlezing uit Malaische Geschriften, door G. K. Niemann. Pt. stuk (La Haye, M. Nijhoff) [Onthologie d' auteurs malais].

Ouvrages à consulter: Reclus (E.), Géogr. univ., t. XIV, Insulinde, p. 195-411. Wilkinson (R. J.), Malay beliefs.., London, Luzac, 1906. Skeat (W. W.), Malay Magic, L. 1900. Hondas (O.), L' Islam. Chantepic de la Saussaye, Manuel d' histoire des Religions: L' Islam, p. 253-312; Les Hindous, p. 313-432. Chailley-Bert (J.), Java et ses habitants, P., Colin, 1899, in-18. Leclercq (J.), Un séjour dans l' île de Java, P. Plon, 1898, in-18.

Troisième année (Diplôme). *Programme du cours.* Etude du malais classique et usuel; a) Place du malais parmi les langues malayo-polynésiennes. Affinités du malais et de plusieurs dialectes de l' Indo-Chine Francaise; b) Déchiffrement et explication de manuscrits et documents relatifs à la géographie, à l' histoire et aux mœurs des pays malais et de l' Indo-Chine; c) Particularités du malais parlé au Cambodge. Notions sur les dialectes malayo-polynésiens de l' Indo-Chine (Cam, jarai, radeh, etc.); d) Exercices practique.

Examen écrit: Version, dictée et thème malais.

Examen oral: Lecture et explication d' un texte manuscrit. Interogations sur la grammaire malaise, la géographie l' histoire et les mœurs des Malais de la Péninsuleet de l' Insulinde.

Ouvrages à consulter: Backer (L. de), L' Archipel Indien. Dulaurier (E.), Des langues et de la littérature de l' Archipel d' Asie, (*in* Revue des Deux-Mondes, 15 juill. 1841). *Et tous les ouvrages indiqués ci-dessus.*

Grammaires malaises de Tugault et de Favre (en francais); de Dennys et Maxwell (en anglais); de Gerth van Wijk et Tendeloo, (en hollandais).—*Dictionnaires* de Favre, de Tugault, de Klinkert, de Pijnappel, de von de Wall et van der Tunk (ces 3 derniers en hollandais).

Father Civet.

By R. O. Winstedt.

This tale is not to be confused with that rollicking farce *Musang Bĕrjanggut,* "The Bearded Civet-Cat;" it is merely a beast fable of the Aesop type. The tale and language is so simple that a literal translation would be tiresome. The following is the gist of it. Some villagers moved from their *kampong* up to a hill rice-clearing and left behind them a hen and two chicken which they could not catch. One day hen and chicken were looking for food in the scrub, when the chicken wandered away from the hen and met a huge civet-cat. Said the civet-cat, "How would you like me for a step-father, you fatherless little chicks? Tell me where your mother roosts to-night and I will come and woo her." "We all sleep at the end of the threshold to-night," chirped the chicken. "All right I'll come and meet your mother," said civet-cat. So the chicken went back to the hen and the elder chicken chirped all about their meeting with civet-cat and how civet-cat was coming to visit them at 'the end of the threshold' that very night. "Oh you very naughty tell-tale chicken" clacked the hen and removed with them to a cross-beam under the roof. And civet prowled in vain that night all round the threshold. The next morning civet-cat met the chicken again and scolded them for their deceit. "All mother's fault" chirped the chicken, "she was angry with us for telling you her roosting-place and moved to the roof beam." "Oh," said civet-cat, "well, where does your mother roost to-night; I am longing to meet her." "On the cross-beam under the roof" chirped the chicken. When they returned to their mother, she asked where they had been and they told the whole story. Then the hen was very angry and beat them for telling civet-cat of the roosting-place and removed and slept on the ridge-pole. In vain civet-cat searched that

night also. Next morning the bigger chicken said to the tiny chick, "Come, let us go and tell civet-cat all about it or he'll be angry with us just because of mother's whims." So they set off and found civet-cat furious but appeased him by protesting their innocence and telling him of their new roosting-place on the roof-tree; and they vowed not to tell their whimsical mother that they had met him or had told him of her roosting-place. Then that night civet-cat crept up on the roof-tree and devoured the poor hen and her silly chicken.

Cherita Pa Musang.

Sa-bĕrmula, maka konon ada-lah orang pĕladang tiga bĕranak bĕrpindah dari kampong-nya diam di-ladang, habis-lah di-bawa-nya dĕngan ayam itek-nya sĕmua sa-kali; tĕr-tinggal-lah tiga ekur ayam-nya sa-ekur ibu-nya dua ekur anak-nya baharu sa-bĕsar tĕkukur bĕtina tiada-lah dapat di-tangkap oleh pĕladang itu karna tĕrlalu amat liar-nya. Maka ayam yang tiga bĕranak itu pun tinggal-lah di-rumah yang kampong itu. Maka ada pun ka-pada suatu hari ia mĕnchari makan ka-dalam sĕmak-sĕmak di-darat rumah tuan-nya itu bĕrchĕrai-chĕrai jauh sĕdikit anak ayam yang dua ekur itu dĕngan ĕmak-nya. Maka ayam itu pun bĕrjumpa dĕngan sa-ekur musang tĕrlalu bĕsar-nya. Dĕmi di-lihat anak ayam itu, maka ia kĕdua bĕradek tĕrlalu kĕtakutan-nya hĕndak lari. Sa-tĕlah di-lihat oleh musang akan anak ayam dua ekur itu tĕrlalu suka-chita hati-nya sambil tĕrsenyum mĕnĕgur anak ayam itu dĕngan pĕrkataan yang halus manis dan kĕlakuan-nya yang lĕmah lĕmbut kata-nya, "Hai anak ayam jangan-lah takut akan aku ini, karna aku sudah bĕrtobat bĕrbuat aniaya ka-pada hamba Allah taala." Maka kata pula ayam yang kĕdua, "Apa pula sahaya takutkan, karna sahaya kĕdua ini tiada bĕrbapa; ĕmak sahaya ada bujang." Maka sahut musang itu, "Jikalau bagitu, ada-kah ĕmak anak ayam lagi?" Kata anak ayam, "Ada ĕmak sahaya." Maka kata

musang, "Jikalau bagitu, mau-kah anak ayam bĕrbapa tiri akan aku, karna aku pun bujang juga tiada bĕrbini: khabarkan ka-pada ĕmak anak ayam katakan aku hĕndak mĕminang dia. Di-mana ĕmak anak ayam tidur pada malam ini?" Maka kata anak ayam, "Sahaya dĕngan ĕmak sahaya tidur di-ujong bĕndul rumah itu." Maka kata musang, "Baik-lah aku datang malam sĕkarang hĕndak bĕrjumpa dĕngan ĕmak kamu hĕndak mĕmutuskan pĕrjanjian kahwin itu; biar-lah aku chakap sa-mulut." Maka kata anak ayam itu "Mari-lah sĕkarang 'pa musang bĕrjumpa dĕngan ĕmak." Maka kata musang, "Baik-lah anak, 'pa musang datang sĕkarang." Sa-tĕlah sudah bĕrkata-kata itu, maka anak ayam itu pun balek-lah mĕndapatkan ĕmak-nya. Hari pun pĕtang-lah. Maka ibu ayam pun pulang-lah bĕrtiga bĕranak lalu tĕrbang hĕndak tidur di-ujong bĕndul rumah itu. Maka kata anak ayam yang tua itu, "'Mak 'mak, aku tadi bĕrjumpa dĕngan 'pa musang; kata-nya hĕndak mĕminang ĕmak dan bĕrtanyakan tĕmpat ĕmak tidur, ia hĕndak datang sĕkarang." Kata aku 'di-ujong bĕndul.'" Sa-tĕlah di-dĕngar oleh ibu ayam itu, ia pun marah-lah akan anak-nya, kata-nya, "Kamu ini tĕrlalu amat pandai bijak sangat." Maka ibu ayam pun bĕraleh-lah pula tidur ka-atas alang rumah itu. Hata sakĕtika lagi hari pun malam-lah. Maka musang itu pun datang-lah mĕnchari ibu ayam itu di-ujong bĕndul rumah itu tiada-lah di-jumpa-nya. Maka musang pun sangat-lah marah akan anak ayam itu oleh sĕbab mĕnipu dia; bĕrfikir di-dalam hati-nya 'Baik-lah ĕngkau aku pĕrdayakan juga baharu puas hati-ku.' Sa-kĕtika hari pun siang, masok-lah musang ka-dalam hutan yang bĕrhampiran di-bĕlakang rumah itu juga bĕrsĕmbunyikan diri-nya hĕndak mĕnantikan ibu ayam dĕngan anak-nya mĕnchari makan.

Hata, hari pun chĕrah. Ibu ayam dĕngan anak-nya pun tĕrbang-lah turun ka-tanah mĕnchari makan kais ka-sana kais ka-mari dapat-lah sĕmut-sĕmut itu di-bĕrikan-nya ka-pada anak-nya dua ekur itu; anak-nya pun makan-lah, ibu-nya mĕnchari pula ka-tĕmpat yang lain. Maka takdir Allah subhana wa-taala tĕrbang-lah dua ekur bĕlalang kĕrĕnnyat hampir dĕngan anak ayam itu. Maka di-kĕjar oleh anak

ayam. Maka bĕlalang itu pun hinggap-lah dĕkat musang itu. Maka anak ayam itu pun sampai-lah. Tĕlah di-lihat oleh musang akan anak ayam kĕdua bĕradek datang dĕkat dia, maka musang bĕrkata dĕngan marah-nya, "Hai anak ayam, apa bahasa kamu mĕnipu aku? Sa-malam aku datang hĕndak bĕrjumpa dĕngan ĕmak kamu; jĕnoh aku chari tiap-tiap ujong bĕndul, tiada aku jumpa." Maka sahut anak ayam itu dĕngan kĕtakutan-nya, "Ayohai 'pa musang; jangan-lah sahaya di-marah; sudah sahaya khabarkan ka-pada ĕmak sahaya; ĕmak sahaya pun marah akan sahaya bĕrkhabarkan tĕmpat tidur ka-pada 'pa musang langsong ĕmak sahaya mĕmbawa sahaya kĕdua bĕradek ini bĕraleh tidur ki-atas alang rumah itu." Sa-tĕlah di-dĕngar oleh 'pa musang itu padam-lah marah-nya akan anak ayam itu sĕrta bĕrkata pula dĕngan lĕmah lĕmbut-nya, "Ayohai anak ayam malam sĕkarang di-mana ĕmak kamu tidur khabarkan ka-pada aku bĕnar-bĕnar karna 'pa musang sangat-lah rindu dĕndam hĕndak bĕrjumpa dĕngan ĕmak kamu itu." Sa-tĕlah di-dĕngar oleh anak ayam kĕdua bĕradek itu akan pĕrkataan musang itu, sangat-lah kĕsukaan hati-nya kata-nya, "Bĕnar-bĕnar 'pa musang malam sĕkarang ĕmak sahaya tidur di-atas alang rumah itu juga." Maka kata musang "Baik-lah, aku datang malam sĕkarang." Sa-tĕlah sudah bĕrkata-kata, anak ayam itu pun lalu-lah tangkap bĕlalang dapat-lah ia sa-ekur sa-orang lalu di-bawa-nya ka-pada ĕmak-nya. Maka di-tanya oleh ibu ayam itu ka-pada anak-nya, "Ka-mana pĕrgi hilang lama sangat tadi." Maka lalu-lah di-chĕritakan oleh anak-nya dari-pada awal sahingga ka-akhir-nya sĕpĕrti pĕrkataan musang itu. Maka sangat-lah marah ibu ayam akan anak-nya lalu di-pukul-nya kĕdua-nya anak-nya itu. Maka anak-nya pun minta ampun-lah mĕngatakan tiada bĕrkhabar lagi. Sa-kĕtika hari pun malam-lah; itu ayam pun mĕmbawa anak-nya tĕrbang pula tidur ka-atas tulang bubong rumah itu. Hata sa-tĕlah jauh malam sĕdikit, musang itu pun datang-lah mĕmanjat ka-atas alang rumah itu rata di-chari-nya tiada bĕrjumpa juga sampai-lah siang di-chari-nya tiada jumpa, bau-bau ayam itu sa-imbas-imbas tĕrchium juga oleh musang itu, makin sangat marah hati-nya. Tĕlah hari siang, musang itu pun pulang-

lah ka-dalam hutan di-darat rumah itu. Maka dĕngan lapar dahaga-nya tiada-lah tĕrhingga lagi marah-nya akan anak ayam itu dua kali sudah ia kĕna tipu.

Sa-tĕlah hari siang ibu ayam pun mĕnchari makan juga sĕpĕrti kĕlaziman sa-hari-hari itu. Maka anak ayam yang tua itu pun bĕrmuafakat dĕngan adek-nya, kata-nya, "Adek, biar-lah kita chari 'pa musang bĕrkhabarkan ka-pada-nya jangan kita di-marah-nya; akan kĕlakuan ĕmak kita, kita pula di-marah 'pa musang itu." Maka kata adek-nya, "Mari-lah, kita bĕrjumpa 'pa musang." Maka pĕrgi-lah anak ayam itu kĕdua bĕradek-nya ka-tĕmpat musang makan. Dĕmi di-lihat oleh musang anak ayam itu datang, maka ia pun marah hĕndak mĕnangkap anak ayam itu hĕndak di-makan-nya. Kata anak ayam, "Hai 'pa musang jangan-lah sahaya di-marah, bukan-nya salah sahaya; ĕmak sahaya sa-olah-olah-nya tiada mau bĕrlakikan 'pa musang, makin ia bĕraleh tĕmpat tidur sa-malam ka-atas bubong pula." Maka kata musang, "Kamu bĕrkhabarkan ka-pada dia pula, aku hĕndak datang?" Maka kata anak ayam, "Macham mana pula sahaya tiada bĕrkhabar biar ĕmak bĕrsiap akan tĕmpat tidur 'pa musang." Maka kata musang, "Sĕkarang usah-lah khabar-kan lagi ka-pada ĕmak kamu aku hĕndak datang, diam-diam sahaja: jikalau di-tanya ĕmak kamu pun, usah-lah di-chakap-kan malam sĕkarang." Maka kata anak ayam itu, "Ĕmak sahaya tidur di-tulang bubong juga; datang-lah 'pa musang sĕkarang tiada sahaya bĕrkhabar lagi ka-pada ĕmak sahaya itu." Maka kata musang, "Baik-lah anak, boleh-lah 'pa musang datang, jangan-lah khabarkan ka-pada ĕmak kamu lagi." Maka kata anak ayam itu, "Baik-lah 'pa musang." Maka sa-tĕlah sudah bĕrkata-kata itu, maka anak ayam kĕdua bĕradek pun pulang-lah mĕndapatkan ĕmak-nya. Maka di-tanya ĕmak-nya akan anak-nya tiada di-khabarkan-nya di-daleh-nya mĕnchari makan juga. Maka ĕmak-nya pun diam-lah.

Hata sa-kĕtika lagi, hari pun pĕtang-lah. Maka ibu ayam pun mĕmbawa anak-nya kĕdua-nya itu tĕrbang tidur di-atas tulang bubong juga. Tĕlah hari pun jauh malam, maka musang itu pun datang mĕrayap-rayap pĕrlahan-pĕr-

lahan mĕmanjat atap rumah itu. Maka sampai-lah musang ka-atas tulang bubong, maka di-lihat-nya ibu ayam itu tidur kĕtiga bĕranak. Maka tĕngah musang itu hĕndak mĕnangkap ibu ayam itu, maka tĕrjaga-lah ibu ayam itu mĕnĕngarkan atap itu sĕrok-sĕrak bunyi-nya bĕkas kaki musang bĕrjalan. Maka di-lihat oleh ibu ayam sa-ekur musang jantan datang hĕndak mĕnangkap dia. Maka ibu ayam kĕtiga bĕranak pun tĕrbang-lah kĕlalak tiada tĕntu hala di-dalam gĕlap gulita. Maka musang itu pun tĕrjun-lah dari tulang bubong mĕngikut tĕrbang ayam itu. Maka ayam itu pun jatoh ka-tanah kĕtiga bĕranak-nya. Maka musang itu pun datang-lah mĕnangkap ibu ayam sĕrta anak-nya yang kĕdua ekur itu di-mamah-nya kĕpala-nya. Maka kĕtiga-nya pun mati-lah di-makan oleh musang itu di-bawa-nya ka-tĕmpat ia di-bĕlakang rumah itu dĕngan kĕsukaan-nya. Sa-tĕlah bĕrbiasa pĕnat lĕlah-nya sa-lama ini tadi, bĕroleh rĕzki yang tĕlah di-chari-chari itu, di-pĕroleh-nya juga. Ada-nya.

(Di-karangkan oleh Pĕnghulu Raja Haji Yahya bin Raja Muhammad Ali, di-mukim Chĕndriang di-dalam nĕgĕri Perak.)

Sindbad's Old Man of The Sea.

By W. George Maxwell.

It was in the fifth voyage of Sindbad the Sailor, after the shipwreck caused by the bereaved and vengeful roc, that he found himself upon an island where he met "an old man, "a comely person, who was clad from the waist downwards "with a covering made of the leaves of trees." The old man was sitting by the side of the stream sighing; and in answer to Sindbad's questions made signs, by dumb show, that he wished to be carried across the stream to some fruit trees on the further side. Sindbad, in pity, took him up on his shoulders, whereupon the old man twisted his legs "which were like the hide of a buffaloe in blackness and roughness" round Sindbad's neck. "I was frightened at him," "Sind-"bad's narrative continues "and desired to throw him down "from my shoulders; but he pressed upon my neck with his "feet, and squeezed my throat, so that the world became black "before my face, and I was unconscious of my existence, fall-"ing upon the ground in a fit like one dead. He then raised "his legs, and beat me upon my back and my shoulders and "I suffered violent pain; wherefore I rose with him. He still "kept his seat upon my shoulders, and I had become fatigued "with bearing him; and he made a sign to me that I should "go in among the trees, to the best of the fruits. When I "disobeyed him, he inflicted upon me, with his feet, blows "more violent than those of whips; and he ceased not to direct "me with his hands to every place to which he desired to go, "and to that place I went with him. If I loitered, or went "leisurely, he beat me; and I was as a captive to him. We "went into the midst of the island, among the trees, and he "descended not from my shoulders by night nor by day; when "he desired to sleep, he would wind his legs round my neck, "and sleep a little, and then he would arise and beat me,

"whereupon I would arise with him quickly, unable to disobey "him, by reason of the severity of that which I suffered from "him."* It will be remembered that eventually, after many days of beatings and ill treatment, Sindbad got rid of the old man by making him intoxicated with fermented grape juice, and then beating out his brains with a stone.

After his escape Sindbad wandered for some days upon the island until he met some merchants who, when they had heard his story, told him who it was that he encountered. "This man" they told him "who rode upon thy shoulders is called the Old Man of the Sea, and no one ever was beneath his limbs and escaped from him excepting thee."

The whole of Sindbad's personal narrative points to his adventure having been with an orang utan (simia satyrus): the difficulty, the only difficulty, but the whole difficulty, is the name ascribed to his persecutor by the people whom he met after his escape. Hole, in his commentary, suggested that the "Old Man" was an orang utan, but the qualifying words "of the Sea" so baffled him that he was prepared to consider them a mistake. "I would willingly suppose" he wrote, "the phrase 'of the sea' to be an addition of the trans-"lator, not countenanced by the original: or that it was "applied to Es-Sindbad's persecutor merely on account of his "insular abode, or usual appearance by the sea side. If "either of these conjectures be allowed we may pronounce "him, without any hesitation to be an *orang outan.*" Hole then goes on to give his reasons for his opinion.

Lane agreed with Hole that the "Old Man" was an orang utan, and supported the theory that the words "of the sea" merely denoted the insular abode.

Burton scoffed at the idea: "the inevitable orang-utan" was his jeering comment. But his own suggestion does not seem worthy of much support. The story is, he says "a "jocose exaggeration of a custom prevailing in parts of Asia "and especially in the African interior where the tsetse fly "prevents the breeding of burden-beasts . . . . . In

* Lane's translation.

"Central Africa the kinglet rides on a slave, and on cere-
"monious occasion mounts his Prime Minister." The weakness of the connection of ideas is however apparent. The custom of one man being carried by another does not convey the impression of the unnatural, clinging, unshakeable, creature with which Sindbad was saddled. For an explanation of the expression "of the Sea" Burton had recourse to the classics. "The classicists," he wrote "of course, find the Shaykh of the Sea in the Tritons and Nereus, and Bochart (Hiero ii 858, 880) notices the home aquaticus, Senex Judaeus and Senex Marinus."

But he has made no attempt to show any connection of ideas between the Man-riding Man and the Water-Man. The five arguments which Hole adduces in favour of the orang utan theory may be briefly enumerated as follows:—

1. The old man never speaks, but expresses his wishes by signs.

2. He apparently lives solely on fruit.

3. Though his face is like that of a human being, the hide of his legs is like that of an animal.

4. The "pressing," the "squeezing" the "winding" of the legs.—[Any one who has kept a pet orang utan, wah-wah (Hylobates lar) or siamang (H. syndactylus) as a pet knows the almost wild despair with which it clings to its master, as if it would suffer itself to be torn to pieces rather than be removed.]

5. The well known partiality of apes and monkeys to intoxicants, and the extreme quickness with which they become intoxicated.

A sixth point, which was probably unknown to Hole, but to which considerable weight may be attached is that stories similar to Sindbad's story are told to his day of the orang utan by the Dyaks. Hugh Clifford's "Story of Chaling, the Dyak" is very like the adventure of Sindbad. Chaling, it will be remembered, was carried off by a female orang utan to its platform on a forest tree, and for many days was unable to effect his escape.

The principal objection to the orang utan theory is that Simia satyrus is red, and not black. But in explanation of this I would suggest that there has been some confusion between Simia satyrus, which is red, and hylobates lar which is black. *At the risk being considered fanciful, I am even prepared to suggest that the white beard, with which some some old versions of the Arabian Story and the modern illustrator to Lane's translation have adorned the "Old Man" are an embelishment of the white ruff of Hylobates lar. A minor objection is the fact that grapes do not grow in the countries where the orang utan is found. Toddy, however, and other similar intoxicants are well known; and it is not improbable that the words "grape juice" were inserted by some copyist.

Let us take it that Sindbad's persecutor was an orang utan. How do we get from orang utan to "Man of the Sea"? Simply, I think; through the Malay. "Man of the Sea" (orang laut) is a mistake for "Man of the Forest" (orang utan).

It is well known that orang utan has two meanings: it is the name for the ape, and is also the generic name for the aborigines. They are known as orang utan; orang bukit, (men of the hills); or, in the case of the tribes driven inland, orang dalam (men of the interior), or orang darat (men of the land); whilst in contradistinction to the latter, the tribes driven to the coast are known as orang laut (men of the sea).

Thus the Sakei are divided into Sakei laut and Sakei darat, in the same way that Dyaks are divided into Sea-Dyaks and Land-Dyaks.

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* In the account of Sindbad's adventure in his third voyage, in the Island of Apes, Lane's translation describes the apes as being "covered with hair like *black* felt," while in the Calcutta edition and Langlès' edition they are described as "*red* downy creatures." I suggest that the mariner who described the animals as red was thinking of the orang utan, and that the other who described them as black was thinking of the wah-wah. A similar confusion seems to have been made in the case of the "*Old Man.*"

Jour. Straits Branch,

It is easily therefore to make a mistake between a "man of the sea" and a "man of the forest," for both are of the same stock; and it is equally easy to make a mistake between the aboriginal and the ape, for both are known by the same name. And this is the mistake that I think has been made. The position may be briefly put thus:—what the merchant said to Sindbad was "you've met an orang utan:" what Sindbad has recorded is "you've met orang laut."

If this is conceded, it would appear that Borneo is the island of the adventure with the "Old Man," (Lane suggested Sumatra, where the orang utan is also found) and that Sindbad's tale and Hugh Clifford's tale are but slightly different versions of the story (founded perhaps on fact) which is told by the Dyaks regarding the gigantic ape that, to this day, is the most typical inhabitant of their forests.

Postscript. I have, since this note was set up in type, come across a mistake which is exactly similar but even more extraordinary. On page 175 of Volume II. of "Asiatick Researches" will be found a curious confusion between the Thibetan Yak and the manatel or dugong. Two more dissimilar animals could hardly be imagined; but one is the "Mountain-Cow" and the other is the "Sea-Cow;" and "Mountain-Cow" and "Sea-Cow" have been confused in exactly the same way that "Forest-Man" and "Sea-Man" have (I suggest) been confused.

W. G. M.

Spada.

One of the first words that a visitor to Java or Sumatra hears is "spada." It is, in the hotels of the Dutch Colonies, the common call for a servant; a person shouts "spada" in the same way that in this Colony he shouts "boy" and in the same curious way the servant, wherever he may be, shouts back "tuan." The word is not a native one, and is not used by the natives.

The derivation usually given of the word is a corruption of two Malay words "siapa ada" (is anyone there?).

I do not know however whether any one has suggested that the word dates from, and is a survival of, the days of British rule in the island now under the Dutch flag. Such however is probably the case. The use in the Bengal Presidency of the call "koi hai" (is anyone there?) is so well known that a civil servant of that Presidency is generally known as "Qui-hai."* I suggest that "siapa ada" is merely the translation of "koi hai" and that it was introduced by the servants of the Honourable East India Company who had served in Calcutta before they came further east. "Siapa ada" certainly is not idiomatic Malay, and would not ordinarily be used by Malays in the sense in which, in this case, "spada" is.

Probably it is this very fact, quite as much as the open vowel sounds of the syllables, that have led to its present corrupted and contracted form.

If my suggestion is correct, two curious facts are worthy of note: first, that in India it is the caller and in the Netherlands Indies it is the person called that is known (in each case

* It has even passed into the French language.

In the "Correspondance avec sa famille" of Victor Jacquemont therre is the following passage (Vol: II. page 308 :)

"J'ai vu dans vos gazettes de Calcutta les clameurs de *quoihaes* (sobiquet des Européens Bengalis de ce cote) sur la chaleur."

by the alien nation) by the words of the call; and second, that the call survives only in a country that has ceased to be under British rule, and does not survive (if indeed it ever was known) in the Colony of the Straits Settlements.

W. G. M.

Two New Species of Cicindela (Tiger beetles) from Borneo.

By Dr. Walter Horn.

Cicindela Hewittii, new species.

Cicindela phalangioide, Schw. Geb. affinis differt statura majore latioreque, tota fere labri latitudine punctis setigeris occupatis (parte marginali solummodo impunctata) clipei angulo laterali, fronte supra antennarum insertionem et discoidaliter intra anticos oculorum margines (his sparsissime) pilosis, inter oculos multe minus excavata; pronoti disco planiore, sulcis transversis (proecipue antico) evidenter minus profundis, apice basique declivibus strangulationem basalem versus abruptius constricte (marginibus lateralibus), in parte media magis parallelis) lateraliter sat late sparsimque piloso, elytris pone angulum externum apicalem minus sinuatis; punctis insculptis (postice vix) antice paullo minus profundis ut sculptara tota valde (aequalis videatur); pedibus brevioribus (sed longis) femoribus distaliter minus late flavescentibus. Tota corporis superficies cum femoribus cupreo-brunnea, tibiis (proximaliter plus minusve flavescentibus) tarsisque caeruleo-viridibus, 4 primis antennarum articulis viridescentibus, (hic inde cuprassentibus) corpore subtus viridiaeneo, hinc inde paullulum caeruleo variegato) lateraliter plus minusve cuprasseatibus. Long 6½ mm (sine labro) 1 mascula; Kuching, Borneo VI. 1903 A. Dom. J. E. A. Lewis captus.

The three first articulations of the maxillar palps hardly, the trochanters mostly greenish. Anterior margin of the labrum a little concave and without any teeth. Yellow margin of the elytra thin running from the shoulders up to the apical spine but a little interrupted be-

hind the shoulder. Cheeks, prosternum and episterna of pro. and mesothorax sparingly covered with long bristles. Mesosternum anteriorly bald, posteriorly shortly and sparingly pilose. Disk of the metasternum (posterior part of it bald), of the posterior coxae (the same for the unier part of them) and of the abdomen densely covered with short bristles.

The meta-espisterna and lateral part of the posterior coxae, of the meta-sternum and of the abdomen with moderately long bristles closely set. Antennae and intermediate coxae and the humeral part of the epipleura of the elytra moderately pilose. Head and prothorax dull, elytra moderately shining with a very short sutural spine.

The species is very remarkable by the prominent eyes, form of the middle part of the pronotum, the moderately shining elytra; the pubescence of the clypeus, cheeks, frons, latral margin of the pronotum, pro-and metasternum and coxae.

It gives me great pleasure to dedicate it to the amiable director of the Museum of Sarawak who was kind enough to present me with the only specimen.

Cicindela spinicollis, n. sp.

Cicindela denticollis, similis, differt labro non recte truncato sed antice ariso, fronte pronotoque perparum grossius anguloso, genis antice sparsim irregulariter punctato-foveolatis; pronoto parte intermedia planiore angustissime longiore lateribus rectis anticem versim magis convergentibus, impressionibus transversis longitudinalique media levioribus, angulis posticis simili in modo dentiformibus, sed hoc dente visu verticali) magis lateraliter directo (declivitate postica minus anguli paullo minus alta et grossim rugata; plica illa antebasali in illa specie a dente oriente et transversaliter intus ducta, in nova specie paullo minus evidente et post dentem originem habente) elytros faeminae macula nigri-

cante solummodo submicante discoidali ornatis, spina suturali magis retracta et longiore totis densius, indistinctiusque punctatis; signatura flavescente valde reducta; macula basali media perparva, vix percipienda, linea tenui humerali marginali brevi, alteraque angusta apicali a spina usque ad angulum apicalem extrorsum ducta. Long 8¼ mm.

One female from North Borneo. The labrum is yellow without any distinct tooth, clypeus and frons bald and finely rugulose, the eyes indistinctly striolated. The pronotum shows a little before the hind angles a laterally prominent tooth, which stands about the same height at the ordinary basal transversal impression; about in the middle between this tooth and the basal margin runs an indistinct elevation (accompanied by a sulcus behind it). In *C. denticollis* this elevation is better developed and takes its origin just *from the basal tooth (the whole middle pronotum is also much broader transverse, etc.) The colouration of the upper side of *C. spinicollis* is a little darker and more dusky brownish brassy than in *C. denticollis;* the puncture of the elytra is finer and less distinctly developed. The cheeks are finely lineated and have at their anterior half some irregular punctiform impressions. The episterna of the prothorax are only at their inner part (sparingly those of the meso and metathorax everywhere moderately densely pilose; the lateral part of the metasternum, posterior coxae and abdomen are densely pilose. The posterior end of the yellow humeral slope and the anterior end of the apical one are indistinct. The four basal articulations of the feeler coppery brassy, femora greenish brassy with the extreme base and a longer part of the apex yellow. Trochanters yellow. My only specimen does not show any

* The same for *C. Wallacei* Bat., where the antebasal elevation is about as indistinctly developed as in the new species, but the pronotum of Bates, species is broader an anteriorly not narrowed, the elytra are much longer and more parallel etc., *C. Wallacei* Bates occurs in Celebes.

bristles at the lateral margins of the pronotum but they might be spoiled.

Some time ago I became doubtful whether the locality, I had once given for *Cicindela denticollis* (i.e. New Guinea) was exact, as I have never seen other specimens but the two types, the question has to be kept still in suspense.

Bats in a Bamboo.

A large clump of the bamboo *Dendrocalamus pendulus* Ridley which had died after flowering in the Botanical Gardens Singapore was being cut down in May and one of the coolies while cutting the culms up into lengths and splitting them noticed a strange noise within a joint. On splitting it up three or four bats flew out but there being more inside he brought it to me tied up. On taking it to the museum and carefully opening it Dr. Hanitsch and I found no less than twenty-three bats of which four were adult females and nineteen were young ones. One of these was still clinging to the mother and sucking. The joint of bamboo in which these bats were enclosed was a foot in length and the diameter of the hollow inside was 2 inches. The septa at each node were perfect and unbroken, and the only possible entrance was made by a crack on one side which allowed of a narrow slip to be pushed outwards so that a triangular aperture a quarter of an inch across in its widest part appeared in the upper septum.

Through this very small space all these bats must have crept. The inside of the bamboo was wet and dark coloured and there were some dipterous larvae within.

In another clump of the same kind of bamboo, two other joints containing young bats of apparently the same kinds were opened. In one joint when opened, it having been felled and left for some days in the sun all the bats were dead and decomposed. They nearly filled the joint and were apparently about thirty in number. In the other several bats had escaped but there were a number of young ones and one half grown. Specimens of these bats were sent to the British Museum where Mr. Oldfield Thomas examined them and found them to be *Tylonycteris pachypus*, (*Vesperugo pachypus* Dobson). He writes, "This bat has an exceedingly flattened skull and thus many account for its ability to get

through a crack only a quarter of an inch wide. I never heard of specimens found in such a place before."

H. N. RIDLEY.

The Labiates of the Malay Peninsula.

By H. N. Ridley.

The *Labiatae* in the Materials for a Flora of the Malay peninsula have been described by Dr. Prain who gives eighteen genera and thirty species of this order as occurring in the Malay peninsula. Like the *Compositae* the Labiates are very poorly represented all through the rain forest region. They are inhabitants of open country and being all small plants and being dispersed chiefly by the mere sprinkling of their seeds as the wind blows, can neither push their way into our dense forests nor establish themselves there in the thick shade if they did get there. The only forest species indeed that we possess, the Gomphostemmas, have been so far modified for forest life that their fruits are developed into small white pulpy drupes, which can be eaten by birds and so the seeds dispersed. An analogous case among the Rubiaceoe with capsular fruit is seen here too in *Hedyotis congesta* belonging to an open country group of capsular seeded weeds in which also the fruit is developed into a small white pulpy berry.

The species recorded in the Materials are as follows:

Ocimum sanctum, L. *O. Basilicum*, L. *O. gratissimum*, L. (and *O. canum* might be added.) *Orthosiphon stamineus*, Benth. *Hyptis brevipes*, Poit. *H. suaveolens*, Poit. *Plectranthus Kunstleri*, Prain! *Coleus atropurpureus*, Benth! *Pogostemon Heyneanus*, Benth! *P. Cablin*, Benth. *Dysophylla auricularia*, Bl! *Mentha javanica*, Bl. *Calamintha gracilis*, Benth! *Salvia coccinea*, Juss. *S. plebeia*, Br. *Scutellaria discolor*, Colebr! *Anisomeles ovata*, Br! *A. malabarica*, Br. *Leonotis nepetifolia*, Br. *Leucas martinicensis*, Br. *L. zeylanica*, Br! *L. lavandulifolia*, Sm! *Leonurus sibiricus*, L. *Paraphlomis rugosa*, Prain! *Gomphostemma microcalyx*, Prain! *G. crinitum*, Wall! *G.*

Scortechini, Prain! *G. Curtisii,* Prain! *Cymaria dichotoma,* Benth! *Acrymia ajugiflora,* Prain! Those marked "!" are the only ones which can claim to be really indigenous.

The Basils, *Ocimum* and the Mint, *Mentha javanica* are garden pot herbs which can hardly be said to have established themselves anywhere. The Mint quoted only from Malacca, Griffith, has long been cultivated. It seldom flowers here, and I have never seen it outside a garden plot. *Salvia coccinea,* Juss. and *Orthosiphon stamineus* as far as our region is concerned are only to be met with in flower beds. The *Orthosiphon* "Kumis Kuching" of the Malays is however a native of Siam and may be found wild across our borders in the extreme north.

Leonurus nepetifolia, Br. is also a cultivated plant only to be found in gardens.

Anisomeles malabarica, Br. only met with in Penang town suburbs, is obviously an introduction from India probably by Tamils. It was collected in 1822 in Penang by Wallich.

Leonurus sibiricus is brought in and cultivated by Chinese who use it in medicine.

Salvia plebeia, Br. is only recorded from Malacca without collector's name, probably the specimen was from an introduced plant. *Leucas martinicensis,* Br. is also an introduction. It has only been obtained by Scortechini in Perak.

None of these plants have ever established themselves as weeds, and can only be classed as Garden escapes.

Thoroughly established here as all over the tropics are the two American *Hyptis, H. suaveolens* and *H. brevipes.*

The rest of the list fall into three groups (1) herbs occurring as weeds only in cleared ground near cultivation, but certainly natives of this area. These are *Coleus atropurpureus,* Benth., *Anisomeles ovata,* Br., *Lencas zeylanica,* Br. and *L. lavandulifolia,* Sm. and *Calamintha gracilis,* Benth. This latter I found in some quantity at the foot of the Thaiping hills in open ground. It has otherwise only been found in Java and once in Assam.

(2). Herbs growing in the jungles and obviously indigenous the *Gomphostemmas,* and I believe *Pogostemon Heyneanus,* Benth. the Indian patchouli.

The *Pogostemon* is not so far as I am aware cultivated here, but it is possible that it is. I have met with it on stream banks in forests, at Rawang in Selangor (No. 7603 of my collection) and at Taka Tahan on the Tahan River (No. 2031) also in Sarawak at Lundu (No. 1238) and it is in Haviland's collection from Penkulu Ampat in Sarawak. In the Tahan River locality it was growing near *Colocasia antiquorum* at an old Sakai camping ground, and was probably carried there by the Sakais, but there was nothing to suggest it had been introduced in the other localities. It is known to the Malays as Rumput Ruku, Poko Nijao, Nilam Bukit and Chilam Bukit. It is used as a poultice in cases of headache, rheumatism and boils, and in the form of a decoction is drunk for dropsy. The flowers the colour of which is not given in the Materials are pale violet.

P. Cablin, Benth. the commonly cultivated patchouli is described fully in the Materials. Its native home is quite unknown.

Dysophylla auricularia, Bl. is undoubtedly wild here, I think. It grows in swampy open ground, edges of rivers, etc.

Scutellaria discolor, Benth. was once collected by Scortechini in Perak and is probably wild. I have never seen it.

(3). The third set of indigenous Labiates are all from the limestone rocks of Ipoh and near by. They are *Plectranthus Kunstleri,* Prain., *Paraphlomis rugosa,* Prain. and *Cymaria dichotoma,* Benth., *Acrymia ajugiflora,* Prain. The occurrence of four species of this order out of so small a number of indigenous species on such a limited area as this range of limestone hills is very remarkable.

Thus this large order is represented in the Malay peninsula by only 15 species which can be considered to be truly indigenous.

The Crackling Moth.

By H. N. Ridley.

It is not unfrequent when passing along roads through woods, just after dusk has set in to hear all around a strange crackling sound not very loud but quite distinct and resembling somewhat Chinese crackers heard at a distance. This is produced by a black moth of some size, which seems to be hardly distinct from *Nyctipao hieroglyphica* as figured in Hampson's moths of India, and Moore's Lepidoptera of Ceylon. I do not find any mention of the peculiar behaviour of this insect made anywhere in these works, so I will give some account of it. The moth is three and a half inches across the wings, which are rather longshaped and scolloped along the edges, wings and body are of a deep brown black, above and below and on the upper wing near the tip is a yellow mark something like an 8 but with the loops more oblong and angled and the neck more distinct. In the centre of the upper wing is a faint shadowy eye formed of two rings of black one inside the other, the centre of a slightly paler brown colour than the rest of the wing. On the underside the yellow spot is seen but not so bright in colour, the peacock's eye is invisible and there is another small yellow spot lower down on the upper wing. The body is cylindric black, and the antennae are wiry and black. The insect differs from the figure of the Ceylon form, in Moore's Lepidoptera of Ceylon, in its darker colour and very indistinct eye, which in the Ceylon form has some chestnut red in the centre, (*Argiva hieroglyphica* Pl. 165) but it is perhaps a local form. The insect above described is a male. The females have a white spot on the upper wing.

During the day, the moth hides under roots or in crevices of rock where it is quite dark, as do most species of the genus, and if disturbed dashes off to seek another hiding place. I

have seen it thus in the garden rockery, and in the Bukit Timah forests. It leaves its resting spot about half past six in the evening and betakes itself to an open road or path. Here it flies briskly backwards and forwards, in the shadows, and at such a pace that owing to this and its dark colour making it so invisible, it is very difficult to capture. Often half a dozen or so are dashing about the road at a time and they keep to specially favoured spots, night after night. They do not make any noise when flying about singly, but when two are flying about chasing each other they produce the strange crackling sound described above. Owing to the darkness it is impossible to see how they do it, neither am I sure whether it is effected by a pair or by two males only. I have only caught males. They remain till it is actually quite dark, but then seem to disappear. Neither light nor cow-droppings which are often attractive to moths engage their attention. They keep just out of the light of the road lamps. When by a lucky stroke one is secured in the net, it is usually very quiet and does not flutter about, so that often one does not notice at first that it is trapped, but so fast it flies and so hard one has to strike at it that the insect is very apt to be damaged by the concussion.

It appears at the end of May. This habit of dashing about the roads and its peculiar crackling noise, are not shared with any other Nyctipaos as far as I know.

A larger species with brown wings ornamented with white eyes, is one of our commonest moths and often comes to light. It rests during the day under rocks or banks, or on beams in sheds or houses and though rapid in flight when disturbed, merely dashes from one hiding place to another, and I have never met with it dashing about the road at night in the way that *N. hieroglyphica* does. The latter is abundant in Singapore and I have also met with it in Pahang and other parts of the peninsula.

Nothing appears to be known of the life history of this moth.

H. N. RIDLEY.

Jour. Straits Branch.

New or Rare Malayan Plants.

Series IV.

By H. N. Ridley.

It will be seen by this series of novelties that the knowledge of our flora even of the best known spots is not yet complete. Even in Singapore with its nearly exterminated native flora, still some novelties lurk in the few remaining bits of forest, thus the Stagmount wood produced the beautiful new ginger which was found growing in a spot which I have frequently visited and only a few yards from my usual track. The *Randia,* the *Heritiera* and *Diospyros* described herein I have known for many years, but they have not been described in the Materials and so are now published for the first time.

The well known furniture wood Katinga from the Siamese borders has long been prized and I obtained leaves and a fruit some years ago from Mr. F. G. Penney, who had a fine collection of furniture made from its wood. A number of young plants were raised in the Botanic Gardens, and I lately obtained specimens shewing parts of the flower from Mr. H. C. Robinson. It proves to be a *Murraya* allied to the well known Kamuning wood, so much valued for the handles and sheaths of Krises.

The low-lying forest region of Southern Johore, has produced several interesting novelties, including a remarkable new genus of gingers, but many more curious and interesting plants will be found in this unexplored district when time serves to investigate it. From Sarawak Mr. Hewitt still continues to send many more novelties, and among Sarawak plants I am glad to be able to associate the name of the

Founder of our Society with the beautiful climber, *Hosea Lobbiana,* the ladder to the moon, (Tanga Bulan) of the Malays. This charming plant abundant in the swamps near Kuching, has been more or less known for a long time. Thomas Lobb while collecting plants for cultivation for Veitch found it and dried a spray of it which is now at Kew, but Lobb does not seem to have troubled to put localities on the tickets of his dried specimens, and when his collections were received at Kew, many were wrongly localised, and this plant was supposed to have come from Penang, and was described as thence by Clarke in the Flora of British India as *Clerodendron Lobbiana,* (the peculiar fruit however prevents it from being a Clerodendron).

Miss North saw it at Kuching and made a drawing of it, which however was not recognized as Lobb's plant. Bishop Hose brought plants of it into his garden at Kuching, and some years ago gave one to the Botanic Gardens in Singapore where it has been cultivated. It seems of slow growth and not very easy to propagate, so that it has not been found possible as yet to distribute it to other gardens. It is a most attractive plant with its red upper leaves and salmon-orange flowers. A contrast to it is the dwarf *Clerodendron pumilum* from the road banks of Matang mountain in Sarawak, perhaps the smallest of clerodendrons, though with a fairly large tuft of white and pink flowers.

STERCULIACEAE.

Heritiera elata, n. sp.

A gigantic tree 100 feet tall 2 feet through with strong buttresses, bark grey flaky. Leaves coriaceous elliptic obtuse with a round or truncate base 4 inches long 2¾ inches wide smooth shining above, coppery scaly beneath, nerves 5 pairs elevated beneath, inconspicuous beneath, petiole ¼-½ inch long. Panicles axillary on the branches in the axils of fallen leaves about five inches long, lax many flowered about 4 inches long, all

densely covered with stellate hairs. Male flowers pink campanulate shortly 5 lobed, $^1/_2$ inch long, covered with stellate hairs outside. Androecium very slender $\frac{1}{3}$ the length of the tube, anthers in a whorl 5: disc large circular. Fruit on stout woody peduncles, obovate woody brown, with a subtriangular woody wing running to a point obtuse, $1\frac{1}{2}$ inch long, wing $\frac{1}{2}$ inch long. Seed oblong, cotyledons fleshy, no albumen.

Singapore: Gardens (Ridley 6015).

There are two or three of these fine trees in the Garden Jungle. The finest is a conspicuous object by the plant sheds growing close to a still taller *Palaquium bancanum*. The underside of the leaves is covered with a layer of coppery silvery scales circular in outline with numerous irregular teeth on the margin. These scales also occur on the upper surface of the young leaves. The Male flowers are produced in great abundance rosy pink in color. The females seem much scarcer. I have failed to find any on my specimens. The fruit has a much more distinct wing than has *H. littoralis* the common sea shore tree, but it is not sufficiently large to act in dispersing the plant. The fruits indeed simply fall in great quantities beneath the tree and most of them perish after a short time.

RUTACEAE.

Murraya caloxylon, n. sp.

A tree of considerable size the branches covered with a pale flaky bark. Leaves 8 inches or more long with 13 leaflets, rachis flattened and winged narrow, leaflets 3-$3\frac{1}{2}$ inches long or less by $1\frac{1}{2}$ inch wide, alternate oblanceolate obtusely acuminate with a triangular base, minutely petiolate inaquilateral thin bright deep green. Flowers pale yellowish green several together in small panicles, in the upper axils of a branch, about an inch long. Sepals connate ovate acute $\frac{1}{10}$ inch long. Petals

and stamens not seen. Ovary stalked, hairy, style rather stout hairy, stigma capitulate. Fruit oblong rounded at both ends, 4 inches long and three inches in diameter, the pericarp dotted and warty greenish eventually becoming yellow, half an inch thick, lemon yellow inside, full of long resin cells narrowed at the mouth and dilated below, cells 5, with rather thick tough walls, pulp of transparent flattened sticky fibres olive green in colour and tasteless. Seeds numerous about 5 in a section ovate flattened half an inch long ⅛ inch thick, olive grey.

Southern Siam: Patani (Penney); Upper Perak: Kenering at 500 feet elevation (Robinson 5548).

This tree known as the Katinga is famous in the Malay peninsula for its beautiful wood. This handsome wood is of light yellow color, ornamented with dark brown streaks and strains, fairly hard in texture and taking a good polish. Mr. F. Penney obtained a considerable quantity of the wood from Siamese territory North of Province Wellesley, from which he had made furniture, boxes, etc., which was very highly valued on account of its beauty. He obtained also leaves and fruit of the tree. For the flowers I am indebted to Mr. H. C. Robinson, who met with it in Upper Perak.

It differs from other species of the genus in the greater size of the leaves, the conspicuously stalked ovary, and the remarkable fruit which resembles a citron. The rind has a bitter terpentiney flavour, and the comparatively scanty pulp is quite tasteless. The fruit is so entirely different from that of any other species of the genus that the plant might almost be separated generically.

MELASTOMACEAE.

Osbeckia chinensis, L.

Has been sent by Mr. Fox from Setul in Southern Siam where it was collected by Mohammed Aniff, the

Foreman Gardener of Penang Gardens. This is a very widely distributed and variable herb occuring all over tropical Asia from India and Ceylon to New Guinea and China, but hitherto it has been wanting from the Malay peninsula. The form collected is the narrow leaved form represented by *O. angustifolia* as figured in Wallich's Icones Rariores.

Rubiaceae.

Randia fragantissima, n. sp.

A stout woody climber, stem through bark of branchlets pale. Thorns in pairs strong woody ¼ to ⅓ inch long. Leaves elliptic acute to ovate acute coriaceous glabrous 5 to 7 inches long 2½ to 3½ inches wide, nerves about 10 pairs; petioles stout ½ inch long. Cymes terminal or lateral 2 inches across, 20 to 30 flowers in each. Flowers waxy white, fragrant. Bracts at the base of the flowers ovate pubescent, several on each very short peduncle, the terminal one double and resembling an epicalyx. Calyx campanulate pubescent ¼ inch long teeth 5 short acute. Corolla tube an inch long cylindric glabrous, lobes oblong obtuse ⅜ inch long, interior of the tube silky hairy. Stamens 5. Anthers nearly sessile in the mouth of the corolla, linear, base bilobed. Style stout longer than the corolla-tube with two flat elliptic lobes. Berry ¼ inch long.

Singapore: Garden Jungle (Ridley 5664), Bukit Timah (13022), Changi, Pulau Tekong; Malacca: Selandor (Cantley's Collector), Ayer Panas (Derry 1056), Bukit Bruang (Derry 274). Native names, "Akar Seburus;" "Akar Kuku lang."

A very beautiful climber when in flower with its tufts of pure white fragrant flowers reminding one of those of the *Stephanotis.*

MYRSINEAE.

Labisia acuta, n. sp.

Undershrub 18 inches tall, stem flexuous. Leaves about 12 lanceolate subacute equally narrowed at both ends, herbaceous dark above paler beneath quite entire, 4 to 6 inches long 1½ inch wide, petiole ¼ inch long winged to the base. Panicles in the uppermost axils dense-flowered, rufous scaly, 2 inches long lower part nude. Bracts lanceolate. Calyx campanulate 5 lobed lobes short. Corolla lobes lanceolate acute eglandular. Anthers eglandular.

Johore: Sungei Tebrau, March 1907 (Ridley 13010).

This really seems distinct specifically from the common and variable *L. pothoina*, Lindl. (*L. pumila*, Benth) in its elongate stem and acute petalled eglandular flowers.

Ardisia § *suffruticosa*, n. sp.

A low ascending undershrub little over a foot tall with a flexuous stem with brown longitudinally rugose bark. Leaves oblanceolate entire narrowed-gradually to the petiole, apex obtusely acuminate, margins faintly undulate eglandular, glabrous, (bud leaves red pubescent) nerves inconspicuous above, beneath about 20 pairs slender, slightly elevated, 4-5 inches long 1 inch across, petiole slender ½ inch long or less. Inflorescence from the axil of an upper leaf; peduncle patent slender, 1 inch long, red scaly pubescent. Pedicels umbellate ½ to ¼ inch long, few, about 7 occasionally umbellate. Flowers small pink. Calyx lobes 5 very small not overlapping lanceolate acute edges glandular ciliate. Petals $\frac{1}{10}$ inch long, lanceolate acuminate, obtuse. Stamens little shorter, filaments very short, anthers apiculate. Style little longer than petals in the open flowers. Fruit globose ¼ inch long, terminated by the remains of the style.

Johore: Sungei Tebrau in sandy woods, covering the ground (Ridley 13009) March 1907.

This species is allied to *A. divergens* but is a much smaller plant.

EBENACEAE.

Diospyros pyriferus, n. sp.

A tree about thirty feet tall with black bark. Leaves glabrous elliptic apex subacute or obtuse, base rounded, coriaceous 11-13 inches long 4 inches across, midrib stout prominent beneath, channelled above lateral nerves prominent beneath, depressed above about 13 pairs, alternate and irregular, meeting in loops within the margin reticulations conspicuous, petiole thick ½ inch long. Flowers in fascicles on the trunk or branches, cream color. Cymes ¾ inch long much branched with slender branches covered with appressed hairs. Bracts small ovate. Calyx lobes small $\frac{1}{10}$ inch long ovate hairy 5. Corolla male, thick and coriaceous ½ inch long, tube flask shaped lobes rounded recurved all glabrous. Stamens very numerous, about 30 ,in pairs, the front and back ones connate in pairs by the filaments, the back one with a longer filament than the front one, filaments very short, anthers linear, tip acute. Female flowers not seen. Fruit pear-shaped glabrous green 3½ inches long, 2 inches through, pericarp inside white, seeds ten. Calyx broad ½ inch long green glabrescent lobes spreading ovate acute inch long.

Singapore: Bukit Timah, forest at the West entrance to the Fern Valley (Ridley Nos. 8101, 10847, 10442, 6118, 8114). Flowering April and October, fruit October.

Near *D. oblonga*, Wall. but with many more stamens and a very different fruit like a small pear.

LOGANIACEAE.

Fagraea rotundifolia, n. sp.

A shrub with short internodes and opposite round leaves, sometimes subretuse with a small projecting point

in the notch, thickly coriaceous 3 inches long and as wide, petiole thick nearly half an inch long. Flowers solitary terminal subsessile. Bracteoles broad ovate. Calyx lobes ovate obtuse an inch long. Corolla tube straight tubular slightly dilate near the limb, 6 inches long ¼ inch through, lobes obovate rounded rather leathery 1 inch long ½ inch wide, apparently white. Stamens just protruding from the tube mouth, anthers oblong ¼ inch long. Styles as long as the capitulate.

Tringanu: Bundi (Rostado).

This fine plant is allied to *F. carnosa*, Jack, differing in the quite round leaves, and the very much larger corolla limb.

F. racemosa, var. *pauciflora*, King and Gamble.

I should certainly be inclined to consider this plant specifically distinct from typical *F. racemosa*. The typical plant is a large stout shrub or small tree common in the open country with flesh colored flowers in dense racemes. The variety *pauciflora* is a tall slender little-branched shrub, with a slender broken up raceme of white or creamy white sweet-scented flowers. It only occurs in dense wet forest and is not found with the common species. Thus the variety occurs in Bukit Timah forest, while *F. racemosa* does not occur at all in Singapore.

F. Ridleyi, King and Gamble.

This is not completely described as the authors had not seen flowers of it. It appears only to have been collected by myself once on the lower slopes of Mount Ophir and also on Bukit Timah in Singapore. The only plant I found in Singapore was growing as an epiphyte on a dead tree at the top of the hill. The tree later fell down and I believe the plant quite perished. Before it did so however, I managed to obtain a cutting and planted it in the Botanic Gardens where it has now developed into

a large branching shrub about 12 or 14 feet tall. It first flowered in 1902, and set fruit. The leaves are dark green shining above, glaucous beneath, obovate with prominent nerves beneath, on the upper surface are scattered roundish elevations, corresponding to glands of a yellowish color beneath. The buds are protected by a white resinous secretion which become, buff yellow when exposed to the air. The flowers are in cymes of four, on short peduncles. Calyx lobes ovate blunt nearly an inch long. Corolla tube thick nearly 2 inches long pale orange green, the lobes oblong obtuse emarginate reflexed, white shaded with green 1 inch long ½ inch wide. Stamens long white, anthers oblong rounded pale violet. Style rather thick greenish. Stigma capitate emerald green conic about 3 inches long, ending in the stout style.

F. auriculata, Jack.

This the finest of all the Fagraeas, usually at least starts life as an epiphyte and killing its host becomes a very large branching shrub sometimes as much as 30 feet tall. The branches are straggling and flexuous, and armed with short sharp points on either side of the auricles of the leaves. Most of the descriptions of this plant as taken from herbarium specimens much underrate the size of the leaves and flowers. There seem to be two forms however in one of which the flowers are much smaller than in the other and commoner forms.

The flowers during life have the following dimensions. Calyx 3 inches long and 2 inches in diameter. Corolla tube 6 inches long and 3 inches across the mouth, lobes 3 inches across, and ¼ inch thick. The whole corolla is eight to 12 inches or more across. The stamens are three inches long, the style four inches with an emerald green stigma more than half an inch across.

The flower opens in the early morning and remains open for two days before falling, or turning yellow. It exhales a coarse rather musky, scent. The stamens have

their anthers at first up-curved, but ere long they fall and lie on the lower face of the tube. The stigma is then not fully developed and not half as big as it eventually becomes. The stamens dihisce, and produce a quantity of white pollen when they are in a prone position. The flowers are now visited by the very small *Trigona (Tr ruficornis)*. These hover about the stamens, then settle and gather pollen, rise hover again and resettle. Occasionally they rest on the stigma, and deposit pollen thereon. Usually however the stigma is not developed till the next day, when the pollen is all gone, and if there has been rain, wet and spoilt, for it has no protection. On the second day, the stigma is fully developed, and has attained its full size. I have seen no other insect at the flower, though I watched for hawkmoths for a long time in the evening, none visited it.

The fruit is six inches long surrounded at the base by the thick green overlapping calyx lobes. These are ellipsoid rounded at the top and elevated in the centre, 3 inches long by 2 inches wide. The fruit is cone-shaped with a blunt top, polished lead-colour. When ripe it dehisces at the top into five lobes, covered with a sweet orange pulp in which the seeds are imbedded. This pulp is evidently derived from the placenta. The fruit often splitting and leaving the placenta erect in the centre and covered with the small seeds imbedded in the pulp. The pulp is sweetish with a strong unpleasant bitter taste and is very attractive to birds and ants. The seeds are irregularly angled, and finely reticulate. The seeds when deposited on a tree trunk germinate and the little plants as they grow emit long olive yellow roots like those of an orchid, which run upwards and downwards on the tree trunk, for a length of 6 or 8 feet or more. The plant branches from the base sending out 2 or more stems. Eventually it appears either to kill the tree or descend to the ground forming a tree of some size. The largest plant in the gardens has layered itself from one of the branches.

Jour. Straits Branch.

F. oblonga, King and Gamble.

This is incompletely described in the Materials for a Flora of the Malay peninsula, for lack of complete specimens. I would add the following notes to the description. It is an epiphyte with rather flaccid leaves for a Fagraea. The flowers are borne in pairs on axillary peduncles at the ends of the branches. The peduncles are an inch long and rather stout, as are the pedicels ¼ inch long. The calyx lobes are ovate blunt ¼ inch long. Corolla white, with a straight tube 1 inch long, the lobes ¾ inch long ½ inch wide oblong obovate with rounded tips. Stamens included, anthers oblong. Style an inch long, with a peltate stigma.

The plant occurs at the Tea Gardens and the Cottage on the Thaiping Hills and I have also found it at the Semangkok Pass in Selangor (No. 12069 of my collection).

F. fragrans, Roxb.

In the Materials for a Flora of the Malay Peninsula the description and quoted collection numbers for this plant include a tree very distinct in life but less easily separated from herbarium specimens. This species is I am pretty certain the plant intended by Blume in his *Fagraea speciosa* (Rumphia II. p. 33, tab. 81).

F. fragrans, Roxb. *F. peregrina,* Blume. Is a tree about 60 feet tall with a diameter of 1-2 feet. The bark is rough and thick deeply irregularly grooved, and brown. The leaves are elliptic acuminate narrowed at the base dark green dull with perfectly straight edges, nerves 8 pairs. The cymes are less lax than those of *F. speciosa.* The calyx lobes are short and ovate. The corolla tube ¼ inch long, trumpet shaped, the lobes oblong obtuse reflexed, as long as the tube. The stamens are long protruded, the anthers ovate, horse-shoe shaped, the loculi having a deep depression between them at the base.

The berry globose scarlet. Seed irregularly quadrate dark brown pustulate.

This plant is the Tembusu of the Malays, and a very well known and beautiful tree, whether in flower, covered with its masses of creamy white flowers scenting the air, or when bearing its bright orange red berries. It occurs in open country only, and comes up frequently in secondary scrub. In the Botanic Gardens it comes up everywhere in the grass plots where the seeds has been carried by bats or birds, or as I have seen by the fruit-eating ants.

Specimens have been distributed from the Botanic Gardens herbaria under Gardens (Ridley 5817); Pahang: Pekan (1028); Penang: Telok Bahang (Curtis 314); Malacca: Merlimau (Derry 53). I have also met it wild in the Dindings and Province Wellesley.

F. speciosa, Bl. is a very different looking tree, which attains a height of 100 feet and a diameter of 3-4 feet. The bark is curious, being channelled in long straight grooves, much less rough than in *F. fragrans.* The leaves are lanceolate gradually narrowed to the petiole and long acuminate, polished light green and conspicuously undulate even when dry, nerves five pairs. The cymes are more lax than in *F. fragrans.* The flowers orange yellow, and rather smaller. The calyx lobes more lanceolate, obtuse. Nerves 5 pairs. The corolla tube ¼ inch long but nearly cylindric, and the lobes lanceolate obtuse much narrower and shorter than the tube. The filaments are twice as long as the corolla lobes. The style is long and yellowish with a capitate stigma. The berry is oblong in outline and always yellow.

This tree is an inhabitant of the dense forests, though there are a few in what is now open country in Singapore, at Tanglin, they are merely the survivors of an old long destroyed forest. The tree is known, as Tembusu paya, Tembusu Bukit, and Tembusu Tembaga and is valued for its timber which is of much greater size than that of *F. fragrans.* The timber is indeed so durable, that there

is in the Garden Jungle, a stump of one of these trees, which has been felled upwards of fifty years ago. The wood of this stump is still very hard, and very resinous. On the top of the stump grows a fairly large tree of *Cumpassia Malaccensis*.

This plant has been distributed under, Singapore: Garden Jungle (Ridley 5818, 8921); Malacca: Bukit Sebukor (Derry 272).

It is by no means as heavy a flowerer as *F. fragrans*, and sets comparatively little fruit.

I have little doubt that Blume's *F. speciosa* is this plant, though he figures the flowers white. His plant was obtained in Java.

GESNERACEAE.

Didymocarpus Winkleri, n. sp.

Stem stout over three inches tall densely covered with appressed silky hairs. Leaves elliptic lanceolate obtuse narrowed slightly at the base slightly oblique, covered on both surfaces with appressed silvery silky hairs, 6 inches long and 2¾ inch wide, petiole silky hairy 3 inches long. Scapes strict erect several at the tip of the stem purple silky hairy 6 inches long including the inflorescence. Bracts linear lanceolate acute hairy narrow. Inflorescence panicled with short branches. Flowers numerous white. Calyx lobes lanceolate acuminate hairy, ¼ inch long. Corolla 1¼ inch long pubescent white, tube thick dilated upwards gradually, lobes rounded. Stamens 2, filaments sinuous, anthers semi-elliptic. Style nearly as long as the stamens, hairy. Stigma cup-shaped. Capsule cylindric acuminate slender pubescent an inch long.

Selangor at the Batu Caves near Kwala Lumpur (Dr. Winkler March 3. 1908).

This species is allied to *D. malayana* differing in its taller stem, more silky foliage and longer white flowers.

It was obtained by Dr. Winkler while making a short excursion to the well known caves.

ACANTHACEAE.

Polytrema cuprea, n. sp.

A slender creeping herb terrestrial. Leaves equal opposite ovate rotundate base rounded scabrid above, subpubescent beneath, margins pubescent, ½-1 inch long and about as wide, petiole ½ inch long, slender, dark coppery brown above paler beneath, nerves sunk on the upper surface. Flowers three or four on a short terminal cyme. Sepals linear acuminate very narrow spreading in fruit, scabrid pubescent brown, inside pinkish. Corolla ½ inch long pale rose, lobes oblong truncate, lower lobe with a bright yellow central patch. Stamens 2, filaments glabrous, anther cells oblong acute at both ends parallel. Pistil pubescent. Stigma capitate. Capsule ½ inch long clubbed 4 seeded. Seed half orbicular punctate.

Perak: at Telor Pinang near Ipoh. Oct. 1898 (Ridley 9769).

This pretty little creeper has been in cultivation in the Botanic Gardens for six years and living plants have been sent to Kew. It seems near *P. isophyllum*, Clarke, but that is a tall erect plant with very different and larger leaves, and axillary flowers. Like so many plants of this kind it constantly produces cleistogamous flowers so that the corolla is seldom seen.

VERBENACEAE.

Hosea, n. gen.

A woody climbing shrub, with opposite elliptic ovate leaves, petioled; the terminal leaves on the shoot partly or entirely red. Cymes long peduncled, axillary from the upper leaf axils, spreading, branches dichotomous. Calyx campanulate spathaceous bilobed pubescent, lobes

ovate. Corolla tube slender long, lobes 4, three obovate one linear oblong. Stamens 4, filaments far extruded, anthers rounded. Style as long. Stigma lanceolate. Ovary four-lobed, 4 celled, with an ovule in each of the two cells: Fruit one or two in each flower, fusiform narrowed at both ends, apex acuminate 2½ inches long, pericarp leathery deep purple. Seed solitary elongate.

H. Lobbiana, n. sp. *Clerodendron Lobbiana*, Clarke Fl. Brit. Ind. Vol.

A tall slender woody climber. Leaves elliptic ovate 2-3 inches long 1½ inch wide glabrous polished green. Upper leaves on the shoot smaller pubescent, orange red, petioles ¼ to 1 inch long. Cymes in the leaf axils of the upper leaves spreading on peduncles 4 inches long pubescent, branches of cyme dichotomous lax, pedicels ½ inch long, all pubescent except the corolla. Calyx campanulate bilobed half an inch long yellowish green lobes about ½ the length of the whole calyx, ovate. Corolla tube slender nearly an inch long, whitish, lobes four, 3 rounded obovate ½ inch long ⅜ inch wide, one linear oblong smaller all light apricot-orange. Stamens 4 filiform projecting for 2 inches from the mouth of the corolla tube, crimson, anthers smaller rounded black, pollen orange colour. Style filiform as long as the stamens crimson. Stigmas very small, lanceolate green. Ovary 4 lobed, lobes rounded elevated. Fruit one or two elongate fusiform deep purple three inches long and nearly ½ inch through in the thickest part.

Sarawak: in hot open swamps at Kuching abundant (Hullett, Haviland b. y. s. d., Ridley 11726).

This beautiful plant is known to the Malays as Tanga bulan, (the moon ladder). It was first partially described by C. B. Clarke as *Clerodendron Lobbiana* from a specimen collected by Lobb and supposed to have come from Penang, but doubtless Lobb collected it at the locality in Borneo. It was cultivated for many years by

Bishop Hose in his garden at Kuching, and I have much pleasure in associating his name with the genus. Plants have been cultivated also in the Botanic Gardens in Singapore.

The peculiarity of the genus lies in its remarkable fruit, which is not baccate as in most species of the genus but one-seeded.

Clerodendron pumilum, n. sp.

A dwarf plant, suffruticose, stem 2 inches tall, with whitish longitudinally ribbed bark, pubescent above. Leaves few 2 or 3, broadly ovate acute, base rounded broad, margin undulate distantly denticulate 4 to 6 inches long, 2 to 3 inches wide covered with pale unicellular hairs on both sides, petiole ½ inch long. Peduncle ½ inch long. Cymes in a pair about 2 inches long and as much across, many flowered, pedicels and peduncle densely pubescent. Sepals 5 lanceolate acute ⅛ inch long green tipped with red and covered with red hairs. Corolla ¾ inch long, tube cylindric dilated at the base curved above pinkish, pubescent, upper part crimson lobes 5-6 obovate rounded creamy white, hairy on the back. Stamens glabrous crimson over ½ inch longer than the corolla tube, anther linear deeply bifid black. Style filiform crimson glabrous long. Stigmas subulate green. Overy subglobose obscurely 4 lobed.

Sarawak: Mt. Matang, above the bungalow on clay banks by the road (Hullett, Ridley 12300).

A pretty little dwarf species of *Clerodendron with a* large tuft of pink and white flowers.

ORCHIDEAE.

Oberonia filaris, n. sp.

Caulescent, stems flexuous 3-4 inches tall, leaves 7 to 12 ensiform acuminate 1 inch long ¼ inch wide. Spike very slender 4-8 inches long, floriferous to the base. Flowers very minute yellow in approximate half whorls.

Bracts lanceolate acute. Sepals ovate acute. Petals narrower linear oblong obtuse. Lip oblong retuse or emarginate as long as the petals. Capsule stalked, elliptic 3 angled, $\frac{1}{10}$ inch long.

Sarawak: Kuching (Ridley, Hullett Sept. 1903).

This is allied to *O. ciliolata,* Hook. fil. but is a much smaller plant, with a very slender filiform spike and more minute not ciliolate flowers.

O. longifolia, n. sp.

Stem less with long fibrous roots. Leaves about 5 elongate scimitar-shaped linear acuminate, articulated and separating from the articulations, when dry 8 inches long $\frac{1}{4}$ inch wide, articulations $\frac{1}{2}$ inch long. Spike slender 8-14 inches long, floriferous nearly to the base, flowers minute irregularly arranged. Bracts linear acuminate longer than the flower. Sepals ovate acute, petals linear obtuse lip three lobed, side lobes from near the base narrow linear, shorter than the midlobe, which is ovate obtuse minutely toothed. Column fairly long with short tooth-like stelidia.

Sarawak: Bukit Tendang, Busau Sept. 1905 (Ridley), Quop March 1908 (Hewitt).

Remarkable for its long narrow leaves, curved and acuminate and long spike.

O. rubra, n. sp.

Acaulescent. Leaves fleshy ensiform $\frac{1}{2}$-1 inch long, $\frac{1}{4}$ inch wide red. Spike 2-3 inches long, base shortly nude above densely floriferous. The flowers in closely packed alternate half-whorls below, in complete whorls above. Bracts linear acuminate entire as long as the flower. Sepals ovate lanceolate. Petals narrower, entire. Lip ovate entire centre depressed. Capsule stalked $\frac{1}{8}$ inch long subglobose 6 angled, the 6 ribs very prominent.

Sarawak: on coffee trees on Matang Estate (Ridley).

I have known this little plant for years but never had the luck to find a flower in fit condition. Mr. Hewitt sends a specimen in flower, without locality. The whole of the little plant is usually red, leaves, flowers and fruit. The leaves are very fleshy. The lip appears to be quite entire ovate.

Platyclinis Bartoni, n. sp.

Pseudobulbs not seen. Leaf narrow lanceolate acuminate obtuse narrowed at the base, 7 inches long ¾ inch wide, keel prominent, ribs less prominent 6. Scape 12 inches, base 6½ inches nude, raceme lax, flowers inch apart. Bracts narrow lanceolate papery ⅛ inch long, spreading persistent. Pedicels with ovary a little shorter. Flowers apparently yellowish with a brown lip ¼ inch across. Sepals lanceolate acuminate acute. Petals nearly as long but little more than half as wide. Lip shorter than sepals, base narrow, side lobes fairly large lanceolate acute, excurved, midlobe much longer ovate acute, dilated towards the middle, margin towards apex denticulate, 2 elevated keels running from base and disappearing on the midlobe. Column hood long oblong three toothed at the truncate tip. Stelidia large rising as a margin to column from base, above triangular lanceolate with a broad base, tip acute, free from just below the stigma.

British New Guinea, (Major F. R. Barton No. 5).

This appears to be the first species of the genus found in New Guinea. It is rather remarkable for the long curved filament of the anther and longer rostellum than usual.

Bulbophyllum patens, Hook. fil.

A plant of this species was sent in a collection of orchids from Java by Mr. Beauclerk, and flowered in the Botanic Gardens, Singapore. The species has not hitherto been recorded from anywhere outside the pen-

ERRATA:—Page 129, for line 3 substitute—

B. lasianthum, Lindl.

insula and is not recorded by Mr. Smith among the Javanese orchids.

B. (§ *Monantha parva*) *Scintilla*, n. sp.

I met with a large plant of this strange orchid on a tree at Kukub, South Johore, in flower in April 1908. It is well known from the rocks on Penang Hill, and I have it also from Sumatra.

B. (§ *Monantha parva*) *Scintilla*, n. sp.

Rhizome slender wiry, pseudobulbs curved base prostrate, upper parts ascending ⅛ inch long, leaf oblanceolate fleshy ¼ inch long. Scape very slender 1 inch long. Flower $\frac{3}{10}$ inch long. Sepals very narrow lanceolate acuminate bright orange. Upper one much narrower than the others. Petals very short linear orange darker at the tips. Lip linear acuminate fleshy deep pink nearly half as long as the sepals.

Sarawak: at Kuching (J. Hewitt).

A distinct little species resembling *B. catenarium*, Ridl. but with acuminate sepals, gibbous below and different pseudobulbs.

B. (§ *Sestochilus*) *punctatum*, n. sp.

Pseudobulbs conic 1 inch long, with fibres of broken up sheaths at the base. Leaf elliptic coriaceous subacute base slightly narrowed to petiole 5 inches long 1½ inch wide, petiole 1 inch. Scape slender 3½ inches long. Flower solitary, upper sepal ovate acuminate ¾ inch long ½ inch wide yellowish with brown spots, laterals gibbous at the base narrower lanceolate linear acute pubescent yellow distally with a reddish tinge and red brown spots below. Petals lanceolate cuspidate nearly as long as the sepal, but narrower. Lip short oblong fleshy, base prolonged into 2 red processes, sides high elevated apparently purple with a pale broad groove between.

Sarawak: Matang (J. Hewitt).

There seem to be a number of these pretty Bulbophyllums in Sarawak, Kranzlin describes in Engler's Bot. Jahrb. 34. ii. 251 viz. *B. cryptophoranthoides, B. hymenochilum, B. scandens* all from Matang. This one is distinct in having pubescent lower sepals. It is allied to *B. insigne,* Ridl. of Borneo.

B. (§ Racemosae) perpusillum, n. sp.

A very small tufted plant, with minute cylindric pseudobulbs $\frac{1}{10}$ inch long crowded together, and subtended with papery lanceolate bracts. Leaf fleshy coriaceous oblanceolate obtuse, nearly $\frac{1}{2}$ inch long $\frac{1}{10}$ inch wide, narrowed into a petiole at the base, tip usually rounded with a minute mucro. Scapes slender as long as the leaves bearing one flower at the top. Bracts 2 the lowest lanceolate, the upper one narrower. Flower yellow less than $\frac{1}{10}$ inch long, pedicel short. Upper sepal lanceolate acuminate, laterals gibbous at base above lanceolate acuminate curved. Petals linear half as long. Lip broad, thin base oblong with two fleshy ridges enclosing a depression, lamina ovate subacute apparently white. Column with oblong stelidia truncate short. Anther rather broad, beak rounded fleshy.

Sarawak: Bidi (C. J. Brookes) Jan. 1908. Flowers yellow.

A very curious little species, forming minute tufts, with the flowers of the racemosae section but only one, on each.

B. (§ Racemosae) pumilio, n. sp.

Rhizome slender short, covered with papery sheaths, pseudobulbs cylindric $\frac{1}{10}$ inch long covered with a lanceolate papery sheath, nearly twice as long. Leaf coriaceous linear subacute 2 inches long, inch wide. Raceme slender 1-$\frac{1}{2}$ inch wide, enclosed at the base with a tubular sheath, with a lanceolate limb. Flowers remote white about 10. Bracts lanceolate acuminate about as long as the pedicel $\frac{1}{20}$ inch long. Sepals $\frac{1}{5}$ inch long,

lanceolate acuminate, lower ones gibbous at the base. Petals lanceolate acute half as long. Lip with a narrow base limb elliptic lanceolate obtuse margins denticulate. Stelidia porrect oblong rounded at the tip rather large for the size of the column.

Sarawak: Bidi, Jan. 1908 (C. Brookes).

The number of *Bulbophylla* of this section seems endless. This small species differs from any other known to me in its linear leaves and denticulate tip.

Bulbophyllum Brookesii, n. sp.

Rhizome thick and woody with closely appressed subglobose pseudobulbs, with depressed tops, truncate rounded ¼ inch long. Leaf coriaceous elongate subspathulate apex rounded, base gradually narrowed to a thick petiole, blade 6 inches long ¾ inch wide petiole 1½ inch long. Raceme 6 inches long slender erect glabrous, with several sheaths at the base. Flowers numerous, scattered from near the base upwards. Bracts linear acuminate $\frac{1}{10}$ inch long. Pedicels little longer. Sepals lanceolate subacute ⅛ inch long. Petals very small not longer than the column ovate. Lip very small fleshy sides at the base and for more than half the length of the lip curved up, with a groove between apex ovate thick and fleshy. Column and its foot short. Stelidia short subulate.

Sarawak: at Bidi (C. J. Brookes).

This species has somewhat of the appearance of *B. puberulum*, Ridl. but is quite glabrous, and has curious closely approximated pseudobulbs of a cupshape.

Bulbophyllum sarcanthoides, n. sp.

Rhizome very short, pseudobulbs very small. Leaf succulent lorate drying black, falcate acute 1½ inch long ¼ inch wide distichous. Racemes very dense ⅕ inch long with lanceolate acuminate bracts, comose. Flowers yellow ¼ inch long. Sepals lanceolate caudate with a strong central midrib no lateral veins. Petals wider at

the base lanceolate caudate, rather shorter. Lip half the length of the sepal base narrow, lateral lobes ovate curved obtuse, midlobe very narrow acuminate caudate centre elevated thickened. Column short and broad winged, filament distinct. Anther for the column large oblong rounded.

Johore: Sungei Tebrau, on trees over the river.

A very curious plant with the habit of a small *Saccolabium*, with flowers in upwards dilated racemes.

Dendrobium gramineum, n. sp.

Stems long very slender, branched about $\frac{1}{10}$ inch through flexuous, branches 6 or more inches long. Leaves linear lanceolate $\frac{1}{2}$-$1\frac{1}{2}$ inch long $\frac{1}{5}$ inch wide, acute bifid with one acuminate point much longer than the other, sheaths $\frac{1}{4}$ inch long ribbed and thickly nigrohirsute. Flowers solitary with several papery ovate bracts, at the base, peduncle slender $\frac{1}{4}$ inch long. Sepals $\frac{3}{10}$ inch long lanceolate threeveined. Mentum long straight parallel to the pedicel obtuse $\frac{1}{5}$ inch long. Petals narrow linear. Lip as long as the sepals base linear, lateral lobes triangular acute, short and broad. Midlobe spathulate with a narrow cloud and a rounded limb, three ridged and papillose. Column stelidia broad rounded.

Sarawak: Matang on trees (Ridley, Hewitt).

Allied to the terrestrial aquatic *D. conostalix*, Lindl. but an epiphyte branched with very different petals and lip.

Dendrobium Ardeni, n. sp.

Stems slender branched, pseudobulbs subcylindric slightly flattened olive green $1\frac{1}{2}$ inch long by $\frac{1}{4}$ inch wide remote. Leaves lanceolate linear 3-4 inches long $\frac{1}{4}$-$\frac{1}{2}$ inch wide dark green coriaceous, narrowed at the base subobtuse. Flowers in tufts from the axils of the leaf appearing singly or in pairs, as large as those of *D. Kelsalli*. Pedicel pale green $\frac{1}{4}$ inch long. Sepals oblong

recurved subobtuse cream with faint purplish veins. Petals linear acute narrower: Mentum short broad conic curved, faintly marked with red veins. Lip as in *D. Kelsalli,* but, lateral lobes short rounded pink, midlobe with a distinct claw then dilated into a bilobed rounded limb, on the disc two thick fleshy large semi-elliptical cushions deep-purple, rest of the disc and claw violet pink, limb creamy yellow. Column lemon yellow.

Johore: Kukub estate, Tempayang River, (Fl. in H. B. S. May 22, 1908).

This resembles *D. Kelsalli* but differs in the rather rather longer recurved sepals, the short rounded lobes of the lip, with a distinct claw between the disc and the limb, instead of overlapping, and instead of three ridges running from the base of the lip to the base of the midlobe, there are two thick fleshy deep purple crimson half elliptic cushions with a groove between. The flowers are less than half an inch long.

D. (§ Pedilonum) Crabro, n. sp.

Stamens subcylindric dilated upwards, strongly grooved of about 6 internodes 2 to 4 inches long, and $\frac{1}{4}$ inch through when dry. Leaves elliptic obtuse 3 inches long 1 inch wide, slightly narrowed at the base. Flowers borne in the leafless stems on the upper nodes solitary on short $\frac{1}{5}$ inch pedicels with an ovate bract. Peduncle slender 1 inch long pink. Sepals ovate $\frac{1}{4}$ inch long petals similar but shorter and more rounded at the tip. Mentum $\frac{1}{2}$ inch long base narrowed then dilate at the base, like the body of a wasp. Lip $\frac{1}{2}$ inch long, base narow linear then suddenly dilate into two oblong ovate rounded lobes $\frac{3}{8}$ inch across when expanded, then narrowed linear ending in a rounded reniform limb. Between the lobes the veins are thickened into a callus. Column dilated widely. Anther conic blunt, apex thick. Stigma cordate large with a broad thick elevated margin.

Sarawak: Matang (June 07, Hewitt). Petals with a green tinge, the veins red. Lip and column white.

This is a fine Pedilonum remarkable for its curious mentum narrowed and dilated towards the tip and curved like the abdomen of wasp, and for the lip with its two broad side lobes about half way from the base and the broad fan-shaped terminal lobe.

D. (§ Pedilonum) multiflorum, n. sp.

Stems slender 18-24 inches tall ¼ inch through slightly flexuous strongly grooved, internodes 1 inch long. Leaves elliptic obtuse nearly sessile 3 inches long by 1 wide. Racemes terminal 2 to 4 inches long many flowered. Bracts narrow lanceolate small. Flowers large. Pedicel winged ½ inch. Sepals elliptic lanceolate acute. Petals similar a little smaller. Mentum long curved half an inch long thick blunt. Lip spathulate, base linear centre thickened, limb broadly orbicular ovate 1 inch across distinctly nerved. Nerves at the base of the limb elevated into an undulating keel. Column rather tall oblong. Anther short and thick. Stigma narrow oblong with an elevated margin and two fleshy wings outside. Capsules ½ inch long elliptic.

Sarawak: at Quop (March 1908). Petals and lip yellow. Sepals red outside, the colour more pronounced on the mentum.

The habit of *D. secundum*, but with very different flowers.

Dendrochilum spathulatum, n. sp.

Rhizome long much branched slender $\frac{1}{10}$ inch thick, yellow, pseudobulbs cylindric yellow and deeply grooved when dry 1 inch long $\frac{1}{10}$ inch through. Leaf elliptic lanceolate narrowed rather abruptly to the base apex obtuse 2 inches long ½ inch wide. Racemes slender about 2 inches long floriferous to the base. Bracts ovate acute minute persistent papery half as long as the pedicels.

Flowers $\frac{1}{10}$ inch across. Sepals linear obtuse fleshy 3 nerved. Petals shorter. Lip less than half as long as the sepals narrow entire fleshy base oblong with two fleshy raised keel, apex subspathulate rounded thin. Column very short, upper margin oblong as long as the r est of the column, stelidia from near the anther base lanceolate acuminate apex subulate as long as the clinandrum margin. Capsule $\frac{1}{2}$ inch long and nearly as wide rounded triquetrous almost cone-shaped.

Pahang: on the Tahan River in fruit; Sumatra; Sungei Kelantan; Siak (Ridley).

Certainly near *D. aurantiacum,* Bl. but distinct in the very large oblong crest to the column, and spathulate lip. I believe the Pahang plant is identical with the Sumatran one though it is only in fruit.

D. intermedium, n. sp.

Stems long woody creeping $\frac{1}{10}$ inch through, pseudobulbs remote 1½-3 inches apart, cylindric rather slender 1 inch long. Leaves coriaceous elliptic obtuse 1½-2 inches long, by 1-1½ inch wide, petiole $\frac{1}{8}$ inch long. Racemes slender 4 inches long, 2 to 5 together close to a pseudobulb, with numerous lanceolate papery bracts at the base, floriferous to the base. Rachis black pubescent. Bracts (floral) minute ovate acute papery as long as the pedicels. Pedicels $\frac{1}{20}$ inch long. Flowers pale yellow very small. Sepals elliptic apices rounded. Petals narrower and shorter. Lip shorter than the sepal $\frac{1}{2}$ its length, linear oblong entire, with two large keels in the centre. Column rather small, stelidia linear acute erect longer than the column, back of clinandrium ovate.

Sarawak: Mt. Matang, June 1907 (Hewitt).

This species is allied to *D. aurantiacum,* Bl. of Java, and *D. brevilabratum,* Pfitzer collected at Baram by Hose. The foliage is quite different from the lanceolate leaves of the former, which it resembles in its nigro pubescent rachis that of *D. brevilabratum* being glabrous.

Eria eurostachys, n. sp.

Stems cylindric 8 inches tall covered with rather large loose sheaths strivate with oblique mouth, 1 inch or less long. Leaves numerous at the apex narrow lanceolate acuminate acute, narrowed to the base 4-6 inches long ½ inch wide. Racemes from upper axils very slender 4 or 5 inches long entirely ferruginous hairy, floriferous nearly to the base. Flowers very small numerous, red hairy. Bracts ovate acute feruginous hairy $\frac{1}{30}$ inch. Pedicel short and thick as long. Flowers to end of mentum ⅛ inch long. Upper sepal ovate acute cymbiform laterals ovate oblique, mentum long straight twice as long as the pedicel. Petals linear oblong obtuse shorter than the sepals. Lip very narrow spathulate, claw linear limb entire cordate obtuse. Column short very broad, anther flattened subquadrate retuse. Stigma elliptic large.

Sarawak: Mt. Matang (J. Hewitt) (June 1907).

A most curious plant with ferruginous spikes of small flowers, and leaves drying too of a rusty brown. It should I think be classed near *E. floribunda* from its habit, and form of stem but the hairiness and form of the flowers suggests an affinity with the Aeridostachya section.

E. tenuiflora, Ridl.

I can hardly separate a plant from Kuching from this Malay peninsula species. The Borneo plant has more acuminate sepals, and a rather wider more rhomboid lip.

E. Brookesii, n. sp.

Stems cylindric fleshy 4 inches long nearly ½ inch thick. Leaves lanceolate oblong acuminate acute narrowed into a petiole, nerves prominent, 9 inches long 1½ inch wide glabrous. Raceme dense, from below the foliage, 1½ inch long flowers numerous crowded, peduncle very short with ovate papery bracts. Floral bracts oblong lanceolate glabrous veined as long as the hairy pedicels

⅛ inch long. Sepal, dorsal ovate lanceolate cymbiform, laterals falcate acute mentum as long as the free portion all hairy, broad rounded at tip. Petals falcate lanceolate acute. Lip claw long linear narrow, lamina ovate obtuse obscurely trilobed, side lobes shorter than midlobe; two elevated nerves run from base of claw diverge on disc and meet again on the centre of midlobe where they are elevated into a fleshy mass and are here joined by the median nerve. Column short but stout, stelidia small. Anther broad thin. Pollinia pyriform.

Sarawak: Bidi March 08 (C. J. Brookes). Flowers pale almost fleshy color, midlobe of lip yellow.

Near *E. densa,* but with hairy flowers and no basal lobes to the lip. The specimen is poor.

Plocoglottis hirta, n. sp.

Stem over half an inch through, covered with long pubescent leaves lanceolate 15 inches long 2½ inches wide acuminate narrowed at the base to the broad sheath hairy on both surfaces ribs 5. Scape axillary 3 foot tall hairy, at the base a few distant sheaths ribbed acuminate 1 inch long, raceme lengthening to about a foot. Bracts comose lanceolate acuminate caudate subulate hairy 1-½ inch long. Pedicels hairy 1 inch long. Sepals and petals similar lanceolate caudate hairy outside ½ inch long ⅛ inch across at the base. Lip glabrous subquadrate narrowed a little at the base, apex with a long linear horn from each angle and a central one decurved at the tip. Towards the base of the lip a pocket is formed by the involution of a portion of the centre. Column short and very broad, clinandrum deep, no arms. Pollen masses 4 oblong ovoid.

Sarawak at Bidi (C. J. Brookes).

A very remarkable plant with apparently a tall leafy stem from the axil of which rises a tall slender scape ending in a gradually elongating raceme of hairy flowers.

The whole plant is very hairy. I have unfortunately no note of colour of flowers or height of the plant.

Geodorum pulchellum, n. sp.

Leafy stem with leaves little over 6 inches tall. Leaves 4 unequal, the largest elliptic undulate acute herbaceous dull dark green about 5 nerved 5 inches long, 2 inches wide. Racemes 2 to each leaf tuft 3 inches tall, peduncle 1-2 inches covered with loose lanceolate acute green sheaths, raceme nodding flowers about 8. Bracts lanceolate acuminate ¼ inch long. Pedicel as long. Sepals oblong lanceolate upper one narrower than the others ⅝ inch long white. Petals wider oblong lanceolate as long white. Lip entire saccate, shortly spurred ½ inch long apex rounded entire, base outside white, inside tinted purplish with 2 short calli or bosses, pustular dark red, apex of lip bright orange yellow. Column short, very broad and flat with no distinct wings, white with purple-madder streaks on the face and edging at base. Stigma large semi-ovate. Anther low, rounded flat truncate in front, pale yellow with a purple margin at the back and edges of cells. Clinandrum margin elevated ovate. Rostellum indistinct nearly entire. Pollinia elliptic.

Siam: Bangtaphan (Dr. Keith); Singgora (St. V. B. Down).

This charming little plant flowered in the Botanic Gardens, Singapore in April 1908. Mr. Down from whom I received it states that it grows under bushes in sandy spots.

Taeniophyllum gracillimum, n. sp.

Epiphytic, stem $\frac{1}{10}$ inch long, roots elongate, very narrowly linear obtuse 3 to 5 inches long $\frac{1}{16}$ inch wide. Scape very slender 1½ inch long, base nude, raceme very short, rachis slightly thickened. Bracts minute ovate acute. Pedicel and ovary longer. Perianth white $\frac{1}{10}$ inch long. Sepals lanceolate obtuse. Petals elliptic rather wider. Lip entire triangular ovate obtuse much

larger than the petals. Spur nearly as long as the pedicel, pendulous clubbed. Column short. Anther skull-shaped. Pollinia 4 hemispheric, pedicel slender terete disc very long lanceolate acute, posticous end rounded. Rostellum elongate broad lanceolate.

Johore: Sungei Tebrau (March 1907), Tempayan River; Selangor: Petaling Woods.

I have two or three times come across this little orchid in the woods fallen from the tops of the higher trees, but never was fortunate enough to find any trace of flowers till I obtained one on a plant collected in the woods bordering the Tebrau River in Southern Johore. The single flower obtained is very small and delicate but I think I have made out its structure completely. The plant seems to be intermediate between *Saccolabium* and *Taeniophyllum*. The short stem, slender inflorescence with persistent distichous bracts and flowers appearing singly, and the pollen masses divided completely, are characters of *Taeniophyllum*, while the disc and pedicel of the pollinia resemble those of a *Saccolabium*. Since writing the above I came across several specimens in the Kukub forests Southern Johore, fallen from lofty trees in flower in April.

Dendrocolla minima, n. sp.

Stem ¼ inch long covered with oblong obtuse fleshy leaves ½ inch long by ¼ inch wide or less. Racemes several ½ inch long, peduncles very short raceme lengthening to nearly half an inch with crowded ovate acute recurved bracts. Flowers very small ⅛ inch long, apparently pink. Upper sepal ovate, laterals ovate subtriangular larger. Petals shorter oblong. Lip with 2 appressed upper lobes linear oblong, below a spur as long as the short peduncle elongate scrotiform rounded, midlobe so short as to be concealed beneath the two side-lobes. Column straight rather tall, no stelidia, rostellum ovate. Anther skull-shaped truncate in front with a short tooth yellow.

Sarawak: Kuching (Hewitt).

A very odd little thing. The habit is quite that of a *Dendrocolla,* but the lip is very curious, the side lobes meet together in the middle line leaving only a slit as an entrance to the spur; the main part of these is depressed so as to form a flat disc, beneath is a minute midlobe. The spur is more like that of a Saccolabium.

Saccolabium laxum, n. sp.

Apparently a tall slender plant, upper part of stem ¼ inch through. Leaves lorate blunt unequally bilobed, coriaceous, 6 inches long ¾ inch wide. Panicle 18 inches long lax diffuse branches 4-6 inches long. Flowers distant. Bracts fleshy triangular. Flowers numerous $\frac{5}{10}$ inch long. Sepals oblong obtuse upper one slightly hooded. Petals smaller linear oblong shorter and only half as wide, greenish inside with a dull brown tinge. Lip white inside lobes triangular lanceolate, midlobe subcordate with a narrow base, fleshy blunt with a fleshy central keel running down into the spur and forming a partition, between the lateral lobes it is pubescent, but in the spur and on the midlobe it is glabrous. Spur ⅕ inch long thick porrect, curved forwards parallel to the midlobe or nearly so, callus on the back of the spur in the mouth, a raised tongue-shaped ridge fleshy grooved down the centre and pubescent at the lower end. Column short and broad, with two short linear pubescent stelidia, at the points where the lip is adnate to the column. Anther broad front margin, broad truncate, top of anther rounded grooved. Pollinia elliptic small, grooved transversely below the middle, pedicel triangular short, disc large fleshy saddle-shaped deeply bifid. Rostellar arms short blunt widely divaricate.

Sarawak: Matang, June 1907 (J. Hewitt).

This is one of the *Sarcanthus* set of this genus, and seems very distinct. The abrupt forward curve of the

thick spur reminds of the form of the lip in *S. penangianum, miserum,* etc. The form of the column and the curious pollinia recalls that of *S. rostellatus,* Ridl.

S. pinifolium, n. sp.

A dwarf plant 4 inches tall, internodes very short. Leaves crowded erect, sheaths strongly grooved $\frac{1}{8}$ inch long, lamina terete acute $1\frac{1}{2}$ inch long $\frac{1}{8}$ inch wide. Raceme slender $\frac{1}{2}$ an inch long 2 or 3 flowered. Bracts very small ovate. Flowers inch long from tip of sepal to spur tip. Sepals, upper one ovate, blunt, laterals broader ovate curved, strongly 3 nerved. Petals narrower and shorter linear oblong, slightly dilated towards the tip dull green with red centre. Lip shorter than sepals bright yellow spur short scrotiform, lateral lobes liner subacute erect small, midlobe has tall acuminate, basal lobes rounded small, callus in spurmouth a small short ridge, on back of spur a short cylindric decurved process. Column rather tall. Anther broad, beak large ovate triangular, pollinia not seen. Rostellar lobes very short.

Sarawak: Bidi (C. Brookes, comm. J. Hewitt).

S. strongyloides, n. sp.

Stem elongate $\frac{1}{10}$ inch through. Leaves terete recurved 4-5 inches long $\frac{1}{8}$ inch thick obtuse, sheaths 1 inch long ribbed and closely transversely wrinkled. Raceme 5 inches long, flowers distant on pedicels $\frac{1}{4}$ inch long. Bracts very small ovate acute. Sepals oblong ovate broad and short, quite blunt. Petals broader almost orbicular ovate. All yellow with red brown centre $\frac{5}{20}$ inch long. Lip pale violet, lateral lobes linear obtuse short apex spoon-shaped mid-lobe hastate, narrow, basal lobes broad rounded larger than the side-lobes, tip narrow obtuse crenulate, thin, spur short thick blunt slightly curved forward, tip retuse. In the centre of the mid-lobe near the mouth of the spur is a depression edged by an elevated V shaped ridge in front, in the centre of the depression a thin keel running down to form the spur

partition which is incomplete. Callus on the back of the spur curved narrow, grooved, apex pubescent, mouth of the spur pubescent. Column short, foot prolonged into the spur in a short process. Anther broad with a narrow straight margin. Pollinia semiorbicular, with a very broad thin pedicel subquadrate with an acute tip, disc fleshy apparently orange colored, saddle-shaped, back rounded; rostellar lobes broad deflexed quadrate.

Sarawak: Kuching Feb. 1908 (J. E. Lewis, comm. J. Hewitt).

Allied to *S. Machadonis,* Ridl. but with broader leaves, rounded broad petals and sepals and a different callus.

Podochilus rupicola, n. sp.

Tall stout tufted plant with long stems 2 feet long. Leaves elliptic 2 inches long ½ inch wide slightly narrowed at base obtuse at tip. Inflorescence 6-8 inches long pendulous, raceme 1½-1 inches long slender. Bracts small lanceolate deflexed, acute persistent. Flowers $\frac{1}{10}$ inch long. Upper sepal ovate small, laterals large triangular. Petals small oblong, mentum gibbous wide. Lip oblong apex bilobed lobes rounded, base rounded, with the horse-shoe-shaped callus at the base and 2 parallel ridges on the limb. Fruit ½ inch long fusiform.

Borneo, Sarawak: on rocks at Bidi (Ridley 11792); Batu (Hewitt).

Leucolena ornata, Ridl.

I put this curious saprophytic orchid into the section Epidendreae of Orchids with some amount of doubt as there was nothing at all which shewed any affinity to the plant in the section. Its appearance certainly suggested that its affinities lay with the Neottieae section among which saprophytes are not at all uncommon. But in the plants obtained in Bukit Sadanen in Malacca, I found what appeared to be a distinct disc to the pollen masses and the anther is not at all like that of most

Neottieae. I have recently (April 17, 1907) rediscovered the plant in Singapore, in dense forests by the side of a stream at a spot formerly known as Stagmount, and have thus had an opportunity of examining the plant again. The Singapore plant differs from the ones found in Malacca in having the lip nearly quadrate with a central tooth and hardly distinctly bilobed, the limb white and only the claw violet. The rostellum very small in the Malacca plant seems quite absent and the curved sausage-shaped pale flesh-colored pollinia have no trace of any disc at all. This plant was evidently destined to be self-fertilised as the pollinia slip into the stigma with the greatest ease. The filament so long in the Malacca plant is quite short in the Singapore one. For the present it may be preferable to consider the Singapore plant as a variety, *Singaporensis* of the species.

Now in the light on the plant shown by this variety, we can more easily determine its affinity, and that is I think with the genus *Gastrodia,* to which it is allied in its stout rhizome, its connate perianth, (for the whole of the perianth is connate at the base, though divided into two lips, one consisting of the sepal and two petals, the other of the two lower sepals), and the form of the pollinia. *Gastrodia* differs in the almost completely tubular flower, and the very short stelidia.

Leucolena ornata var. *Singaporensis.*

Lip subquadrate with a median tooth hardly bilobed, limb white, base violet. Rostellum quite absent. Pollinia free 4 with no disc. Filament of anther much shorter.

Damp sandy woods on a stream bank at Stagmount, Singapore, flowering in April 1907.

ZINGIBERACEAE.

Geocharis, n. gen.

Creeping herbs with rather slender rhizomes throwing up leafy stems and inflorescences at intervals. Leaves

elliptic to lanceolate shortly petioled. Inflorescence on a tall or short peduncle covered with long green sheaths, raceme erect many flowered. Flowers orange or red very shortly pedicelled. Bracts very small spathaceous. Calyx tubular trifid, lobes caudate ciliate. Petals as long somewhat similar. Lip deeply bifid into two narrowed linear lobes base adnate to the corolla. Stamen filament broader than the anther involute forming a tube with the lip, with two short subulate staminodes at the upper angle. Anther broad oblong with an entire ovate appendage. Style stout. Stigma obcuneate curved subbilobed. Stylodes annulate lobed.

Johore, Sumatra and Borneo.

This genus though based on a plant obtained in Johore, I think must include one at least and probably both of the plants described by Schuman under the section *Geocharis* of *Alpinia* vis. *A. macrostemon,* Schumann of Sumatra, and probably *Alpinia decurva,* Ridley a New Guinea plant. I have therefore adopted Schumann's sectional names as a generic names for these plants. Schumann who included a great many and very varied plants in the genus *Alpinia,* noted the fact that both the above mentioned plants resembled the genus *Riedelia,* and it is possible that *A. decurva,* Ridl. may belong to that Papuan genus. I cannot see any connection with or resemblance to the plants of the genus *Geostachys,* as suggested by him.

G. aurantiaca, n. sp.

Rhizome ¼ inch thick, leafy stems about 2 feet tall swollen at the base, sheaths rugose closely brown hairy blade a foot long 4½ inches wide elliptic glabrous deep green shining above, paler beneath, petiole ½ inch long brown hairy. Peduncle of inflorescence 1 inch long, covered with long loose deep green rugose sheaths. Raceme 5 inches long, flowers crowded very shortly stalked numerous. Bracts minute spathaceous. Calyx

tubular 3 lobed, lobes caudate hairy 1¼ inch long, glabrous except at the cuspidate tip, orange. Corolla lobes equally long linear oblong orange. Lip as long as the anther, deeply split into two linear lobes for nearly all its length lobes obtuse crimson with a yellow edge. Anther oblong pale yellowish with a small ovate crest, filament broad, edges involute towards the lip and forming a tube with it, pinkish yellow, with two subulate points at the top near the anther. Stylodes forming a shortly 3 lobed pale violet ring. Style stout, stigma obcuneate, upper lip longer than the lower and incurved. Base of filament in the tube with a large tuft of silky hairs. Ovules numerous.

Johore: In thick low swampy forest at Kukub. In bud April 1908. Borneo, Sarawak: Bidi (Hewitt Aug. 1907).

This remarkable plant seems most nearly allied to the genus *Riedelia* which is confined to the Papuasian region of the Archipelago.

The separate inflorescence and the corolla-like sepals are very remarkable points of difference, and the broad involuted filament forming a tube with the lip though free from it is very curious. I only found one plant of it in bud.

The woods in which this plant occurs are remarkable in many ways. The soil consists of nothing but dead and rotten timber and vegetable debris, for a very considerable depth, below and in other parts of the estate there is a great deal of a very greasy stiff clay. The presence of recognisable fruits of the Nipa palm show that this part of the coast was marine at no very distant period. The mangrove swamps and tidal streams seem to have receded and been covered up with a dense wet forest, containing a somewhat peculiar flora. The trees are of very large size, *Cumpasia Malaccensis* being very abundant. The absence of *Nephrodiums Lastreas* and such ferns is very striking, and indeed the

terrestrial ferns common in the clayey woods of Singapore and the greater part of the Singapore flora is not represented, except in the matter of epiphytes. *Calanthe veratrifolia.* A very fine form with unusually grey leaves, *Lepidogyne longifolia* otherwise only known from Penara Bukit in Penang, *Cystorchis purpurascens, Plocoglottis javanica, Nephelaphyllum pulchrum* were among the terrestrial orchids. In some spots the preponderance of Monocotyledons over Dicotyledons was very marked. Thus some parts of the forests consisted of *Phrynium malaccense* and *Ph. hirtum, Donax grandis, Alpinia melanocarpa, Plagiostachys albiflora* n. sp., with several other *Zingiberaceae* not in flower. *Zalacca conferta* and *Wallichiana;* one or two species of *Daemonorops, Calamus pencillatus* and several species of *Pinanga,* and *Nenga Wendlandiana, Oncosperma tigillaria* and *Pholidocarpus Kingianus* a few tree ferns, and some large dicotyledonous trees, formed the rest of the flora. *Schismatoglottis Wallichii* often in great abundance, *Alocasia longiloba, Homalomena rostrata* represent the aroids.

The immense mass of vegetable debris forming the soil to a considerable depth, without any apparent mixture of mineral matter, not a pebble or fragment of stone being visible over the whole of this area, suggests that the tertiary coal deposits of Borneo and Labuan have had some such origin as this.

G. rubra, n. sp.

Rhizome slender with strong rather stout roots. Stem slender 14 inches long $\frac{1}{8}$ inch through. Leaves narrow lanceolate caudate tapering gradually at the base to a short petiole, glabrous above, pubescent on the back especially on the mid-rib 9 inches long $1\frac{1}{8}$ inch wide, ligule oblong rounded entire, sheaths ribbed with transverse ribs. Raceme 3-6 inches long erect from the rhizome, on a short peduncle 1-$1\frac{1}{2}$ inch long covered with lax sheaths. Flowers red, on slender erect pedicels 1 inch long. Bracts very small ovate pubescent. Calyx $\frac{1}{4}$ inch

long with three triangular caudate lobes. Corolla tube but little longer, lobes linear oblong obtuse slightly pubescent and hooded at the tip. Lip deeply bifid into two narrow linear blunt lobes for half its length basal portion linear with a strong median keel, free from the filament except near the base. Anther oblong curved, with the cells slightly diverging at the tip, appendage very short rounded ovate, filament below the anther for some way linear flat fleshy, then winged widely with the staminodes in the form of two short triangular subulate processes. Style and stigma about as long as to the tip of the appendage.

Borneo, Sarawak: at Quop (Hewitt, March 1908). Flowers red.

This species differs from the preceding in its much smaller size, short racemes of long pedicelled flowers, and colour. The wings of the filaments, evidently the attached staminodes do not reach as high in this species as in the other, where they are adnate to the anther. The lip is not split so far down and is free for a longer distance.

Alpinia vittata, Hort. Bull. Nicholson Gard. Dict. 54. pl. 63. *Costus Zebrinus,* Hort.

Stems rather slender about 6 feet tall, leafy. Leaves lanceolate acuminate glabrous narrowed at the base not petioled, fifteen inches long and three inches across, green striped longitudinally with white, ligule short entire truncate edges ciliate, pink. Raceme terminal many flowered, 3 inches long rather lax, rachis white. Bracts about seven not imbricate, elliptic rounded at the top hardly narrowed at the base, glabrous pink half an inch long and wide, shortly mucronate, with a scarious edge. Flowers 1 to each bract white. Ovary glabrous obovoid ¼ inch long polished. Calyx tubular ¾ inch long, shortly split on one side, with three short teeth on the other. Corolla tube hardly longer than the calyx lobes oblong half an inch long, truncate hooded not expanding, all

white. Lip as long oblong fleshy slightly tapering to the blunt tip, concave with a median depressed line quite entire except that occasionally there is a short tooth on one side. Filament of stamen adnate below the anther to the lip and forming a tube with it. Anther cells oblong white narrow. Connective very thick fleshy ending above in an irregularly dentate thick appendage. Style shorter than connective. Stigma thick and wide with a transverse slit. Stylodes forming a complete circle with numerous vertical grooves.

New Ireland (Micholitz).

This plant has long been in cultivation for its ornamental foliage. I saw it in Ceylon Botanic Gardens in 1888, and it appears to have been introduced before that. It was named *Castus zebrinus* in Ceylon. Probably *Alpinia albolineata,* Williams Cat. 1880 is the same thing. The flowers do not appear to have ever been described nor has any proper description of the plant ever been published. It is only mentioned in Schumann's v. *Scitamineae* in the P*f*lanzenreich. It is best I think to refer it to the genus *Alpinia* though it differs from typical species of that genus in the entire lip of the same shape as the corolla lobes but more fleshy, and the prolongation of the very thick connective into a crest behind the anther, and the lip connate with the filament up to the anther.

A. grandiceps, n. sp.

A stout plant, stem over ¼ inch through. Leaves oblong lanceolate caudate acuminate, base long acuminate into a distinct petiole, blade 30 inches long, petiole 4 inches long subterete, width of blade 3 inches finely appressed pubescent on both surfaces, petiole pubescent, ligule oblong 3 inches long hairy on the edge, sheath pubescent. Capitulum subterminal 4 inches through nodding, outer bracts lanceolate acuminate papery 4 inches long, ribbed pubescent, edges silky hairy, ovate.

Floral bracts tubular bilobed, lobes ovate triangular, strongly ribbed pubescent, containing 5 flowers, inner ones contained in similar but smaller bracteoles. Calyx broad tubular 3 lobed, lobes ovate subobtuse, half an inch long apparently red. Corolla tube hardly longer, lobes broadly oblong keeled, upper one hooded yellow. Lip rather longer cymbiform edge crisped and curled, fleshy "veined with red brown below the throat." Stamen rather short, filament broad linear, anther lobes thick and fleshy unappendaged. Fruit capitulum very large, six inches through. Capsule glabrous hairy an inch long, crowned with the persistent calyx tube.

Sarawak: Kuching (Hewitt).

This fine plant is closely allied to *Alpinia capitellata*, Jack. and *A. javanica*, Bl. but a very much larger plant.

Zingiber longipedunculatum, n. sp.

Stem stout. Leaves lanceolate acuminate caudate narrowed to the base, widest about the middle, slightly pubescent at the base otherwise glabrous 12 inches long 2 inches wide, ligule rounded $\frac{1}{5}$ inch long pubescent, sheath 4 inches long pubescent. Scape peduncle 12 inches long stout covered with oblong truncate sheaths tubular at the base 2 inches long, about 5. Spike cylindric acuminate, base not narrowed, 6 inches long 1 inch through. Bracts ovate obtuse with a scarious edge, pubescent, I inch long $\frac{1}{2}$ inch wide. Corolla tube thick, lobes lanceolate acuminate acute $\frac{1}{2}$ inch long. Lip broad. Stamen hardly longer than corolla. Anther thick, appendage, curved narrowed to a long point. Style stout, stigma broad flattened triangular with long hairs on the edge.

Sarawak (J. Hewitt).

Z. chryseum, n. sp.

Stems tufted about 6 feet tall stout. Leaves oblong lanceolate caudate dark green paler beneath glabrous,

base rounded broad, sessile, 18 inches long, 3¾ to 4 inches wide, ligule very short rounded entire. Flower spikes cylindric acuminate, 7 inches long on a peduncle of the same length covered with loose sheaths, all bright lemon yellow. Bracts ¾ to½ an inch across, rounded glabrous. Inner bracts oblong acute 2 inches long. Calyx spathaceous entire, mouth obliquely elliptic 1 inch long. Corolla tube 2 inches long, lobes lanceolate acuminate over an inch long creamy white. Lip trilobed, side lobes erect rounded, mid-lobe oblong obtuse entire, the same colour as the petals and nearly an inch long. Anther an inch long with the long curved appendage.

Singapore: Stagmount, in thick woods. In flower April 1908.

This superb species was certainly quite a surprise. I had many times explored the Stagmount woods, but had never came across this plant although I had been several times close to where this time I discovered it. It belongs to the same group as *Z. gracile,* Jack. and *Z. Griffithii,* but is very distinct in its brilliant yellow spikes, those of all the others of this group being pinkish red. It is much larger in all its parts than any other species of this section here except *Z. puberula,* Ridl. which rivals it in height of stems at least. In flower spike and flower this plant is bigger than any of this section. Its deep green shining leaves and the numerous bright yellow spikes make it the most attractive of its group.

Plagiostachys albiflora, n. sp.

A tufted plant about six feet tall. Stems several rather swollen at th ebase and reddish, ½ an inch through. Leaves lanceolate caudate narrowed at the base to the petiole, 13 inches long 3 inches wide, glabrous, petiole 2 inches long, ligule ¼ inch long deeply cleft into two rounded lobes. Spikes from near the base of the stems oblong obtuse, solitary or three together 2 inches long, 1½ inch thick. Flowers densely crowded. Bracts ob-

long pectinate, as long as the calyx tube pink at the base, brown above. Calyx lobes unequal acute ovate very thick and fleshy. Petals lanceolate acute, the upper one hooded white tipped with pink. Lip obovate hairy at the base apex bifid with two short points, bright yellow with horizontal red streaks running from the edges inwards towards the centre. Stamen white, anther broad pubescent at the base, filaments broad. Staminodia not visible. Stylodes as in *Pl. lateralis* but with several distinct lobes. Fruit elliptic obovate obscurely triquetrous, apex flat depressed with a circular scar of the perianth, dull red pulpy at first ½ inch long, pericarp becoming eventually leathery, 3 celled. Seeds 12 very small ⅛ inch long black ovate smooth.

Johore: Dense wet woods at Kukub. In flower April 1908.

Altogether smaller than *Pl. lateralis,* Ridl. with white flowers, and a differently shaped lip yellow marked with red. The inflorescence is lower down on the stem and quite near the base.

Palmae.

Plectocomia minor, n. sp.

Leaf as sent 4 feet long, petiole 8 inches, flagellum 2 feet, sheath with a few small thorns on the edge, thorns acicular ⅛ inch long, petiole with a few distant short thorns, back rounded channelled above; leaflets elliptic lanceolate in threes below in alternate pairs above, base narowed subpetioluled, apex with a long slender point, many nerved, no distinct mid-nerve, 4-6 inches long 2 inches across filiform point 3 inches long or less, rachis with distant solitary hooks, flagellum with clusters of hooks 1 inch apart. Fruit spikes 2 feet long. Bracts oblong apex blunt 2 inches long 1½ inch wide. Rachis pubescent. Fruit 3-4 in a bract as large as in *P. elongata.* Bracteole triangular lanceolate. Pedicel stout angled distinct. Sepals large ovate obtuse. Petals

narrow lanceolate smaller. Fruit subglobose long-beaked, scales dark brown longer than broad acute, lanceolate hairy on edges and tip, tip hairs elongate up-turned.

Sarawak: Santubong (Hewitt).

A remarkably small species for this genus of gigantic rattans.

Ceratolobus discolor, Becc.

Mr. Hewitt sends the termination of a stem with spathe and spadix of what appears to be this species. The stem is little armed. The bud surrounded by a dry brown sheath lanceolate over a foot long and 2 inches wide, acuminate. The young leaf has a stout flagellum with hooks in threes, and there are two flagella one stout bearing one or two abortive leaflets at the base, the other then slender and without leaflets. Spathe 18 inches long lanceolate ending in two long stiff points, smooth brown about 4 inches across. Spadix 9 inches much branched with slender branches and distant flowers. Spathels small dilate upwards with a short lanceolate limb. Calyx saucer-shaped with three short points. Petals ovate stiff connate at base, large. Ovary covered with brown glistening scales.

Sarawak: Batu (Hewitt). This plant hiterto has only been known from a leaf obtained at Kuching. The flowers have not previously been described.

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